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PROCEEDINGS
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THE GENERIC NAMES OF THE NORTH
AMERICAN SKUNKS.

BY ARTHUR H. HOWELL.

Dr. J. A. Allen, in a recent paper on 'The Generic Names of the *Mephitinae*',* has presented a careful study of the nomenclatural questions relating to the genera *Mephitis*, *Spilogale*, and *Chincha*, reaching the conclusion that the changes in the application of these names which I proposed in my recent revision of the genus *Chincha*† rest on a faulty basis.

It is of course very much to be regretted that a generic name should ever have to be changed, and the case of the North American skunks, where the name of one genus is transferred to another is especially deplorable. It was on this account that I not only exercised great care in the investigation of the question, but also, before suggesting so important a change, invoked the aid of several of our best mammalogists, including Dr. Allen.

The change, however, then appeared inevitable, and after a very careful reading of Dr. Allen's paper, and a thorough rehearsal of all the evidence bearing on the question, I am still compelled to hold the same view.

*Bull. American Museum Nat. Hist., XIV, pp. 325-334, Nov. 12, 1901.

†North American Fauna, No. 20, Aug. 31, 1901.

It seems wise, in view of the radical differences between Dr. Allen's position and my own, to go over the evidence again in greater detail than was possible or necessary in my former paper. In order to facilitate comparison of the two arguments, I shall adopt the order of presentation used by Dr. Allen, and at the close give a summary of my own views.

The Genus *Mephitis*.

The whole question of the application of the name *Mephitis* hinges on the identification of Cuvier's '*conepate*'. If as Dr. Allen concludes, this is not one of the little spotted skunks, but the common two-striped skunk of the eastern United States, no further argument is required to support his contention, and the so-called '*restrictions*' of Gray and Lichtenstein have no bearing on the question. For in that event the genus is not composite, but is composed of two congeneric species.

But Dr. Allen's position seems to be untenable. The '*conepate*' of Cuvier, although doubtless the equivalent of Buffon's '*conepate*,' is based primarily on *Viverra putorius* Linn., since Cuvier refers to Linnæus and to no other author; and *Viverra putorius* of Linnæus is admittedly based on Catesby's '*pol-cat*' of Carolina, which he calls *Putorius americanus striatus*. In order to make the matter clear, I shall endeavor to show that Catesby's animal is referable to a species of *Spilogale*, and shall then trace the subsequent history of the species down to Cuvier's time.

The '*pol-cat*' was described and figured by Catesby in his '*Natural History of Carolina*,' published in 1731, this being the first account of any North American skunk. The description was prepared from his personal observation during a sojourn of several years in South Carolina and the adjacent portions of Georgia. He appears never to have visited Florida. Since it is important to show that he traveled in a region where *Spilogale* occurs, I will quote his brief itinerary, as follows:

"The inhabited parts of *Carolina* extend West from the Sea about 60 Miles, and almost the whole Length of the Coast, being a level, low Country. In these Parts I continued the first Year * * * *. I then went to the Upper uninhabited Parts of the Country, and continued at and about *Fort Moore*, a small Fortress on the Banks of the River *Savanna*,

which runs from thence a Course of 300 Miles down to the Sea, and is about the same Distance from its Source, in the Mountains. I was much delighted to see Nature differ in these Upper Parts, and to find here abundance of Things not to be seen in the Lower Parts of the Country; this encouraged me to take several Journeys with the *Indians* higher up the Rivers, towards the Mountains * * * *."

As Mr. Bangs has shown, *Spilogale* probably does not occur in the coast region of South Carolina or Georgia,* but that both the large and small skunks occupy the mountainous portions of North Carolina is well known. It is entirely probable, therefore, that they are both found on the upper courses of the Savannah River. It was doubtless during one of his excursions 'up the rivers towards the mountains' that Catesby saw the animal which served as the basis of his drawing. A copy of his plate is presented with this paper. His description of the 'Pol-Cat' is as follows:

"This in Shape is not unlike our common Polcat, except that the Nose of this is somewhat longer: The Colour of all I have seen is black and white, tho' not always alike marked; this had a List of white, extending from the hind-part of the Head, along the Ridge of the Back, to the Rump, with four others, two on each Side, running parallel with it."

Following this is an account of the characteristic habits of the skunk.

Although neither the figure nor the description furnishes an accurate portrayal of either of the two skunks inhabiting the region where he travelled, the reference of both plate and description to *Spilogale* seems unquestionable. The chief discrepancy lies in the continuity of the white stripes, and in the statement that there are *five* stripes, the median one being on the ridge of the back. The real animal shows *four* parallel stripes on the back (two on either side of the median line), broken on the hinder parts of the body into numerous irregular markings, while lower down on each side an additional stripe runs parallel to the others for a part of their length. (See plate.)

When we consider that Catesby's drawing was probably made from his recollection of an animal seen afield, perhaps at some distance, and probably in the dusk of twilight, the differences between the figure and the real animal become unimportant. It

*Proc. Boston Soc. Nat. Hist., XXVIII, p. 224, 1898.

must be remembered that it is not necessary to show that his figure is a correct representation of a *Spilogale*: the question is simply, could it have been based on anything else? Had he seen one of the large skunks, it is hardly conceivable that he would have represented an animal with *two divergent* stripes as having *five parallel* ones.

The large skunks of the highlands of Carolina are extremely variable in color, some being almost entirely white on the upper surface of the body and tail, others nearly all black; in no case, however, are there more than two white stripes. The little spotted skunks of the same region, though subject to slight variation, always have the four parallel white stripes. The accompanying plate is presented in order to bring out clearly the resemblance of Catesby's figure to the little spotted skunk and its dissimilarity to the two-striped skunk. The figures of the skins (made from photographs) represent the average color patterns of the two species occurring in the region in question.

In view of the foregoing evidence, there seems to be no reason for doubting that Catesby's Polecat was based entirely on the little spotted skunk occupying the highlands of western Carolina, viz. *Spilogale ringens* Merriam. If the Florida species should later be shown to range northward as far as South Carolina, Catesby's animal may then be properly referred to that form.

Since the existence of a species of *Spilogale* in the region where Catesby traveled became known to naturalists, no one, so far as I know, excepting Dr. Allen, has ever questioned the applicability of Catesby's species to some member of that genus.

Even if it be admitted that there is room for some difference of opinion as to the identification of Catesby's species, it is customary in such cases to adopt the decision of the first author who revises the group. The name *Mephitis putorius*, based on Catesby's species, was first used by Dr. Coues, who applied it in a broad sense to all the little spotted skunks of North America.* Some years later, the name was definitely fixed by Dr. Merriam to the Florida species.† Its use by these two authors would seem to be sufficient to establish the name on a firm basis. The only way in which it can now be overthrown is to

*Fur-bearing Animals, p. 239, 1877.

†North American Fauna, No. 4, p. 7, 1890.

show beyond question that it cannot possibly apply to a *Spilogale*, which has not been done.

Pursuing the later history of Catesby's species, we discover that his account influenced strongly every author who treated the North American skunks down to the time of Cuvier.

Kalm, during his travels in Pennsylvania and New Jersey, learned of the presence of skunks in that region, where we know *Spilogale* does not occur, but his account of them,* as Dr. Allen says, is drawn largely from Catesby, and scarcely at all from personal observation. Furthermore, he identifies his Polecat with Catesby's.

Linnaeus, the next author to treat of the North American skunks, described, in the 10th edition of his *Systema Naturae* (1758), under the name *Viverra putorius*, an animal having four white stripes. He cited Catesby and Kalm.

Buffon, in 1765, described the same animal under the name of '*le cone pate*,' attributing to it five white stripes. His plate is evidently a copy of Catesby's (a point not specifically mentioned by Dr. Allen), and he quotes a long extract from Kalm, choosing his account, rather than Catesby's, probably because it is fuller.

Schreber, in 1776, under the Linnæan name *Viverra putorius*, reproduced Catesby's plate again, and quoted Linnaeus, Catesby and Kalm.

Finally in 1798, Cuvier adopted Buffon's name '*le cone pate*' for a five-striped skunk which he identified with *Viverra putorius* Linn., and renamed *Mustela putida*.†

It will be seen from this résumé that the basis of Cuvier's '*cone pate*' is primarily Catesby's Polecat, which has been shown to be a species of *Spilogale*. The references to Kalm are purely secondary, and should be accorded little weight, in view of the certain fact that Linnaeus, Buffon, and Cuvier all described a species having five (or four) white stripes, and obviously based on Catesby's figure. Not a single element of the two-striped skunk appears anywhere in this chain except in Kalm's account, where owing to the absence of *Spilogale* from the region in

*Travels, Vol. II, p. 378, Stockholm, 1756.

†The reason he excluded *Viverra zorrilla* from his group of *mouffettes* is because he considered it to be a weasel from the Cape of Good Hope, and not a skunk at all.

which he travelled, the reference to the large skunk is implied.

The second species in the original genus *Mephitis*, viz.: '*le chinche*,' *Viverra mephitis*, is admittedly one of the large North American skunks, the only question raised by Dr. Allen being the proper application of the specific name.

Hence, as stated in my previous paper, *Viverra mephitis* having been removed by Lesson in 1842 to form the genus *Chincha*, the remaining species, *V. putorius* (here shown to be applicable to the species now known as *Spilogale ringens*) becomes, by elimination, the type of the genus *Mephitis*.

The question of the type is not affected by the revisions of the genus by Gray (1837) and Lichtenstein (1838), for the reason that neither of the two groups composing the original genus was removed by them to another genus. Even on the assumption that Cuvier's first species (*V. putorius*) is not a *Spilogale*, neither Gray's revision nor Lichtenstein's is a 'restriction' or 'dismemberment' of the *original* genus (which according to this view contains but one group) but is simply a removal into new genera of species which had been associated with *Mephitis* by later authors.*

The Genus *Chincha*.

The applicability of the name *Chincha* to the large North American skunks is not questioned by Dr. Allen, except that he considers *Chincha* a synonym of *Mephitis*; but since he has opened the way for a fuller discussion of the evidence on this point, it may be well to refer to several facts which have come to my attention since the publication of my paper on the genus.

These facts relate to the basis of Lesson's type species, *Chincha americana*. A critical re-examination of the references cited under this name indicates that the last—that to F. Cuvier—is the most important, rather than the first—'*Viverra mephitis* Erxl.'—which, on account of its prominent position, I rather hastily assumed to be the one on which Lesson relied as the basis of his type. The importance of the reference to Cuvier is

*In this connection it may be well to call attention to a *lapsus penne* in Dr. Allen's paper, where on page 328, in the 6th and 7th lines from the top of the page, the words 'first' and 'second' should be interchanged.

shown by Lesson's note that Cuvier's plate is a 'good figure' of the species he is treating ('B. fig.'=*Bonne figure*), and by his assignment of 'Louisiana' as the type locality, that being the source of the specimen recorded by Cuvier. An examination of Cuvier's plate shows that it is indeed a 'good figure' of one of the North American two-striped skunks, and in the text we find the statement that the figure was based on a specimen which the elder Cuvier had in captivity, and which came from Louisiana.

In view of this certain evidence, it seems best to consider that *Chincha americana* Lesson, which is the type of the genus, was based largely on the animal described by F. Cuvier, which is referable to *Chincha mesomelas* (Licht.) This conclusion, of course, does not affect the validity of the name *Chincha*, but simply serves to fix with greater certainty the basis of the type.*

***Viverra mephitis* Schreber.**

Dr. Allen has made a very clear presentation of the facts bearing on the tenability of this name. His conclusion, however, that it should be referred to *Mephitis macroura* Licht., seems to be based on a misapprehension of the facts.

The members of the *macroura* group (Subgenus *Leucomitra*) as I pointed out in my previous paper, are usually either wholly white or wholly black on the back, and in any case *never* have the divided stripe of the United States species (subgenus *Chincha*). The tail, in the majority of specimens, equals or exceeds the head and body in length, and never falls below 85 per cent of the combined length of head and body. Buffon's figure (of which Schreber's is a copy) portrays an animal with two broad divergent stripes separated by a small area of black; the tail is said to be *half* as long as the head and body.

*In this connection, I may take occasion to publish a name which escaped me while preparing the list of specific names referable to the genus *Chincha*. (N. Am. Fauna, No. 20, p. 15). To that list should be added *Mephitis vulgaris* F. Cuvier, Hist. Nat. Mamm., VII, Table Gen. et. Method, p. 3, 1842, based on the plate and description of '*le Chinche*,' published in a previous volume of the same work (Hist. Nat. Mamm., III, livr. 28, 1821). Cuvier says in this connection: "This animal is the *Viverra mephitis* of the systematic catalogues; the name should be changed, since *Mephitis* has become the generic name."

It is evident, therefore, that the specimen on which the description was based came from some part of the United States or Canada, and not from Mexico. The figure can be exactly matched by specimens from the eastern States, and also by specimens of *estor* from Arizona. It could hardly be supposed to have come, however, from the latter region, and the most logical conclusion is that it was taken somewhere in the eastern part of the United States or Canada.

The amount of white on the back is excessive for the Canada skunk, so far as our present limited knowledge of the species indicates. The short tail, however, is strikingly diagnostic, for this is a character possessed by no other eastern species. In the absence of any definite knowledge of the origin of Buffon's specimen, it seems wise therefore to fix the name *mephitis* to the Canada skunk. If the name be rejected as unidentifiable, *mephitica* of Shaw would have to be rejected for the same reason, for Shaw's name has exactly the same basis as Schreber's, viz. Buffon's '*chinche*'. The name *mephitis*, although accredited to Linnæus, is not his name, for he wrote *memphitis*, a word of quite different meaning; furthermore, Schreber's description, as shown by Dr. Allen, is based on Buffon, rather than on Linnæus.

Summary.

1. The original genus *Mephitis* Cuvier, contained two species, the first of which (*Mustela putida*) is a little spotted skunk, the second (*Mustela mephitis*) a large two-striped skunk.

2. *Mustela putida* Cuvier, is based on *Viverra putorius* Linn., and therefore primarily on Catesby's *Putorius americanus striatus*, which is clearly referable to the little spotted skunk of the highlands of Carolina, i. e., *Spilogale ringens* Merr. Linnæus's reference to Kalm, since it is wholly secondary to the reference to Catesby, should have little weight.

3. Gray in naming *Conepatus*, and Lichtenstein in naming *Thiosmus*, did not restrict the genus *Mephitis*, but simply separated groups which had been associated with *Mephitis* by authors other than Cuvier.

4. When *Chincha* was proposed by Lesson, the original genus *Mephitis* had never been divided, nor had the type in any way been fixed. Hence his selection of the second group, rep-

THE TWO GENERA OF CAROLINA SKUNKS IN COMPARISON WITH
CATESBY'S 'POL-CAT'.

resented by the species *Viverra mephitis*, to form a new subgenus was perfectly legitimate.

5. The type of the genus *Mephitis* was fixed, not by Lesson's assignment of the name to his third subgenus, but by the action of the principle of elimination, through the removal of *Chincha* from the original genus.

6. *Mustela putida* Cuvier, 1798, does not preoccupy *Mephitis putida* Boitard, 1842, for the reason that the former name, having been shown to be based on Catesby's Polecat rather than Kalm's, is applicable to a species of *Spilogale* (*Mephitis* as restricted) while Boitard's name belongs to the large skunk of New Jersey—a species of *Chincha*.

7. *Viverra mephitis* Schreber, cannot, on account of the color pattern and short tail of the type specimen, relate to any species of the subgenus *Leucomitra*. Its restriction to the skunk of eastern Canada is entirely within the bounds of a reasonable interpretation of the probable origin of the specimen on which the name was based.

EXPLANATION OF PLATE.

(From photographs).

- Fig. 1. Skin of *Chincha putida*, from Washington. D. C.
Fig. 2. Skin of *Spilogale ringens* from Roan Mtn., N. C. (Top view.)
Fig. 3. Skin of *Spilogale ringens* from Roan Mtn., N. C. (Side view.)
Fig. 4. Reproduction of Catesby's plate of the 'pol-cat'.

PROCEEDINGS
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DESCRIPTION OF A NEW WEASEL FROM ALABAMA.

BY ARTHUR H. HOWELL.

Weasels are exceedingly scarce and very difficult to obtain in the Southern States. Within the past year three specimens, representing both winter and summer pelage, have been received from Alabama by the Biological Survey, and these seem to represent an undescribed subspecies, closely related to *Mustela peninsulæ* (Rhoads).

The acquisition of this material is due to the energy of Mr. Lewis S. Golsan of Autaugaville, and Mr. Bennington King of Leighton, who, at my suggestion, made special efforts to obtain specimens of the Alabama Weasel.

The new race may be characterized as follows :

***Mustela peninsulæ olivacea* subsp. nov.**

Type from Autaugaville, Ala. ♂ ad. No. 180,802, U. S. National Museum, Biological Survey Collection. December 22, 1912. Collected by L. S. Golsan. Original No. 144 (9988x).

Characters.—Similar to *M. peninsulæ*, but color in winter pelage decidedly paler and more olivaceous; yellowish of feet less extensive.

Color.—Type (winter pelage): upperparts nearest to buffy-brown (of Ridgway); head slightly darker, about Natal brown; a small patch of white on each side of face behind the eyes, and a few flecks of white on top of nose; color of upperparts covering about half of front feet, the remainder, including toes, being cream-buff; toes of hind feet tinged with whitish; black tail tip about 70 mm. in length; underparts straw-color, irregularly blotched with cartridge-buff.

Summer pelage.—(Specimens from Leighton, Alabama): upperparts mummy-brown; head Vandyke brown with a few white flecks between the eyes; underparts cartridge-buff to colonial buff; color of upperparts encroaching on the belly; toes of front feet cream color; those of hind feet tinged with whitish.

Skull.—Similar to that of *peninsulæ*, with broad braincase, widely spreading zygomata, large post-orbital processes, broad and much inflated audital bullae, broad inter-ptyergoid fossa and heavy molars. The bullae are of essentially the same shape as those of *peninsulæ* but are not quite so high.

Measurements.—Type (♂ ad.): total length, 420; tail vertebrae, 140; hind foot, 50. Skull: occipito-nasal length, 48; basilar length, 46.8; palatal length, 21.6; mastoid breadth, 25.3; zygomatic breadth, 29.3; breadth across post-orbital processes, 14; least interorbital breadth, 9; audital bullae, 15 x 7.6; width of inter-ptyergoid fossa, 3.5.

Remarks.—On account of the scarcity in collections of *Mustela peninsulæ peninsulæ*, the range of color variation in that race is not known. The two winter specimens before me, however, differ widely, the palest one (No. 9379, Coll. Acad. Nat. Sci. Phila., Tarpon Springs, Florida) being about Verona-brown (of Ridgway), the other a much darker shade of brown. Both are darker and browner than the type of *olivacea*. The summer pelage of *peninsulæ* is not definitely known, but a worn specimen from Hernando Co., Florida, is decidedly lighter than the specimens of *olivacea* from Leighton. The latter do not differ much in color of the upperparts from certain specimens of *noveboracensis*, but the underparts are a duller shade of yellow.

This weasel may be instantly recognized as distinct from *Mustela noveboracensis* by its striking skull characters. The latter species ranges down the Alleghenies to northern Alabama, as evidenced by a typical specimen which I collected on Lookout Mountain near Fort Payne, in July, 1911.

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DESCRIPTIONS OF TWO NEW BIRDS FROM ALABAMA.

BY ARTHUR H. HOWELL.

Recent field work conducted by the Biological Survey in Alabama has resulted in the discovery of undescribed forms of the common crow and of the towhee. Both of these new forms reach the extreme of differentiation on the Gulf coast, the towhee ranging nearly throughout Alabama and the crow still farther north to southern Illinois and the District of Columbia. One interesting fact developed by these studies is that neither of the new races is closely related to the forms occupying peninsular Florida, nor are they strictly intermediate between the latter and the northern races of the species. The crow is decidedly smaller than the Florida Crow while the towhee is much larger than the Florida Towhee and slightly larger even than the northern race.

***Corvus brachyrhynchos paulus* subsp. nov.**

SOUTHERN CROW.

Type from Bon Secour, Alabama. ♀ adult, No. 204,882, U. S. Nat. Mus., Biological Survey Collection. October 24, 1908, A. H. Howell. Orig. No. 741.

Characters.—Decidedly smaller than *Corvus b. brachyrhynchos*, with a much slenderer bill. Nearest to *Corvus b. hesperis* but with shorter wing and slightly larger bill.

Distribution.—Alabama, Mississippi, Louisiana, southeastern Texas, Georgia (?), South Carolina, and north to the District of Columbia and southern Illinois.

Measurements.—Type (♀ adult): wing, 273; tail, 165; exposed culmen, 46; depth of bill at nostrils, 16.5; tarsus, 54; middle toe, 34. Average of 4 adult males from Autaugaville, Alabama: wing, 290 (285-300); tail, 170 (166-178); exposed culmen, 51 (47-54); depth of bill at nostrils, 17.5 (17-18); tarsus, 60.5 (60-61); middle toe, 33.9 (31-36.5). Average of 3

adult females from coast of Alabama: wing, 274.3 (270-280); tail, 162.7 (155-168); exposed culmen, 45.8 (45.5-46); depth of bill at nostrils, 16.2 (16-16.5); tarsus, 57 (54-59); middle toe, 33 (32-34).

Remarks.—This new race of the common crow seems to be fully as well characterized as the other recognized subspecies. Although the bird is nearest to *C. b. hesperis* in size, its range apparently is separated from the range of *hesperis* by a strip of country in central Texas in which no crows breed. Specimens examined from east Texas are apparently intermediate between *brachyrhynchos* and *paulus*. A series of 9 breeding birds from the District of Columbia and vicinity are also somewhat intermediate, but much nearer to *paulus*. This form shows no approach to *pascuus*, the resident bird of south Florida, which has much larger bill and feet. A breeding male from Christchurch Parish, South Carolina, is typical *paulus* and a breeding female from Mt. Carmel, Illinois, is apparently nearest to this form.

Since *Corvus brachyrhynchos* has now been separated into five races, it seems desirable to fix the type locality of the original form. Brehm, in describing the species,* attributes it to North America, without mention of a definite locality. The measurements given by him (length, 19½ inches; tail, 8¼ inches; bill 23 lines) indicate a large bird and there is every probability that his specimen came from northeastern America. The large form is known to occur throughout New England and the type locality is hereby fixed at vicinity of Boston, Massachusetts.

Specimens examined.—Total number 24, from the following localities:

Alabama: Autaugaville, 6; Bayou La Batre, 1; Bon Secour, 1; Florence, 1; Whistler, 1.

Mississippi: Fayette, 1.

Louisiana: Tallulah, 1.

Texas, Sour Lake, 1.

South Carolina: Christchurch Parish, 1.

Virginia: Falls Church, 5; Addison, 1.

Maryland: Bladensburg, 1; Garrett Park, 1.

District of Columbia: Washington, 1.

Illinois: Mt. Carmel, 1.

* Beiträge zur Vögelkunde, II, 1822, pp. 37, 56.

MEASUREMENTS OF 23 SPECIMENS OF *Corvus brachyrhynchos paulus*.

Museum No.	Sex	Locality	Date	Wing	Tail	Culmen	Depth of bill at nostrils	Tarsus	Middle toe
230434	♂	Autaugaville, Alabama	September 17, 1911	288	170	53	17.5	61	36.5
230895	♂	"	October 15, 1911	285	168	54	17.5	60	33
230946	♂	"	November 5, 1911	289	166	50	18	60	31
230948	♂	"	December 22, 1911	300	178	47	17	61	35
238189	♂	Florence, Alabama	May 7, 1912	301	178	49	18	58	31
239530	♂	Fayette, Mississippi	September 24, 1912	296	180	49	17.5	62	31
193309	♂	Sour Lake, Texas	March 20, 1905	298	181	55	18	67	36
193696	♂	Tallulah, Louisiana	February 25, 1904	289	169	53	17.5	64	36
222322	♂	Christchurch Parish, South Carolina	May 5, 1911	295	174	49	17	64	37.5
83914	♂	Fairfax County, Virginia	September 13, 1879	296	178	49	17.5	59	25
234161	♂	Falls Church, Virginia	May 7, 1913	295	176	53	17	61	36
234162	♂	"	May 7, 1913	318	192	49	17.5	59	32.5
234163	♂	"	May 7, 1913	287	166	48	18	58	32
240111	♂	Garrett Park, Maryland	June 13, 1913	298	170	46	17.5	56	35
204882	♀	Bon Secour, Alabama	October 24, 1908	273	165	46	16.5	54	34
230944	♀	Bayou La Batre, Alabama	February 9, 1912	270	155	45.5	16	58	33
230945	♀	Whistler, Alabama	March 11, 1912	280	168	46	16	58	32
230947	♀	Autaugaville, Alabama	January 5, 1912	286	166	48	16.5	62	34
230606	♀	"	September 24, 1911	305	180	50	16.5	60	33
240174	♀	Bladensburg, Maryland	April 8, 1913	297	180	47	16	60	33
234164	♀	Falls Church, Virginia	May 7, 1913	303	180	43	16	60	32.5
239927	♀	Addison, Virginia	May 13, 1913	300	167	48	17	62	35
131508	♀	Washington, District of Columbia	May 9, 1892	298	186	48	17.5	60	36
83915	♀	Mt. Carmel, Ill.	April 13, 1869	297	181	45.5	17.5	57	33

TABLE OF COMPARATIVE MEASUREMENTS OF THE RACES OF *Corvus brachyrhynchos*.*

Males	Wing	Tail	Ex- posed culmen	Depth of bill at nostrils	Tarsus	Mid- dle toe
<i>C. brachyrhynchos</i> <i>brachyrhynchos</i>	321	182	51.5	19.5	62	38
" " <i>pascuus</i>	304	175	51.5	19	62.5	38
" " <i>hesperis</i>	302.5	171	47.5	16.5	57.5	35.5
" " <i>paulus</i> †	290	170	51	17.5	60	33.9
" " <i>caurinus</i>	283.5	163	47	16.5	51	33
Females						
<i>C. brachyrhynchos</i> <i>brachyrhynchos</i>	305	177	48	18	57.5	35
" " <i>pascuus</i>	304	169	51	19	62	38
" " <i>hesperis</i>	295	169.5	45.5	16	55.5	34
" " <i>paulus</i> †	283	167	47	16.3	59	33
" " <i>caurinus</i>	272	153	45	16	48	30.5

Pipilo erythrophthalmus canaster subsp. nov.

ALABAMA TOWHEE.

Type from Spring Hill near Mobile, Alabama. ♀ adult, No. 207,771, U. S. Nat. Mus., Biological Survey Collection. May 8, 1911, A. H. Howell. Original No. 944.

Characters.—Similar to *P. e. erythrophthalmus*, but with larger bill and slightly longer tail; white markings on tail feathers less extensive; sides and flanks averaging paler; females with head, neck, chest, and upper parts more grayish (dark olive-brown instead of Prout's brown); iris red.

Distribution.—Greater part of Alabama excepting extreme northern counties where it grades into *erythrophthalmus*; eastern and western limits of range unknown.

Color.—Females: Upper parts varying from dark olive-brown to clove-brown; top of head somewhat browner (sepia or bistre); throat and chest pale fuscous, shading to bistre; otherwise as in *erythrophthalmus*.

Measurements.—Average of 8 adult males from Alabama: wing, 89 (85–93); tail, 97 (90–101); exposed culmen, 14.9 (14–16); depth of bill at base, 10.2 (10–11); tarsus, 29.9 (28–32) middle toe, 19.9 (19–21.5); length of white spot on outermost tail-feather, 28.7 (26–33). Female (type): wing, 86; tail, 96; exposed culmen, 14; depth of bill at base, 10.3; tarsus, 29; middle toe, 19; length of white spot on outermost tail-feather, 24.5.

Remarks.—This new race may be recognized in either sex by the relatively small amount of white on the tail, as compared with *erythrophthalmus*, and by the large size and red eyes as compared with *alleni*. Females are much more grayish than those of either *erythrophthalmus* or *alleni*. The bird is probably in the main non-migratory, and occurs locally in moderate numbers throughout Alabama and probably adjacent parts of Georgia and Mississippi.

* All measurements, except those of *paulus*, from Ridgway's "Birds of North and Middle America."

† Average of 4 adults from Autaugaville, Alabama.

‡ Average of 5 adults from southern Alabama.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTIONS OF A NEW GENUS AND SEVEN NEW
RACES OF FLYING SQUIRRELS.

BY ARTHUR H. HOWELL.

A study of the American flying squirrels has led to the discovery of a number of unrecognized forms, preliminary descriptions of which are presented herewith. The subgenus *Glaucomys* Thomas,* is believed to be of generic rank and the name is therefore used for all the American species. The large Himalayan species, *Sciuropterus fimbriatus* Gray, referred by Thomas to *Glaucomys*, is here made the type of a new genus. *Sciuropterus* F. Cuvier, 1825, as has been shown by Miller,† is a synonym of *Pteromys* G. Cuvier, 1800‡; the latter name, in my opinion, should be restricted to the small Palearctic species—*volans*,§ *büchneri*, and related forms.

Eoglaucomys genus nov.

Type, Sciuroptera fimbriata Gray (= *Sciuropterus fimbriatus* auct.).

Characters.—Skull essentially similar in general features to that of *Glaucomys*; postorbital processes longer and more strongly decurved; interparietal with antero-posterior diameter much greater than in *Glaucomys*—about two-thirds of the transverse diameter; molariform teeth much as in *Glaucomys*, with comparatively simple structure, but with crown of pm³ divided into two cusps by a distinct sulcus (partially worn teeth

* Ann. & Mag. Nat. Hist., (ser. 8) I, 1908, p. 5 (type *Mus volans* Linn.).

† Proc. Biol. Soc. Wash., XXVII, 1914, p. 216.

‡ *Pteromys* G. Cuvier, Leçons Anat. Comp., I, 1800—Type, *Sciurus volans* Linn. = *Pteromys russicus* auct.

§ Linnaeus (Syst. Nat. ed. 10, 1758) named the European flying squirrel *Sciurus volans* and the American species *Mus volans*; the names are not homonyms, therefore, and in recognizing the two animals as generically distinct, it will be necessary to use the name *Pteromys volans* (= *P. russicus* of Tiedemann and later authors) for the Russian animal, retaining *Glaucomys volans* for the small species of eastern North America.

showing two closed triangles). *Soles partially naked, bearing five pads*—four at the bases of the toes, and *a large metatarsal pad*, elliptical in shape, situated about midway between the heel and the base of the toes;* tail slightly flattened, full and bushy, narrowing decidedly towards the tip; ears large, subtriangular in shape, more acutely pointed than in either *Glaucomyss* or *Pteromyss*.

Remarks.—The genus, so far as known, is monotypic. In external appearance it bears no close resemblance either to the American *Glaucomyss* or to the small Palaearctic flying squirrels of the genus *Pteromyss*, being readily distinguished from either by the characters of the soles, as well as by large size and bushy, tapering tail. In cranial characters, the resemblance to *Glaucomyss* is certainly striking, as Mr. Thomas has pointed out,† but in assigning the animal to the latter group, he evidently overlooked the important structural differences in the anterior premolar and in the plantar tubercles.

***Glaucomyss volans saturatus* subsp. nov.**

Type from Dothan, Alabama; adult female, No. 178,366, U. S. Nat. Mus. (Biological Survey collection); collected March 13, 1912, by A. H. Howell; original number 1960.

Characters.—Similar in size and skull characters to *volans*, but upperparts darker at all seasons; toes not conspicuously whitened in winter. Compared with *querceti*: Upperparts darker, face grayer (less buffy), hind feet grayer (less brownish), and audital bullae smaller.

Measurements.—Average of 12 adults from southern Alabama: Total length, 226; tail vertebrae, 100; hind foot, 30. Skull (of type): Greatest length, 34.9; zygomatic breadth, 20.4; mastoidal breadth, 17.4; interorbital breadth, 7.2; length of nasals, 9.5; alveolar length of maxillary tooth row, 6.5.

Remarks.—This dark race of *volans* occupies the Gulf States, excepting Florida and Texas (and perhaps Louisiana), extending north to eastern Tennessee and western North Carolina and west to Arkansas and Oklahoma. It differs in color from all the surrounding races and from *querceti* and *texensis* also in skull characters.

***Glaucomyss volans texensis* subsp. nov.**

Type from 7 miles northeast of Sour Lake, Texas. Adult male, No. 136,400, U. S. Nat. Mus. (Biological Survey collection); collected March 15, 1905, by J. H. Gaut; original number 3480.

Characters.—Similar in size and color to *volans*; upperparts slightly more ochraceous and toes without conspicuous white markings in winter; skull decidedly shorter and relatively broader. Compared with *saturatus*: Colors much paler; skull shorter and broader. Compared with *querceti*: similar in color, but skull shorter, with smaller audital bullae.

* A small, circular, supplementary tubercle appears in some specimens on the outer side of the sole, directly posterior to the pad at the base of the fifth digit.

† Ann. & Mag. Nat. Hist. (Ser. 8), I, 1908, p. 6.

Measurements.—Average of six adults from type locality: Total length, 229; tail vertebrae, 104; hind foot, 30.8. *Skull* (of type): Greatest length, 34; zygomatic breadth, 20.9; mastoidal breadth, 17.2; interorbital breadth, 7.3; length of nasals, 9.2; alveolar length of maxillary toothrow, 6.3.

Remarks.—This subspecies bears a close resemblance to both *volans* and *querceti* in color but differs from them in characters of the skull. It is known from only a few localities, but apparently occupies the humid portion of eastern Texas and portions of Louisiana.

***Glaucomys sabrinus canescens* subsp. nov.**

Type from Portage la Prairie, Manitoba. Subadult female, No. 7663, Field Mus. of Nat. Hist.; collected February 3, 1900, by G. F. Dippie.

Characters.—Similar to *G. s. macrotis*, but much paler, with grayer head and larger skull. Compared with *sabrinus*: Size smaller; upperparts and feet paler; underparts whiter.

Measurements.—Average of two specimens from type locality: Total length, 298; tail vertebrae, 140; hind foot, 38. *Skull* (of type): Greatest length, 38.8; zygomatic breadth, 22.9; mastoidal breadth, 17.6; interorbital breadth, 7.6; length of nasals, 11.2; alveolar length of maxillary toothrow, 7.6.

Remarks.—This is the palest of the races of *sabrinus* and is apparently intermediate in size between *sabrinus* and *macrotis*. By reason of the small number of specimens available, its range can not be defined with exactness, but probably it occupies the thinly timbered portions of southern Manitoba and eastern North Dakota and may range even farther westward.

***Glaucomys sabrinus columbiensis* subsp. nov.**

Type from Okanagan, British Columbia. Subadult male, No. 94,310, U. S. Nat. Mus. (Biological Survey collection); collected May 9, 1898, by Allan Brooks; original number 1214.

Characters.—Similar to *G. s. klamathensis*, but upperparts more vinaceous and tail much darker; much paler than *oregonensis*, both above and below; very similar to *sabrinus*, both in color and cranial characters, but soles of hind feet often yellow (as in *klamathensis*); skull similar to that of *oregonensis*; smaller than that of *klamathensis*, with smaller bullae.

Measurements.—Two specimens (subadult) from Okanagan Lake, B. C., each measured: Total length, 313; tail vertebrae, 143; hind foot, 42. *Skull*: Average of 4 (adult and subadult) from same locality: Greatest length, 41; zygomatic breadth, 24.4; mastoidal breadth, 19.1; interorbital breadth, 7.3; length of nasals, 12.7; alveolar length of maxillary toothrow, 7.8.

Remarks.—This subspecies is most closely related to *oregonensis* of the coast region of Oregon and Washington, intermediates between the two forms occurring at Sumas and Chilliwack, B. C. Intergradation with *fuliginosus*—the form occupying the Cascades—is shown by specimens from mouth of Salmon River, B. C. The present form occupies the low country in the interior of British Columbia and northern Washington.

***Glaucomys sabrinus latipes* subsp. nov.**

Type from Glacier, British Columbia. Adult female, No. 68,753, U. S. Nat. Mus. (Biological Survey collection); collected August 13, 1894, by J. Alden Loring; original number 2111.

Characters.—Similar to *G. s. fuliginosus*, but larger, and upperparts averaging darker and grayer; feet larger and darker colored. Compared with *alpinus*: Size larger; colors darker (more brownish, less drab); underparts darker.

Measurements.—Adult female (type): Total length, 359; tail vertebrae, 161; hind foot, 43; average of 9 adults from Coolin, Idaho, and Stanton Lake, Mont.: 339, 151; 40.6. *Skull* (of type): Greatest length, 44.2; zygomatic breadth, 25.1; mastoidal breadth, 20; interorbital breadth, 8.3; length of nasals, 14; alveolar length of maxillary toothrow, 8.8.

Remarks.—This subspecies is one of the largest of the American flying squirrels, equaling *yukonensis* in external measurements and exceeding it in size of skull. Although evidently closely related to *fuliginosus*, of the Cascades, there is at present no evidence of intergradation with that race. The present form differs widely from *alpinus*, which occupies the eastern slopes of the Rockies in Alberta, and from the much smaller *bangsi* of the Bitterroot and Sawtooth Ranges of Idaho and Montana.

***Glaucomys sabrinus flaviventris* subsp. nov.**

Type from head of Bear Creek, Trinity County, California (altitude 6400 feet). Adult male, No. 13,319, Univ. of Calif., Mus. Vert. Zool.; collected August 13, 1911, by Annie M. Alexander; original number 1775.

Characters.—Similar in size and skull characters to *G. s. lascivus*, but underparts and feet strongly suffused with yellow or buff; similar to *klamathensis*, but smaller, with much smaller audital bullae; underparts more yellowish and tail darker beneath. Compared with *stephensi*: Upperparts much paler and underparts more yellowish; skull flatter with shallower braincase.

Measurements.—Average of five adults from type locality: Total length, 301; tail vertebrae, 133; hind foot, 40.4; ear, 20.7. *Skull* (of type): Greatest length, 40; zygomatic breadth, 23.4; mastoidal breadth, 17.9; interorbital breadth, 7.9; length of nasals, 12.3; alveolar length of maxillary toothrow, 8.1.

Remarks.—This race is apparently most nearly related to *lascivus* of the Sierra Nevada, from which it differs widely in the color of the under-

parts. It intergrades with *lascivus* in the region around Mt. Lassen, with *klamathensis* in the Warner Mountains, and with *fuliginosus* in the Siskiyou Mountains.

***Glaucomys bullatus* sp. nov.**

Type from Sawtooth (Alturas) Lake, Idaho. Adult female, No. $\frac{34271}{1883}$, U. S. Nat. Mus. (Biological Survey collection); collected September 28, 1890, by Vernon Bailey and B. H. Dutcher; original number 1883.

Characters.—Size large (about equaling *G. sabrinus latipes*; much larger than *G. s. bangsi*); color of upperparts similar to that of *bangsi* but decidedly more ochraceous (less vinaceous); gray on face purer and more extensive; skull large, with narrow, deep braincase, the fronto-parietal region markedly elevated; molars heavy; audital bullae very large.

Measurements.—Adult female (type): Total length, 340; tail vertebrae, 150; hind foot, 46; average of 6 adults from Ketchum, Idaho: 336; 142; 42.5. *Skull* (of type): Greatest length, 44; zygomatic breadth, 25; mastoidal breadth, 19; interorbital breadth, 8.7; length of nasals, 13.9; alveolar length of maxillary toothrow, 9.2.

Remarks.—This species resembles certain of the forms of *sabrinus* rather closely in color but is readily separated from all of them by its peculiar skull with very large bullae. Its range, as now known, is from Ketchum, Idaho, north to Cranbrook, British Columbia. At Sawtooth Lake it occurs on the same ground with the much smaller *G. s. bangsi* and at Cranbrook, B. C., occurs with *G. s. columbiensis*.

PROCEEDINGS
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DESCRIPTIONS OF TWO NEW BIRDS FROM ALABAMA.

BY ARTHUR H. HOWELL.

Recent field work conducted by the Biological Survey in Alabama has resulted in the discovery of undescribed forms of the common crow and of the towhee. Both of these new forms reach the extreme of differentiation on the Gulf coast, the towhee ranging nearly throughout Alabama and the crow still farther north to southern Illinois and the District of Columbia. One interesting fact developed by these studies is that neither of the new races is closely related to the forms occupying peninsular Florida, nor are they strictly intermediate between the latter and the northern races of the species. The crow is decidedly smaller than the Florida Crow while the towhee is much larger than the Florida Towhee and slightly larger even than the northern race.

***Corvus brachyrhynchos paulus* subsp. nov.**

SOUTHERN CROW.

Type from Bon Secour, Alabama. ♀ adult, No. 204,882, U. S. Nat. Mus., Biological Survey Collection. October 24, 1908, A. H. Howell. Orig. No. 741.

Characters.—Decidedly smaller than *Corvus b. brachyrhynchos*, with a much slenderer bill. Nearest to *Corvus b. hesperis* but with shorter wing and slightly larger bill.

Distribution.—Alabama, Mississippi, Louisiana, southeastern Texas, Georgia (?), South Carolina, and north to the District of Columbia and southern Illinois.

Measurements.—Type (♀ adult): wing, 273; tail, 165; exposed culmen, 46; depth of bill at nostrils, 16.5; tarsus, 54; middle toe, 34. Average of 4 adult males from Autaugaville, Alabama: wing, 290 (285-300); tail, 170 (166-178); exposed culmen, 51 (47-54); depth of bill at nostrils, 17.5 (17-18); tarsus, 60.5 (60-61); middle toe, 33.9 (31-36.5). Average of 3

adult females from coast of Alabama: wing, 274.3 (270-280); tail, 162.7 (155-168); exposed culmen, 45.8 (45.5-46); depth of bill at nostrils, 16.2 (16-16.5); tarsus, 57 (54-59); middle toe, 33 (32-34).

Remarks.—This new race of the common crow seems to be fully as well characterized as the other recognized subspecies. Although the bird is nearest to *C. b. hesperis* in size, its range apparently is separated from the range of *hesperis* by a strip of country in central Texas in which no crows breed. Specimens examined from east Texas are apparently intermediate between *brachyrhynchos* and *paulus*. A series of 9 breeding birds from the District of Columbia and vicinity are also somewhat intermediate, but much nearer to *paulus*. This form shows no approach to *pascuus*, the resident bird of south Florida, which has much larger bill and feet. A breeding male from Christchurch Parish, South Carolina, is typical *paulus* and a breeding female from Mt. Carmel, Illinois, is apparently nearest to this form.

Since *Corvus brachyrhynchos* has now been separated into five races, it seems desirable to fix the type locality of the original form. Brehm, in describing the species,* attributes it to North America, without mention of a definite locality. The measurements given by him (length, 19½ inches; tail, 8¾ inches; bill 23 lines) indicate a large bird and there is every probability that his specimen came from northeastern America. The large form is known to occur throughout New England and the type locality is hereby fixed at vicinity of Boston, Massachusetts.

Specimens examined.—Total number 24, from the following localities:

Alabama: Autaugaville, 6; Bayou La Batre, 1; Bon Secour, 1; Florence, 1; Whistler, 1.

Mississippi: Fayette, 1.

Louisiana: Tallulah, 1.

Texas, Sour Lake, 1.

South Carolina: Christchurch Parish, 1.

Virginia: Falls Church, 5; Addison, 1.

Maryland: Bladensburg, 1; Garrett Park, 1.

District of Columbia: Washington, 1.

Illinois: Mt. Carmel, 1.

* Beiträge zur Vögelkunde, II, 1822, pp. 37, 56.

MEASUREMENTS OF 23 SPECIMENS OF *Corvus brachyrhynchos paulus*.

Museum No.	Sex	Locality	Date	Wing	Tail	Culmen	Depth of bill at nostrils	Tarsus	Middle toe
230434	♂	Autaugaville, Alabama	September 17, 1911.	288	170	53	17.5	61	36.5
230895	♂	"	October 15, 1911	285	168	54	17.5	60	33
230946	♂	"	November 5, 1911	289	166	50	18	60	31
230948	♂	"	December 22, 1911	300	178	47	17	61	35
238189	♂	Florence, Alabama	May 7, 1912	301	178	49	18	58	31
239530	♂	Fayette, Mississippi	September 24, 1912	296	180	49	17.5	62	31
195909	♂	Sour Lake, Texas	March 20, 1905	298	181	55	18	67	36
193696	♂	Tallulah, Louisiana	February 25, 1904	289	169	53	17.5	64	36
222322	♂	Christchurch Parish, South Carolina	May 5, 1911	295	174	49	17	64	37.5
83914	♂	Fairfax County, Virginia	September 13, 1879	296	178	49	17.5	59	35
234161	♂	Falls Church, Virginia	May 7, 1913	295	176	53	17	61	36
234162	♂	"	May 7, 1913	318	192	49	17.5	59	32.5
234163	♂	"	May 7, 1913	287	166	48	18	58	32
240111	♂	Garrett Park, Maryland	June 13, 1913	298	170	46	17.5	56	35
204882	♀	Bon Secour, Alabama	October 24, 1908	273	165	46	16.5	54	34
230944	♀	Bayou La Batre, Alabama	February 9, 1912	270	155	45.5	16	58	33
230945	♀	Whistler, Alabama	March 11, 1912	280	168	46	16	59	32
230947	♀	Autaugaville, Alabama	January 5, 1912	286	166	48	16.5	62	34
230606	♀	"	September 24, 1911	305	180	50	16.5	60	33
240174	♀	Bladensburg, Maryland	April 8, 1913	297	180	47	16	60	33
234164	♀	Falls Church, Virginia	May 7, 1913	303	180	43	16	60	32.5
239927	♀	Addison, Virginia	May 13, 1913	300	167	48	17	62	35
131508	♀	Washington, District of Columbia	May 9, 1892	298	186	48	17.5	60	36
83915	♀	Mt. Carmel, Ill.	April 13, 1869	297	181	45.5	17.5	57	33

TABLE OF COMPARATIVE MEASUREMENTS OF THE RACES OF *Corvus brachyrhynchos*.*

Males	Wing	Tail	Ex- posed culmen	Depth of bill at nostrils	Tarsus	Mid- dle toe
<i>C. brachyrhynchos</i> <i>brachyrhynchos</i>	321	182	51.5	19.5	62	38
“ “ <i>pascuus</i>	304	175	51.5	19	62.5	38
“ “ <i>hesperis</i>	302.5	171	47.5	16.5	57.5	35.5
“ “ <i>paulus</i> †	290	170	51	17.5	60	33.9
“ “ <i>caurinus</i>	283.5	163	47	16.5	51	33
Females						
<i>C. brachyrhynchos</i> <i>brachyrhynchos</i>	305	177	48	18	57.5	35
“ “ <i>pascuus</i>	304	169	51	19	62	38
“ “ <i>hesperis</i>	295	169.5	45.5	16	55.5	34
“ “ <i>paulus</i> ‡	283	167	47	16.3	59	33
“ “ <i>caurinus</i>	272	153	45	16	48	30.5

***Pipilo erythrophthalmus canaster* subsp. nov.**

ALABAMA TOWHEE.

Type from Spring Hill near Mobile, Alabama. ♀ adult, No. 207,771, U. S. Nat. Mus., Biological Survey Collection. May 8, 1911, A. H. Howell. Original No. 944.

Characters.—Similar to *P. e. erythrophthalmus*, but with larger bill and slightly longer tail; white markings on tail feathers less extensive; sides and flanks averaging paler; females with head, neck, chest, and upper parts more grayish (dark olive-brown instead of Prout's brown); iris red.

Distribution.—Greater part of Alabama excepting extreme northern counties where it grades into *erythrophthalmus*; eastern and western limits of range unknown.

Color.—Females: Upper parts varying from dark olive-brown to clove-brown; top of head somewhat browner (sepia or bistre); throat and chest pale fuscous, shading to bistre; otherwise as in *erythrophthalmus*.

Measurements.—Average of 8 adult males from Alabama: wing, 89 (85–93); tail, 97 (90–101); exposed culmen, 14.9 (14–16); depth of bill at base, 10.2 (10–11); tarsus, 29.9 (28–32) middle toe, 19.9 (19–21.5); length of white spot on outermost tail-feather, 28.7 (26–33). Female (type): wing, 86; tail, 96; exposed culmen, 14; depth of bill at base, 10.3; tarsus, 29; middle toe, 19; length of white spot on outermost tail-feather, 24.5.

Remarks.—This new race may be recognized in either sex by the relatively small amount of white on the tail, as compared with *erythrophthalmus*, and by the large size and red eyes as compared with *alleni*. Females are much more grayish than those of either *erythrophthalmus* or *alleni*. The bird is probably in the main non-migratory, and occurs locally in moderate numbers throughout Alabama and probably adjacent parts of Georgia and Mississippi.

* All measurements, except those of *paulus*, from Ridgway's "Birds of North and Middle America."

† Average of 4 adults from Autaugaville, Alabama.

‡ Average of 5 adults from southern Alabama.

PROCEEDINGS
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TEN NEW MARMOTS FROM NORTH AMERICA.

BY ARTHUR H. HOWELL.

A study of the marmots or woodchucks of North America, based chiefly on the collections of the U. S. Department of Agriculture, has revealed a surprisingly large number of unrecognized races, and examination of a large amount of material from practically all parts of the range of the genus has served to show clearly that the three groups represented in North America are practically three species, the forms in each group, with the exception of two isolated species in the *caligata* group, being all subspecifically related to one another. Thus the *flaviventer* group (which includes *engelhardti* and *dacota*) ranges from the Cascades of Oregon and the Sierra Nevada of California to the Black Hills of South Dakota, and consists of a single species divisible into 9 or more races connected by almost perfect series of intergrades.

Since the publication of the results of this study may necessarily be delayed for some time, it is deemed advisable to publish here preliminary descriptions of the new forms.

Marmota monax rufescens subsp. nov.

RUFESCENT WOODCHUCK.

Type from Elk River, Minnesota. Adult male, No. 186,521, U. S. National Museum (Merriam Collection, No. $\frac{2}{11}\frac{6}{3}$); April 9, 1886, V. Bailey; original number, 237.

Characters.—Similar to *M. m. monax* (from Maryland and Virginia), but colors much redder, both above and below, the underfur on back pinkish cinnamon instead of light buff; skull similar to that of *monax*, but decidedly smaller and relatively broader across the zygomata; much larger than that of *canadensis*.

Measurements.—Average of five adult males from Minnesota: Total length, 548; tail vertebrae, 143; hind foot, 83. *Skull*: Adult male (type): Condyllo-basal length, 87.2; zygomatic breadth, 64.7; breadth of rostrum, 18.7.

Remarks.—The range of this form includes the southern parts of Minnesota, Wisconsin, Michigan, and Ontario, and the greater part of New York State. The animal is intermediate in size between *monax* and *canadensis* and differs from both in color and cranial characters.

***Marmota monax preblorum** subsp. nov.**

NEW ENGLAND WOODCHUCK.

Type from Wilmington, Mass. Adult male, No. 78,360, U. S. National Museum (Biological Survey Collection); April 19, 1896, A. E. Preble; original number, 127.

Characters.—Size medium (smaller than *rufescens*, larger than *canadensis*); colors pale (redder than *monax*, but red not so dark as in *canadensis* or *rufescens*); skull smaller and relatively narrower than that of *rufescens*, especially the rostrum and inter-orbital region.

Measurements.—Adult male (type): Total length, 560; tail vertebrae, 149; hind foot, 80. *Skull* (type): Condyllo-basal length, 85.3; zygomatic breadth, 57.4; breadth of rostrum, 18.5.

Remarks.—The woodchuck of southern New England is noticeably smaller and paler than *rufescens*, and larger and paler beneath than *canadensis*. Its skull is much larger than that of *canadensis*. It ranges from Connecticut north to Rutland, Vermont and Ossipee, New Hampshire, and probably farther, but material is lacking from northern New England to determine its exact limits.

***Marmota flaviventer parvula* subsp. nov.**

NEVADA MARMOT.

Type from Jefferson, Nye Co., Nevada (in Toquima Range, about 10 miles north of Belmont). Adult female, No. 93,690, U. S. National Museum (Biological Survey Collection); June 3, 1898, V. Bailey; original number, 6495.

Characters.—Similar to *M. f. avara*, but smaller, and colors darker; similar in color to *flaviventer* from the southern Sierra of California, but colors less reddish and upperparts overlaid with a buffy mantle; similar to *engelhardti*, but smaller, the upperparts more buffy and underfur paler; skull similar to that of *avara*, but decidedly smaller, with rostrum narrowed at the tip; smaller than that of *engelhardti* with narrower and less inflated bullae.

Measurements.—Adult female (type): Total length, 470; tail vertebrae, 130; hind foot, 70. *Skull* (type): Condyllo-basal length, 71.3; zygomatic breadth, 49; breadth of rostrum, 17.4.

Remarks.—This is the smallest of the subspecies of *flaviventer* and the

* Named for Messrs. Edward A. and Alfred E. Preble.

smallest known form in the genus. It is known only from the Toyabe and Toquima Ranges but probably occurs, also, in other desert ranges in central Nevada.

***Marmota flaviventer nosophora** subsp. nov.**

GOLDEN-MANTLED MARMOT.

Type from Willow Creek, 7 miles east of Corvallis, Montana (altitude 4000 feet). Adult female, No. 168,494, U. S. National Museum (Biological Survey Collection); April 8, 1910, A. H. Howell; original number, 1723.

Characters.—Similar to *M. f. dacota*, but slightly smaller; upperparts less extensively reddish and more mixed with black, the underfur decidedly paler; fore part of back overlaid with a mantle of golden buff; skull averaging smaller, with relatively slenderer rostrum and much smaller palatal foramina.

Measurements.—Adult female (type): Total length, 583; tail vertebrae, 170; hind foot, 75. *Skull* (type): Condylar-basal length, 79; zygomatic breadth, 53.2; breadth of rostrum, 17.

Remarks.—This race occupies the northern Rocky Mountain region, from Flathead Lake, Montana, south to the Wahsatch Mountains, Utah, and east to the Bighorn Mountains, Wyoming. It intergrades with *avara* at the northern end of its range, with *dacota* in Wyoming and probably with *engelhardti* and *parvula* in Utah and Nevada, respectively.

***Marmota flaviventer luteola* subsp. nov.**

PARK MARMOT.

Type from Woods P. O., in Medicine Bow Mountains, Wyoming (altitude about 7500 feet). Adult male, No. 186,520, U. S. National Museum (Merriam Collection, No. 44444); August 13, 1888, V. Bailey; original number, 148.

Characters.—Similar in color to *dacota* and *nosophora*, but paler and less intensely ochraceous above and yellowish instead of deep red below. Compared with *engelhardti*: colors paler and more yellowish (less brownish). Skull similar to that of *nosophora*, but averaging slightly longer and narrower, with longer rostrum and smaller auditory bullae.

Measurements.—Sub-adult male (type): Total length, 650; tail vertebrae, 182; hind foot, 90. *Skull* (old male from Mt. Lincoln, Colorado): Condylar-basal length, 92.5; zygomatic breadth, 59.4; breadth of rostrum, 20.8.

Remarks.—This subspecies occupies the mountains of northern Colorado and southeastern Wyoming (from the Laramie Mountains south to Park County, Colorado), intergrading with *dacota* on the north and with *warreni* on the south.

* In allusion to the fact that the animal aids in the spread of Rocky Mountain spotted fever, through serving as a host for the fever ticks.

***Marmota flaviventer warreni** subsp. nov.**

WARREN'S MARMOT.

Type from Crested Butte, Colorado. Adult female, No. 202,937, U. S. National Museum (Biological Survey Collection); July 11, 1902, E. R. Warren; original number, 35 (10,639, X catalogue).

Characters.—Size large (equalling *flaviventer* or *dacota*); colors deep red with very little buff (much darker than *luteola*); skull larger than that of *dacota*, with longer, slenderer rostrum and narrower palatal foramina.

Measurements.—Adult female (type): Total length, 565; tail vertebrae, 131; hind foot, 82. *Skull* (type): Condyllo-basal length, 89.3; zygomatic breadth, 59; breadth of rostrum, 20.3.

Remarks.—This race is the reddest of the forms of *flaviventer*. It is apparently confined to western Colorado, but the limits of its range are not definitely known. It intergrades with *luteola* on the north and with *obscura* on the south. It differs markedly, both in size and color, from *engelhardti*, but material from eastern Utah will very likely show that these two forms are connected by intergrades. Specimens have been examined from Crested Butte, Mud Springs (Garfield Co.), Cochetopa Pass, and Sapinero.

***Marmota flaviventer obscura* subsp. nov.**

DUSKY MARMOT.

Type from Wheeler Peak, 5 miles south of Twining, New Mexico (altitude 11,300 feet). Adult female, No. 133,505, U. S. National Museum (Biological Survey Collection); July 24, 1904, V. Bailey; original number, 8181.

Characters.—Size large (exceeding *dacota* and equalling *flaviventer*); sexes about the same size; tail long; colors dark brown mixed with white, with little of the buff or tawny shades of the related races; face usually without white markings; skull similar to that of *dacota* (that of male about same size, of female larger) with narrower palatal foramina.

Measurements. Average of 3 adult males from New Mexico: Total length, 655; tail vertebrae, 204; hind foot, 90.7; average of four adult females from same localities: 646; 190; 89.3. *Skull*: Adult female (type): Condyllo-basal length, 84.5; zygomatic breadth, 59.4; breadth of rostrum, 22.3.

Remarks.—This is the darkest and one of the largest of the races of *flaviventer*. It occupies the upper slopes of the higher peaks, chiefly above timber line, in northern New Mexico and southern Colorado, from the Pecos River Mountains north to the Sangre de Christo and San Juan Ranges, Colorado. Intergradation with *warreni* is indicated by an intermediate specimen from Florida, Colorado.

* Named for Mr. Edward R. Warren, whose extensive collection of Colorado marmots has aided materially in clearing up the relationships of the group.

***Marmota caligata cascadiensis* subsp. nov.**

CASCADE HOARY MARMOT.

Type from Mt. Rainier, Washington (altitude 6000 feet). Adult female, No. 90,134, U. S. National Museum (Biological Survey Collection); August 11, 1897, W. K. Fisher; original number, 422.

Characters.—Size large (equalling *olympus* and "*sibila*,"* larger than *caligata*); color similar to that of *caligata*, but head and feet usually browner and underparts darker; skull similar to that of *sibila*, but relatively broader across zygomata and inter-orbital region; decidedly larger than that of either *caligata* or *okanagan*.†

Measurements.—Adult female (type): Total length, 740; tail vertebrae, 230; hind foot, 107. *Skull*: Adult male from Cascade River (near head), Washington: Condyllo-basal length, 106.2; zygomatic breadth, 69.8; breadth of rostrum, 24.5.

Remarks.—The Cascade Marmot differs from the Olympic Marmot in being much whiter, and in skull characters; from *okanagan* of the Selkirk and Gold Ranges and *sibila* of northern British Columbia in whiter and browner (less black) coloration above; and from *caligata* in much larger size. It ranges from Mount Rainier, Washington, north to the Mount Baker Range, British Columbia.

***Marmota caligata nivarica* subsp. nov.**

MONTANA HOARY MARMOT.

Type from mountains near Upper St. Mary's Lake, Montana (altitude about 6100 feet). Adult female, No. 72,235, U. S. National Museum (Biological Survey Collection); May 27, 1895, A. H. Howell; original number, 23.

Characters.—Similar in size and skull characters to *sibila*, but colors much whiter, both above and below; skull closely similar to that of *sibila*, possibly averaging a little shorter; compared with *cascadiensis* the premaxillæ are broader.

Measurements.—Average of 4 adult females from type locality: Total length, 751; tail vertebrae, 224; hind foot, 105. *Skull*: Average of 4 adult females from same locality: Condyllo-basal length, 102; zygomatic breadth, 65.7; breadth of rostrum, 23.

Remarks.—This form, although closely resembling *sibila* in skull characters, differs widely from it in color, being, indeed, the whitest member of the group. In addition to the series from the type locality, specimens have been examined from the Bitterroot and Salmon River Mountains, Idaho.

* *Marmota sibila* Hollister, Smiths. Misc. Coll., vol. 56, No. 35, 1912, p. 1; type locality, Moose Pass, Alberta (not *Arctomys sibila* Wolf).

† *Arctomys okanaganus* King, Narr. Journ. to Shores of the Arctic Ocean, II, 1836, p. 236; type locality: The region occupied by the Okanagan Indians, "on the borders of the Rocky Mountains * * * between the Columbia and Fraser Rivers"—hereby fixed in the Gold Range, British Columbia.

Marmota caligata sheldoni * subsp. nov.

MONTAGUE ISLAND MARMOT.

Type from Montague Island, Alaska. Adult male, No. 137,319, U. S. National Museum (Biological Survey Collection); May 24, 1905, Charles Sheldon; original number, 12. (5461, X catalogue.)

Characters.—Similar to *caligata*, but size smaller; skull with shorter nasals and narrower premaxillæ.

Measurements.—Adult male topotype: Total length, 670; tail vertebrae, 185; hind foot, 94; adult female topotype: 640; 180; 90. *Skull*.—Adult male (type): Condyllo-basal length, 89.5; zygomatic breadth, 61.5; breadth of rostrum, 20.5.

Remarks.—This race is confined to Montague Island and differs from the mainland form in size only.

* Named for Mr. Charles Sheldon, in recognition of his valuable contributions to our knowledge of Alaska mammals.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTION OF A NEW RACE OF SAY'S GROUND
SQUIRREL FROM WYOMING.

BY ARTHUR H. HOWELL.

A study of the Wyoming specimens of the genus *Callospermophilus* in the Biological Survey collection for the purpose of mapping the ranges of the several forms shows that an unrecognized race occupies the Wind River and Gros Ventre ranges, with their foothills. It is here named for Mr. Merritt Cary, of Neligh, Nebraska, in recognition of his work on the Wyoming fauna.

***Callospermophilus lateralis caryi*, subsp. nov.**

Type, Adult female, skin and skull, No. 176,826, U. S. National Museum (Biological Survey Collection), from 7 miles south of Fremont Peak, Wind River Mountains, Wyoming (altitude 10,400 feet); collected July 19, 1911, by Merritt Cary; original number, 2211.

General characters.—Similar to *C. l. castanurus*, but upperparts (in spring pelage) decidedly grayer (less vinaceous); dorsal stripes clearer white; head, mantle, and rump paler; under surface of tail much paler. Compared with *cinerascens*: Under side of tail darker (clear pinkish cinnamon or tawny unmixed with black); mantle paler; skull decidedly smaller. Compared with *lateralis*: Upperparts grayer; dorsal stripes more distinct, the black and white stripes strongly contrasted; sides and underparts clearer white; under side of tail darker.

Color.—*Worn winter pelage*: Upperparts smoke gray more or less mixed, especially on head, shoulders, and rump, with cinnamon or pale russet; dorsal stripes broad, clear white, bordered on each side with a clear black stripe; underparts grayish white; feet white; under surface of tail varying from pinkish cinnamon to tawny, bordered with black, the sides tipped with pinkish buff. *Summer pelage* (specimen from Gros Ventre Range, 12 miles northwest of Kendall, Wyo.): Head and mantle tawny; sides of nose grayish white; white dorsal stripes tinged with buff; median dorsal area vinaceous cinnamon, mixed with whitish; sides, underparts, and feet washed with cinnamon-buff; tail as in winter pelage.

Skull.—Similar to that of *castanurus*, possibly averaging a little larger; decidedly smaller than that of *cinerascens* or of *lateralis*.

Measurements.—Average of 6 adults from Wind River and Gros Ventre ranges: Total length, 274.5; tail vertebræ, 95; hind foot, 40.7. *Skull* (type): occipito-nasal length, 42.7; zygomatic breadth, 25.9; mastoidal breadth, 18.4; least interorbital breadth, 12; length of nasals, 14.2; alveolar length of maxillary toothrow, 8.2.

Remarks.—This race is most nearly related to *castanurus* from which it may always be distinguished by its paler tail. In winter pelage *caryi* is decidedly grayer dorsally than *castanurus*; in summer pelage the differences in color apparently are less, but only a single adult in full pelage has been examined and that from a region where we might expect intergradation to occur. Certain immature specimens of *caryi* bear a marked resemblance to certain specimens of *trepidus* from Nevada, but comparison of typical adults shows that *caryi* differs from that form in having the shoulders and sides of the head darker—tawny instead of ochraceous.

Specimens examined.—Total number, 11, from localities as follows: Wyoming: Fremont Peak, 3; Lake Fork, Wind River Mts., 2; Bull Lake, Wind River Mts., 1; Jakey's Creek, 5 miles south of Dubois, 3; Kendall (12 miles northwest), 1; Jackson, 1.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTIONS OF NINE NEW NORTH AMERICAN
PIKAS.

BY ARTHUR H. HOWELL.

Study of the North American pikas of the genus *Ochotona* has resulted in the discovery of a number of new forms, nine of which are here named in advance of a revision of the group now in preparation.

Ochotona princeps lutescens, subsp. nov.

Type.—No. 108,650, U. S. National Museum, Biological Survey collection; adult ♂, skin and skull; from Mt. Inglesmaldie, near Banff, Alberta; collected July 26, 1899, by G. F. Dippie; original number 193 (2973, "X" catalogue).

Subspecific characters.—Similar to *princeps*, but smaller; coloration decidedly paler, both above and below.

Color.—*Type* (acquiring summer pelage): Upperparts mixed pinkish buff and fuscous, darkest in the middle of the back, shading to clear pinkish buff along sides; hinder back (in worn winter pelage) smoke gray, blotched with pinkish buff and fuscous; ears hair-brown, broadly margined with light buff and clothed inside with buffy white hairs; feet creamy white, faintly washed with pinkish buff; soles drab; palms pale olive-buff; underparts creamy white, faintly washed with pale pinkish buff, chiefly along median line.

Skull.—Averaging decidedly smaller than that of *princeps*, with shorter nasals.

Measurements.—Average of 8 adults (4 males, 4 females) from Canmore, Alberta: Total length, 177 (170–188); hind foot, 29.4 (26–31). *Skull* (of type, adult male): Occipito-nasal length, 43.3; zygomatic breadth, 21.6; breadth of cranium, 18; interorbital breadth, 5.3; width of palatal bridge, 2; length of nasals, 13.9.

Remarks.—This race is a strongly characterized form occupying, apparently, the ranges in southern Alberta lying to the eastward of the main divide of the Rocky Mountains. A considerable series has been examined from the vicinity of Banff, and a few from Mt. Forget-me-not, Alberta.

Ochotona uinta ventorum, subsp. nov.

Type.—No. 176,778, U. S. National Museum, Biological Survey collection; ♂ adult, skin and skull; from Fremont Peak, Wind River Mountains, Wyoming; collected July 19, 1911, by H. E. Anthony; original number 395.

Subspecific characters.—Size of *uinta*; color in winter pelage paler and more grayish (less buffy); hind feet paler; summer pelage less intensely buffy, both dorsally and ventrally. Compared with *princeps*: Size larger; color in both pelages paler (less blackish).

Color.—*Type* (acquiring summer pelage): Head, shoulders, and fore back cinnamon-buff, strongly washed with fuscous-black; sides and hinder back (in worn winter pelage) smoke gray, faintly washed with pinkish buff; ears chaetura drab, margined with buffy white; feet pale pinkish buff; soles hair-brown; palms soiled buffy white; underparts soiled whitish, faintly washed with light buff. *Winter pelage* (specimen from Jackson, Wyoming, September 19): General tone of upperparts between drab and wood brown, shading on sides to light pinkish cinnamon; front of face washed with clay color; head and back washed with fuscous; rump blotched with blackish; underparts soiled white, faintly washed with pinkish buff; ears deep mouse gray; feet pinkish buff.

Skull.—Closely similar to that of *uinta*; larger than that of *princeps*, with longer nasals.

Measurements.—*Type* (adult ♂): Total length, 186; hind foot, 31. *Skull*: Occipito-nasal length, 44; zygomatic breadth, 21.5; breadth of cranium 17.8; interorbital breadth, 4.6; width of palatal bridge, 2; length of nasals, 15.

Remarks.—This race occupies the Wind River, Gros Ventre, Absaroka, and Teton Ranges in northwestern Wyoming and the Beartooth Mountains in southwestern Montana. It is closely related to *uinta*, as shown by the skull; the coloration in all pelages is more grayish and less buffy, this difference being most strikingly shown in the worn winter pelage of June or July specimens.

Ochotona uinta lemhi, subsp. nov.

Type.—No. $\frac{28548}{39988}$, U. S. National Museum, Biological Survey collection; ♀ adult, skin and skull; from Lemhi Mountains, 10 miles west of Junction, Idaho; collected August 19, 1890, by Clark P. Streater; original number 174.

Subspecific characters.—Size small (much smaller than *ventorum*; slightly smaller than *princeps*); color in summer pelage similar to *ventorum* but paler; much paler than *princeps*; in winter pelage nearest to *princeps*, but paler and more grayish.

Color.—*Type* (acquiring summer pelage): Head, shoulders, and fore back cinnamon buff, washed with fuscous; hinder back (retaining worn winter pelage) smoke gray, washed with fuscous; sides grayish white, washed with pinkish buff; feet pinkish buff, the soles hair-brown; ears externally chaetura black, internally fuscous, with light buff hairs, the margins light buff; underparts soiled whitish, moderately washed with pinkish buff.

Skull.—Similar to that of *ventorum*, but shorter and relatively broader;

averaging slightly smaller than that of *princeps*, the nasals narrower posteriorly.

Measurements.—*Type* (adult ♀): Total length, 180; hind foot, 28. *Skull*: Occipito-nasal length, 41.3; zygomatic breadth, 20.4; breadth of cranium, 17; interorbital breadth, 4.8; width of palatal bridge, 2.1; length of nasals, 14.3.

Remarks.—The Lemhi pika is most nearly related to *ventorum*, with which it intergrades in southwestern Montana (Emigrant Peak, Park County). A large series is available from the type locality, and smaller series from Little Lost River Mountains, Ketchum, Stanley Lake, the head of Wood River, and mountains east of Birch Creek, Idaho.

***Ochotona uinta nevadensis*, subsp. nov.**

Type.—No. 94,213, U. S. National Museum, Biological Survey collection; adult female, skin and skull; from Ruby Mountains, southwest of Ruby Valley P. O., Nevada, altitude 10,500 feet; collected June 21, 1898, by Vernon Bailey; original number 6580.

Subspecific characters.—Similar in worn winter pelage to *uinta*, but distinctly paler, and sides of nose and face more extensively grayish. Compared with *cinnamomea*: Color very much paler; skull larger, with much broader palatal bridge and longer nasals. Compared with *lemhi*: Size smaller; skull flatter; nasals broader posteriorly.¹

Color.—*Type* (in worn winter pelage): Upperparts mixed pinkish buff and fuscous, darkest in the median line and on front of face; sides of nose and face smoke gray; ears fuscous, margined with light buff; sides pinkish buff; feet pale pinkish buff; soles drab; palms soiled buffy white; underparts grayish white, moderately washed with pinkish buff.

Skull.—Closely similar to that of *uinta*, with long, wide nasals and broad palatal bridge.

Measurements.—*Type* (adult female): Total length, 200; hind foot, 32; occipito-nasal length, 44.1; zygomatic breadth, 21.2; breadth of cranium, 18; interorbital breadth, 5.2; width of palatal bridge, 2.8; length of nasals, 14.5.

Remarks.—The Ruby Mountains pika, as shown by its skull characters, is most nearly related to *uinta* of the high mountains of eastern Utah, the ranges of the two forms being separated by the Great Salt Lake Desert. It is widely different from *cinnamomea* of the Beaver Mountains, the latter being in the *schisticeps* group. At present the new form is known only from two adults and one young specimen in worn winter pelage; additional material in fresh summer or fall pelage is needed before a complete description can be prepared.

***Ochotona saxatilis incana*, subsp. nov.**

Type.—No. 128,914, U. S. National Museum, Biological Survey collection; ♀ adult, skin and skull; from Pecos Baldy, New Mexico, altitude 12,000 feet; collected August 10, 1903, by Vernon Bailey; original number 8079.

¹Color differences not definable, through lack of comparable material.

Subspecific characters.—Similar in size and coloration to *O. saxatilis saxatilis*, but general tone of upperparts in summer pelage paler and less tawny; in winter pelage more grayish and less ochraceous. Compared with *nigrescens*: Upperparts paler and more buffy.

Color.—*Type* (acquiring summer pelage): General tone of upperparts between cinnamon-buff and pinkish buff, moderately washed with fuscous or fuscous-black; sides cinnamon-buff, shading posteriorly to pinkish buff; rump (in worn winter pelage) smoke gray; ears chaetura black, margined with buffy white and blotched on inner surface with the same color; feet pinkish buff, washed with cinnamon-buff; soles chaetura drab; palms soiled whitish, tinged with drab; underparts soiled whitish, washed with pinkish buff.

Skull.—Closely similar to that of *saxatilis*, but nasals averaging slightly shorter.

Measurements.—*Type* (adult ♀): Total length, 202; hind foot, 33. *Skull*: Occipito-nasal length, 46.8; zygomatic breadth, 22.5; breadth of cranium, 19; interorbital breadth, 5.3; width of palatal bridge, 2.5; length of nasals, 15.8.

Remarks.—This form is closely related to *saxatilis*, of the Colorado Mountains, but is widely different from *nigrescens* of the Jemez Mountains, New Mexico. Its range includes the Pecos River, Taos, and Culebra Ranges in northern New Mexico, extending, probably, into Colorado as far as Sierra Blanca.

***Ochotona fenisex brunnescens*, subsp. nov.**

Type.—No. 227,259, U. S. National Museum, Biological Survey collection; ♂ subadult, skin and skull; from Keechelus, Washington; collected August 23, 1917, by George G. Cantwell; original number, 38 (19568, "X" catalogue).

Subspecific characters.—Similar (in winter pelage) to *fenisex*,¹ but upperparts decidedly browner (less grayish) and underparts more buffy.

Color.—*Type* (in fresh pelage, August 23): Upperparts mixed cinnamon and fuscous, the general tone near snuff brown; sides deep pinkish cinnamon, shading to light pinkish cinnamon; ears chaetura black, margined with buffy white; feet soiled whitish, washed with light pinkish cinnamon; soles chaetura black; palms hair-brown; underparts light pinkish cinnamon.

Skull.—Similar to that of *fenisex* but averaging larger, with relatively shorter nasals.

Measurements.—*Type* (subadult ♂): Total length 200; hind foot, 33. *Skull*: Occipito-nasal length, 42.9; zygomatic breadth, 22.1; breadth of cranium, 18.4; interorbital breadth, 5.6; width of palatal bridge, 2.6; length of nasals, 14.1.

Remarks.—The Cascade pika is a strongly marked race, and has an extensive range on the high Cascades, from the vicinity of Chilliwack in

¹As distinguished by specimens from near Okanagan, British Columbia, and Horse-shoe Basin, near Mt. Chopaka, Washington.

southwestern British Columbia south to Crater Lake, Oregon. It has been identified by most recent writers¹ with *Lagomys minimus* Lord (= *Ochotona fenisex* Osgood), but material now in hand indicates that the latter is a paler animal, occupying the interior ranges to the eastward of the main Cascade Range.

***Ochotona fenisex fumosa*, subsp. nov.**

Type.—No. 91,144, U. S. National Museum, Biological Survey collection; ♂ adult, skin and skull; from Permia Lake, west base Mt. Jefferson, Oregon; collected October 4, 1897, by J. Alden Loring; original number 4799.

Subspecific characters.—Similar to *O. fenisex brunnescens*, but coloration darker, with much black on dorsal surface in fresh winter pelage.

Color.—*Type* (in winter pelage): Upperparts a mixture of vinaceous-cinnamon and black, the median dorsal area nearly solid black, shading on sides to nearly clear vinaceous-cinnamon; sides of nose dark smoke gray and top of head shaded with the same; sides of neck, beneath ears, washed with cinnamon-buff; ears chaetura black, edged with buffy white; feet cinnamon-buff; soles chaetura drab; palms hair-brown; underparts soiled whitish, strongly washed along middle of belly with vinaceous-cinnamon, shading on throat to pinkish cinnamon. *Summer pelage* (specimen from Three Sisters, Oregon, July 15): Similar to the winter pelage, but upperparts less blackish, less buffy, and more strongly shaded with grayish.

Skull.—Similar to that of *brunnescens*, but averaging slightly narrower; posterior border of palate with a very small spine in the middle of the post-palatal notch.

Measurements.—*Type* (♂ adult): Total length, 202; hind foot, 33. *Skull*: Occipito-nasal length, 44.5; zygomatic breadth, 21.3; breadth of cranium, 18.2; interorbital breadth, 5.3; width of palatal bridge, 2.4; length of nasals, 15.4.

Remarks.—This is a very dark form, occupying the western slopes of the Cascade Range in Oregon. It is known at present from the west slope of Mt. Jefferson, Three Sisters, Mackenzie Bridge, and Clackamas River, 15 miles above Estacada.

***Ochotona schisticeps jewetti*,² subsp. nov.**

Type.—No. 208,352, U. S. National Museum, Biological Survey collection; adult ♂, skin and skull; from head of Pine Creek, near Cornucopia, south slope Wallowa Mts., Baker County, Oregon; collected September 3, 1915, by Stanley G. Jewett; original number 2362.

Subspecific characters.—Nearest to *O. schisticeps schisticeps*, but paler in summer pelage, and slightly darker in winter pelage; decidedly darker than *O. schisticeps muiri*, in both summer and winter; paler (less blackish) than *O. s. taylora* in both pelages.

¹See especially, Bangs, Proc. New England Zool. Club, I, p. 39, 1899.

²Named for Mr. Stanley G. Jewett in recognition of his excellent field work on Oregon mammals.

Color.—*Type* (summer pelage): Upperparts light pinkish cinnamon, mixed with fuscous; sides of nose pale smoke gray; sides of face, occiput, and nape washed with the same; ears chaetura drab, margined with grayish white and faintly washed with the same inside; sides light pinkish cinnamon; feet grayish white, washed with light pinkish cinnamon; soles chaetura drab; palms grayish white, washed with drab; underparts grayish white, washed with light pinkish cinnamon. *Winter pelage*: Closely similar to *schisticeps* in the corresponding pelage, but slightly darker.

Skull.—Closely similar to that of *schisticeps*.

Measurements.—Average of 12 adults (6 males, 6 females) from type region: Total length, 182 (165–195); hind foot, 31 (30–32). *Skull*.—*Type* (♂ adult): Occipito-nasal length, 42.6; zygomatic breadth, 21.6; breadth of cranium, 19; interorbital breadth, 5.2; width of palatal bridge, 1.5; length of nasals, 13.7.

Remarks.—The pika of the Blue Mountains is most nearly related to *O. schisticeps schisticeps* of the high Sierra Nevada; its range, however, is separated from that of *schisticeps* by the intervening lava bed region, occupied by *O. schisticeps taylora*.

***Ochotona schisticeps fuscipes*, subsp. nov.**

Type.—No. 158,094, U. S. National Museum, Biological Survey collection; ♂ adult, skin and skull; from Brian Head, Parawan Mts., Utah; Collected September 7, 1908, by Wilfred H. Osgood; original number 3475.

Subspecific characters.—Similar to *O. cinnamomea* but larger, with larger and relatively broader skull; coloration above more blackish and less intensely cinnamon; very similar to *O. schisticeps taylora*, but general tone pinkish cinnamon, rather than vinaceous cinnamon; head paler and more grayish; underparts paler.

Color.—*Type* (summer pelage): Upperparts mixed light pinkish cinnamon and fuscous-black (the blackish prevailing); tip of nose fuscous-black; sides of nose and face smoke gray, tinged with buff and washed with fuscous; back of head and nape washed with pale neutral gray; ears fuscous-black, margined with buffy white; sides pinkish cinnamon mixed with fuscous, becoming clear pinkish cinnamon along line of belly; hind feet soiled whitish, washed with pale cinnamon-buff, the soles fuscous; front feet cinnamon-buff, the palms hair-brown; underparts grayish white, heavily washed with pinkish cinnamon.

Skull.—Similar to that of *cinnamomea*, but larger and relatively broader, with larger audital bullae.

Measurements.—*Type* (adult ♂): Total length, 195; hind foot, 30.5; average of 4 adult females: 201; 30.2. *Skull* (of type): Occipito-nasal length, 41.7; zygomatic breadth, 21.4; interorbital breadth, 5; width of palatal bridge, 1.4; length of nasals, 12.3.

Remarks.—This race, at present known only from the Parawan Range, is based on a series of 5 adults and one young in summer pelage. Although occupying a range of mountains practically continuous with the Beaver Range—the home of *O. cinnamomea*—the present form is apparently much more closely related to *schisticeps* of the northern high Sierra and to *taylora* of southern Oregon than that it is to *cinnamomea*. Its range is separated, however, from the ranges of these forms by a broad expanse of desert.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTION OF A NEW CHIPMUNK FROM GLACIER
NATIONAL PARK, MONTANA.

BY ARTHUR H. HOWELL.

Faunal studies of the chipmunks of Montana have shown the necessity for recognizing an undescribed species of *Eutamias* from the eastern slopes of the main Rocky Mountain divide, specimens of which have been in the Biological Survey collection for many years. It may be described as follows:

Eutamias ruficaudus, sp. nov. Rufous-tailed Chipmunk.

Type.—No. 72294, U. S. National Museum, Biological Survey Collection; adult male, skin and skull; from Upper St. Mary's Lake, Montana; collected May 30, 1895, by A. H. Howell; original number 27.

Specific characters.—Similar to *Eutamias umbrinus*, but coloration decidedly more rufescent; head and face more tawny (less grayish); dorsal stripes and spots behind ears less whitish; under side of tail deeper reddish.

Description of type (unworn winter pelage).—Sides of nose cinnamon; top of head and face, cinnamon, mixed with grayish white and bordered with fuscous; stripe from tip of nose above the eye to anterior base of ear and another beneath the eye to posterior base of ear buffy white, these light stripes bordered on each side with fuscous stripes mixed with tawny (the median one in front of and behind the eye); ears fuscous, with a rather broad band of pinkish buff on posterior margin; inside of ear clothed with tawny hairs; median dorsal stripe (extending from crown to root of tail) and lateral pair of dark stripes black or fuscous black, slightly mixed with tawny; alternate dorsal stripes (four in number) grayish white, mixed with tawny, the median pair shading anteriorly into the color of the crown, the outer pair bordered beneath with an indistinct stripe of fuscous black; sides of body deep tawny; thighs and rump mixed cinnamon and grayish white, producing a drabby tone; fore- and hind-feet pinkish cinnamon, the toes washed with pinkish buff; underparts grayish white, faintly washed with pale pinkish buff; under side of tail, Sanford brown,

bordered with fuscous black and edged with pinkish cinnamon; same shades above, but colors more intimately mixed and the blackish more prominent.

Skull.—Closely similar to that of *umbrinus*, but averaging slightly larger; and broader across zygomata.

Measurements.—*Type* (male adult); total length, 227 mm.; tail vertebrae, 118; hind foot (dry) 33.8. *Skull*.—Occipito-nasal length, 35; zygomatic breadth, 19.5; mastoidal breadth, 15.6; least interorbital breadth, 7.6; length of nasals, 11.2.

Remarks.—This handsome chipmunk is apparently a well-marked species, belonging in the *quadrivittatus-umbrinus* group, but not at present known to intergrade with *umbrinus*. It bears some resemblance to *Eutamias felix* from the coast region of British Columbia, but may be distinguished from that species by its whiter belly, more reddish tail, more whitish dorsal stripes, and larger skull with longer rostrum.

The species is represented by a series of 26 specimens from the Glacier Park region (St. Mary's Lake, Bear Creek, Summit, Paola, and Lake McDonald) and 13 specimens from the Bitterroot Mountains (Florence, Bass Creek, and mountains east of Corvallis). Nearly all are in unworn winter pelage, the summer pelage being imperfectly known. Under the name of "forest chipmunk," Bailey has described its habits and range in the Glacier Park region.¹

¹ Bailey, Vernon, *Wild Animals of Glacier National Park*, 1918, p. 42.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTIONS OF SIX NEW NORTH AMERICAN
GROUND SQUIRRELS.

BY ARTHUR H. HOWELL.

A revision of the North American ground squirrels, now in progress, has revealed a number of new races, which are here briefly described in advance of a more formal paper.

***Citellus townsendii brunneus*, subsp. nov.**

IDAHO SPOTTED GROUND SQUIRREL.

Type.—Female adult, skin and skull No. 201,963, U. S. National Museum (Biological Survey collection); collected at New Meadows, Adams County, Idaho, July 11, 1913, by L. E. Wyman; original number 178.

Subspecific characters.—Similar to *Citellus t. townsendii*, but color of upperparts more brownish (less grayish), and the dorsal spots smaller; cinnamon patch on face darker and more extensive; ears much larger, raised conspicuously above the crown; tail darker above; skull averaging larger and relatively broader.

Measurements.—*Type*: Total length, 224; tail vertebrae, 61; hind foot, 32. *Skull*.—Average of 4 adult males from Weiser and Midvale, Idaho: Greatest length, 40.4 (39.8–40.8); zygomatic breadth, 25.5 (24.9–26.1); breadth of cranium, 18.4 (18.3–18.5); least interorbital breadth, 8.4 (7.5–9.2); least postorbital breadth, 10.8 (10.4–11.6); length of nasals, 15 (14.6–16.1); maxillary tooth row, 8.5 (8.4–8.8). *Adult female* (type): 38.2; 24; 17.2; 8.1; 9.5; 13.4; 7.5.

Range.—West-central Idaho; specimens examined from Weiser, Midvale, Goodrich, Van Wyck, and New Meadows.

***Citellus elegans nevadensis*, subsp. nov.**

Type.—Female adult, skin and skull, No. 156,788, U. S. National Museum (Biological Survey collection); collected at Paradise, Humboldt County, Nevada, March 3, 1908, by Stanley E. Piper; original number 112.

Subspecific characters.—Similar to *Citellus e. elegans*, but larger, with longer tail and hind foot; upperparts averaging more grayish (less brownish) especially on head and shoulders; underparts darker buff; skull larger, but postorbital breadth less.

Measurements.—*Type*: Total length, 337; tail vertebrae, 100; hind foot, 47. Average of 9 adults from Ruby Valley and Skelton, Nevada, and McDermitt, Oregon: Total length, 291.1 (270–307); tail vertebrae, 88.1 (76–100); hind foot, 46.1 (42–48). *Skull*.—Average of 5 adults (3 males, 2 females) from Paradise and Metropolis, Nevada: Greatest length, 47.6 (44.7–48.6); zygomatic breadth, 31.5 (29.9–32.4); breadth of cranium, 21.1 (19.8–21.7); least interorbital breadth, 10.1 (9.2–11.6); least postorbital breadth, 10.8 (10.4–11.5); length of nasals, 17.7 (17–18.6); maxillary tooth row, 9.7 (9.3–10.3). *Skull of type*: 48.6; 32.2; 21.4; —; 10.5; 18.6; 10.3.

Range.—Northeastern Nevada and southeastern Oregon; specimen examined from McDermitt and head of Quinn River, Oregon; Paradise Valley, Mountain City, Metropolis, Elko, Skelton, and Ruby Valley, Nevada.

***Citellus columbianus ruficaudus*, subsp. nov.**

BLUE MOUNTAINS GROUND SQUIRREL.

Type.—Female adult, skin and skull, No. 231,942, U. S. National Museum (Biological Survey collection); collected at Wallowa Lake, Wallowa County, Oregon; by George G. Cantwell; original number 1093.

Subspecific characters.—Similar to *Citellus c. columbianus*, but sides of face and usually the throat a deeper shade of tawny; legs and feet darker; upper side of tail tawny (instead of gray); hind feet and skull larger.

Measurements.—Average of 10 adults (8 males, 2 females) from Wallowa Mountains, Enterprise, Elgin, and Bourne, Oregon: Total length, 369.6 (340–410); tail vertebrae, 100.7 (80–115); hind foot, 54.2 (51–58). *Skull*.—Average of 8 males from same localities: Greatest length, 54.2 (51.5–57); palatal length, 26.6 (24.5–28); zygomatic breadth, 34.1 (33.2–35.6); breadth of cranium, 21.9 (21.5–22.4); least interorbital breadth, 12.4 (11.1–14.3); least postorbital breadth, 11.9 (10.5–12.6); length of nasals 19.8 (18.8–20.3); maxillary tooth row, 11.4 (10.5–12.4). *Skull of type* (♀) 52.8; 25.5; 34.1; 21.7; 13; 12.2; 19.1; 11.

Range.—The Blue Mountain region of northeastern Oregon and southeastern Washington. Specimens have been examined from the following localities:

Washington: Anatone; Blue Mountains, 20–30 miles southeast of Dayton.
Oregon: Austin; Anthony; Bourne; Cornucopia; Dixie Butte; Elgin; Enterprise; Meacham; Wallowa Lake.

***Citellus spilosoma pallescens*, subsp. nov.**

Type.—Male adult, skin and skull, No. 79,535, U. S. National Museum (Biological Survey collection); collected at La Ventura, Coahuila, Mexico, August 10, 1896, by E. W. Nelson and E. A. Goldman; original number, 10,016.

Subspecific characters.—Similar to *Citellus s. spilosoma* (as represented by specimens from Durango), but paler; skull smaller, with shorter, broader rostrum. Compared with *Citellus s. canescens*, of Arizona: Size larger; tail

longer, with more black on distal half; dorsal spotting finer; skull larger, with narrower rostrum.

Description of type.—Upperparts wood brown (of Ridgway, 1912), finely speckled, chiefly on hinder back, with white; tail above, light pinkish cinnamon on proximal half, the distal half bordered with fuscous-black, and edged with buffy white; tail beneath, pinkish buff, bordered with fuscous-black and buffy white; underparts white.

Measurements.—Average of 12 adults from the type locality: Total length, 242.6 (232–253); tail vertebrae, 84.4 (76–92); hind foot, 35.7 (34.5–37). *Skull*.—Average of 10 adults from type locality: Greatest length, 40.1 (38.9–41.1); zygomatic breadth, 23.8 (22.9–24.5); breadth of cranium, 18.6 (18.2–19); interorbital breadth, 8.4 (7.8–8.9); least post-orbital breadth, 14 (12.8–15.1); length of nasals, 13.6 (13–14.5); maxillary tooth row, 7.5 (7.1–8.1).

Remarks.—Before undertaking further subdivision of this group, it was found necessary to identify the typical form, named without indication of its locality. Fortunately, the original specimens forming the basis of the description of *spilosoma* are still in the British Museum collection, and with the kind assistance of Mr. Oldfield Thomas, I have been able to obtain direct comparison of certain specimens in the Biological Survey collection with these types. Typical *spilosoma* is found to range from Durango City southward to Aguas Calientes, whereas the present form occupies the plains of north-central Mexico, from southern Chihuahua (Santa Rosalia) southward to San Luis Potosi and eastward to southern Nuevo Leon (Doctor Arroyo).

***Citellus tridecemlineatus arenicola*, subsp. nov.**

Type.—Male adult, No. 87,686, U. S. National Museum (Biological Survey collection); collected April 22, 1897, at Pendennis, Kansas, by J. Alden Loring; original number 3988.

Subspecific characters.—Similar to *Citellus t. tridecemlineatus*, but smaller and paler, the dark dorsal stripes snuff brown (instead of sepia); similar also to *C. t. texensis*, but smaller and much paler.

Measurements.—Average of 8 adults (4 males, 4 females) from type locality: Total length, 238 (214–295); tail vertebrae, 77.7 (71–83); hind foot, 32.2 (31–34). *Skull*.—Average of 4 adult males from type locality: Greatest length, 38.3 (37.3–39); palatal length, 17.7 (17–18.5); zygomatic breadth, 23 (22.2–23.6); breadth of cranium, 17.1 (16.8–17.4); least inter-orbital breadth, 11.5 (10.8–11.8); length of nasals, 13.5 (12.9–13.9); maxillary tooth row, 6.8 (6.5–7).

Range.—Southwestern Kansas, extreme eastern Colorado, northwestern Texas, western Oklahoma, and eastern New Mexico. Specimens have been examined from the following localities:

Colorado: Eureka Hill, Cheyenne County; Leroy; Monon, Baca County; Springfield.

Kansas: Oakley; Pendennis.

Oklahoma: Woodward.

Texas: Lipscomb; Lubbock; Mobeetie; Texline; Washburn.

New Mexico: Cabra Springs; Clayton; Loveless Lake, Lincoln County; Roswell; Tucumcari.

***Citellus tridecemlineatus monticola*, subsp. nov.**

Type.—Male adult, skin and skull, No. 209,255, U. S. National Museum (Biological Survey collection); collected June 15, 1915, at Marsh Lake,¹ White Mountains, Arizona (9,000 feet altitude), by Edward A. Goldman; original number 22,616.

Subspecific characters.—Similar to *Citellus t. alleni* (of Wyoming), but upperparts chestnut-brown instead of sepia and underside of tail more reddish; similar to *Citellus t. parvus*, but larger; coloration of upperparts and underside of tail darker; underparts more buffy. Compared with *hollisteri*: Upperparts paler, the dorsal stripes more whitish (less buffy); and underside of tail more reddish.

Description of type.—Ground color of upperparts chestnut-brown; light stripes and spots creamy white; front feet pinkish buff; hind feet cartridge buff, the thighs mikado brown; tail above, pinkish cinnamon on proximal third, the remainder fuscous-black, broadly edged with cartridge buff; tail beneath, russet, bordered with fuscous-black and tipped with cartridge buff; underparts and lower sides cartridge buff.

Range.—Known only from the type locality—a plateau at an elevation of about 9,000 feet in the White Mountains, Arizona. Specimens from Springerville, at the base of the mountains, are intermediate between *monticola* and *parvus*.

¹Also called Big Lake.

BIRDS OF ALABAMA

A. H. Howell

ISSUED BY THE
Department of Game and Fisheries of Alabama
I. T. QUINN, Commissioner
Montgomery, Ala.

1924

Bachman Sparrow (*Peucaea aestivalis bachmani*).

BIRDS OF ALABAMA

BY

ARTHUR H. HOWELL

Assistant Biologist, Bureau of Biological Survey,
United States Department of Agriculture

Issued in co-operation with the
UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF BIOLOGICAL SURVEY
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BY THE
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BIRDS OF ALABAMA

By ARTHUR H. HOWELL.

INTRODUCTION.

ALABAMA, by reason of its geographical position and the abundance and variety of its bird life, possesses unusual interest for the student of ornithology. Situated in the heart of the South, its northern portions including the terminals of the Appalachians and its southern border touching the Gulf of Mexico, its avian fauna contains representatives of both northern and southern types. In autumn the resident bird population is augmented by the arrival of hosts of migrants from the North, some of which pass on to tropical climes, while others remain throughout the winter. In spring these winter visitants leave for their breeding grounds in the North, and their place is taken by summer visitants arriving from their winter homes in the Tropics.

The many interesting problems of bird distribution centering in Alabama and the need for definite information concerning the economic value of southern bird life led to the selection of this State by the U. S. Biological Survey as a special field for investigation. A biological survey of the State was accordingly undertaken during parts of the years 1908 and 1911-1916, involving a detailed study of the distribution and migrations of the birds and of the distribution of the mammals and plants, with special reference to a determination of the boundaries of the life zones.*

Reports on the physiography and life zones of Alabama and on the mammals of the State have already been published;† the report on the birds is presented herewith. Prior to the

*Most of the field work in this investigation was carried on by the writer with the assistance of James S. Gutsell, Ernest G. Holt, James L. Peters, and Luther J. Goldman. Observations were made also by C. S. Brimley in 1890 and Russell J. Thompson in 1892. Every month was covered by these field studies and practically all sections of the State were visited.

†Howell, Arthur H., A biological survey of Alabama; I, Physiography and life zones; II, The mammals: U. S. Dept. Agr., North Amer. Fauna No. 46, pp. 88, pls. 11 (incl. map in color), figs. 10 (maps), 1921.

inception of this investigation, comparatively little detailed information was available concerning the distribution and local abundance of birds in the State, and the total number of species actually recorded within its borders did not exceed 200. In this report 314 forms are listed.

History of Alabama Ornithology.

EARLY EXPLORATIONS.

In the reports of the early explorers and naturalists who visited Alabama the bird life of the State received comparatively little attention. William Bartram, the first naturalist to visit the State, made no mention in his "Travels" of birds seen; and Adam Hodgson, who crossed Alabama in 1820, mentions casually only pelicans, wild turkeys, and doves.‡

In the winter of 1825-26, Bernhard, Duke of Saxe-Weimar, passed through Alabama from Fort Mitchell to Montgomery, and traveled thence by steamboat to Mobile. On the Alabama River near Cahaba he mentions seeing flocks of wild geese and ducks, "several astonishingly numerous flocks of black-birds," numerous buzzards, and hundreds of paroquets, many of which were shot by members of the party. From Mobile he went to Pensacola, Florida, crossing the bay to Blakely and going thence overland by stage-coach. Near Blakely he speaks of seeing robins, and on the return trip was aroused from his slumbers "by a powerful uproar * * * caused by cranes that flew over the house." After his return from Pensacola, he shipped on a sailing vessel from Mobile for New Orleans, but being delayed by a storm in the gulf, some of the company landed on Dauphin Island, "and brought back a few thrushes which they had shot."*

In the winter and early spring of 1830, Thomas Nuttall traveled extensively through the Southern States, but apparently never published an account of the trip, and his itinerary can only be roughly outlined from a collation of the casual references in his "Manual"† to localities visited. He was at Charleston, South Carolina, on January 12, and at

‡Hodgson, Adam, *Letters from North America*, vol. 1, pp. 117-154, 262-273; 1824.

*Saxe-Weimar, *Travels through North America*, vol. 2, pp. 26-52, 1828.

†Nuttall, Thomas, *Manual of Ornithology*, 2 vols., 1832-34.

Barnwell, South Carolina, January 17; from there, apparently, he crossed the State of Georgia into Alabama, where he speaks of being on February 12; on February 20, he was at Tuscaloosa, and on February 26, "in one of the prairies of Alabama." Later he proceeded to western Florida in the region of Tallahassee, remaining until about the middle of March, when he traveled to the Altamaha River in Georgia. His "Manual" contains many references to birds seen in Alabama, but usually without date or definite locality.

Early in the spring of 1837, Audubon, in the course of his journey from Augusta, Georgia, to New Orleans, Louisiana, and return, crossed Alabama twice, but he has left us only a brief outline of the journey and casual mention of the birds seen.† Describing this trip, he says:

After several days of severe traveling we arrived at Montgomery in Alabama, and meeting there with a steamboat bound to Mobile, secured our passage. Next day we arrived there, and spent two days in examining the neighborhood; after which we proceeded to Pensacola. After searching the country around Pensacola, we returned to Mobile, and proceeded to New Orleans in a steamer, by way of the great lakes.

Audubon then visited the coast of Texas, returning to New Orleans on May 27, 1837, soon after which he started back to Mobile. Of this trip, he says:

bidding farewell to our friends, I and my son set out for Charleston by way of Mobile, whence we crossed the country in a cart with the United States mail-bags whereon, in lieu of downy beds and pillows, our bones rested in cramped positions during the night, whilst by day we had ample opportunities of walking over the miserable roads, through an almost uncultivated country, and with very indifferent fare. On reaching Montgomery, however, we met with a good coach, and moved more rapidly toward our destination.*

Among the species which he mentions, the most important are the flamingo, the ivory-billed woodpecker, and the purple gallinule—perhaps the three most striking birds of the State.

†Audubon, J. J., *Ornithological Biography*, vol. 4, pp. xiv-xv, 1838.

*Op. cit. p. xix.

He speaks of having personally observed the habits of the purple gallinule in "the lower parts of Alabama." His record of the flamingo, although apparently not based on his own observation, was doubtless obtained from local residents during his visit to Pensacola, and furnishes the only record of the occurrence of this rare bird in the State.

In the winter of 1853-54, Charles Lanman traveled through Florida, Georgia, Alabama, Mississippi, and Louisiana. In his "Adventures,"† published in 1856, several chapters were devoted to an account of his experiences in Alabama, including mention of a number of birds found in the State. His journey carried him from Tallahassee, Florida, up the Chattahoochee River to Columbus, Georgia, thence by rail to Atlanta and Macon, Georgia, and to Chattanooga, Tennessee; down the Tennessee River by steamboat to near Huntsville; thence overland to Montgomery, and by steamer to Mobile and up the Tombigbee River to Columbus, Mississippi. Writing of the plantation of St. Stephens, on the Tombigbee, he says:

If ornithology is his [the visitor's] passion, here he may study the habits of the wild turkey (which are killed by the hundred), of the partridge and quail, of many varieties of the duck tribe, of the vulture and the crow, of the robin (which becomes intoxicated by feeding on the buds of the China tree), of the tropical paraquette with its bright-green plumage, of the glorious mocking-bird, and of the whippoorwill, whose song to the superstitious negro, portends, in times of sickness, a death on the plantation.‡

Shortly prior to 1859, Philip Henry Gosse, an English naturalist, resided for seven or eight months in Dallas County, Alabama, teaching school in a little log schoolhouse on the banks of Mush Creek, not far from the village of Pleasant Hill. Keenly interested in the natural history of the region, particularly in the insects, birds, and plants, he published in 1859 some of his observations in a small volume entitled "Letters from Alabama (U. S.), Chiefly Relating to Natural History." In these letters, which constitute practically the first contribution to the ornithology of Alabama, we find

†Lanman, Charles, *Adventures in the wilds of the United States and British American Provinces*, vol. 2, pp. 146-198, 1856.
‡Op. cit., p. 187.

treated more or less fully 48 species of birds, including a few now rare or exterminated, as the swallow-tailed kite, Carolina parakeet, and ivory-billed woodpecker. Apparently Gosse did not succeed in inspiring any of his pupils with the enthusiasm for natural history he himself possessed, for nearly twenty years passed before any further contributions were made to the ornithology of the State.

LOCAL LISTS OF BIRDS.

In 1878 and 1879 Nathan Clifford Brown published a list of birds observed at Coosada, Elmore County, between January 21 and April 30, 1878.* The list numbers 119 species, and is fully annotated, thus furnishing the first modern local list of Alabama birds. Among the rarities he discovered were the Leconte sparrow and the Swainson warbler.

In 1890 and 1891, Dr. William C. Avery published in *American Field*,† under the initials "W. C. A.," a list of birds observed in Hale County. This paper, treating of 184 species and embodying the results of his many years' observation and collecting at Greensboro, furnishes an important contribution to the faunal ornithology of Alabama. Dr. Avery's untimely death in 1894 doubtless retarded the progress of ornithology in the State. His extensive collection of bird skins is preserved at the State University in the Museum of the Geological Survey, and through the kindness of the director, Dr. Eugene A. Smith, I have been enabled to examine and identify these specimens and to make use of Dr. Avery's original field notes.

Within a few weeks after the completion of Dr. Avery's list, Fred W. McCormack, editor of the "*Leighton News*," began in that paper the publication of a series of articles entitled "*Notes on Colbert Co. (Ala.) Birds*," appearing semi-monthly from February 1, 1891, to January 2, 1892. This list, numbering 156 species, was based almost wholly on observations of the author and his friends in and around Leighton, and contains a fund of original information which has proved of great importance in the preparation of the present report. So far as known, the only complete copy of Mr. Mc-

*Bull. Nutt. Ornith. Club, vol. 3, pp. 168-174, 1878; vol. 4, pp. 7-13, 1879.

†*Amer. Field*, vol. 34, pp. 584, 607-608, 1890; vol. 35, pp. 8, 32, 55, 1891.

Cormack's list in existence is one which he saved for his own use, and which is now deposited in the library of the Department of Archives and History, at Montgomery. I have quoted freely from it in the following pages. Pressure of business prevented Mr. McCormack from pursuing his bird studies after the completion of his list, and 17 years passed before the appearance of another local list from the State.

In 1908, Aretas A. Saunders published a list of 129 species of birds observed from March 7 to June 9, 1908, in portions of Coosa, Clay, and Talladega Counties, chiefly in the region about Mount Weogufka.† The list included records of a number of rare and interesting birds, among them the Nashville, Bachman, and Kirtland warblers, and extended the known breeding range of the black-throated green warbler to central Alabama.

In the "First Report of the Department of Game and Fish of the State of Alabama," published in 1908, there appeared a nominal list of the birds which might be expected to occur in Alabama, by Dr. Harry C. Oberholser. This numbered 275 species, and included (so Dr. Oberholser tells me) 77 forms for which no definite record existed. Most of these, however, have since been added to the State list on the basis of authentic records.**

In 1914, Lewis S. Golsan and Ernest G. Holt published a list entitled "Birds of Autauga and Montgomery Counties," numbering 184 species and based almost entirely on observations of the authors.* This list is fully annotated and gives detailed records of nesting habits of many species. A supplementary paper by the same authors in 1917 adds seven more species.†

In 1921, Ernest G. Holt published an "Annotated List of the Avery Bird Collection," listing 216 species taken in Alabama, and giving extensive quotations from Dr. Avery's field

†The Auk, vol. 25, pp. 413-424, 1908.

**The following species occurring in Oberholser's list have not yet been discovered in Alabama: Noddy tern (*Anous stolidus stolidus*), glossy ibis (*Plegadis autumnalis*), white-fronted goose (*Anser albifrons albifrons*), golden plover (*Pluvialis* [*Charadrius*] *dominica dominica*), white-crowned sparrow (*Zonotrichia leucophrys*), Carolina junco (*Junco hyemalis carolinensis*), Cairns warbler (*Dendroica caerulescens cairnsi*), sycamore warbler (*Dendroica dominica albilora*), and mourning warbler (*Oporornis philadelphia*).

*Golsan and Holt, The Auk, vol. 31, pp. 212-235, 1914.

†Golsan and Holt, The Auk, vol. 34, pp. 466-467, 1917.

notes. The paper includes, also, a "Biographical Sketch of William Cushman Avery" by Miss Mary E. Avery.‡

UNPUBLISHED NOTES.

In addition to the above published records I have been enabled to draw freely on the manuscript notes made by Lewis S. Golsan and F. W. McCormack during their many years' residence at Autaugaville and Leighton, respectively, and upon the records of Ernest G. Holt, at Barachias. I have examined also the mounted collection of birds made by Mrs. Bessie R. Samuel, of Guntersville, and that of James K. Glennon, at Point Clear, both of which contain a number of specimens of much interest.

A considerable amount of data has been supplied by the migration reports on file in the Biological Survey. The most important of these were sent by Edward W. Graves, from Sand Mountain, Jackson County (near Carpenter); W. F. Ponder, from Smelley and Rendalia; Miss Carrie E. Parkhurst, from Talladega; E. G. Holt, from Barachias; and L. S. Golsan, from Autaugaville.**

Economic Value of Birds.

Birds, by reason of their beauty of form and plumage and their attractive songs, have always appealed to man in an esthetic way. In recent years, as a result chiefly of scientific investigation made of their food habits by the Biological Survey, most of them have been shown to be valuable as destroyers of the insect pests of the farm and forest.

Of the greatest interest, perhaps, to the southern farmer, are the birds that destroy the cotton-boll weevil, in which class are included 66 species. In summer the birds rendering the best service as weevil destroyers are the orioles, swallows,

‡Museum Paper No. 4, Alabama Mus. Nat. Hist., pp. 1-142, University, Ala., 1921.

**For the loan of specimens and the privilege of using records based on the specimens and on personal field notes I am indebted to Dr. Eugene A. Smith, State Geologist; Mr. Peter A. Brannon, of the Department of Archives and History; Mrs. Bessie R. Samuel, of Guntersville; Mr. F. W. McCormack, of Leighton; Mr. Lewis S. Golsan, of Prattville, and Mr. M. Mahorner, Jr., of Mobile. To the late John H. Wallace, Jr., formerly State Game and Fish Commissioner, I am indebted for hearty co-operation in granting necessary permits to collect specimens, and in other ways. In the identification of the specimens collected I have been greatly assisted by Dr. Harry C. Oberholser, of the Biological Survey, he having identified a large share of the more difficult forms.

flycatchers, and the nighthawk (bull-bat). The orioles seek out the weevils in their hiding places on the cotton plants, while the other birds mentioned capture the insects in the air. In winter a host of birds render valuable service by hunting out and destroying the boll weevils in their hiding places under rubbish, in crevices in the ground, or in the bark of trees. Among the species most useful at this season in the destruction of weevils may be mentioned the meadowlark or "field lark," the various blackbirds or grackles, the pipit or "titlark," the Carolina wren, the tufted titmouse, the Savannah sparrow, and the killdeer.

As conservators of the forests the various woodpeckers (with the single exception of the yellow-bellied sapsucker) rank very high. Important service in this respect is rendered also by the nuthatches, wrens, titmice, and creepers.

On the farm and in the orchard a great host of insectivorous birds constantly prey upon the numerous pests which infest the foliage, bark, or roots of cultivated crops, and it is doubtless true that without the aid of the birds insects would become so numerous that the raising of crops would be impossible. Careful investigation of the food habits of the hawks and owls, usually killed on sight without discrimination, has shown that with the exception of three or four species these much-maligned birds are really friends of the farmer, their food being composed in large part of insects, field mice and rats, snakes, frogs, and crawfish. The only birds of prey which habitually destroy poultry or game birds are the Cooper hawk and the sharp-shinned hawk (known as "blue darters"), and the great horned owl. All other hawks and owls are worthy of protection, except in the rare instances when an individual bird acquires a taste for chicken.*

Game Resources of Alabama.

During the settlement of the country by white men and for many years thereafter wild game was abundant practically everywhere. Quail and wild turkeys were found in all sec-

*For detailed information on the food habits of birds, consult Farmers' Bulletin 755, "Birds of Southeastern United States in Relation to Agriculture," and other bulletins of the Biological Survey, U. S. Department of Agriculture; also "Useful Birds and their Protection" and "Game Birds, Wild Fowl, and Shore Birds," by E. H. Forbush, published by the Massachusetts State Board of Agriculture.

tions, ruffed grouse occurred in the mountainous parts, wild pigeons visited the State every winter in countless numbers, and ducks and geese swarmed in the bays along the coast and in most of the rivers and ponds. With the introduction of cheap breech-loading guns and the resulting large increase in the number of hunters, all kinds of wild game suffered a marked reduction in numbers, and this decrease was greatly hastened by the practice of shipping birds within and out of the State, both dead game for market and live birds for propagation.†

The ruffed grouse and wild pigeons were the first birds to disappear, the pigeons being now exterminated and the grouse being found only in very limited numbers in some of the more remote mountainous sections. Turkeys, quail, and waterfowl generally have suffered severely, but are still to be found in moderate numbers, and under proper protection may be maintained as a State asset for many years to come.

Decimation of the wild life was not confined to the game birds, but extended to the large breeding colonies of gulls and terns found on the outer islands, the eggs of the larger species being taken for food and the terns being shot for millinery purposes. The beautiful least tern was almost exterminated by this traffic, and probably some other species through constant persecution were driven away from their accustomed breeding grounds.

Legislation for the Protection of Birds.

By the beginning of the present century public sentiment in favor of bird protection had been aroused to the necessity for having adequate protective laws, and in many States such laws were in operation. In "A Review of the Game Legislation in Alabama," Dr. T. S. Palmer, of the Biological Survey, stated as follows:‡

At the opening of the legislature of 1907 a general game bill, prepared by Honorable John H. Wallace, Jr., was introduced. This bill, as indicated by its title, was a comprehensive measure

†In 1906, J. M. Kirkpatrick stated that during the season of 1905-6 over 500,000 quail had been shipped from Alabama to northern and eastern markets. (Amer. Field, vol. 65, p. 384.)

‡In First Bien. Rept., Dept. Game and Fish, State of Alabama, 1908, pp. 69-81.

providing for a State Game Commissioner and a license system, prohibiting sale and shipment, limiting the seasons, protecting nongame birds, and creating a game protection fund and a well-equipped department of game and fish. * * * With slight change and little or no opposition, the bill was promptly passed by both houses of the legislature and received the approval of the Governor on February 19, 1907. Soon after, the author of the bill was elected Commissioner of Game and Fish* in recognition of his deep interest and long-continued efforts in behalf of game preservation. The Commissioner at once established an office in the State capitol and took steps to make the law generally known and to enforce its provisions.

The passage of this comprehensive protective law has had a markedly beneficial effect upon the abundance not only of game birds but of the non-game species as well. Mockingbirds and cardinals are no longer trapped and sold as cage birds, the reckless shooting of nighthawks ("bull-bats") for food or sport has practically ceased, and gulls and terns, formerly considered legitimate marks for the sportsman who wished to try his skill as a wing shot, are now afforded the same protection that is given to the small insectivorous species.

On March 4, 1913, a Federal law protecting migratory birds was enacted by Congress and on October 1 of that year, under its provisions, regulations prescribing closed seasons on all migratory birds were promulgated by the President. By the terms of these regulations spring shooting of all migratory game birds was abolished, the open seasons on certain species were shortened, and complete protection for a term of years was afforded a number of vanishing species, including sandhill cranes, swans, curlews, and all shorebirds except the black-bellied and golden plovers, Wilson snipe, woodcock, and greater and lesser yellowlegs.

In 1918, upon the passage of the migratory-bird treaty act, giving effect to a convention between the United States and Great Britain for the protection of migratory birds in the United States and Canada,† full jurisdiction was assumed by the Federal Government in the protection of migratory birds. The regulation promulgated under the terms of this act short-

*In 1919, the Department of Game and Fish was merged into a new Department of Conservation, Mr. Wallace being continued as Commissioner of Conservation.

†Ratification exchanged December 7, 1916; proclaimed December 8, 1916; constitutionality sustained April 19, 1920.

ened the open season on certain species, notably doves, prescribed bag limits and restrictions on methods of hunting, regulated possession and transportation, and prohibited the sale of migratory game birds; these regulations, in conjunction with the police powers conferred by the act upon officers appointed to enforce the law, have resulted in greatly restricting the slaughter of migratory game.

The beneficial effect of Federal protection is seen in a marked increase in many species of waterfowl and shorebirds, not only in Alabama, but throughout the country. Much still remains to be done in the complete enforcement of the game laws, but a long step forward has been taken, and with a continuation of the present enlightened policy, the bird life of the State seems likely to be preserved and increased for the use of the present and future generations.

Faunal Areas of the State.

The life zones and physiographic features of Alabama have already been treated.† As there shown, the greater part of the State is included in the Lower Austral Zone (Austro-riparian Division), the upper slopes of the mountains above 1,500 feet altitude being in the Upper Austral Zone (Carolinian Division). The physiographic divisions listed are the Mountain Region, Tennessee Valley, Warrior Tableland, Central Prairie Belt, Coast Pine Belt, and Coast Plain or Gulf Strip.

Only a few of the birds found on the lowlands push up to the summits of the higher ridges. Among these are the blue jay, crested flycatcher, Bachman sparrow, indigo bird, and Carolina wren. Of the few species found on the mountains and not to any extent in the valleys may be mentioned the ruffed grouse, whip-poor-will, scarlet tanager, oven-bird, and black-throated green warbler.

The Warrior Tableland marks the southern limit in the breeding season of certain northern types, including the phoebe, scarlet tanager, worm-eating warbler, and black-throated green warbler.

The Central Prairie Belt limits the northward range of the

†North American Fauna No. 45, pp. 7-16, 1921.

ground dove, Florida red-wing, loggerhead shrike, and Florida yellow-throat. In the Semitropical or Gulf Strip of the Lower Austral Zone occur a number of species scarcely ever found beyond the boundaries of that region, such as the Louisiana clapper rail, purple gallinule, Florida grackle, boat-tailed grackle, Howell seaside sparrow, and Marian marsh wren. The waters of Mississippi Sound, of Mobile Bay, and of the bayous in the Delta afford ideal winter homes for a great variety and profusion of waterfowl, none of which, however, remain there during the breeding season.

ANNOTATED LIST OF SPECIES.

GREBES: Family Colymbidae.

[HOLBOELL GREBE: *Colymbus holboellii* (Reinhardt).*

The Holboell grebe occurs in winter along the Atlantic coast as far south as Georgia and possibly Florida; there is no definite record of its occurrence in Alabama, but W. L. Bryant, of Bayou Labatre, reports a "large white diver" seen occasionally in winter in small numbers in Mississippi Sound. Both the loon and the horned grebe are well known to Mr. Bryant, so in all probability his record refers to the Holboell grebe.]

HORNED GREBE; HELL DIVER; LITTLE WHITE DIVER: *Colymbus auritus* Linnaeus.

State records.—The horned grebe occurs as a common winter visitor in Mississippi Sound and the larger bays along the coast and as a rare visitor on the inland waters. In Mississippi Sound near Bayou Labatre I saw it daily from November 12 to 26, 1915, usually in bunches of 3 to 5, but occasionally in flocks of a dozen or more. On November 26 fully 50 birds were seen. Two pairs were seen in the Sound, also, on December 4, 1916; two birds in Duckers Bay, near Mobile, December 3, 1915, and one in Perdido Bay, December 8, 1915. Mrs. Bessie R. Samuel, of Guntersville, has a mounted specimen taken on the Tennessee River in December, 1910, at which time a number of others were seen.

General habits.—Grebes are wonderful divers and can swim for long distances under water, which habit has earned for them the name of "hell-diver." The horned grebe, so called from the tufts of feathers in the breeding plumage on each side of the head, feeds chiefly in rather deep water, and, unlike the pied-billed grebe, is rarely seen in shallow ponds or bayous. For this reason it is sometimes known as "little salt-water diver." It has a weak, high-pitched call, somewhat like the mewling of a kitten. Being quite unsuspicious, many are shot wantonly or for sport by thoughtless hunters.

*Species in brackets and in smaller type are of hypothetical occurrence and therefore not included in the number of recognized birds of the State.

Food habits.—A prejudice against grebes prevails in many sections on account of their supposed destruction of fish, but a study by the Biological Survey of the contents of 57 stomachs of the horned grebe showed that its food consists largely of insects, which furnished about a third of the total; of crawfish and other crustaceans, which also made up about a third; and of fishes, which furnished about 28 per cent. Considerable quantities of feathers were found in most of the stomachs examined.†

PIED-BILLED GREBE; DIDAPPER; HELL-DIVER;
DABCHICK: *Podilymbus podiceps podiceps*
(Linnaeus).

State records.—The pied-billed grebe is fairly numerous as a migrant in ponds, rivers, and bays in all parts of the State. Occasionally a few may remain during the breeding season, as on a millpond near Autaugaville, where L. S. Golsan observed a pair during all of May, 1911, but no nest has as yet been discovered in the State.

On the coast the species occurs in moderate numbers during the winter and more commonly during the migrations. One was seen October 24, 1908, on Little Lagoon, and small numbers in ponds on Petit Bois Island, February 12, 1912, and November 24, 1915. A few were seen also in November and December, 1915, near Bayou Labatre, and in Duckers Bay and Nigger Lake.

In fall this grebe usually appears at Leighton about the middle of September and remains until the middle of October. It was recorded there also on July 27 and August 19, 1893. A few sometimes stay till winter. In spring it is found in some numbers from the middle of March to the second week of May (McCormack). Dr. Avery found it not uncommon in spring at Greensboro, where it arrived about March 15. Single birds were observed by the writer on Warrior River, near Lock 15, April 12 (1912), at Montgomery, April 19 (1912), and on Sipsey Fork, near Melville, May 1 (1914).

General habits.—This little grebe is partial to fresh water, being most often found on ponds, rivers, and lakes, though

†McAtee, W. L., Some common game, aquatic, and rapacious birds in relation to man: Farmers' Bull. 497, U. S. Dept. Agr., Repr. pp. 16-17, 1917.

sometimes in brackish waters along the coast. It is a shy, secretive bird, very adept at hiding among the reeds or other vegetation in its chosen haunts. Usually it escapes its pursuer by diving with lightning-like rapidity and reappearing at some distant and unexpected point, but it has the power, also, of sinking slowly beneath the water, leaving scarcely a ripple on the surface. It rarely takes wing when pursued, but is capable of rapid and sustained flight. It is readily distinguished in life from the horned grebe by its brownish color and its short, thick bill.

Food habits.—The food of this grebe, according to Bent, consists largely of "animal matter, such as small fishes, snails, small frogs, tadpoles, aquatic worms, leeches, and water insects; it also eats the seeds and soft parts of aquatic plants to some extent. Balls of its own feathers often occur in its stomach."*

A single stomach from Alabama contained, in addition to feathers (which composed more than half of the content), remains of two or three small fishes and of two crawfishes.

LOONS: Family *Gaviidae*.

LOON: *Gavia immer immer* (Brunnich.)

State records.—Loons are common winter residents in the waters of Mississippi Sound and Perdido Bay and are found in smaller numbers on the inland waters of Alabama. In Mississippi Sound they were seen daily from November 12 to 26, 1915, and on December 4, 1916. I observed a flock of 9 feeding in the middle of Perdido Bay, December 9, 1915. Golsan and Holt report one taken at Prattville in the winter of 1889 or 1890, and one at Barachias in April, 1905.† In the collection of the University of Alabama is a mounted specimen killed near Tuscaloosa about 1894. An unusual occurrence, reported by R. R. Bottoms, was the capture of a loon in a field at Logan in February, 1912, the bird being unable to fly.

The species arrives from the North during October and remains until April. An unusually late date is furnished from

*Bent, A. C., Life histories of North American diving birds: Bull. 107, U. S. Nat. Mus., p. 44, 1919.

†Golsan and Holt, The Birds of Autauga and Montgomery Counties, Alabama: The Auk, vol. 31, p. 216, 1914.

a specimen which I shot at Grande Batture Island, May 23, 1911, but this bird may have been a cripple. At Coosada, a dozen were seen by N. C. Brown flying north in March, 1878;† at Umbria (8 miles west of Greensboro) one was taken in a pond, and at Leighton, F. W. McCormack shot one, April 24, 1890. D. H. Bacon observed a pair in the Tennessee River, near Florence, on May 8, 1912, and I saw one near Muscle Shoals, April 22, 1914.

General habits.—Loons are seen usually singly or in small companies and are very wary, keeping well out of gunshot and diving at the flash of a gun. They afford a tempting mark for the hunter and are frequently shot at, usually with indifferent success. When pursued, they easily escape by diving and swimming long distances under water. They are swift and powerful on the wing as well, and are often seen flying over the waters of Mississippi Sound or the larger bays along the coast. They are unable to rise from the land and in taking flight from the water, they use their feet to aid them in gaining momentum, pattering along on the surface for some distance before rising into the air. Their loud, laughing notes are often heard during their winter sojourn.

Food habits.—Loons feed almost wholly upon fish, which they secure by pursuing them beneath the surface of the water. Bent mentions an instance of a loon killed at Chat-ham, Massachusetts, which had in its gullet 15 flounders averaging about 4 inches in length, several of them being 6 inches long.* Audubon speaks of having found in the loon's stomach aquatic insects, "water-lizards," frogs, leeches, and occasionally the roots of fresh-water plants.†

GULLS AND TERNS: Family Laridae.

HERRING GULL: *Larus argentatus argentatus* Pontoppidan.

State records.—The herring gull is a common winter resident on the Gulf coast and in the bays and harbors from November to March, and a few remain till May or June. It

†Brown, N. C., A list of birds observed at Coosada, central Alabama: Bull. Nutt. Ornith. Club, vol. 4, p. 13, 1879.

*Bent, A. C., Bull. 107, U. S. Nat. Mus., p. 53, 1919.

†Audubon, J. J., Ornith. Biog., vol. 4, p. 52, 1838.

was observed in numbers at Mobile and Dauphin Island in February, and again, March 16-20, 1912. At Mobile, November 10, 1915, three gulls were seen and by the last of the month they were numerous in the river. There were many about the mouth of Perdido Bay, January 27, 1912, and December 8, 1915. Small numbers were seen in Mississippi Sound, May 16-23, 1911, and November 12-26, 1915, and one—possibly a cripple—on Dauphin Island, June 3, 1914.

In its migrations this species usually follows the coast line or the larger rivers, but occasionally an individual is found far from water, as in the case of one shot on the campus of the Alabama Polytechnic Institute, at Auburn, in January, 1912. A specimen was killed by G. R. Wigley in the Warrior River near Tuscaloosa, in November, 1912; and a single bird was seen by the writer in the Tennessee River, at Florence, May 5, 1912. Brannon records one collected at Lock 12, Chilton County, and another captured alive on the Tallapoosa River, Elmore County.*

General habits.—The herring gull is a strong flyer and rides the water as buoyantly as a duck, though it does not ordinarily swim for any distance. It secures its food chiefly from the surface of the water, but, according to Bent, on rare occasions captures small fish by diving. In the river at Mobile the graceful birds may be seen in numbers at any time during the winter season, feeding close to the docks and about the ships at anchor. Since the passage of the State law which protects all gulls, these birds have become very tame in the harbors, but on the outer beaches, where they are frequently shot at, they are as wary as any bird that flies. The birds are found chiefly in small companies or in loose flocks of considerable size.

Food habits.—Herring gulls feed largely during the winter on refuse floating in the harbors and on garbage thrown from vessels. Under natural conditions they patrol the sea beaches to pick up dead fish and other refuse cast up by the waves and here they secure also live food, such as crabs, clams, mussels, snails, echinoderms, and worms. "Many crabs and mollusks," says Bent, "are broken with the bill, but if this can not be

*Brannon, Peter A., *The Auk*, vol. 38, p. 463, 1921.

accomplished the gull seizes the difficult morsel and flies up with it into the air, nearly vertically or in circles, drops it onto the hard sand or rocks, follows closely the descent, and alights to regale itself on the exposed contents. If unsuccessful the first time the gull tries a second and sometimes a third or fourth time."† Bent states also, on the authority of George H. Mackay, that this gull feeds on dead ducks, and quotes Seton as saying that it "will pursue wounded game and often follows the hunter to share in the kill."‡

RING-BILLED GULL: *Larus delawarensis* Ord.

State records.—The ring-billed gull occurs as a common winter resident on the coast. Numbers were observed in Mobile River in February and March, 1912, and on December 5, 1916. At Bayou Labatre, February 9-17, 1912, 10 or 12 birds were seen about the oyster factory, feeding in shallow water and on the mud flats, and a few were noticed on Dauphin Island, February 13, 1912. On November 26, 1915, a flock of about 15 was observed resting in shallow water on a mud flat near Point-aux-Pines.

General habits.—The ring-bill is somewhat smaller than the herring gull, but in flight is not easily distinguished from it, except at close range. It associates with its larger relative during its winter sojourn in the South, but is often found in flocks composed only of its own species. In Mobile harbor it seems to be about as common as the herring gull, but rather less wary. Bent says that its notes are similar to those of the herring gull, but are pitched in a higher key.

Food habits.—Like the herring gull, the ring-bill feeds largely in winter on carrion and on refuse thrown from vessels; it takes also crabs, mollusks, fish, and some insects. On the western plains, where it is abundant, flocks are often seen following the plowman to pick up the insects as they are turned up.

†Bent, A. C., *Op. cit.*, p. 111.

‡*Op. cit.*, p. 112.

LAUGHING GULL: *Chroicocephalus atricilla megalopterus*
(Bruch).*

State records.—The laughing gull nests abundantly on the Louisiana islands and after the breeding season visits the Alabama coast in numbers to feed. The species is common in Mississippi Sound and in the bays along the coast both in summer and winter, but it does not at present nest within the borders of the State. A small flock was seen on Petit Bois Island, February 12, 1912, and about 20 on Dauphin Island, March 22, 1912. In the latter flock there was one black-headed adult. About 20 or 30 birds were seen on Dauphin Island, July 5, 1913, and by the end of the month they were common there. Small numbers also were seen there June 1-5, 1914 (Peters). Two immature birds were seen near Mobile, May 9, 1911, and 50 or more, both young and adults, in scattered flocks, on July 14, 1913. The latter were flying toward the city early in the morning, evidently intending to feed in the river. On Grand Bay, November 16, 1915, several laughing gulls flew over my duck blind, and near Point-aux-Pines, November 26, 1915, I saw a flock of about 6 birds.

General habits.—This medium-sized gull is easily recognized in its summer plumage by its black head; young birds and adults in winter, however, have the head white and are less easy to distinguish. It is a gentle, confiding bird, and possessed of much curiosity, often allowing an observer excellent opportunities to study it at close range as it flies just above his head and peers down at him. This species breeds either in grassy marshes or on the sandy sea beach. In the northern part of its range it is migratory, arriving in New Jersey the latter part of April. It feeds not only along the shores and on the marshes, but sometimes visits ploughed fields to feed upon insects and their larvae. The cry of this gull is described by Nuttall as "a coarse, laughing scream," and Langille says "it might be imitated by the syllables hah-ha-ha-ha-ha-hah-hah, all of which are uttered on a high, clear tone, the last three or four syllables, and especially

**Larus atricilla* of the Check-list of North American Birds of the American Ornithologists' Union, 3d. ed. (rev.), 1910; for change of name see *The Auk*, vol. 37, p. 276, 1920.

the last one, being drawn out with peculiar and prolonged effect, the whole sounding like the odd and excited laughter of an Indian Squaw, and giving marked propriety to the name of the bird."†

Food habits.—The food of the laughing gull, as indicated by examination of the contents of 11 stomachs from Alabama, consists principally of small fishes, crabs, shrimp, water beetles, water bugs, ants and other Hymenoptera, grasshoppers, and spiders. One bird had taken 7 catfish, the largest about 5 inches long. Bent states that its food "consists largely of small fish or fry which it catches for itself on the surface or steals from the brown pelican."‡ The species is reported also to destroy the eggs of terns in their breeding colonies.

BONAPARTE GULL: *Chroicocephalus philadelphia* (Ord).*

State records.—The Bonaparte gull is probably a regular winter visitor along the Gulf coast, but thus far has been found in Alabama only once. On a bar at the mouth of Perdido Bay, January 25, 1912, two were seen and one was collected by E. G. Holt. In the harbor of Pensacola, Florida, February 2, 1912, we observed a good many associated with herring and ring-billed gulls.

General habits.—During its stay in the South this little gull feeds in shallow bays or about the wharves in the harbors and to some extent in the Gulf near shore. It is a gentle, unsuspicious bird, occurring during the winter season in small companies, or sometimes in flocks of considerable size.

Food habits.—The food of the Bonaparte gull consists largely of insects. On the seacoast, according to Bent, the birds "live on small fish, shrimps, and other surface-swimming crustaceans, marine worms, and other small aquatic animals."*†

†Langille, J. H., Our birds in their haunts, p. 535, 1884.

‡Bent, A. C., Bull. 113, U. S. Nat. Mus., p. 160, 1921.

**Larus philadelphia* of the A. O. U. Check-list; for change of name see The Auk, vol. 37, p. 276, 1920.

*†Bent, A. C., Bull. 113, U. S. Nat. Mus., pp. 177-178, 1921.

GULL-BILLED TERN: *Gelochelidon nilotica aranea*
(Wilson).

State records.—A small colony of gull-billed terns nests on Petit Bois Island just a little to the westward of the Alabama-Mississippi line. According to Capt. W. M. Sprinkle, Audubon Society Warden, this is the only place on the Gulf coast east of Texas where it breeds, and not over 15 or 20 pairs are found there. When I visited the island, July 4, 1913, several pairs of birds greeted us with loud cries as soon as we landed and flew about high above our heads as long as we remained in the vicinity. No nests were discovered, but several specimens were taken at this time; one also by Holt on July 29, and two by Gutsell on July 26 and August 30, 1911.

General habits.—The gull-billed tern is much less common than formerly and at present is found in only a few localities along the South Atlantic and Gulf coasts. Ridgway found it abundant at Cobbs Island, Virginia, in 1879, "nesting on the dry sand, just beyond the surf, and on the higher parts of the island."† Its note he describes as a harsh, chattering laugh. Chapman describes the notes as "a high, reedy tee-tee-tee, sometimes suggesting those of a weak-voiced katydid."* Audubon states that these terns swim buoyantly but not swiftly, and when wounded do not attempt to dive. In several instances he observed them catching insects on the wing.‡

Food habits.—Audubon examined a number of stomachs of this tern taken in Texas, Louisiana, and New Jersey and found in them "insects of various kinds, including Coleoptera;"† Wilson examined several taken in New Jersey and found them crammed with a mass of large, black spiders, which he considers to be the principal food of the bird in summer.** Five stomachs from Alabama, taken in July and August, contained remains of the marine crustacean commonly known as "sand-bug" and of several large dragonflies.

†Baird, Brewer, and Ridgway, *Water birds of North America*, vol. 2, p. 278, 1884.

*Chapman, F. M., *Handbook of birds of Eastern North America*, p. 165, 1912.

†Audubon, J. J., *Ornith. Biog.*, vol. 5, p. 129, 1839.

**Wilson, Alex., and C. L. Bonaparte, *Amer. Ornith.*, vol. 3, pp. 151-152, 1831.

CASPIAN TERN; REDBILL: *Hydroprogne caspia*
*imperator** (Coues).

State records.—The Caspian tern formerly may have bred on the Alabama coast, but at present it seems to be rather rare there and only a few have been observed. One was shot May 19, 1911, and another, February 13, 1912, in the sound near Dauphin Island. A single bird was seen July 4, 1913, flying eastward on Petit Bois Island. A specimen taken near Bayou Labatre January 10, 1916, by W. L. Bryant, is in the collection of the Department of Archives and History, at Montgomery.

General habits.—The Caspian tern is the largest of the terns and even exceeds in size some of the gulls. It may be distinguished from the gulls by its deep-red, straight-pointed bill, its forked tail, and the fact that when flying over the water in search of its prey it carries the bill pointed downward, as is the habit of all terns. Both this species and the royal tern are known to the baymen as "redbills." From the royal tern it may be distinguished, according to Bent, "by its heavier, more stocky build, by its heavier flight, by its shorter and less deeply forked tail, and by the larger amount of black in the primaries, which look wholly black when seen from below, whereas those of the royal tern seem to be largely white or grayish."† The species breeds both in colonies and in isolated pairs, usually on sandy islets. The nearest known breeding colony is on Grand Cochere Island, about 100 miles off the Louisiana coast.

Food habits.—The food of this tern consists almost exclusively of fish, which are secured by diving, in the usual manner of the smaller terns. It is reputed to rob other species of their food and also to destroy their eggs and young.**

ROYAL TERN; REDBILL: *Thalasseus maximus*
(Boddaert).‡

State records.—The royal tern may be found along the coast at all times, except during the nesting season. Although

**Sterna caspia* of the A. O. U. Check-list; for change of name see *The Auk*, vol. 33, p. 429, 1916; vol. 34, p. 198, 1917; vol. 37, p. 276, 1920.

†Bent, A. C., *Bull.* 113, U. S. Nat. Mus., p. 209, 1921.

**Seebohm, H., *History of British birds*, vol. 3, p. 269, 1885.

‡*Sterna maxima* of the A. O. U. Check-list; for change of name see *The Auk*, vol. 34, p. 199, 1917.

breeding in abundance on the Chandeleur Islands, Louisiana, it does not nest on the Alabama islands. Capt. W. M. Sprinkle states, however, that it bred on Pelican Island, at the mouth of Mobile Bay prior to 1893, when the island washed away.

A large flock was seen at the west point of Dauphin Island, February 13, and again March 22, 1912. Peters noted about 200 on Dauphin and Petit Bois Islands early in June, 1914, and Holt found the birds common there the last week in July. At Point Clear, July 13, 1913, I saw about 30 royal terns sitting on piles near the shore, and the next morning, about 6:30, as I sailed down the harbor below Mobile, I met nearly a hundred coming up toward the city with laughing gulls. Four or five birds were seen, December 6, 1916, feeding in Spanish River, at the head of Mobile Bay.

General habits.—These terns, either in flight or at rest, are most graceful and attractive. They travel usually in small, or sometimes large, flocks, feeding in the bays and tidal rivers, and to some extent in the surf. A large flock was observed in February, 1912, at the west point of Dauphin Island, feeding where the surf breaks over the bar; later the same day the birds lined up on the beach in close ranks to rest. They dive for their prey from a height of 15 or 20 feet, striking the water with great force and partly disappearing beneath the surface. They are usually shy and generally fly rather high, but when one of their number is wounded, the rest of the flock at once fly close over the wounded bird in response to its cries. In the harbors the royal terns are much tamer than those living about the outer islands.

Food habits.—The food of the royal tern consists largely of fishes (97 per cent) and a small quantity (3 per cent) of crustaceans. The fishes found in the stomachs were yellow perch, bluefish, and menhaden, the last constituting 65 per cent of the total.*

CABOT TERN: *Thalasseus sandvicensis acuflavidus*
(Cabot).†

State records.—The Cabot tern occurs as a rather uncommon summer visitor on Dauphin and Petit Bois Islands.

*McAtee, W. L., Farmers' Bull. 497, U. S. Dept. Agr., p. 20, Repr. 1917.

†*Sterna sandvicensis acuflavida* of the A. O. U. Check-list; for change of name, see The Auk, vol. 34, p. 199, 1917.

Capt. Sprinkle states that it nested on Pelican Island, at the mouth of Mobile Bay, about 1890, but the colony was broken up when the island washed away in 1893. It nests abundantly on the Chandeleur Islands, Louisiana, and it is from this colony that stragglers come to Alabama waters to feed. I saw a few on the west point of Dauphin Island, July 5, 1913, and E. G. Holt collected three specimens there, July 30 and 31. J. L. Peters saw one at Grants Island, early in June, 1914.

General habits.—This tern is similar in appearance to the common and Forster terns, but is slightly larger than these and has a rather conspicuous yellow tip on its black bill. It is usually found in small companies about the sandbars of the outer islands, and is not particularly shy. Audubon describes its cries as sharp and grating, and loud enough to be heard at the distance of half a mile.

Food habits.—Seven stomachs of this tern taken in Alabama and South Carolina in summer have been examined by the Biological Survey. One contained the remains of three prawns (*Penaeus setiferus*), the others, remains of small fishes. Bent says the species feeds on small mullets, sand launces, young garfish, shrimps, and squids.‡

FORSTER TERN: *Sterna forsteri* Nuttall.

State records.—The Forster tern occurs rather commonly in Mississippi Sound and about the outer islands in summer, but does not breed within the State. I found scattered flocks in the sound and on Dauphin Island, May 16-23, 1911, and saw one bird on the island, July 5, 1913. Holt took two specimens there July 30, 1913, and Gutsell noticed the birds frequently during late summer (July 20 to September 5, 1911). Breeding colonies are found on the Chandeleur Islands, 50 or 75 miles to the southwestward of Petit Bois, and the birds seen in Alabama waters are doubtless wanderers from these colonies.

General habits.—This is one of the smaller terns, and is difficult to identify except with a specimen in hand. Unlike most of the other terns, it is a marsh-inhabiting species,

‡Bent, A. C., Bull. 113, U. S. Nat. Mus., p. 225, 1921.

making a rather bulky nest in the marsh grass. Chapman describes its notes as a "long-drawn, reedy cackle and a *tweet-tweet-tweet-tweet*."*

Food habits.—According to Bent, this species feeds less on fish and has a more varied bill of fare than the other terns. It sometimes dives for its food in the ordinary manner of the terns, but more often catches insects on the wing or takes them from the surface of the water.

COMMON TERN: *Sterna hirundo* Linnaeus.

State records.—The common tern occurs on the coast of Alabama as a moderately common migrant. Specimens were taken at Bayou Labatre, May 16 and 23, 1911; on Dauphin Island, August 24, 1911, July 31, 1913, and June 4, 1914; and in Perdido Bay, September 11, 1911.

General habits.—The common tern is similar to the other small terns in habits and general appearance. It breeds in the northern States in colonies on uninhabited, sandy islands. In migration it is usually seen in small companies, coursing over the waters of the sounds along the coast.

Food habits.—Bent says of this species:

The food of the common tern consists almost wholly of small fish, not over 3 or 4 inches long, such as the sand lance (*Ammodytes americanus*) and the pipe fish (*Siphonostoma fuscum*), and probably the young fry of larger species. Shrimp and aquatic insects are eaten to some extent.†

LEAST TERN: *Sternula albifrons antillarum* (Lesson).‡

State records.—The least tern is a moderately common summer resident on the coast, breeding on both Dauphin and Petit Bois Islands. Gutsell found it fairly common about Mississippi Sound during the summer of 1911 and estimated the number roosting on Petit Bois Island to be between 300 and 400. Apparently the birds all leave the State during the winter, as several visits to the islands at that season failed to reveal their presence. Doubtless the species occurred for-

*Chapman, F. M., Handbook of birds of eastern North America, p. 167, 1912.

†Bent, A. C., Bull. 113, U. S. Nat. Mus., p. 245, 1921.

‡*Sterna antillarum* of the A. O. U. Check-list; for change of name see The Auk, vol. 34, p. 199, 1917.

merly in the interior, but at present it is unknown there. A record of two individuals seen and one secured in Montgomery County appeared in "Forest and Stream" for 1883 (vol. 20, p. 323).

This species was once abundant along the entire Atlantic and Gulf coast from Maine to Florida and Texas, as well as in the interior, breeding in large colonies chiefly on uninhabited islands. During the period when the plumage of terns was in great demand for millinery purposes this species, with others, was almost exterminated by plume hunters. Fortunately, however, a few small colonies were left, and with the passage of protective laws and the awakening of a healthy sentiment in favor of bird protection, it became possible to save a remnant of this exquisite species. Efforts are now being made, both by the Federal Government and the National Association of Audubon Societies, to protect and increase the few small colonies now remaining.

General habits.—This little tern is very active and graceful on the wing. It feeds chiefly over the water, diving beneath the surface for its prey. According to Bent "its food is generally swallowed on the wing, but if not properly adjusted in the bill it is sometimes dropped and caught again before it reaches the water."*

On Dauphin Island, May 19, 1911, the birds were just beginning to nest. I discovered about 20 nests, little hollows scratched in the sand, into which the birds had carried small pieces of shells, some on perfectly bare sand flats, others on the higher parts of the beach among scattered drift (Pl. III, fig 2). Most of the nests contained 2 eggs, two contained 3, and one 4 eggs. The colony was estimated to number about 30 or 35 pairs. On July 5, 1913, I again visited this colony and found no appreciable increase in the numbers. The old birds flew excitedly about at a considerable height over my head, screaming continually. Some of them were carrying food in their bills for their young ones.

On the east end of Petit Bois Island only scattered pairs breed at present. Holt discovered two nests there, July 28, 1913, each containing 2 eggs; and Peters observed about 20

*Bent, A. C., Bull. 113, U. S. Nat. Mus., p. 277, 1921.

Fig. 1.—Petit Bois Island. Breeding grounds of the Least Tern (*Sternula antillarum*) and Black Skimmer (*Rynchops nigra*).

Fig. 2.—Marsh on bay shore of Dauphin Island. Habitat of the Louisiana Clapper Rail (*Rallus longirostris saturatus*) and Marion Marsh Wren (*Telmatodytes palustris marianae*).

Fig. 1.—Black Skimmers (*Rynchops nigra*) on Petit Bois Island.

Fig. 2.—Nest of Least Tern (*Sternula antillarum*) on Dauphin Island.

pairs there, June 1-5, 1914, but all the eggs had been washed away by a heavy sea.

Food habits.—The food of the least tern has been found to consist chiefly of small fishes, with about 5 per cent of crustaceans.†

BLACK TERN; "SEA PIGEON": *Chlidonias nigra surinamensis* (Gmelin).‡

State records.—The black tern is an abundant migrant and transient visitant, chiefly along the coast, but is not known to breed in the State. At the west point of Dauphin Island, May 19, 1911, I found a flock of more than a hundred of these terns in their handsome black spring dress, standing quietly in close ranks on a mud flat, or when alarmed, taking wing and flying a short distance. At the same place and on Petit Bois Island, July 4-5, 1913, I found the species fairly common, most of those seen being young birds. Peters saw 6 birds on Petit Bois, June 1 and 3, 1914, and Gutsell found the species there in great abundance, July 26 to 29, and August 28 to September 1, 1911.

Black terns are frequently seen during migration in the interior of the State, about the rivers, lakes, and ponds. Dr. Avery noted a few at Greensboro in July, 1888, and September 11, 1893; and McCormack has observed them a number of times at Leighton (August 10, 1892; August 18, and September 5-23, 1893). On September 5 and 6, 1893, flocks of 20 to 75 were seen. Mrs. B. R. Samuel has a specimen taken at Guntersville late in September, 1912.

This species arrives from the South in April or early in May and remains into June, but at that season is not very common. In the fall migration it arrives from the North early in July and is extremely abundant locally during August and September. In August, 1911, Gutsell found these terns abundant on Petit Bois Island, roosting on the east point of the island in flocks which blackened the beach. "From late afternoon till dark," he says, "these flocks come with ever increasing frequency and of ever increasing size, so that just

†McAtee, W. L., Farmers' Bull. 497, U. S. Dept. Agr., p. 24, 1912.

‡*Hydrochelidon nigra surinamensis* of the A. O. U. Check-list; for change of name see The Auk, vol. 37, p. 440, 1920.

before dark they form a great dense cloud over the point and surrounding waters."

General habits.—In flight the black tern is extremely buoyant but rather wavering and uncertain, like the night-hawk or the swallows. It rarely plunges into the water for its food, as do most of the terns, but catches insects in the air and gleans food from the surface of the water and from the reeds and rushes of the marshes. Its call note is described by Bent as "a short, sharp, metallic '*krik*.' When much excited this is prolonged into a shrill scream like '*kreek*' or '*craik*,' given with ear-piercing vehemence when attacking an intruder near its nest."*

Food habits.—A study of the food habits of this species by W. L. McAtee shows it to be a useful bird. He says that the bird preys upon no food fishes, as far as known, but does feed extensively upon such fish enemies as dragonfly nymphs, dytiscid beetles, and crawfishes, and takes a great variety of insects, including some of economic importance, as the moth of the cotton bollworm and the fall army worm, click beetles (adults of wire worms), weevils, and grasshoppers.†

SKIMMERS: Family Rynchopidae.

BLACK SKIMMER; "SHEARWATER"; RAZOR-BILL;
SCISSOR-BILL: *Rynchops nigra* Linnaeus.

State records.—The black skimmer, more often known in Alabama as "shearwater" or "scissor-bill," is common along the coast beaches both in summer and winter. At the west point of Dauphin Island, May 19, 1911, I saw about 10 skimmers, mainly in pairs, flying along the edge of the beach. At times they were wary, and again would fly directly over my head, screaming loudly. At the mouth of Perdido Bay, Gutsell found skimmers fairly common in September, 1911; and on January 27, 1912, at the same place, I observed a flock of about 30 standing on a sandbar on the Gulf shore. In Mississippi Sound, near Bayou Labatre, flocks of 100 to 200 were seen on November 16 and 20, 1915, either resting on mud bars or flying about in a compact flock over the flats.

*Bent, A. C., Bull. 113, U. S. Nat. Mus., p. 297, 1921.

†McAtee, W. L., Farmers' Bull. 487, U. S. Dept. Agr., p. 22, Repr. 1917.

On the east point of Petit Bois Island is a colony of 40 or 50 of these birds. I visited the colony July 4, 1913, and found that the birds had been molested so that only about a dozen nests contained eggs and only two held full sets of four eggs. Holt found a similar condition there the last week in July, about 20 nests containing eggs or young, but only two containing as many as 3 eggs. Peters found skimmers numerous there, June 1 to 5, 1914, at which time nesting had not begun. Gutsell found them fairly common at Bayou Labatre late in July and in August, 1911, and on the east point of Petit Bois Island and the west point of Dauphin Island he found nesting colonies. July 27, on Petit Bois, he observed several downy young, several sets of eggs, and a young bird hardly able to fly. On August 29, at the same place, both eggs and downy young were observed.

General habits.—This curious bird is remarkable for the shape of its bill, the lower mandible being much longer than the upper and compressed to knifelike thinness. The function of this peculiar development is apparently unknown, but doubtless it serves the bird in some way in obtaining its food. Many writers have described the bird's habit of "skimming" close to the surface of the water, occasionally dipping the bill into the water and catching small fishes or other food.

Quite recently, another method of feeding has been described by Stanley C. Arthur, who says that on the coast of Louisiana this bird secures its food while standing in shallow water, picking up small fishes "with straight downward motions of the mandibles."[‡] Mr. Arthur attempts to discredit the statements of Audubon and other naturalists as to the method of feeding on the wing, but this habit is verified by Dr. Witmer Stone, who observed it on the New Jersey coast in July, 1921,* and by Bent in his recent work on gulls and terns, where it is described in some detail.[†] While I have never seen the skimmer feeding, I have many times observed the birds in large flocks on the Alabama coast resting quietly on sand bars in close, regular ranks like soldiers, or cutting circles in the air. They are very graceful in flight, the whole

[‡]Arthur, S. C., *The Auk*, vol. 38, p. 571, 1921.

*Stone, W., *The Auk*, vol. 38, p. 595, 1921.

†Bent, A. C., *Bull.* 113, U. S. Nat. Mus., p. 316, 1921.

flock seemingly moved by one impulse as they wheel and circle swiftly back and forth; when alighting they hold their long wings high over their backs for a few seconds until all have settled down, facing usually in one direction, into the wind. Their harsh, nasal notes, variously described as a honking, baying, or "yapping," are uttered while the birds are on the wing.

The species is more or less nocturnal in habit, as evidenced by the testimony of Audubon and many other observers. Gutsell, who observed it on Petit Bois Island, says: "Long after dark may be heard the 'honking' of this bird as it follows the shoreline; if a fire be built on shore, the bird may be seen as it passes, with its bill's tip in the water." He states, also, that it carries fish to its young crosswise in the bill. The newly hatched young, he says, run at considerable speed, then squat motionless on the sand.

Food habits.—Ten stomachs of the skimmer collected in Alabama have been examined. Six of them were empty and the others contained remains of small fishes. Nuttall states that the bird consumes small crabs and other crustaceans and mollusks.**

FULMARS, SHEARWATERS, AND PETRELS: Family *Hydrobatidae*.†

SOOTY SHEARWATER: *Puffinus griseus* (Gmelin).

State records.—The sooty shearwater probably occurs regularly in the Gulf of Mexico, but its occurrence in Alabama is purely accidental. The only record is that of a bird found in a garden at Attalla, after a heavy storm, on May 4, 1898. It was completely exhausted and died during the day. The specimen was identified by Edgar Magness, who published a note on the occurrence in *The Osprey*.* The shearwaters are ocean wanderers and their occurrence on land is of course purely accidental.

**Nuttall, Thos., *Manual ornith., water birds*, pp. 264-266, 1834.

†Procellariidae of the A. O. U. Check-list; for change of name see *The Auk*, vol. 36, p. 276, 1919.

*Magness, Edgar, *The Osprey*, vol. 3, p. 45, 1898.

GANNETS: Family Sulidae.

[BOOBY: *Sula leucogastris* (Boddaert).]

The booby gannet is a tropical species, occurring casually on the Atlantic and Gulf coasts of the United States. It has been observed on the lower Mississippi, in Louisiana, in September and January, and may therefore be expected to occur along the Alabama coast.]

DARTERS: Family Anhingidae.

WATER-TURKEY; SNAKE BIRD: *Anhinga anhinga*
(Linnaeus).

State records.—The water-turkey, sometimes called snake-bird or anhinga, is a rare and local resident, though formerly probably not uncommon. It is a swamp-loving bird and is thus most likely to be found in the extensive sloughs bordering the lower Alabama and Tensaw Rivers. At Chuckvee Bay, July 11, 1913, I saw two individuals—one flying over the bay, the other sitting on a log in a shallow bayou. At Stiggins Lake, near Mount Vernon, May 26, 1914, we took two females, which were undoubtedly breeding in the vicinity. The bird is reported by C. M. Holloway to breed near Carlton, two young ones having been seen there by him in 1911. L. S. Golsan states that a pair was seen in Bear Swamp near Autaugaville, in July, 1883, and others were frequently killed in fall prior to that date.† Avery reports the species as a rare breeder at Greensboro, and Brown records it on the authority of sportsmen as common in summer at Coosada.‡

General habits.—This curious bird is a dweller in swamps and timbered sloughs and bayous, often nesting in company with great blue herons, cormorants, or other swamp-loving birds. Its nest is placed either in low bushes or tall trees, and as it prefers fresh water, it is rarely seen on the coast. It is rather a sluggish bird and spends a good deal of its time sitting quietly on stubs or in bushes over the water, often spreading its wings in the morning sun as if to dry them. It is a strong flyer, however, and is sometimes seen soaring at a considerable height, much like a buzzard; it sails a short

†Golsan and Holt, *The Auk*, vol. 31, p. 216, 1914.

‡Brown, N. C., *Bull. Nuttall Orn. Club*, vol. 4, p. 13, 1879.

distance, then flaps the wings a few times. Anhingas secure their food of fishes by pursuing them under water. The birds are good swimmers and when too closely pressed often submerge the body, moving off with only the head and neck showing above the water. In such an attitude their resemblance to a snake is striking and easily accounts for the origin of one of their common names.

Food habits.—Two stomachs of this bird from Alabama contained remains of fishes, including sunfishes (*Lepomis*) and gizzard shad (*Dorosoma cepedianum*).

CORMORANTS: Family Phalacrocoracidae.

DOUBLE-CRESTED CORMORANT; "WATER-TURKEY":
Phalacrocorax auritus auritus (Lesson).

State records.—Cormorants occur in considerable numbers in the Gulf and adjacent waters and occasionally along the larger rivers throughout the State. They probably breed in the State, but no nesting colonies have been located. The birds are usually wary and are therefore infrequently shot. They are known locally as "water turkeys," "water buzzards," or "nigger-geese."

On Perdido Bay and the adjacent Gulf beach in January, 1912, we found cormorants fairly common, mainly in small companies, but twice gathered into flocks numbering about 100. Several small flocks were seen in Tensaw River and Chuckvee Bay on March 19, 1912, and three single birds in Mobile River, November 10, 1915. On Petit Bois Island, November 24, 1915, cormorants were abundant, and in the afternoon of that day I observed an almost continuous series of flocks flying eastward along the inside beach; later many large flocks were seen standing on the beach near the eastern point of the island, where, doubtless, they roost.

The bird is rarely seen on the coast in summer, but two were observed on the west end of Petit Bois Island, July 3 and July 29, 1913; two were seen singly, April 12, 1912, on the Warrior River near Lock 15, and one in the Tennessee River near Muscle Shoals, April 22, 1914. F. W. McCormack observed two birds, July 22, 1891, near the mouth of Town

Creek and another, October 24, 1892, at Florence. The species is reported also from Autaugaville by L. S. Golsan, where a flock of 7 was seen on a mill pond, July 31, 1909.

Four specimens from Alabama, all referable to the northern form, are in the Biological Survey collection—one from Perdido Bay, taken January 26, 1912; two from Mobile, November 10, 1915; and one from Grand Bay, November 13, 1915. The occurrence of the Florida cormorant (*Phalacrocorax a. floridanus*) in the State is problematical.

General habits.—This species breeds in colonies, in the South usually in dense cypress swamps, the nests being placed near the tops of tall trees. The rookery is often shared by great blue herons or other species of similar habits. In winter cormorants gather in large flocks in the coastal waters of Alabama and feed around the shores of the outer islands. They are strong swimmers and procure their food of fishes entirely by pursuing them beneath the surface, never by diving.

Food habits.—Cormorants feed exclusively on fish; stomachs of two collected in the Mobile River each contained remains of two gizzard shad (*Dorosoma cepedianum*) about 10 inches long, and one stomach contained, also, part of the tail of an eel.

PELICANS: Family Pelecanidae.

WHITE PELICAN: *Pelecanus erythrorhynchos* Gmelin.

State records.—The white pelican occurs regularly in some numbers in Alabama in migration and in winter. Dr. W. C. Avery records the capture of a specimen at Livingstone about 1890.* F. R. King, of Leighton, has a mounted specimen taken at that place, October 9, 1895, and Mrs. B. R. Samuel, of Guntersville, has one captured in October, 1909, at Muscle Shoals. Amel Calloway reports seeing a flock of eight or nine birds in Perdido Bay in January, 1912. In Mississippi Sound, March 22, 1912, I saw a flock of about seventy-five on a sand bar off Grande Batture Island and about ten on the west point of Dauphin Island. These birds were reported

*Amer. Field, vol. 40, p. 7, 1893.

to have arrived in the sound early in March and were seen once at the mouth of Bayou Labatre. Near the same place, November 12 and 17, 1915, smaller flocks were seen resting on the bars. W. L. Bryant states that these birds in good sized flocks usually spend the entire winter in that vicinity.

General habits.—The white pelican never dives for its food, as does the brown pelican, but captures fish by pursuing them on the surface, thrusting the head and neck into the water for its prey. According to Audubon fishing is carried on chiefly in the early morning and before sunset, the birds remaining inactive during a great part of the day. At times, however, a flock will mount high in air and indulge in extended gyrations, after the manner of cranes or the wood ibis.†

Food habits.—The white pelican feeds mainly on fish, but is known to eat also salamanders, crawfish, and tadpoles.

BROWN PELICAN; "BLUE PELICAN": *Pelecanus occidentalis occidentalis* Linnaeus.

State records.—The brown pelican is a common resident in the waters of Baldwin and Mobile Counties, but apparently does not breed within the State. Occasionally it is seen in the upper part of Mobile Bay near the city but more frequently nearer the Gulf. At Bon Secour in October, 1908, I found the birds common, and good-sized flocks were seen on the Gulf beach at the mouth of Perdido Bay, in January, 1912, and on December 8, 1915. In Mississippi Sound they are moderately common at all seasons and on Dauphin Island are at times abundant. About 30 were seen in the surf at the west point of the island on February 13 and a smaller number, March 19, 1912. On May 18 and 19, 1911, upward of 200 were seen about the island, and in July, 1913, and June, 1914, the species was observed commonly there. Eight individuals were seen sitting on piles near the shore at Point Clear, July 13, 1913, and a few were observed next day fishing in the lower bay.

General habits.—These big birds are not particularly wary and their interesting habits may easily be observed. Fre-

†Audubon, J. J., Ornith. Biog., vol. 4, pp. 91-93, 1838.

quently one will sit motionless for a long period on a pile over the water, seemingly in a trance. More often they may be seen slowly flapping or sailing a few yards above the water, or diving with a great splash in pursuit of their prey. They frequent sand bars about the outer islands, where they rest in daytime in companies of 50 or more and at night roost in similar situations in much larger flocks.

Food habits.—This pelican apparently feeds exclusively on fish. Dr. Morris Gibbs examined a number of stomachs and pouches of the bird in Florida and found in them a variety of fishes from 4½ inches to 11½ inches in length. The species identified were mullet, porgy, sailor's-choice, sheepshead, catfish, and toadfish.† George Nelson examined a number of fish dropped by young pelicans on Pelican Island, Indian River, Florida, and found that all of them were menhaden (*Brevoortia tyrannus*) about 8 inches in length.* T. Gilbert Pearson also reports that menhaden composed the principal food of young pelicans in Aransas Bay, Texas.‡

MAN-O'-WAR-BIRDS: Family *Fregatidae*.

MAN-O'-WAR-BIRD; MAN-O'-WAR-HAWK; FRIGATE PELICAN: *Fregata magnificens rothschildi* Matthews.‡‡

State records.—The man-o'-war-bird may frequently be seen along the Gulf coast but is nowhere very common. It is not known to nest in the State, but may have done so in former years. Individuals were frequently seen in Mississippi Sound in May, and from July 20 to September 5, 1911; also in Perdido Bay during September. During July, 1913, small companies were frequently observed in the Sound near Dauphin and Petit Bois Islands, and I saw a flock of 5 near Petit Bois, November 24, 1915. A few were seen by Peters in the Sound and at Alabama Port in early June, 1914. Golsan and Holt state that one was found dead near Prattville, after a severe storm, about 1905 or 1906.**

†Gibbs, Morris, *Forest and Stream*, vol. 38, p. 296, 1892.

*Nelson, Geo., *The Auk*, vol. 28, p. 396, 1911.

‡Pearson, T. G., *The Auk*, vol. 38, p. 515, 1921.

‡‡*Fregata aquila* of the A. O. U. Check-list; for change of name see *The Auk*, vol. 35, p. 203, 1918.

**Golsan and Holt, *The Auk*, vol. 31, p. 216, 1914.

General habits.—These great birds are masters of the art of flight. Much of their time is spent in the air, often so high that they appear as mere specks in the sky, and this great altitude is attained by soaring usually without a single perceptible motion of the wings. Fishermen who visit the waters of the Gulf assert that these birds often come about their vessels to pick up the scraps of fish that are thrown out.

DUCKS, GEESE AND SWANS: Family Anatidae.

MERGANSER; SAWBILL: *Mergus merganser americanus*
Cassin.

State records.—The merganser is probably an uncommon winter visitor in Alabama, but no specimens are available and there are but two definite records of its occurrence in the State. F. W. McCormack examined and identified a specimen killed at Leighton, January 23, 1892, and Mrs. B. R. Samuel reports also having identified one killed on the Tennessee River near Guntersville, in January, 1912. W. L. Bryant, of Bayou Labatre, states that there is a merganser larger than the red-breasted occurring in the Sound, which is locally known as "Cuban duck;" this may be the species now under consideration.

General habits.—The merganser is a hardy bird, nesting in the far north and retiring south only with the advent of cold weather. It frequents the larger rivers and the bays along the coast, feeding on the small fish abounding in such places, keeping for the most part in small companies, and not associating much with other ducks.

RED-BREASTED MERGANSER; SAWBILL: *Mergus serrator* Linnaeus.

State records.—The red-breasted merganser is a fairly common winter visitor on the coast and probably not infrequent on the inland waters. In Mississippi Sound and in shallow ponds on Petit Bois Island, March 22, 1912, I observed numerous small flocks of these birds, and in the same waters, November 12-26, 1915, found them fairly common. Five specimens were taken at Bayou Labatre, November 12 and 23,

1915, one at Orange Beach, December 6, 1915, and one at Bayou Labatre, January 19, 1916. Peters saw a male of this species at Grants Island, June 5, 1914. Mrs. B. R. Samuel, of Guntersville, has a specimen collected on the Tennessee River near that place.

General habits.—This merganser is rather partial to the sea coast. In the South it feeds chiefly in shallow bayous or ponds, and is not particularly shy, often coming to decoys or flying past a boat within gunshot. The flight is rapid and usually in line, one bird behind another. The birds are expert divers and fishermen.

Food habits.—The food of this species, as indicated by 5 stomachs from Alabama, consists principally of small fishes; one stomach contained also remains of about 13 shrimp.

HOODED MERGANSER; SAWBILL; BEC-SCIE:

Lophodytes cucullatus (Linnaeus).

State records.—The hooded merganser occurs over the greater part of Alabama, both in summer and winter, and breeds locally in small numbers. In the interior it is commonly known as "saw-bill," but on the coast is more frequently called by its French name, "bec-scie." Golsan and Holt record it as a permanent resident near Autaugaville, and state that broods of young have been seen on several occasions.* Avery records it as an uncommon winter resident at Greensboro, and McCormack has observed it at Leighton in February, March, April, and July. During the first week in April, 1912, at Leighton, I found a number of these mergansers living in a slough in the woods where, possibly, they intended to breed. Both males and females were taken, but the birds were not paired. At Muscle Shoals, November 3, 1915, I observed a female in Town Creek, and on December 18, saw a pair in the river near the same point. The species is found also at Montgomery and at Guntersville, as evidenced by mounted specimens in the possession of the Country Club of Montgomery and in the collection of Mrs. B. R. Samuel, of Guntersville.

*Golsan and Holt, *The Auk*, vol. 31, p. 216, 1914.

In Mississippi Sound, November 12-26, 1915, I found this bird fairly common, frequenting the bayous near Bayou Labatre and on Coffee and Petit Bois Islands.

General habits.—In the breeding season this little duck inhabits timbered swamps and river bottoms, placing its nest in a hollow limb of a tree, usually over the water. In winter it frequents not only the rivers and sloughs of the interior, but lives also in the shallow muddy bayous on the coast marshes. The birds are wary and expert divers and if surprised at close quarters will often disappear beneath the water before the hunter can raise his gun to his shoulder. A wounded bird will often escape, too, by diving and remaining for a long period beneath the surface. This species flies very swiftly, often with an undulatory motion of head and neck. Its notes are harsh, somewhat resembling the barking of a young puppy.

Food habits.—The food of the hooded merganser, as indicated by the contents of 6 stomachs examined from Alabama, consists of crabs, shrimp, crawfish, small fishes, aquatic insects, and seeds of the cotton gum (*Nyssa aquatica*).

MALLARD; GREEN-HEAD: *Anas platyrhyncha platyrhyncha* Linnaeus.

State records.—The mallard, often called "greenhead" or "English duck," is a common migrant throughout the State and a moderately common winter resident, though much less numerous than formerly. Avery records it from Greensboro as a common winter resident, and Golsan noted it at Autauga-ville from December 8, 1911, to January 12, 1912. McCormack reports it abundant at Leighton during migration and as occurring also in winter. In the Alabama River between the mouth of the Tallapoosa and Selma in favorable seasons the species often occurs in considerable numbers. Holt observed hundreds on McConnell Island in the big swamp near Carlton, February 28 to March 11, 1912, feeding in shallow water backed up by the flooded river. It is usually plentiful and sometimes abundant all winter in Mississippi Sound and in the bays and bayous about the head of Mobile Bay. A single bird was taken in a pond on Petit Bois Island, Novem-

ber 25, 1915, and small numbers were seen at Nigger Lake and in Duckers Bay, November 29 to December 4, 1915.

The first migrants from the north arrive during the latter part of October (October 21, 1889, Greensboro), and the largest flights usually occur during November. The northward movement takes place chiefly during March. A. Z. Oberhaus, of Mobile, tells me that about April 1, 1911, at Nigger Lake, above Hurricane, he saw an old female mallard with small young. At Speigner Lake, Elmore County, in the spring of 1914, Haygood Patterson saw the nest, eggs, and young of a wild mallard. Brannon states that a small colony nested in 1922 on the grounds of the Fusihatchi Country Club, in Elmore County.* These are the only known instances of this bird's breeding in the State.

General habits.—Mallards feed exclusively in shallow ponds and bayous and along the banks of rivers. They gather into small flocks, usually numbering from 2 or 3 to 20. They are rarely seen in the open waters of the sound and never come anywhere near an artificial blind in such situations. They are sometimes secured, however, by placing a few decoys in the water close to the edge of a marsh, the gunner concealing himself in a natural grass blind on the shore; or they may occasionally be surprised by stealthily approaching their feeding grounds either in a small skiff or on foot across the marsh.

Food habits.—The food of the mallard has been exhaustively studied by McAtee in the Biological Survey, with the following results: Nine-tenths of the entire content of 1,578 stomachs was of vegetable origin; sedges (including bulrushes and sawgrass) furnished the largest proportion (21.6 per cent), the birds eating not only the seeds, but the stems, leaves, rootstocks, and tubers as well; wild grasses composed 13 per cent of the food, and included wild rice, wild millet, crabgrass, switchgrass, salt-marsh grass, and others; other vegetable matter eaten by the mallard includes seeds of smartweed, pondweed, widgeon-grass, eelgrass, duckweeds, and coontail, the rootstocks and buds of wild celery, and the tubers, stems, and seeds of wapato and its allies (*Sagittaria*). Seeds and nuts of various trees and shrubs furnish a favorite food

*Brannon, Peter A., *Oologist*, vol. 40, p. 45, March, 1923.

supply for the mallard; among those most frequently eaten are acorns, hickory nuts, and the fruit of the water elm, hackberry, buttonbush, cypress, red haw, poison ivy, holly, dogwood, bayberry, swamp privet, and tupelo gum. The animal food, comprising nearly 10 per cent of the total, consists mainly of mollusks, crustaceans, fishes, and insects.†

Twelve stomachs of this species from Alabama have been examined. Individuals taken in Mississippi Sound had eaten principally small snails and grass or sedge fibers; those taken in the big swamp country above Hurricane had fed largely on acorns, seeds of hornwort, knotweed, the foliage of pondweed, and a few insect larvae.

RED-LEGGED BLACK DUCK; BLACK MALLARD:

Anas rubripes rubripes Brewster.

State records.—The "black mallard," as this bird is most often called in the South, occurs as a common winter resident from November to March on most of the larger waters of the State. It is recorded by Brown as very rare at Coosada* and by Avery as a rare winter resident at Greensboro.‡ Four individuals were seen by local hunters, November 3, 1915, on the Tennessee River at Muscle Shoals, and I saw about 8 there December 19, 1915. The species is frequently taken in the Tennessee River and also in the Alabama River in the vicinity of Montgomery. Two were secured near Mobile on November 7, 1915, by Dr. S. C. Frederic—doubtless among the first migrants to arrive from the North.

On the coast during the winter this species is usually abundant. On February 12 and 13, 1912, I saw about 20 individuals in the ponds on Petit Bois Island and about that many on the west point of Dauphin Island, besides a number in the open Sound. On March 22, they were likewise common in the Sound. In November, 1915, black mallards were as numerous in these same localities as in 1912.

In the big swamps of the lower Tensaw River, above Hurricane, November 29 to December 2, 1915, they were common,

†Cf. McAtee, Food habits of the mallard ducks of the United States: Bull. 720, U. S. Dept. Agr., 1918.

*Brown, N. C., Bull. Nuttall Ornith. Club, vol. 4, p. 13, 1879.

‡Avery, W. C., Amer. Field, vol. 34, p. 584, 1890.

and just below Hurricane, December 2, I saw 200 or more resting in the middle of the river. The next day considerable numbers were feeding on mud bars just outside the mouth of Duckers Bay, and at dusk they flew in to roost in shallow water around the edges of the marsh. On March 20, 1912, in a big marsh on the lower Tensaw River, I saw a pair of black ducks, presumably of this species, this being about as late as it remains in the State. Eleven specimens from the coast of Alabama are in the Biological Survey collection; all are referable to *Anas r. rubripes*.

General habits.—The black mallard resembles the common mallard in its habits of feeding, but on the coast it does not confine itself to the bayous, but feeds extensively along the beaches. Near the mainland the birds feed chiefly in the shallow, muddy bayous on the marshes, but on Petit Bois Island they forage during the day on the mud bars along the inner beach, flying at dusk to the small shallow ponds on the island, in which they rest and feed until daybreak. The same habit of feeding by day on exposed mud bars characterized the ducks of this species living about the head of Mobile Bay. This habit, however, prevails only during moderately calm weather.

This bird is very wary and usually difficult to bag. To insure success, the gunner must be familiar with its habits and must be well concealed in a grass blind. Moreover, he will often have to wait until dark before he obtains a shot. Although much persecuted, this species seems to be holding its own in the State.

Food habits.—About three-fourths of the food of this duck consists of vegetable matter, a considerably smaller proportion than in the case of its relative the mallard. Fully half of this was from submerged plants, including pondweed, eelgrass, widgeon grass, and wild celery. Grasses and sedges contributed nearly 11 per cent of the total food, among which wild rice and salt-marsh grass were most frequently eaten. Other important items of the vegetable food are the seeds of smartweeds and bur reeds; among the less important items are seeds of waterlilies, coontail, and pickerel weed, and the leaves, roots, and tubers of wapato (*Sagittaria*).

The animal food was largely composed of mollusks, which furnished over 12 per cent of the total; the common blue mussel (*Mytilus*) furnished the most important single item, having been found in 35 of the 622 stomachs examined by McAtee; snails of various species were frequently taken, no less than 650 having been found in one stomach. Crustaceans, including barnacles, shrimp, crawfishes, and crabs, composed about 8 per cent of the food; insects were taken in smaller numbers, as well as marine worms and a few fishes and their eggs.†

Ten stomachs from southern Alabama contained small snails, sedge tubers, the foliage of various aquatic plants, acorns, seeds of the gum tree (*Nyssa*), and small quantities of insects and fiddler crabs.

[FLORIDA DUCK: *Anas fulvigula* Ridgway.

The Florida duck, or the western race, the mottled duck, possibly occurs in small numbers on the coast of Alabama, but as yet no specimens have been taken. Gutsell observed several flocks of "black mallards," numbering 3 to 5 individuals, on Petit Bois Island between July 28 and September 1, and 3 individuals in the brackish lakes west of Orange Beach, on September 13, 1911. It is uncertain, however, whether these were the present species or the black duck of the North. No one fortunate enough to discover a nest or young of black mallard in Alabama should fail to secure definite evidence of the species to which it belongs.]

GADWALL; GRAY DUCK: *Chaulelasmus streperus*
(Linnaeus).

State records.—The gadwall occurs commonly on the coast as a winter resident. It is apparently most numerous in Mobile Bay, but is reported also from Mississippi Sound and is occasionally taken on the lower Tensaw River. Five were killed by Dr. S. C. Frederic in Mobile Bay, November 7, 1915, with the first flight from the North; in Duckers Bay, December 2 to 4, 1915, I found them common, and secured 2 specimens. Two single birds were taken at Nigger Lake, November 30 and December 2, 1915. This species is recorded as occurring in Louisiana from early October to March 15,* and it should be found in Alabama at about the same period.

†McAtee, W. L., Bull. 720, U. S. Dept. Agr., pp. 10-14, 1918.

*Beyer, Allison, and Kopman, The Auk, vol. 24, p. 818, 1907.

General habits.—The gadwall is essentially a fresh-water duck, but in Alabama is found most frequently in the brackish waters of Mobile Bay. It feeds in shallow, muddy bays and creeks, generally in small flocks of its own kind, but sometimes associated with the widgeon. In Duckers Bay, where I found these birds common in December, they were feeding at night and with all the other ducks left, *en masse*, on the firing of the first gun in the morning. They returned shortly before dark to roost in the shallow waters of the bay.

Food habits.—The food of the gadwall, as determined by stomach examinations made in the Biological Survey, consists almost exclusively (97.85 per cent) of vegetable matter, of which pondweeds (including widgeon grass) are the most prominent item, furnishing 42 per cent of the total. The bird feeds chiefly on the leaves and stems of these plants, sometimes also on the buds and tubers. Other plants extensively eaten are algae, coontail or hornwort (*Ceratophyllum*), various wild grasses, seeds of sedges, and the tubers of a species of arrowhead known as the delta potato.‡ The animal food of the gadwall amounts to only about 2 per cent of the total and consists mainly of snails and aquatic insects. The stomachs of 4 gadwalls killed in Alabama contained leaves of wild celery (*Vallisneria*) and pondweed (*Najas*) and seeds of sedges.

BALDPATE; WIDGEON: *Mareca americana* (Gmelin).

State records.—The baldpate, or American widgeon, as it is more often called, occurs not uncommonly as a migrant and winter visitor. Dr. Avery speaks of it as seen occasionally in fall and spring at Greensboro, arriving about the first of March.† McCormack records capturing one at Leighton on March 17, 1891, and seeing a flock of 7 on the 23d of the same month, and several others on the 27th.* Gunners report the bird rather common on the Tennessee River in the vicinity of Muscle Shoals. In Mobile Bay and Mississippi Sound it occurs in some numbers. One was taken near Mobile, Novem-

‡Mabbott, D. C., Food habits of seven species of American shoal-water ducks: Bull. 862, U. S. Dept. Agr., pp. 2-10, 1920.

†Avery, W. C., Amer. Field, vol. 21, p. 545, 1884; vol. 34, p. 584, 1890.

*Leighton (Alabama) News, vol. 2, No. 25, January 2, 1892.

ber 7, 1915, and I found the species fairly common in Duckers Bay, December 2 to 4, 1915. Around Coffee Island, near Coden, on November 12, 1915, it was fairly common and several were shot over decoys.

General habits.—The baldpate frequents the larger rivers and the bays along the coast. It is reported to associate in some localities with canvas-backs and red-heads, and to steal from these birds the grasses and roots which they bring from the bottom. In Duckers Bay, where I found the species common, the birds fed at night, like the other ducks, and rested on the outside bars during the day. Their sweet, whistling notes were several times heard as they came into the bay in the evening.

Food habits.—The food of the baldpate is very similar to that of the gadwall, but the proportion of animal food (6.77 per cent) was somewhat greater, consisting chiefly of small mollusks and a few insects. The vegetable food, as determined by Biological Survey stomach examinations, consists of pondweeds (42.8 per cent); grasses (13.9 per cent); algae (7.7 per cent); sedges (7.4 per cent); wild celery and waterweed (5.75 per cent); water milfoils (3.48 per cent); duckweeds (2.2 per cent); smartweeds (1.47 per cent); and other miscellaneous plants in smaller quantities.†

GREEN-WINGED TEAL: *Nettion carolinense* (Gmelin).

State records.—The green-winged teal occurs regularly as a winter visitor, but from all reports seems to be not very common. Avery in 1890, reported it rare at Greensboro, though formerly abundant. McCormack likewise considers it rare at Leighton, having taken only 3 specimens—1, November 8, 1889, and 2, October 17, 1890. Holt took a specimen at Barachias, January 9, 1913.** The bird is reported by gunners as occurring in fall and winter at Muscle Shoals in the Tennessee River, at Orange Beach, and on Mississippi Sound. One was taken near Mobile, November 7, 1915, and one in Duckers Bay, December 3, 1915, from a flock of 20.

†Mabbott, D. C., Bull. 862, U. S. Dept. Agr., p. 11, 1920.

**Golsan and Holt, The Auk, vol. 31, p. 216, 1914.

General habits.—The green-winged teal is a fresh-water bird, and although found along the coast, it resorts mainly to the marshes and the shallow, muddy bayous and bays. It gathers into good-sized flocks and sometimes associates with mallards or other large ducks. When much persecuted it feeds chiefly at night.

Food habits.—The food of the green-winged teal consists largely of vegetable matter (90 per cent) of which the seeds of sedges (including bulrushes and sawgrass) furnish the most important part (38 per cent). These seeds evidently are eagerly sought by the teal, for they formed the sole contents of 51 of the 653 stomachs examined, while no less than 30,000 seeds were found in one stomach and 25,000 in another. Pondweeds furnish also an important element of the food, amounting to 11.5 per cent, and the seeds of various grasses, including wild millet and wild rice, are eaten in about the same proportion. Other plants taken in smaller quantities are smartweeds, duckweeds, water milfoil, and algae (musk grass). Rice is occasionally eaten in the winter months. The animal food, amounting to 4.5 per cent, consists of insects, mainly snails, small crustaceans, and the immature stages of flies.*

BLUE-WINGED TEAL: *Querquedula discors* (Linnaeus).

State records.—The blue-winged teal is a common transient visitant, apparently more numerous in spring than in autumn. Migrants from the North have been observed at Greensboro as early as September 10 (1886), and September 14 (1891), and at Montgomery, September 20 (1912), about 200 having been observed on the last date. During mild seasons a few may remain in the State all winter. The northward movement begins in March and continues till May. Avery speaks of seeing this teal at Greensboro about the first of March, and individuals have been observed at Leighton as early as March 19 (1890), and as late as May 17 (1893).

The species is recorded from Coosada by Brown, and I observed 3 in an overflowed field at Jackson Lake, Elmore County, on April 19, 1912. One was killed near Mobile, No-

*Mabbott, D. C., Bull. 862, U. S. Dept. Agr., pp. 17-22, 1920.

vember 7, 1915, and about 6 were seen, November 30 to December 1, in the bayous at Nigger Lake.

General habits.—This species is sometimes known as the "summer teal" because of the fact that it leaves its summer home quite early in fall and returns late in spring. It travels usually in rather large flocks and is partial to fresh-water lakes and ponds, especially such as contain wild rice and other seed-bearing plants. It is not especially shy and is easily decoyed by the gunner.

Food habits.—About seven-tenths of the food of the blue-winged teal consists of vegetable matter and about three-tenths of animal matter. Of the vegetable matter, seeds of sedges furnish the largest part (18 per cent) with seeds, stems, and leaves of pondweeds (including widgeon grass) next in importance, forming over 12 per cent. Various wild grasses, including wild rice, are frequently eaten, and cultivated rice is occasionally taken, but usually at a season when such grain is undoubtedly waste. Smartweeds furnish about 8 per cent of the food, and many other plants are consumed to a lesser extent. The animal content of the food, amounting to nearly 30 per cent, consists mainly of snails (16.8 per cent), insects (10 per cent), and crustaceans (1.9 per cent). The insects most frequently taken are the larvae of caddisflies, nymphs of damselflies and dragonflies, and various species of beetles.†

SHOVELER; SPOONBILL: *Spatula clypeata* (Linnaeus).

State records.—The shoveler, or "spoonbill," is a fairly common migrant and winter visitant. Avery records it from Greensboro, as occurring in spring, never in large numbers, arriving about the first of March; and McCormack speaks of it as uncommon at Leighton, "found usually in pairs or small parties of 3 or 4, seldom in large flocks, and frequents small ponds and flooded bottoms, feeding close to the edge like the teal;" he observed it on March 21 and April 1, 1890, and March 12, 1891. It is reported by gunners from Montgomery, Mobile Bay, and Orange Beach. One was seen near

†Mabbott, D. C., Bull. 862, U. S. Dept. Agr., pp. 22-28, 1920.

Mobile on November 20, and one in Duckers Bay, December 3, 1915.

General habits.—The spoonbill frequents fresh water marshes, where it dabbles in the mud in shallow water after the manner of the mallard. When rising from the water it makes a rather loud noise with its wings—a habit which usually serves to identify it at a distance. Its flight is rather slow and somewhat irregular and hesitating, “as if the bird was uncertain just where to go” (Elliot).

Food habits.—This duck feeds in the South largely on the seeds and stems of various grasses, sedges and other water plants, including ditchgrass (*Ruppia*); pondweed (*Potamogeton*), sawgrass (*Cladium*), and water lily (*Castalia*); and on snails and other mollusks, crawfish, small fishes, dragonfly nymphs, and other aquatic insect forms.

PINTAIL; SPRIGTAIL; PICKET-TAIL: *Dafila acuta*
tzitzihua (Vieillot).*

State records.—The pintail occurs as an abundant migrant, most numerous in spring, and a few remain all winter in the State. Avery speaks of it (1890) as once abundant but growing scarcer at Greensboro, where it arrives in spring about the first of March; and McCormack records it from Leighton only once, March 13, 1891, when about 25 were seen. At Muscle Shoals, in the Tennessee River, F. W. Scruggs saw a flock of about 12 on November 3, 1915. At Montgomery it is reported to be a regular visitor in spring and fall; and on March 7, 1912, C. N. Hinderer saw a flock of 150 or more in an overflowed field opposite the city. Golsan and Holt state that a few remain throughout the winter on the Alabama River near Montgomery.‡

Dr. S. C. Frederic reported pintails abundant in Mobile Bay, November 7, 1915; and I found several flocks of 12 to 20 in Duckers Bay on December 2 and 3, 1915. In Mississippi Sound, November 12 to 26, 1915, I found them in moderate numbers nearly every day. A few were seen on Petit Bois

**Dafila acuta* of the A. O. U. Check-list; for change of name see *The Auk*, vol. 34, p. 200, 1917.

‡Golsan and Holt, *The Auk*, vol. 31, p. 216, 1914.

Island, November 24, and one was taken near Orange Beach, December 7, 1915.

General habits.—The pintail is a graceful bird, either in the air or the water. In flight it may readily be identified by its long, slender neck and the long, pointed tail feathers. Its call note is a mellow whistle somewhat like that of the widgeon. The birds occur in flocks, often of considerable size, frequenting reedy ponds and sloughs in the interior and the shallow waters of the coastal bays. They are usually shy, and rather difficult to decoy.

Food habits.—About seven-eighths of the food of the pintail consists of vegetable matter; of which seeds of pondweeds and of sedges furnish the favorite items; of the 790 stomachs of this bird examined in the Biological Survey, 254 contained seeds of widgeon grass (one of the pondweeds), several with over a thousand seeds in each. Others contained even larger numbers of other species of pondweeds, rushes, and sedges, varying from 1,500 to 9,000 seeds in individual stomachs. Seeds of wild grasses are eaten less frequently but often in large quantities, one stomach containing 11,500 seeds of barnyard grass. Cultivated rice was found in 52 of the stomachs examined, but the fact that these were all taken in the winter months indicates that the grain was waste. Other plants which furnished food for the pintail are smartweeds, arrowgrass, muskgrass, glasswort (*Salicornia*), waterlilies, and the tubers of the delta potato (*Sagittaria platyphylla*). The animal food, amounting to 12.85 per cent of the total, consists of mollusks, crustaceans, and insects.† The stomachs of 2 individuals taken in Duckers Bay contained snails and the leaves and stems of pondweed (*Najas*); one taken at Orange Beach contained about 60 snails and a large number of seeds (chiefly in the gullet), including about 12,500 of smartweed (*Polygonum punctatum*) and smaller quantities of those of sawgrass (*Cladium effusum*) and of *Lippia nodiflora*.

WOOD DUCK; SUMMER DUCK: *Aix sponsa* (Linnaeus).

State records.—The handsome wood duck was once very abundant throughout Alabama, but in recent years has been

†Mabbott, D. C., Bull. 862, U. S. Dept. Agr., pp. 31-36, 1920.

greatly reduced in numbers. It remains in the State all the year and the inadequate protection formerly afforded by the State law, when the hunting season opened on September 1, before the young were fully grown, is probably in large part the cause of its disappearance. The establishment by Federal regulation in 1918 of a continuous closed season for the wood duck will, it is hoped, save this valuable and attractive species from extermination.

As long ago as 1890, Avery said of this bird:

Once abundance, now not at all common. Twenty-five years ago, in September, I saw one morning at least three hundred of these ducks come at dawn to feed in a pond, at Millwood, on the Warrior River, ten miles west of Greensboro. Now for a whole year not half of that number could be found in that locality*

McCormack, in 1891, recorded the species as a resident of Colbert County and stated that he had often seen the young during July and August.† On July 13, 1891, he saw about 50 wood ducks in a pond at Leighton. On May 10, 1912, also at Leighton, I observed a female with a brood of 5 or 6 young, about one-third grown, swimming in a timbered slough; and Holt saw 3 in a pond near there in July, 1913. In the Tennessee River near Fort Deposit on June 18, 1913, we saw 3 young birds. At Teasley Mill, Montgomery County, May 15, 1914, a female was caught in a beaver trap set in Catoma Creek; and at Seale, May 21, 1914, a female and 3 young were seen in a pond near town. On the lower Tensaw River, between Mobile and Stiggins Lake, May 25 to 28, 1914, I found the species fairly common.

The wood duck has been recorded from Coosada (1879, Brown), Hollins (1908, Saunders), Montgomery (breeding),‡ and Carlton (1912, Holt). On the coast it is said to be rare, but a few were shot by Childress Calloway near Orange Beach in 1909.

General habits.—The wood duck is a dweller in timbered swamps and wet river bottoms, where it places its nest in a hollow tree, usually over or near the water. The young take

*Avery, W. C., Amer. Field, vol. 34, p. 584, 1890.

†McCormack, F. W., Leighton (Ala.) News, vol. 2, No. 5, February 28, 1891.

‡Golsan and Holt, The Auk, vol. 31, p. 216, 1914.

to the water, or are carried there in the bill of the parent, at an early age, and the mother with her brood spends the summer in some secluded nook in a swamp or creek. They feed not only in or near the water, but often wander into the drier parts of the woods to pick up acorns or other nuts, and berries. They are very swift of flight, the wings producing a whistling sound.

Food habits.—About nine-tenths of the wood duck's food consists of vegetable matter; duckweed apparently furnishes the favorite food wherever it can be obtained, since it was present in 196 of the 413 stomachs examined in the Biological Survey, often to the exclusion of any other food. Cone scales and galls from cypress trees furnished the next largest item in the stomachs examined, this duck standing alone in its choice of this rather peculiar diet. Like many other ducks, the wood duck feeds on the seeds of sedges, rushes, and grasses, though in smaller quantities than the true marsh-feeding species. Of the grasses, wild rice is most sought after and in certain localities, while it lasts, is said to furnish the favorite food of this duck. Other important items in the vegetable food are the seeds and tubers of pondweeds, seeds of waterlilies and wild grapes, and the fruit of the buttonbush, swamp privet (*Adelia acuminata*), and the water elm (*Plainera aquatica*).

Mast formed about 6 per cent of the food in the stomachs examined, but more extended collections in certain localities doubtless would show a larger percentage, for many writers testify to the fondness of the wood duck for acorns and beech-nuts. Besides these nuts, the species in the South feeds extensively on the nuts of the water hickory (*Hicoria aquatica*).

The animal food of the wood duck amounts to nearly 10 per cent of the total, and consists chiefly of dragonflies, bugs, beetles, grasshoppers, crickets, and a few other insects, and a small quantity of crustaceans.*

Stomachs of 2 individuals taken in November in Town Creek, near Muscle Shoals, contained fragments of galls, leaves, seeds of the hornbeam (*Carpinus*) and dogwood (*Cornus*), and a few insect remains; one taken in the Tensaw

*Mabbott, D. C., Bull. 862, U. S. Dept. Agr., pp. 37-48, 1920.

River near Stockton in May contained a larger proportion of insects, including two beetles, a grasshopper, an ant, and a weevil, and fragments of seeds of the gum tree (*Nyssa*).

REDHEAD: *Nyroca americana* (Eyton).†

State records.—The redhead occurs commonly, though somewhat irregularly, as a winter visitant. Avery, in 1890, stated that it had not been seen for 8 or 10 years, although formerly common in the Cypress Slough, near Millwood, on the Warrior River.‡

It is reported to occur sparingly at Muscle Shoals in the Tennessee River, and at Orange Beach, and frequently in the bays around Mobile, where one was killed, November 7, 1915. According to Mr. C. N. Hinderer, it has once been taken at Montgomery. In Mississippi Sound it is considered a common winter resident. Around Coffee Island, near Coden, on November 12 and 23, 1915, I saw redheads in some numbers and secured several specimens. One was taken, also, near Bayou Labatre, January 20, 1916.

General habits.—This species is a deep-water, diving duck, frequenting both fresh-water lakes and the salt waters of the coastal bays. It is found in flocks, often of considerable size, and is very swift of wing, flying rather high in a wide, V-shaped line. Although a suspicious bird, it may often be decoyed within range, and being of large size and excellent quality is much prized by hunters. Elliot states that the redhead feeds much at night, especially if the moon is shining; he says, also, that this species is often robbed of its food by widgeons which attend the redheads and snatch much of the grass and roots brought by them to the surface.*

Food habits.—McAtee records this species†† as feeding on wild rice, wild celery, pondweeds, and coontail (*Ceratophyllum demersum*), and Audubon states that it consumes acorns, beechnuts, snails, tadpoles, and small fishes.** The birds taken in Alabama had been feeding on the leaves, stems, and

†*Marila americana* of the A. O. U. Check-list; for change of name see Proc. Indiana Acad. Sci., 1920, pp. 105-113 (1921).

‡Avery, W. C., Amer. Field, vol. 34, p. 584, 1890.

*Elliot, D. G., Wild Fowl of the United States, pp. 156-157, 1898.

††McAtee, W. L., Bull. 205, U. S. Dept. Agr., p. 24, 1915; Bull. 465, pp. 20-21, 1917.

**Audubon, J. J., Ornith. Biog., vol. 4, pp. 198-199, 1838.

rootstocks of ditchgrass (*Ruppia maritima*) and on mollusks. One individual had consumed 400 snails at one meal.

CANVAS-BACK: *Aristonetta valisineria* (Wilson).**

State records.—The famous and much-prized canvas-back, though formerly plentiful, is now rather uncommon in the State. It is reported to occur in winter at Muscle Shoals in the Tennessee River, at Orange Beach, and near Autaugaville. At the last named place a flock of 7 was seen on a mill pond, November 28, 1911, and 1 was secured two days later. During January, 1912, about a dozen remained in the vicinity several weeks, visiting the mill pond and other ponds and marshes near Bear Swamp (Golsan). In Mobile Bay the species is said to be fairly common; Dr. S. C. Frederic reported seeing 6 there, November 7, 1915, and Addie Taylor saw 12 in Chuckvee Bay, about November 15, 1915.

General habits.—The canvas-back is a diving duck and, like the redhead, feeds in deep water, usually gathering into good-sized flocks. Its flight is exceedingly rapid, usually in a straight line and often at a great height. It is a very wary bird, but may under favorable circumstances be decoyed within range.

Formerly, when much more abundant than at present, vast flocks were accustomed to gather in the waters of Chesapeake Bay, Maryland, and upon suddenly taking wing they produced a noise like thunder. The canvas-back has long been famous for the high quality of its flesh, which was believed to be due to its habit of feeding on wild celery. McAtee has shown, however, that while the bird does consume considerable quantities of this plant, it feeds to a large extent also on other plants, notably pondweeds (*Potamogeton*). In the shallow lakes of southern Louisiana he found this bird (which in more northern regions prefers comparatively deep water) in abundance, living largely upon the tubers of a species of arrowhead known as the wild potato*

Food habits.—The canvas-back feeds extensively on wild celery (*Vallisneria spiralis*), pondweeds, widgeon-grass or

***Marila valisineria* of the A. O. U. Check-list; for change of name see *The Auk*, vol. 36, p. 267, 1919.

*McAtee, W. L., Bull. 465, U. S. Dept. Agr., p. 21, 1917.

ditchgrass (*Ruppia maritima*), coontail or hornwort (*Ceratophyllum demersum*), and on the tubers of the delta potato (*Sagittaria platyphylla*), banana waterlily (*Nymphaea mexicana*), and nutgrass or chufa (*Cyperus esculenta*).† Nuttall states that it eats seeds and grain and is especially fond of wheat.‡

SCAUP DUCK; BULLHEAD; BIG BLUEBILL: *Fulix marila nearctica* (Stejneger).**

State records.—The scaup occurs in winter in moderate numbers in Mississippi Sound and probably also less frequently on the interior waters of the State. In Grand Bay, close to the Mississippi line, on November 16 and 17, I secured 5 specimens from among the large flocks of lesser scaups which were flying about the sound, and on January 3 and 6, 1916, W. L. Bryant secured 2 more near Bayou Labatre.

Avery says that this bird in 1890 was common on the Warrior River, where it was a winter resident.*† In view of the fact, however, that the lesser scaup is known to be much the commoner bird throughout the State and that the only specimen collected by Dr. Avery proves to be of that species, it is probable that he was mistaken as to the relative abundance of the two species.

General habits.—During the winter season this species seems to be largely confined to the sea coast. There it associates with the lesser scaup, from which it can not readily be distinguished at a distance, and with which it shares the name of "*dos-gris*." The head and neck in the adults are glossed with green instead of purple, as in the lesser scaup. The scaups feed in open water of moderate depth, diving easily to the bottom for their food.

Food habits.—Examination of seven stomachs of this species collected in Mississippi Sound, showed the food to consist of various species of snails and the stems, leaves, and

†Cf. McAtee, W. L., Bulls. 205 and 465, U. S. Dept. Agr.

‡Nuttall, Thos., Manual Ornith., Water birds, p. 438, 1834.

***Marila marila* of the A. O. U. Check-list; for change of name see The Auk, vol. 38, p. 265, 1921; also Oberholser, Proc. Indiana Acad. Sci., 1920, pp. 106-108, 1921.

*†Avery, W. C., Birds observed in Alabama: Amer. Field, vol. 34, p. 584, 1890.

rootstocks of ditch grass (*Ruppia maritima*), the proportion of animal food averaging about the same as the vegetable.

LESSER SCAUP DUCK; BLUEBILL: *Fulix affinis*
(Eyton).

State records.—The lesser scaup is probably the commonest and most widely distributed of its tribe as a winter resident of the Southern States. It is found abundantly in Alabama on all the rivers, lakes, and ponds in the interior as well as on the bays along the coast. In the interior it is commonly known as "bullhead;" in Perdido Bay it is called "blackhead;" and in Mississippi Sound, "gray-back" or "*dos-gris*."

At Leighton, and doubtless also throughout the Tennessee Valley, it is an abundant spring migrant, occurring from the middle of February to the middle of April in large flocks in many of the ponds which at this season cover the low spots in the fields. Small flocks are seen in the rivers very late in spring. At Florence, May 1, 1912, I saw a flock of about 20 and at Decatur, May 12, a bunch of 8. The species occurs also irregularly but often in some numbers on the Alabama River, near Montgomery, where on December 11, 1915, I saw 4 individuals. At Orange Beach, late in January, 1912, this was the only species of duck to be found in numbers. Small companies were seen in the bay, but the large flocks, numbering sometimes several hundred, were living in the brackish lakes between Orange Beach and Little Lagoon. When I again visited these lakes in December, 1915, however, I found no ducks at all. In Mississippi Sound and in the ponds on Dauphin and Petit Bois Islands in February, 1912, lesser scaups were moderately common, but by the 22d of March their numbers were much reduced. In Mississippi Sound in November, and in Mobile Bay in December, 1915, I found the species common in company with the ringneck and small numbers of the greater scaup duck. Smaller numbers were seen, also, at Nigger Lake early in December.

Migrants begin to arrive in fall about the first week in October (October 7, 1890, Greensboro), and in spring the birds linger sometimes well into May (May 15, 1891, Leighton; May 14, 1912, Guntersville).

General habits.—Lesser scaups occur in both small and large flocks, feeding usually in open water of about 4 feet or less in depth, although frequently found in the bays in deeper water. They fly swiftly in rather compact ranks and, being unsuspicious, they may usually be shot from a boat with little difficulty or decoyed within reach of a blind. Their notes, uttered usually when flying in companies, are harsh and guttural, though not loud.

Food habits.—The food of this duck in Alabama, as shown by the examination by the Biological Survey of 18 stomachs, consists of the foliage and seeds of pondweed, water milfoil (*Myriophyllum*), smartweed (*Polygonum*), waterlily (*Cas-talia*), hornwort (*Ceratophyllum*), and sedges; snails and other mollusks; crabs; caddis cases; dragonfly nymphs; and chironomid larvae.

Snails formed a large percentage of the food of nearly all the birds examined, and in several instances composed the entire stomach content. One individual had consumed over 500 snails of 6 or more species. A bird taken on Petit Bois Island had eaten 800 seeds of the waterlily, and another from the same place had taken 1,800 seeds of pondweed (*Ruppia maritima*).

RING-NECKED DUCK; "BLACK DUCK:" *Perissonetta collaris** (Donovan).

State records.—McCormack records the ring-necked duck as a very common migrant and possible winter resident at Leighton, arriving in November and remaining till the middle of December. He has not seen it in January or February, but it is common during the early part of March. Golsan and Holt report it as wintering in small numbers in Autauga County,† and Amel Callaway states that it occurs occasionally at Orange Beach. On Mississippi Sound it is one of the commonest wintering species, apparently about as numerous as the lesser scaup. A number of specimens were taken there, November 13 to 17, 1915. It is also fairly common in Mobile Bay, where

**Marila collaris* of the A. O. U. Check-list; for change of name see The Auk, vol. 39, p. 245, 1922.

†Golsan and Holt, The Auk, vol. 31, p. 216, 1914.

Dr. S. C. Frederic took specimens on November 7, 1915. I secured several, also, at Nigger Lake, November 30, 1915.

General habits.—The ringneck, usually called "black duck" on the Alabama coast, resembles the scaup ducks very closely in general appearance, but may be distinguished by the bluish-gray patch in the wing, which in the scaups is white. In Mississippi Sound it associates with the scaup ducks, often in large flocks, and is of very similar habits, feeding usually in water of moderate depth. Its note, too, is similar—a low, guttural croak. In the interior it lives much in shallow ponds.

Food habits.—Ten stomachs of this species from Alabama have been examined and these show the food to consist of the seeds and foliage of a variety of water plants, including pondweeds (*Najas* and *Potamogeton*), ditchgrass (*Ruppia*), wild rice (*Zizania*), hornwort (*Ceratophyllum*), and purple water-shield (*Brasenia*); also a few seeds of dogwood and gum (*Nyssa*), small quantities of caddisfly larvae, and a considerable proportion of snails.

GOLDEN-EYE; WHISTLER: *Glaucionetta clangula americana* (Bonaparte).‡

State records.—The golden-eye occurs in small numbers as a winter visitant on the Gulf coast. In Mississippi Sound it is reported at times to be fairly numerous. On Coffee Island, near Coden, November 23, 1915, a single golden-eye came to our decoys and was shot. The next day, and again on the 26th, one was seen near the same spot. The same day I saw a pair out in the Sound, and on January 6, 1916, W. L. Bryant killed 2 females, which he sent to the Biological Survey. Two more specimens (male and female) taken by him near Coden, January 26, 1916, are in the collection of the Department of Archives and History at Montgomery. This species is reported to occur occasionally in Mobile Bay.

General habits.—This duck is commonly known as "whistler," from the shrill noise produced by the wings in flight. In its summer home in the North it lives about small inland

‡*Clangula clangula americana* of the A. O. U. Check-list; for change of name see *The Auk*, vol. 37, p. 442, 1920.

streams and lakes, placing its nests in hollow trees. In winter, however, it frequents the sea coast, feeding about the bars and reefs in the shallow bays, usually in company with its own kind. In Mississippi Sound I found a few birds living about the oyster reefs near the mainland. On account of their habit of feeding on fiddler crabs, these ducks are often called "fiddler ducks" by local hunters.

Food habits.—The stomachs of 3 individuals taken in Mississippi Sound contained ground-up remains of crustaceans—probably small crabs—and a few snails. McAtee records the bird as feeding on wild celery (*Vallisneria*), pondweed, eelgrass (*Zostera*), and tubers of musk grass (*Chara*).*

BUFFLEHEAD; BUTTER-BALL: *Charitonetta albeola*
(Linnaeus).

State records.—The buffle-head, commonly known as "butter-ball" or sometimes "marionette," occurs in small numbers as a winter visitor on the coast and is occasionally met with on the interior waters. In Mississippi Sound it is reported to be rather uncommon; I observed one there on February 10, 1912. A large flock was reported to have been seen in Perdido Bay in January, 1912. Two were seen in Grand Bay, November 19, and two, November 20, 1915, by T. P. White, who showed me the head of one for identification. He killed 4 there also the last of November, 1916. McCormack records it as occurring occasionally at Leighton, the species having been taken December 5, 1889, and March 17 to 22, 1890. C. N. Hinderer reports it from Montgomery and Dr. S. C. Frederic reports killing several in the bays near Mobile late in November, 1916.

General habits.—This little duck is usually found in open water of considerable depth; it is an expert diver, disappearing so quickly when alarmed that it is difficult to shoot even when it is resting on the water. It flies rapidly, but may often be enticed within the circle of a bunch of decoys. It breeds in the far North, placing its nest in hollow trees, after the manner of the wood duck.

*McAtee, W. L., Bulls. 205, U. S. Dept. Agr., pp. 1, 14, 1915; and 465, pp. 4, 10, 17, 1917.

Food habits.—Of the food of this species, Baird, Brewer, and Ridgway say:

On the seacoast and on the estuaries, it obtains, by diving, small fry, shrimps, bivalve-shells, and mollusks; in fresh water, small crawfish, leeches, snails, grasses, and other water-plants.†

McAtee states that it feeds on wild rice, wild celery, and pondweeds.‡

OLDSQUAW: *Clangula hyemalis* (Linnaeus).*

State records.—The oldsquaw, or long-tailed duck, apparently is rather uncommon in the waters along the coast. No specimens are known from Alabama but its occurrence is reported at Bayou Labatre by two experienced hunters, both of whom identified the bird (independently) from the drawing of the head in Chapman's "Handbook."** Mr. A. D. Gollott stated that he killed one of the birds in Mississippi Sound, near Bayou Labatre, on March 3, 1912, and saw a large flock of the same species there in the spring of 1911. Mr. T. P. White reported seeing a flock of about 20 in the same locality in January, 1912.

General habits.—This duck is a hardy bird, breeding in the far North and coming South only during severe weather. It frequents the ocean as well as the bays and often feeds just beyond the inner line of breakers. Not only is it an expert diver but it is one of the swiftest-flying members of its family. It has an odd, nasal, though mellow, call which has given it the name of "south-southerly."

Food habits.—Nuttall states that the species subsists chiefly upon small shellfish and marine plants, particularly the *Zostera*, or grass-wrack.

†Baird, Brewer, and Ridgway, Water birds of North Amer., vol. 2, p. 51, 1884.

‡McAtee, W. L., Bull. 465, U. S. Dept. Agr., pp. 4, 10, 17, 1917.

**Harelda hyemalis* of the A. O. U. Check-list; for change of name, see The Auk, vol. 37, p. 442, 1920.

**Chapman, F. M., Handbook of birds of Eastern North America, Pl. XII, 1912.

SURF SCOTER; "COOT": *Melanitta perspicillata*
(Linnaeus).‡

State records.—The surf scoter occurs rarely or irregularly in winter in Mississippi Sound. I secured an immature specimen near Point-aux-Pines, November 13, 1915, and saw another one next day in Grand Bay. W. L. Bryant shot one in Grand Bay, February 8, 1916, which is now preserved in the collection of the Department of Archives and History, at Montgomery. Addie Taylor, of Mobile, tells me that he has frequently shot these coots in the sound near Coffee Island, where they occur in flocks of 50 to 75.

General habits.—This hardy bird is a lover of the sea and of cold weather. It spends the winter in large numbers along the Atlantic Coast as far south as Chesapeake Bay, and stragglers reach the Gulf of Mexico. It congregates, often in large flocks, feeding in the open waters of the larger bays and sounds, as well as in the ocean. Surf scoters are not very wary, and may usually be shot with little difficulty, but by reason of the poor quality of their flesh and the difficulty of picking them they are little sought after by hunters.

Food habits.—Audubon mentions having found fish of different kinds and several species of shellfish in stomachs of this species.* The stomach of a specimen collected in Mississippi Sound contained remains of a marine invertebrate and of small crabs and mollusks.

RUDDY DUCK: *Erismatura jamaicensis* (Gmelin).

State records.—The ruddy duck is reported to occur regularly in the small shallow bays near Mobile. Apparently, however, it is not very common, and the only definite record is that of a pair which I shot in Duckers Bay, December 4, 1915, as the birds rested alone on the water. The species has not thus far been recorded from other parts of the State.

General habits.—In Alabama this little duck is known to the local hunters as "sleeper," from its habit of sleeping on sandbars in the daytime. It does not associate much with

‡*Oidemia perspicillata* of the A. O. U. Check-list; for change of name see *The Auk*, vol. 34, p. 200, 1917.

*Audubon, J. J., *Ornith. Biog.*, vol. 4, p. 164, 1838.

larger species of ducks, but feeds mainly with flocks of coots (*Fulica americana*) in the shallow parts of the bays. Flocks of 20 or more are sometimes seen, and when fired into while flying, the birds will at once fall to the water and dive, soon reappearing, however, and continuing their flight. When swimming they often carry the tail, which is composed of stiff, pointed feathers, elevated to a perpendicular position or even directed forward. They ride deep in the water and are able to sink beneath the surface without diving.

The notes of this bird, according to Audubon, are uttered in a low tone and closely resemble those of the female mallard.

Food habits.—Audubon states that the ruddy duck when living in fresh water feeds upon the roots, blades, and seeds of aquatic grasses; when on salt marshes it eats small univalve shells, fiddlers, and young crabs, and on the seacoast devours fry of various sorts.† McAtee records the bird as feeding on wild rice, wild celery, pondweed, arrowhead, and the seeds of waterlilies.‡ The two individuals taken in Alabama had been feeding on the seeds and leaves of pondweeds and on small snails.

SNOW GOOSE; "BRANT:" *Chen hyperborea hyperborea* (Pallas).

State records.—Although common winter residents about the mouth of the Mississippi, snow geese apparently visit Alabama only at irregular intervals. A. D. Gollott, of Bayou Labatre, reports having killed one in Mississippi Sound in the fall of 1909, and Amel Callaway, of Orange Beach, states that early in November, 1915, a good many were seen passing over in flocks with Canada geese, the white birds being more numerous than the gray ones. On the Tennessee River, at Muscle Shoals, snow geese are said to occur irregularly. F. W. Scruggs states that about the year 1907 they were fairly common during one season.

BLUE GOOSE: *Chen caerulescens* (Linnaeus).

State records.—The principal winter home of the blue goose is about the mouth of the Mississippi River. Reports re-

†Audubon, J. J., Ornith. Biog., vol. 4, p. 328, 1838.

‡McAtee, W. L., Bull. 465, U. S. Dept. Agr., 1917.

ceived from two observers indicate that the bird probably occurs casually in Alabama. Frank King, of Leighton, in May, 1912, repeatedly saw four strange geese grazing in a pasture close to the Tennessee River at the foot of Muscle Shoals. His description of the birds as "solid blue" in color agrees well with the young plumage of this species, and could not well apply to any other goose. They were observed in the same pasture on a number of different days, the last time on May 8. They did not seem to be very wild, but when frightened would fly over the shoals and in a short while return. In November, 1914, Charles N. Hinderer killed a strange goose near Montgomery, which he describes as follows: "Head, white; back, gray; breast, white; feet, red." This description, apparently, could apply to no other goose known from this region.

[WHITE-FRONTED GOOSE: *Anser albifrons gambelli* Hartlaub.

The white-fronted goose, which winters in the whole southern half of the United States, and south to Cuba and northern Mexico, probably occurs occasionally on the coast of Alabama.]

CANADA GOOSE; WILD GOOSE: *Branta canadensis canadensis* (Linnaeus).

State records.—The Canada goose occurs not uncommonly as a winter resident in Alabama, arriving from the north during October and returning about the middle of March. It is probably most abundant on the Tennessee River in the vicinity of Muscle Shoals and many are shot in that locality every winter. In the fall of 1915 they were unusually common, and on November 4, when I first visited the Shoals, I saw about 400 geese in flocks of 40 to 100 or more. This is a favorite feeding ground for them and many roost at night on the rocks in the shoals. On a second visit to this locality, on December 19, 1915, smaller numbers were observed, probably not over a hundred.

In December, 1911, a wild goose became entangled in a wire fence on Richard King's plantation, bordering on Tennessee River, north of Leighton. It was captured and kept in captivity for several months, and finally was preserved as a

museum specimen. It proved to be the typical form of the species.

Avery records the Canada goose as a rare winter resident at Greensboro, and McCormack found it moderately common at Leighton—noted between October 23 and March 13. Brown, writing from Coosada, says that a large flock spent the winter of 1877-78 in a cornfield, on the banks of the Coosa River, and left for the North about the second week in March.*

Wild geese are still numerous every winter in the vicinity of Montgomery. On the coast they apparently are not common, though found occasionally. One was reported at Bayou Labatre about March 20, 1912.

In 1915 geese were reported to have arrived at Muscle Shoals during the first week in October. Northbound migrants were first seen at Carrollton, March 14, 1887, and March 15, 1888.

General habits.—During their stay in Alabama, wild geese live mainly on the larger rivers and ponds, roosting at night on sand bars or on rocks in the shoals, and feeding in near-by fields of wheat or corn. They gather into large flocks and in flight assume regular formations, either straight lines or V-shaped ranks. They are at all times wary and while feeding provide against surprise by posting sentinels at various points. The usual method of hunting them is to conceal one's self before daylight in a shock of corn or a pit in a field where the birds are known to feed and await their arrival at or soon after daybreak. In the Tennessee River at Muscle Shoals many are killed by hunters concealed in piles of drift on the little islands or "towheads" (as they are called), or in boxes sunk in the shallower part of the river. If a good place has been selected and particularly if the weather is misty or foggy, some of the flocks of geese in their flights up and down the stream are almost certain to pass over the hunter close enough for a shot.

Food habits.—The Canada goose subsists principally upon the stems, leaves, and roots of sedges and other aquatic plants, corn and other grain gleaned in the fields, and the tender shoots of wheat and various grasses. Audubon mentions

*Brown, N. C., Bull. Nuttall Ornith. Club, vol. 4, p. 13, 1879.

waterlily seeds as being greedily eaten by this bird. The single stomach examined by the Biological Survey from Muscle Shoals, contained ground-up leaves, stems, and rootlets of pondweed (*Najas flexilis*) with two *Panicum* seeds.

WHISTLING SWAN: *Cygnus columbianus* (Ord).†

State records.—Swans are now of rare occurrence in the State and no specimens are available. The few records probably refer to this species. A flock was seen by several people about 1910 in the fields near Leighton; the birds are reported to occur rarely as winter visitors in Mississippi Sound. In early December, 1916, a swan was reported to be living in Polecat Bay, near Mobile, spending much time on a mud flat near the head of the Bay.

General habits.—This bird feeds in shallow water about muddy flats, immersing its head and neck and dragging up from the bottom bunches of its favorite aquatic plants. It is said to be at times very noisy, its notes being described as shrill and discordant.

FLAMINGOES: Family *Phoenicopteridae*.

FLAMINGO: *Phoenicopterus ruber* Linnaeus.

State records.—That flamingoes once occurred in the State is evidenced by the remark of Audubon, who says of these striking and beautiful birds: "The western coast of Florida, and some portions of that of Alabama, in the neighborhood of Pensacola, are the parts to which they mostly resort."* D. D. Stone records the capture alive in 1881 of four young flamingoes at Warrington, Florida, a short distance from the Alabama line.‡ The species does not at present occur in this region and is found in the United States only in southern Florida, and there very rarely.

General habits.—The flamingo is an abundant bird in the Bahamas, nesting in large colonies in remote, shallow lagoons. The nests, truncate-conical in shape, and from 8 to 14 inches high, are constructed of mud, which the bird scoops up with

†*Olor columbianus* of the A. O. U. Check-list; for change of name see *The Auk*, vol. 40, p. 515, 1923.

*Audubon, J. J., *Ornith. Biog.*, vol. 5, p. 256, 1839.

‡Stone, D. D., *Orn. and Ool.*, vol. 10, p. 158, 1885.

its bill from about its feet. A single egg is laid in a depression on top. The young "are fed by regurgitation on the partially digested juices of a small mollusk of the genus *Cerithium*, which forms apparently the only food of the adult. The note of the young is a shrill whistling, that of the adult a goose-like honking."‡

SPOONBILLS: Family Plataleidae.

ROSEATE SPOONBILL: *Ajaia ajaja* (Linnaeus).

State records.—The occurrence of roseate spoonbills in Alabama is mentioned by Nuttall, who says of them: "They are also occasionally met with on the river shores of the Alabama, and in other parts of that State."* The only recent record is furnished by Capt. W. M. Sprinkle, who states that he saw two birds of this species killed on Dauphin Island about the year 1897.

General habits.—The roseate spoonbill frequents the muddy shores of shallow lagoons or ponds, chiefly near the sea coast. It is gregarious at all seasons, flying in rather compact flocks and nesting in bushes growing in shallow water.

IBISES: Family Threskiornithidae.†

WHITE IBIS: *Guara alba* (Linnaeus).

State records.—The white ibis is apparently an accidental visitor in southern Alabama. It is a common breeder in western Florida (Chipley and Whitfield) and may have nested occasionally on the Alabama coast. A. D. Gollott, of Bayou Labatre, informs me that he has seen the species on Petit Bois Island, and Capt. W. M. Sprinkle also states that it was in former years an occasional visitor there.

General habits.—This species breeds in colonies, placing its nests in bushes or small trees. It feeds, generally in flocks, about mud flats or marshes. The birds fly swiftly in close ranks, alternately flapping and sailing, and often indulge in graceful evolutions high in air.

‡Chapman, F. M., Handbook of Birds of Eastern North America, p. 217, 1912.

*Nuttall, Thomas, Manual of ornithology, water birds, p. 80, 1834.

†Ibididae of the A. O. U. Check-list; for change of name, see The Auk, vol. 37, p. 441, 1920.

[SCARLET IBIS: *Guara rubra* (Linnaeus).]

The scarlet ibis occurs in the United States merely as a straggler, having been recorded from Colorado, Arizona, New Mexico, Louisiana, and Florida. The only record from Alabama is the very indefinite one of Nuttall, who says: "They migrate in the course of the summer (about July and August) into Florida, Alabama, Georgia and South Carolina."†]

[GLOSSY IBIS: *Plegadis falcinellus* (Linnaeus).*

The glossy ibis, once widely distributed in both hemispheres, is now rare and local in the Southeastern States, where it has been recorded from Florida and Louisiana. It doubtless occurred formerly and may still be found in Alabama.]

STORKS AND WOOD IBISES: Family Ciconiidae.

WOOD IBIS; GOURDHEAD: *Mycteria americana*
Linnaeus.

State records.—Nuttall refers to the wood ibis as "not uncommon in Mississippi, Alabama, Carolina, and Georgia."‡ In the note book of Dr. W. C. Avery I find a record of the capture of a specimen at Cockes Pond, 5 miles west of Greensboro, on July 26, 1891, and the further note, "Seen some years ago." It was reported by C. E. Pleas to breed at Chipley, Florida, in 1903, so may possibly be found breeding in southeastern Alabama.

General habits.—The wood ibis breeds in colonies, usually in tall cypress trees; at other seasons it may be found either singly or in loose flocks, feeding in shallow, muddy pools in the woods or on marshy meadows. Audubon mentions having seen flocks composed of several thousands. The birds are strong flyers, often ascending in spirals to a great height and sailing in graceful circles for a considerable period.

Food habits.—Audubon states that the wood ibis feeds on small fish, frogs, aquatic reptiles, and young alligators, which it procures in muddy lakes or bayous by stirring up the mud with its feet and spearing the animals as they come to the surface.**

‡Nuttall, T., Manual of Ornith., water birds, pp. 84-85, 1834.

**Plegadis autumnalis* of the A. O. U. Check-list; for change of name see The Auk, vol. 40, p. 515, 1923.

‡Nuttall, Thos., Manual ornithology, water birds, p. 83, 1834.

**Audubon, J. J., Ornith. Biog., vol. 3, p. 129, 1835.

HERONS AND BITTERNS: Family Ardeidae.

BITTERN; SUN-GAZER: *Botaurus lentiginosus*
(Montagu).

State records.—The bittern occurs in moderate numbers as a spring and fall migrant and a few may remain throughout the winter. McCormack says that it is never abundant at Leighton, where it is most frequently met with in July and August. One was shot there September 9, 1912, and another October 19, 1912. Dr. Avery collected a specimen in Hale County, 5 miles west of Uniontown, March 28, 1891; and Mrs. B. R. Samuel has a specimen taken at Guntersville. Gutsell reported one seen at Bayou Labatre, August 26, 1911. I noted single birds there, November 16 and 20, 1915, and W. L. Bryant took a specimen, December 2, 1916. Single individuals were noted in Chuckvee Bay, March 16, 1912; at Montgomery, April 19, 1912; Auburn, April 27, 1912; and in Duckers Bay, December 4, 1915. Holt took one at Barachias, November 15, 1911, and one at Thomasville, April 11, 1912, on the edge of a cultivated field, where it had been feeding on crawfish. Golsan has observed the bird as late as May 28 in marshes near Autaugaville—suggesting the possibility of its breeding there.*

Migrants from the south reach the southern border of the State in March and occasional individuals may be found during all of that month and April. The southward movement in fall begins early, often in July or August, and migrants may be found as late as November.

General habits.—The bittern lives chiefly in wet marshes, but during its migrations is sometimes found in low fields near water courses. It is an expert at concealment, and its habit of standing motionless among the reeds with its bill pointing skyward has given to it the name of "sun-gazer." Its curious booming notes, suggesting the sound made by an old-fashioned wooden pump or the driving of a stake may be heard for a long distance and have given the bird another common name, "stake-driver."

*Golsan and Holt, *The Auk*, vol. 31, p. 217, 1914.

FIG. 1.—Least Bittern.

Food habits.—The food of the bittern consists mainly of frogs, snakes, lizards, crawfish, mollusks, mice, small fishes, spiders, beetles, grasshoppers, flies, and other insects.

LEAST BITTERN: *Ixobrychus exilis exilis* (Gmelin).

State records.—The least bittern (fig. 1) is an abundant summer resident in the marshes along the coast, and a rare or local breeder in the interior. In migration it may occur almost anywhere in the lowlands. McCormack has taken the bird once at Leighton, May 10, 1902. In the big marshes at Bayou Labatre I found it numerous in May, 1911, and Gutsell reported it fairly common on Petit Bois Island in July and August. Peters found it common at Alabama Port in June, 1914. At Bon Secour, October 19, 1908, I collected a single specimen, this being the latest date on which the species has been observed. Nests with eggs were found at Bayou Labatre, May 22, 1911, and at Chuckvee Bay, May 28, 1914; a nest which the young had just left was seen at Alabama Port, June 6, 1914. Golsan considers the species a rare breeder in the marshes of the Alabama River near Autaugaville.

General habits.—This bird is perfectly at home in the reedy marshes, where it clings with ease to the upright stems of the sedges or threads its way rapidly over the oozy ground through the maze of tangled vegetation. Although gentle and unsuspicious, it is rarely seen, for most of its time is spent under cover of the marsh grasses. Occasionally it takes flight, but after the manner of the rails, flies but a short distance before dropping again into the vegetation. The nest, loosely constructed of dead rushes, is placed in rushes a foot or two above the water.

Food habits.—The bittern, according to Audubon, feeds upon snails, tadpoles, young frogs, lizards, insects, small fishes, and occasionally small shrews and mice.

GREAT BLUE HERON; "BLUE CRANE:" *Ardea herodias herodias* Linnaeus.

State records.—Great blue herons, representing either the typical subspecies or *wardi*, are common and well known throughout the State under the name of "blue crane" or (on

the coast) "long tom." Specimens are lacking to determine the exact limits of the two races, and the northern bird (*herodias*) may occur in the State only as a migrant. All records from the extreme northern part, however, are provisionally referred to this form. In winter *herodias* ranges south to the coast marshes.

Specimens of this race have been examined from Castleberry, November 10 and 18 (1911); Grand Bay, November 16 (1915); Nigger Lake, November 30 (1915); and Duckers Bay, December 2 (1915). These undoubtedly were migrants from the north, since the breeding form in the coast marshes is *wardi*. In this region the species is more numerous than elsewhere in the State and about equally common in winter and summer. Single birds were seen at Florence, May 4, 1912; Stevenson, July 15, 1911; and Guntersville, June 17, 1913. Three were seen at Muscle Shoals, July 1, 1913, and several more in November, 1915. McCormack records the species as a tolerably common resident at Leighton, most often seen during the summer months.

General habits.—This heron is found chiefly about marshes, lakes, and the larger water courses. It is at all times extremely wary and is rarely surprised at close quarters unless the hunter is well concealed. Its flight is steady and powerful, often at a considerable height, or again just over the marshes, the long neck folded back and the legs stretched out behind. Although nesting usually in colonies, these herons feed mainly singly or in pairs. They feed both by day and night. Their long legs enable them to wade in deep water in search of their prey, which they transfix with a lightning-like thrust of the powerful beak. Their note is a harsh and discordant squawk, often several times repeated. McCormack writes of the breeding of this bird as follows:

About half a mile below Bainbridge Ferry, in the Tennessee River, and about nine miles from this place, is a small island known as Crane Island where, as I was informed by an old fisherman, a few "cranes" have nested every spring for the past twenty years, and probably for a much longer time than that. He said the nests are inaccessible, being placed in tall sycamore trees, sometimes as many as fifteen in the same tree.*

*McCormack, F. W., Leighton (Ala.) News, vol. 2, No. 6, March 14, 1891.

The nesting season in South Carolina is in the latter part of March and in northern Alabama probably in April.

Food habits.—According to Barrows, the great blue heron “feeds mainly on fish and frogs, but also eats immense numbers of crayfish, small snakes, salamanders, insects (among them grasshoppers), meadow mice, and almost anything of an animal nature.”†

The stomach of one of these herons taken at Orange Beach, Alabama, contained remains of 11 fishes, including 4 gizzard shad (*Dorosoma cepedianum*) and 1 catfish; one from near Stockton contained 3 sunfishes; and one from Mobile contained 1 fish and remains of wasps and damselflies.

WARD HERON: *Ardea herodias wardi* Ridgway.

State records.—The Ward heron is the southern and slightly larger form of the great blue heron. Its range is not definitely known, but is assumed to include at least the lower half of the State. In the coast region these herons are particularly numerous, and in the interior moderate numbers are found in the swamps and along the larger rivers.

At Orange Beach, in January, 1912, we found them common about the marshes bordering the bay and on the outer beaches. A specimen taken there proved to be typical *wardi*. A colony is reported to nest in a cypress swamp near Orange Beach. At Bon Secour, in October, 1908, they were equally numerous and not quite so shy as usual. In the marshes bordering Mississippi Sound and on Petit Bois Island, Gutsell found them common during the summer. In the big marshes about the head of Mobile Bay a few are always to be found, both in winter and summer, but they are less numerous there than nearer the coast. On a trip to Stiggins Lake, May 25 to 28, 1914, we saw perhaps 20 individuals, and secured 1 specimen. An immature bird was taken, also, at Dog River, below Mobile, July 4, 1913.

This species is reported as a common resident and breeder at Greensboro (Avery) and a rare summer resident at Autaugaville (Golsan).

†Barrows, W. B., Michigan bird life, p. 136, 1912.

General habits.—This race does not differ in habits from the northern form. The birds feed extensively on the coast marshes, their long legs and bodies enabling them to stand even in tall reeds and still keep a lookout for danger. They feed, also, on the outer beaches; in Bon Secour River, in October, I saw many sitting on rafts watching for their finny prey. It is of course impossible to approach anywhere near one in the open, but by quietly pushing a boat through the tortuous bayous on the marshes, many may be flushed at very close range.

EGRET; "WHITE CRANE:" *Casmerodius alba egretta*
(Gmelin).‡

State records.—The large white egret, commonly but erroneously called "white crane," was once an abundant bird in all the Southern States, but has been almost exterminated through the demands of the millinery trade. No breeding colonies are at present known in Alabama, but they undoubtedly occurred in former times. Dr. Avery records one specimen taken near Greensboro, August 14, 1889, and mentions seeing two others in spring.* McCormack records it as quite common near Leighton, and his notes show that he observed eight herons on July 9, and four on July 23, 1889; these records do not necessarily indicate, however, that the birds were breeding, as this and other species of heron are well known to wander northward after their nesting season is over.

At Stiggins Lake, near Mount Vernon, May 27, 1914, we noted three egrets in flocks of the little blue heron (*Florida-cærulea*) and secured one specimen. These birds must have been breeding in the near vicinity, but the colony was not located. With proper protection, this attractive species may yet become re-established in the State.

General habits.—This egret nests in colonies, usually in heavily timbered swamps, and often in company with great blue herons, cormorants, anhingas, or other species. The birds feed in marshes and on the borders of ponds, lakes, or

‡*Herodias egretta* of the A. O. U. Check-list; for change of name see *The Auk*, vol. 37, p. 442, 1920.

**Amer. Field*, vol. 34, p. 584, 1890.

bayous, repairing about sundown to a common roost in some inaccessible swamp or timbered bottom. McCormack speaks of the species as quite common on Pond Creek (near Leighton) during the latter half of summer and early fall, where sometimes as many as a dozen may be seen at a time, some standing motionless in the water with their long necks folded on the breast, some wading along with stately step as far out as the middle, and others flying up and down the creek, occasionally alighting with much flopping and balancing in the tops of the trees scattered along the creek.†

Food habits.—Nuttall states that the food of this species consists of frogs, small fish, lizards, mice, moles, insects, small water snakes, and the seeds of pondlilies.‡ The stomach of the specimen secured at Stiggins Lake contained 3 gizzard shad (*Dorosoma cepedianum*) about 5 inches long.

SNOWY EGRET; "WHITE CRANE:" *Egretta thula thula* (Molina).*

State records.—The beautiful snowy egret, a much smaller bird than the white egret, has suffered severely from persecution by plume hunters, so that now it is extremely rare, and confined to a few isolated colonies on the coast from North Carolina to Florida and Louisiana. It occurred in former years in Alabama but seems now to be entirely extinct in the State. Brown's report† of several small white herons seen at a distance, April 29, 1878, at Coosada, is quite unsatisfactory, as is his further statement that the species is said to be very common during summer, for there is a strong probability that some, if not all, of the birds spoken of were little blue herons in the white phase.

McCormack says this species seems to be quite rare, as he had met with it only a few times. Avery does not include it in his published list, but in his note book he has recorded a specimen taken July 1, 1889, in Greene County, which he mounted for John Cocke, Jr., of Cockeville. Captain Sprinkle, who formerly hunted this bird for its plumes, tells me that it

†Leighton News, vol. 2, No. 6, March 14, 1891.

‡Nuttall, Thomas, Manual of ornithology, water birds, p. 48, 1834.

**Egretta candidissima* of the A. O. U. Check-list; for change of name see The Auk, vol. 35, p. 204, 1918.

†Bull. Nutt. Ornith. Club, vol. 4, p. 13, 1879.

nested abundantly about 1893 in a cypress swamp near the junction of the Alabama and Tombigbee Rivers, as well as in the swamps on Petit Bois Island.

General habits.—The snowy egret breeds in colonies, often in company with other species of herons, placing its nests in low trees or bushes. It is found in flocks throughout most of the year, and feeds usually in shallow, muddy sloughs.

LOUISIANA HERON: *Hydranassa tricolor ruficollis*
(Gosse).

State records.—The Louisiana heron is a moderately common summer resident in the southern part of Alabama. A colony of 50 pairs, or more, nests in the bushy swamps on Petit Bois Island, and during the summer the birds are fairly numerous also on the west end of Dauphin Island. I observed them flying about on both islands July 4 to 6, 1913, but did not collect any specimens. They are said to breed also on Coffee Island, near Coden. Gutsell records the species in small numbers at Bayou Labatre late in July and early in August (1911), where they became common after a "blow" on August 12. He took a specimen on Petit Bois Island, July 28, and saw a few about Perdido Bay in September, 1911. Peters took two specimens at Alabama Port, May 30 and June 6, 1914. L. S. Golsan reports the bird as a rare breeder at Autaugaville, frequently seen in the marshes near the Alabama River from middle April till fall.

This heron migrates in autumn to Central America, but a few probably remain all winter in southern Alabama. I saw a flock of about 8 on a march in Grand Bay, November 16 (1915), and a few on Coffee Island, November 20 (1915), and December 4 (1916).

General habits.—The Louisiana heron is found chiefly about open marshes, nesting in low trees or bushes, either in segregated colonies or in company with other larger species of herons. It feeds in shallow ponds or bayous and along the banks or ditches or creeks, and is not at all shy. According to Audubon, its apparent insensibility to danger has secured for it in southern Louisiana the name of "*egrette folle*."

Food habits.—Audubon states that the food of this species consists of small fry, water insects, worms, slugs, snails, leeches, tadpoles, and aquatic lizards.‡ Three stomachs from birds taken on Petit Bois Island contained remains of minnows (*Fundulus*), with a few small shrimps and two dragon-flies.

LITTLE BLUE HERON: *Florida caerulea caerulea*
(Linnaeus).

State records.—In former years the little blue heron probably nested in suitable localities over most of the State. Now it is moderately common in the southern part and doubtless breeds in a number of localities. Avery mentions it as a "common summer resident;" his note books record its arrival on April 18, 1891, specimens collected August 16, 1889, and July 19, 1890, and 25 or 30 seen September 3, 1892. Brown records it common at Coosada during the last two weeks of April, 1878.* McCormack has taken it at Leighton but once, July 27, 1893, but Holt reports a flock of 25 or more, July 4, 1913, roosting regularly in a small woodland near that place. Mrs. B. R. Samuel has a specimen taken near Guntersville, where also I saw two individuals, June 15, 1913.

This species breeds near Autaugaville, as indicated by a female bird in laying condition which I collected from a bunch of five in blue plumage May 26, 1913. Peters caught a young individual in a trap at Hayneville, August 4, 1915. Gutsell found the species common at Bayou Labatre in summer and reports it probably nesting on Petit Bois Island. I saw one there July 4, and two, July 6, 1913, on Dauphin Island, where they probably breed. In Chuckvee Bay, above Mobile, May 12, 1911, I collected an adult male in the white phase, and at the same place, July 11, 1913, saw about 10 white birds. July 14, I saw a flock of about 20 white ones flying up from the lower Bay toward Mobile. At Castleberry, June 1, 1911, I collected an adult and at Dothan, June 5, saw another, both being in the blue phase. At Stiggins Lake, May 26-27, 1914, the species was common and was reported to be breeding in

‡Audubon, J. J., Ornith. Biog., vol. 3, pp. 139-140, 1835.

*Brown, N. C., Bull. Nutt. Orn. Club., vol. 4, p. 13, 1879.

"button bushes" in a pond in the canebrake, but we could not locate the colony.

General habits.—Fortunately for itself, this heron lacks the highly developed plumes worn by the egrets; hence it has not been in demand for millinery uses. In the blue plumage it is easily recognized, but in the white phase is liable to be confused with the snowy egret, though it may always be distinguished from the latter by its yellowish green legs and the slaty tips of the primaries.

The species nests in colonies, sometimes in company with the Louisiana heron or other species, placing its nest in low trees or bushes over the water. It feeds by day in marshes, or flooded bottoms, along the borders of ponds or streams, or even in little sloughs in heavy woodland. As night approaches the birds congregate in a common roost.

Food habits.—The food of this heron, as indicated by 4 stomachs examined from Alabama, consists of crawfish, small frogs, small fishes, spiders, and dragonflies. The stomach of one taken at Castleberry (June) contained 12 crawfish and one from Autaugaville (May) contained 12 cricket frogs, 2 large spiders, and a dragonfly nymph.

GREEN HERON; "INDIAN-HEN": *Butorides virescens virescens* (Linnaeus).

State records.—The little green heron, the most abundant and widely distributed of its tribe, is a common summer resident throughout the State. Strangely enough, its relationship to the larger herons is rarely suspected and its true name is known to very few people. Nearly everyone, however, will recognize the bird under the name of "Indian hen," which is commonly applied to it in the South. It has been observed in the breeding season at Elkmont, Stevenson, Greensboro, Auburn, Weogufka, Seale, Dothan, Mobile, Stockton, Coden, and on Dauphin Island. McCormack records it arriving at Leighton, in spring, about the first of April and departing in fall by the 20th of September. Nesting begins in April and continues through May. Young birds were found in a nest at Prattville, May 7,† and eggs at Leighton, May 15.

†Golsan and Holt, *The Auk*, vol. 31, p. 217, 1914.

General habits.—The green heron is more solitary in habit than most of the other herons, and single pairs are often found nesting in a small swamp or a clump of bushes close to a pond. Occasionally, however, a number of pairs may be associated in the nesting season. The birds are most active early in the morning and late in the evening, feeding chiefly along the borders of ponds and streams as well as on marshes and around wet, boggy spots in fields. They are not particularly shy, and on being startled often fly but a short distance before alighting on a tree, stump, or fence whence they view the intruder with outstretched neck and nervous twitchings of the tail.

The nest is a shallow, loosely constructed platform of small sticks, placed usually in the upper branches of a small tree.

Food habits.—Five stomachs of this bird taken in Alabama have been examined. They contained remains of crawfish, small fishes, spiders, water bugs, and dragonfly nymphs. One bird had consumed 13 crawfishes, another 12, and another 9; one stomach contained, besides crawfish, remains of at least 43 minnows (*Fundulus* and *Notropis*) and 33 young gizzard shad (*Dorosoma*).

BLACK-CROWNED NIGHT HERON; GROSBEC:

Nycticorax nycticorax naevius (Boddaert).

State records.—The black-crowned night heron is apparently rather uncommon locally as a summer resident. Dr. Avery omits the bird from his Hale County list, but his note book records one seen at Greensboro, September 6, 1886. Golsan and Holt report it as a breeder in Autauga County, a nest having been found April 23, 1911.† Gutsell observed these herons in considerable numbers on Petit Bois Island, July 28, August 21, and September 1, 1911, and found a few nests supposed to belong to them; an adult female specimen was taken on the island on July 28, and Peters saw two adults and an immature bird there, June 3, 1914.

General habits.—This species, as its name indicates, is chiefly nocturnal in habit. In the dusk of evening the birds

†Golsan and Holt, *The Auk*, vol. 31, p. 217, 1914.

frequently may be seen winging their way slowly to their feeding grounds, uttering as they fly a hoarse, guttural *kwah* or *kwok*. They feed on the banks of creeks, bayous, or ponds or on wet meadows or salt marshes, and, according to Audubon, are constantly moving about in search of food, walking in a stooping posture with the neck retracted.

Food habits.—The night heron feeds principally on fish, but is reported to capture also shrimps, crabs, frogs, tadpoles, lizards, mice, and grasshoppers and other insects. The stomach of one taken on Petit Bois Island contained remains of 6 minnows (*Fundulus* sp.) and 5 gizzard shad (*Dorosoma cepedianum*).

YELLOW-CROWNED NIGHT HERON; GROSBEC:

Nyctanassa violacea (Linnaeus).

State records.—The yellow-crowned night heron, known as the "grosbec" in the South, is a locally common summer resident in the southern half of the State. At Greensboro Dr. Avery records it "not common," specimens having been taken there July 1, 1879, and August 12, 1889. At Leighton it has been taken but once (McCormack, about March 20, 1902). Gutsell reported the species plentiful in July and August at Bayou Labatre and on Dauphin Island. Two young birds were collected at the latter place, July 5 and 27, 1913. Peters saw a few on Petit Bois Island, June 3, 1914. In Catoma Swamp, near Teasley Mill, I saw four birds on March 30, 1914, and a few at the same place in May. One was seen on Uchee Creek, near Seale, May 20, 1914, and they were common at Stiggins Lake, May 27.

In the secluded bayous bordering Chuckvee Bay, above Mobile, May 12, 1911, I discovered five nests on low limbs overhanging the water. The nests were shallow, flat platforms of small sticks, and each contained either 4 partly incubated eggs or 4 young just hatched. Golsan records the species as a common summer resident in Autauga County and describes a rookery of 25 or more nests. Eggs were found by him on April 12, 1908, April 23, 1911, and May 8, 1909.*

*Golsan and Holt, *The Auk*, vol. 31, p. 217, 1914.

General habits.—This heron is less gregarious than many other species of heron, often nesting in isolated pairs or sometimes in small, rather scattered colonies. It breeds in timbered swamps or river bottoms, placing its nest sometimes at a considerable height in tall trees, again on low limbs overhanging the water or in bushes.

Audubon states that he has observed it "searching for food among the roots of mangroves at all hours of the day, and that as assiduously as any diurnal bird, following the margins of rivers, and seizing on both aquatic and terrestrial animals."†

Food habits.—The food of this heron is said to consist principally of crawfish, crabs, snails, lizards, snakes, small mammals, and fish. Three stomachs examined from Alabama contained remains of crawfish, one bird having taken 8, another 10 of these crustaceans.

CRANES: Family Gruidae.

WHOOPING CRANE; WHITE CRANE: *Limnogeranus americanus* (Linnaeus).‡

State records.—The whooping crane is now a very rare bird, restricted in the breeding season to the interior of Canada. Formerly it was not rare in migration in the eastern United States and doubtless occurred regularly in Alabama. Dr. Avery says of it: "Rare. Seen many years ago in the Cypress Slough, Millwood."* Capt. W. M. Sprinkle states that this bird was formerly common on Dauphin Island during the winter. Golsan and Holt furnish the most recent record—that of 5 or 6 birds seen near Prattville late in November or early in December, 1899.**

SANDHILL CRANE: *Megalornis canadensis mexicana* (Muller).‡‡

State records.—The sandhill crane was formerly abundant in eastern North America, breeding in Florida and from Illi-

†Audubon, J. J., Ornith. Biog., vol. 4, pp. 290-291, 1838.

‡*Grus americana* of the A. O. U. Check-list; for change of name see The Auk, vol. 35, p. 204, 1918.

*Amer. Field, vol. 24, p. 584, 1890.

**The Auk, vol. 31, p. 218, 1914.

‡‡*Grus mexicana* of the A. O. U. Check-list; for change of name see The Auk, vol. 38, p. 81, 1921.

nois and Indiana northward. It is now very much reduced in numbers and nests commonly only in Florida and in Canada. A few pairs are resident and breed in the pine flats of Baldwin County. D. R. Peteet reports a small bunch living within two miles of Foley, and a few are known to occur about the shores of Perdido Bay, having been frequently heard calling in January, 1912, by the residents of Orange Beach. A pair was reported in the same vicinity, also, in August, 1911, and during the same summer an adult and a young bird were captured near the mouth of Perdido Bay, on the Alabama side.

General habits.—These cranes live on prairies and in open pine flats, usually in unsettled districts. While exceedingly wary and difficult to approach on foot, they will sometimes permit a wagon or automobile to pass near them. Their nests are in small, grassy ponds or marshes on the prairie or in pine woods, made of mud, grass, weeds, etc., and elevated a few inches above the water. The birds are noisy, their loud, resonant notes being uttered either from the ground or while flying. They frequently gather into small companies or, where abundant, into flocks of considerable size.

Food habits.—Sandhill cranes are said to be destructive to sprouting grain and to corn after it is ripe. They feed to a considerable extent on insects, destroying thousands of grasshoppers and the grubs (beetle larvae) found under green sod. Writing of a tame individual of this species in Florida, Mrs. L. H. Toussaint states that in one morning the bird captured and consumed 148 grasshoppers, 2 moths, 1 roach, 1 lizard, 2 grubs, and 11 spiders.*

RAILS, GALLINULES, COOTS, ETC.: Family Rallidae.

KING RAIL; MARSH-HEN: *Rallus elegans elegans* Audubon.

State records.—The king rail is a locally common summer resident and a rare winter resident. Avery records a specimen captured March 24, 1888, at Greensboro, from which was taken a fully formed egg.† He considers the bird an uncom-

*Bird-Lore, vol. 16, p. 359, 1914.

†Avery, W. C., Orn. and Ool., vol. 13, p. 80, 1888.

mon resident, having taken other specimens December 23, 1889, and May 23, 1891. In Mrs. B. R. Samuel's collection is a mounted specimen taken at Guntersville, and in the Country Club at Montgomery is one taken near that place. McCormack took one and observed two others at Leighton, in April, 1911. A specimen taken May 13, 1911, in the marsh bordering Mobile River, above Mobile, was probably a breeder.

At Barachias, a nest containing 8 eggs ready to hatch was found May 30, 1908 (Holt); and at Autaugaville one with 12 eggs on June 1, 1912 (Golsan).

General habits.—This rail, the largest of the North American species, is exclusively a fresh-water bird, breeding in low, wet, grass fields and about the grassy borders of rivers, ponds, or ditches, as well as in fresh-water marshes. Bachman mentions having found (in South Carolina) as many as 20 pairs breeding in a space not over 30 yards in diameter; he states that the nests were "placed on the ground, and raised to the height of six or eight inches by means of withered weeds and grasses.†

A nest found by Holt at Barachias was placed on a ditch bank in a hay field; it was "a slightly concave mass of *Sorghum halapense*, 8 inches in diameter and about 1 inch deep, woven together about stalks of high grass."**

Food habits.—This bird is said to feed on crawfish, frogs, tadpoles, snails, insects, and seeds of grasses. Audubon states that he once examined a bird whose stomach was crammed with seeds of the cane; another contained a large quantity of oats which had evidently been secured from a newly sown field adjacent to a marsh.*

LOUISIANA CLAPPER RAIL; MARSH-HEN: *Rallus longirostris saturatus* Ridgway.

State records.—The Louisiana clapper rail (fig. 2) is restricted to the marshes of the Gulf coast, where it is permanently resident and very abundant. It is plentiful on both Dauphin and Petit Bois Islands. Several specimens were taken in the Perdido Bay marshes, January 27, 1912, and one

†Audubon, J. J., Ornith. Biog., vol. 3, p. 28, 1835.

**Golsan and Holt, The Auk, vol. 31, p. 218, 1914.

*Audubon, J. J., Op. cit., p. 29.

FIG. 2.—Louisiana Clapper Rail.

was seen on Blakely Island in Mobile River, February 3, 1912. A nest found May 22, 1911, at Bayou Labatre contained 9 eggs on the point of hatching. At Mobile, May 30, an old rail with a brood of tiny young was seen in the marsh opposite the city, and on Dauphin Island, May 19, 1911, a half-grown young one was collected.

General habits.—Clapper rails are essentially birds of the sea coast and in the United States are never found far from salt water. Their loud, cackling notes frequently may be heard, but the birds are very loath to take wing, preferring to escape by running in and out among the dense tangle of rushes, where it is impossible to be seen. Occasionally one may be seen, however, as it flies across a bayou and drops again into the marsh, or more rarely one may be flushed at close quarters. The nests are placed in rushes, built up about a foot above the water on a solid foundation of dead vegetation.

Food habits.—This species feeds on small crabs, snails, shrimp, shellfish, minnows, aquatic insects, and the young of the diamond-back terrapin.† The stomachs of 7 specimens taken in Alabama in May contained only remains of crabs.

FLORIDA CLAPPER RAIL: *Rallus longirostris scottii*
Sennett.

State records.—The occurrence of the Florida clapper rail in Alabama rests on the record of a single specimen collected by the writer, January 27, 1912, in a marsh near the mouth of Perdido Bay. This point apparently marks the western limit of its range, for in other parts of this bay the Louisiana clapper rail is the prevailing form.

VIRGINIA RAIL: *Rallus virginianus* Linnaeus.

State records.—The Virginia rail occurs as a migrant and probably as a winter visitant, but records of it are very limited. At Leighton, in September or October, 1901, several individuals were shot in tall grass in a pasture (McCor-

†Simmons, G. F., The Auk, vol. 31, pp. 380-381, 1914.

mack). A specimen was taken September 21, 1911, at Orange Beach, and one October 19, 1908, at Bon Secour.

General habits.—This species usually resorts to wet fresh-water marshes, but in migration may be found also in grass fields. Its notes are described by Brewster as "a succession of grunting sounds not unlike those of a hungry pig; and, during the breeding season, a guttural *cut, cutta-cutta-cutta*."†

Food habits.—The food of this species is said to consist of aquatic insects, worms, snails, and the seeds of various kinds of grasses that grow on marshy ground and in the low fresh-water meadows which it frequents.**

SORA RAIL; CAROLINA RAIL: *Porzana carolina*
(Linnaeus).

State records.—The sora, or Carolina rail, is probably a regular and not uncommon migrant in spring and fall, but by reason of its seclusive habits is not often observed. McCormack has observed it at Leighton in fall between September 13 and 28, and in spring between April 4 and May 19. One was killed at Guntersville the second week in September, 1913. I saw two at Montgomery, April 19, 1912, and L. S. Golsan saw one on a very late date near Autaugaville, June 1, 1912. Avery records the bird rare at Greensboro, having seen one October 10, 1888, and collected one March 11, 1893. He took one, also, on Dauphin Island, September 21, 1892. W. L. Bryant killed one on Coffee Island, near Coden, December 2, 1916.

General habits.—During its migrations this rail may be found about the marshy borders of ponds, in overflowed fields, or salt marshes. When pursued it skulks among the reeds in preference to taking flight, and when on the wing the flight is slow, straight forward, and usually not protracted. Chapman describes the bird's notes as a clear, whistled *ker-wee*; and again, as "a high-voiced, rolling whinny."*

Food habits.—The sora feeds on the seeds of wild rice or other marsh plants and on insects and snails.

†Chapman, F. M., Handbook of Birds of Eastern North America, pp. 233-234, 1912.

**Baird, Brewer, and Ridgway, Water birds of North America, vol. 1, p. 365, 1884.

*Chapman, F. M., Handbook of birds of Eastern North America, p. 234, 1912.

YELLOW RAIL: *Coturnicops noveboracensis* (Gmelin).

State records.—The yellow rail is apparently a rather rare winter resident but is fairly common at times during migration. In the collection of the University of Wisconsin is a specimen taken at Montgomery in 1876 by L. Kumlien; single specimens were taken also by Dr. Avery, 10 miles south of Greensboro, December 19, 1891; by E. G. Holt, at Barachias, December 11, 1911; and by W. L. Bryant, at Bayou Labatre, in January, 1917. Golsan and Holt state that the bird is "common in fall and early spring on open hay fields at Barachias."†

General habits.—During its winter sojourn in the South, this species inhabits somewhat drier and less marshy situations than the other rails. The birds are very difficult to flush, preferring to hide in the thick grass among which they live. They will even at times allow themselves to be caught by a dog rather than take flight. In overflowed savannas, however, I have known them to flush rather easily. Their flight is steady and rather more protracted than that of the other rails. Nuttall describes their notes as "an abrupt and cackling cry, 'kre-k, 'kre-k, 'kre-k, 'kre-k, 'kuk, k'kh," resembling the croaking of a tree frog.

Food habits.—Audubon states that this rail feeds on insects, seeds of grasses, and small fresh-water snails.‡ Wayne also records finding fresh-water snails in the stomachs of specimens taken in South Carolina.**

[BLACK RAIL: *Creciscus jamaicensis jamaicensis* (Gmelin).

The black rail, the smallest of the North American rails, is also the rarest. It breeds locally from southern Canada south to South Carolina and winters from the Gulf States south to Jamaica and Guatemala, so may be expected to occur as a migrant and possibly as a breeder in Alabama. It is recorded as striking the lighthouse at Warrington, Florida, only a few miles from the Alabama border, March 22, 1885.*]

†Golsan and Holt, *The Auk*, vol. 31, p. 218, 1914.

‡Audubon, J. J., *Ornith. Biog.*, vol. 4, p. 253, 1838.

**Wayne, A. T., *Birds of South Carolina*, p. 28, 1910.

*Stone, D. D., *Orn. and Ool.*, vol. 10, p. 158, 1885.

PURPLE GALLINULE: *Ionornis martinicus* (Linnaeus).

State records.—The purple gallinule is a rather rare summer resident in the coast marshes and probably occurs irregularly and locally in the interior. Audubon states that he observed it in "the lower parts of Alabama,"† but at present it seems to be rare there. In Chuckvee Bay, Baldwin County, May 12, 1911, I saw two of the birds, but was unable to get a specimen. Again, in July, 1913, I hunted there assiduously without seeing a single gallinule, but on May 28, 1914, I secured an adult female. Local hunters told me that these birds occur there regularly in summer, but disappear during cold weather. L. S. Golsan states that a purple gallinule was killed in summer several years ago on the borders of Bear Swamp, near Autaugaville.

General habits.—Wayne has found this species abundant in South Carolina, where it lives on abandoned rice plantations or "on freshwater rivers where the wampee (*Pontederia cordata*) grows in profusion." The birds arrive in that region in spring between April 10 and 17. He states that the birds may be seen "walking over the large leaves of the pondlily, every now and then flirting their tails or holding their wings over their heads * * * while flying, the legs always hang down and the birds cackle continuously * * *. The birds are exceedingly tame, and one can almost step on them before they fly. If wounded, they dive immediately and remain under water for fully five minutes. * * *. The nests are commenced about May 5, and are built in the wampee and rushes, invariably over water, and are made of half decayed leaves of these plants. They are substantially built and well secured to the wampee as it grows in the water."‡

Food habits.—Forbush states that this bird feeds on insects, worms, mollusks, and other small aquatic animals, and on fruit, seeds, and other vegetable productions.** The stomach of the single bird collected in Alabama contained more than 400 seeds of water millet (*Zizaniopsis miliacea*) which abounds in the marshes inhabited by the bird.

†Audubon, J. J., Ornith. Biog., vol. 4, p. 38, 1838.

‡Wayne, A. T., Birds of South Carolina, pp. 40-41, 1910.

**Forbush, E. H., Game birds, wild-fowl, and shore birds, p. 218, 1912.

FLORIDA GALLINULE: *Gallinula chloropus cachinnans*
Bangs.*

State records.—Because of its very wide distribution in America, breeding as it does from southern Canada south to Mexico and South America, the Florida gallinule might with propriety bear the name of American gallinule. It probably occurs regularly in Alabama, but the scarcity of records seems to indicate that it is rare or local. F. W. McCormack reported (in 1912) that two were killed within the preceding two or three years at Leighton. Amel Callaway reports it in winter around the brackish lakes near Orange Beach, and H. P. Lodging states that he killed a specimen at Dog River, Mobile Bay, in November, 1895. An adult male in full plumage was captured in a yard in Montgomery, May 21, 1914, and kept in confinement several days by Peter Brannon. On its death it was preserved as a specimen and is now in the collection of the Department of History and Archives at Montgomery. The bird showed no indications of breeding, but had a severe bruise on the lower end of the sternum, indicating an injury sustained in migration. R. H. Dean reports one individual seen near Anniston, October 24, 1916.

In Chuckvee Bay, May 28, 1914, I flushed and shot down in a small bunch of grass a bird of this species, but it hid or swam away under water and could not be found. At Nigger Lake, December 1, 1915, I observed three individuals and collected one of them as they swam across a bayou in front of my blind in the rushes.

General habits.—The Florida gallinule inhabits fresh-water ponds and brackish bayous where there is an abundance of vegetation affording cover. The birds swim easily and gracefully, their tails erect and heads bobbing at every stroke of the feet. Like the rails, when flushed they fly rather slowly and clumsily, with dangling legs, and quickly seek the cover of the marsh again. They have a variety of loud, harsh, guttural notes, which Brewster compares to the notes of a domestic hen. The nests, which are quite bulky, are composed of

**Gallinula galeata* of the A. O. U. Check-list; for change of name see *The Auk*, vol. 33, p. 430, 1916.

old cattail flags and dry grasses, and placed among rushes, reeds, or bushes growing in water.

Food habits.—Audubon states that the food of this gallinule consists of grasses, seeds, water insects, worms, and snails. The stomach of one taken in Alabama contained ground-up remains of hornwort (*Ceratophyllum*), fragments of uni-valves, and a few caddisfly cases.

COOT; POULE-D'EAU: *Fulica americana* Gmelin.

State records.—The coot is a common winter resident and an abundant migrant in Alabama. On the coast it is universally known by its Creole name, "*poule d'eau*," but in the interior it is called "water-guinea" (McCormack) or "fool-hen" (Avery). In Chuckvee Bay, February 7, 1912, about 50 were seen, and on March 16, in the same place, a flock numbering 150 or 200. In Polecat Bay, November 10, 1915, there were 50 or more, and in Duckers Bay, December 3-4, 1915, a flock of at least 400. On Petit Bois Island, February 12, 1912, the birds were common, and on November 24, 1915, they were present in smaller numbers. On Oxford Lake, a small artificial lake near Anniston, I observed on October 22, 1916, a flock of about 15 coots; the superintendent of the park stated that they had been there throughout the previous summer, but whether they bred there is not known. McCormack has observed the coot at Leighton between February 6 and May 12, and once in fall, October 26, 1893. Avery records it as a spring and autumn migrant and mentions a specimen taken at Greensboro, October 29, 1890, which could not fly, having settled during migration in a fence corner.† Golsan and Holt report it abundant in migrations on the Alabama River near Montgomery, a few remaining throughout the winter.‡

The northward migration takes place chiefly during March and April, but a few linger into May. On May 9, 1911, in Polecat Bay, near Mobile, I saw a flock of 20; on May 12 I shot a single bird in Chuckvee Bay and another, which showed no signs of breeding, in Tensaw River, near Stockton, May 27,

†Amer. Field, vol. 34, p. 584, 1890.

‡The Auk, vol. 31, p. 218, 1914.

1914. McCormack records this species as a common spring migrant at Leighton, becoming plentiful about the 10th of March, but rarely occurring in the fall migration.

General habits.—During the winter season coots gather into large flocks and feed in ponds and shallow bays, mainly in open water. They are highly esteemed for their flesh and thousands are shot each season by gunners who find them much easier to kill than ducks. When driven from their feeding grounds they will persistently return, often flying directly over the hunters and affording an easy mark. In the secluded bays and reed-grown ponds where they love to feed these birds become very talkative, uttering a variety of curious squawks and cacklings.

Food habits.—The coot feeds largely upon the seeds and leaves of aquatic plants, and takes also small mollusks, crustaceans, worms, and insects. Stomachs of 8 individuals from Alabama contained stems and leaves of pondweed (*Najas* and *Potamogeton*), seeds of wild rice and sawgrass (*Cladium*), and small quantities of snails, ants, and beetles.

PHALAROPES: Family Phalaropodidae.

WILSON PHALAROPE: *Steganopus tricolor* Vieillot.

State records.—The Wilson phalarope, one of the smaller shorebirds, occurs in Alabama only as a rare migrant. The single record is of a bird collected by J. S. Gutsell, September 5, 1911, at Bayou Labatre, on the mud flats near the mouth of the Bayou.

General habits.—The phalaropes are remarkable for the fact that the females are more brightly colored than the males and that they do the wooing, while the males take upon themselves the duties of incubation. The birds, by reason of their lobed feet and their dense plumage, are able to swim with ease and grace and they are quite at home on the bosom of the ocean. This species breeds chiefly in prairie sloughs in the interior of North America, placing its nest in a shallow depression in the ground or in a tussock of grass in a marsh.

SNIPES, SANDPIPERS, ETC.: Family Scolopacidae.

WOODCOCK: *Rubicola minor* (Gmelin).*

State records.—The woodcock, one of our most famous game birds, is a permanent resident, generally distributed in the State, but nowhere very abundant. It is sometimes called "hill partridge," or "swamp partridge." McCormack considers it rather rare at Leighton, where he has observed it in December, January, February, March, and July. Avery reports it uncommon at Greensboro. Golsan and Holt report that it is resident in small numbers in Autauga and Montgomery Counties; and that about 20 birds were seen near Montgomery, January 12, 1913.† Mrs. B. R. Samuel has a specimen taken at Guntersville. It is said to be fairly numerous in Mobile County in winter, and has been reported also from Coosada, Weogufka Creek (Coosa County), and Pleasant Hill. McCormack found a nest at Leighton, March 15, 1892; and Avery found one at Greensboro, February 23, 1893, containing four slightly incubated eggs.

General habits.—The woodcock is a dweller in low, swampy woodland and marshy meadows. Being mainly nocturnal or crepuscular in habit, it remains during the daytime concealed in woods or thickets and is flushed only by accident or by hunting dogs. At twilight it resorts to its favorite feeding places in wet meadows or wooded swamps, where it procures its food by probing in the soft ground with its long bill. In spring, at morning and evening, it indulges in a remarkable spiral flight accompanied by a peculiar series of whistled or twittering notes—the love song of the bird.

Food habits.—The chief food of the woodcock consists of worms and the larvae of various insects; occasionally it includes beetles, locusts, or other insects, and small seeds.

WILSON SNIPE; JACKSNIPE: *Capella gallinago delicata* (Ord).‡

State records.—The Wilson snipe, commonly known as the "jacksnipe," or "squatting snipe," occurs as an abundant mi-

**Philohela minor* of the A. O. U. Check-list; for change of name see The Auk, vol. 40, p. 516, 1923.

†The Auk, vol. 31, p. 218, 1914.

‡*Gallinago delicata* of the A. O. U. Check-list; for change of name see The Auk, vol. 38, p. 266, 1921.

grant in spring and fall, and is a moderately common winter resident, more especially near the coast. At Bon Secour, October 20 to 25, 1908, I found a few snipe on the marshes; on Petit Bois Island, February 12, and at Bayou Labatre, February 15, 1912, they were fairly common. In Greenbrier Cove, near Whitesburg Ferry, I saw a single bird, November 8, 1916. About 10 were seen at Speigner Lake, December 13, 1916. During March and April, 1912, small numbers were seen at Uniontown, Auburn, Jackson, Thomasville, and Leighton. Holt took specimens at Barachias, December 17, 1911, and January 9, 1914, and records the last seen there in spring, April 13, 1913. Golsan and Holt report the species very common during March and April in the marshy fields of Montgomery County.†

Dr. Avery shot specimens at Greensboro as early in the fall as September 12 (1891), but the birds usually arrive in October and remain till the last of April (April 30, 1912, Leighton). The height of the spring migration is early in March.

General habits.—The jacksnipe frequents wet marshes where the grass is short and low spots about cultivated fields. It usually squats closely until the hunter approaches rather near, when it springs up with a startled “scape” and for a short distance flies in an erratic, zigzag course which affords an attractive although rather difficult mark. Although the marsh may be thickly populated, the birds usually flush singly or at most in twos or threes, and often they will alight again within a short distance.

Food habits.—The food of the snipe, according to Forbush, consists largely of insects, including grasshoppers, locusts, cutworms, and beetles, with such others as may be picked up from cultivated fields and marshes. Earthworms, leeches, seeds of smartweed and other plants, together with roots and other vegetable matter, have been found in their stomachs. Enough is known of their food habits to place them among the beneficial species.‡

†The Auk, vol. 31, p. 219, 1914.

‡Forbush, E. H., Game birds, wild-fowl, and shore birds, p. 252, 1912.

DOWITCHER: *Limnodromus griseus griseus* (Gmelin).*

State records.—The dowitcher, or red-breasted snipe, is a common migrant along the coast, particularly in summer and fall. Gutsell observed small flocks at Bayou Labatre, August 13 and 14, and others on Dauphin and Petit Bois Islands, August 18 and 24, 1911. Four specimens collected by him and one by the writer (Dauphin Island, May 18, 1911), are referable to this subspecies. I saw about 10 on Dauphin Island, July 5, 1913, and Holt saw about a dozen at the same place, July 30; four specimens, all adults, were collected on these dates. Peters saw two individuals there, June 3, 1914; and I shot a pair on a mud bar at Coffee Island, near the mainland, November 12, 1915.

General habits.—Dowitchers resort mainly to mud flats, but are occasionally found on the sand beaches. They travel in compact flocks and associate freely with yellowlegs and other species of snipe or sandpipers. They utter in flight a series of mellow whistles.

Naturally unsuspicious, they easily fall prey to the gunner. In early times they migrated along our coasts in immense flocks, but in recent years have been greatly reduced in numbers.

Food habits.—Stomachs of seven individuals taken in Alabama contained marine worms, flies, water boatmen, and masses of eggs—probably fish eggs. Nuttall states that the dowitcher consumes leeches, beetles, mollusks, and occasionally seeds of aquatic plants and the roots of eelgrass (*Zostera marina*).†

LONG-BILLED DOWITCHER: *Limnodromus griseus scolopaceus* (Say).‡

The western form of the dowitcher is apparently less common in Alabama than the eastern form, only two occurrences being known. A specimen was killed at Leighton, May 15, 1891, by F. W. McCormack and carefully identified with the

**Macrorhamphus griseus* of the A. O. U. Check-list; for change of name see The Auk, vol. 37, p. 442, 1920.

†Nuttall, Thos., Manual of ornithology (water birds), pp. 181-183, 1834.

‡*Macrorhamphus griseus scolopaceus* of the A. O. U. Check-list; for change of name, see The Auk, vol. 37, p. 442, 1920.

aid of Ridgway's Manual. On Dauphin Island, July 5, 1913, I collected two adult birds (male and female) from a flock of *Limnodromus g. griseus*.

STILT SANDPIPER: *Micropalama himantopus*
(Bonaparte).

State records.—The stilt sandpiper is usually considered a rare or irregular migrant in the eastern United States, but at times it may be observed in some numbers. The only record of its occurrence in Alabama is furnished by F. W. McCormack, who observed four birds at Leighton on a number of days between August 17 and September 6, 1892. One specimen was shot and carefully identified.

General habits.—This sandpiper often associates with lesser yellowlegs, which it somewhat resembles in habits and general appearance. The birds observed by McCormack frequented the muddy margins of ponds in cultivated fields, wading about in shallow water and probing in the mud like snipe.

KNOT; ROBIN SNIPE: *Calidris canutus rufus* (Wilson).*

State records.—The knot is considered rare on the Gulf coast, except in Florida. There are only a few records from Alabama. On Dauphin Island, I collected a specimen, May 19, 1911, and another, July 5, 1913. Peters observed a flock of about 30 and collected two specimens there, June 3, 1914. On Petit Bois Island, August 29, 1911, Gutsell secured one which was feeding with several dowitchers and two or three more of its kind.

General habits.—This snipe is found about sandy beaches and mud flats along the shores of the Gulf. It is strongly gregarious and often occurs (at least formerly) in flocks of considerable size; it associates on friendly terms with turnstones, black-bellied plovers, and various species of sandpipers. Its notes are described as a soft whistle of two syllables and "a single note resembling a little *honk*."†

Food habits.—The knot feeds on marine insects and their

**Tringa canutus* of the A. O. U. Check-list; for change of name see *The Auk*, vol. 34, p. 200, 1917; and vol. 40, p. 516, 1923.

†Mackay, G. H., *The Auk*, vol. 10, p. 27, 1893.

larvae, small mollusks, and the larvae of cutworms found in marshes.

PECTORAL SANDPIPER: *Pisobia maculata* (Vieillot).

State records.—The pectoral sandpiper, known in Louisiana as the "cherook" and on the Atlantic coast as "grass snipe" or "krieker," is a fairly common migrant in Alabama, both in spring and fall. Dr. Avery's note books record his observation at Greensboro on March 20, 1893, of a flock of 20, and on March 27, of "a large flock." Others were seen there by him April 8 and 24, 1888, and two specimens in his collection were taken March 25 and April 15, 1893. On Dauphin Island, September 21, 1892, he collected 3 specimens. At Leighton, McCormack took single specimens July 24 and 26, 1892. In Mobile Bay, May 12, 1911, I saw one bird flying over a marshy island. Golsan and Holt record 4 specimens taken at Barachias, March 30, 1913.†

General habits.—This sandpiper frequents wet, short-grass marshes rather than beaches or mud flats. Although sometimes flying in flocks, the birds usually scatter out over the marsh to feed and flush a few at a time after the manner of the Wilson snipe. As they fly they utter a guttural, creaking note which has given them in some localities the name "krieker."

Food habits.—The food of this species, according to Forbush, consists of crickets, grasshoppers, ground-dwelling larvae, earthworms, snails, shellfish, and vegetable matter.*

WHITE-RUMPED SANDPIPER: *Pisobia fuscicollis* (Vieillot).

State records.—The white-rumped sandpiper is apparently an uncommon migrant in the State, having been taken only twice, at Greensboro, by Dr. Avery. He records 2 specimens taken May 26, 1888,† and his collection contains also 4 specimens taken May 30, 1891. The species is common on the

†The Auk, vol. 31, p. 219, 1914.

*Forbush, E. H., Game birds, wild-fowl, and shore birds, pp. 273, 274, 1912.

†Avery, W. C., Amer. Field, vol. 34, p. 584, 1890.

Louisiana islands and should occur regularly on the Alabama coast, but has not thus far been detected there.

General habits.—This sandpiper frequents mud flats and sandy beaches, in company with the semipalmated sandpiper and other species of shorebirds; occasionally it is found about pools on the marshes or in overflowed fields on the uplands.

LEAST SANDPIPER: *Pisobia minutilla* (Vieillot).

State records.—The least sandpiper, known frequently as "peep" or "oxeye," is an abundant migrant and a winter resident on the coast. Although nesting only in the far North, it lingers in the South so long and returns so early that it may be considered almost a permanent resident. It is particularly abundant on the coastal islands, but during migration is found also in the interior, about shallow ponds and overflowed fields. On the west point of Dauphin Island, a particularly favorable locality for shorebirds, this species was common August 21, 1911, tolerably common February 13, and abundant March 22, 1912. On the last date several large flocks, apparently composed exclusively of this species, were observed feeding on the mud flats. Golsan and Holt record two specimens taken at Barachias, March 30, 1913,† and Peter A. Brannon took several on the Alabama River, near Montgomery, September 20, 1919.

Migrants from the north reach northern Alabama the latter part of July and by the middle of August they are common on the coast. At Leighton, McCormack records the birds on numerous dates between July 26 and September 6; at Greensboro, Avery noted them September 3, 1886, and at Bayou Labatre, Gutsell records their arrival on August 14, 1911. In spring, a few remain on the coast well into May (Bayou Labatre, May 16, 1911, one specimen), but the northward migration begins early in that month. Migrating individuals have been seen at Greensboro, May 9 to 16, and at Leighton, May 9 to 20. Golsan and Holt record two specimens taken at Barachias, March 30, 1913.

General habits.—This is the smallest of the sandpipers and one of the most numerous. During its migrations and in

†The Auk, vol. 31, p. 219, 1914.

winter it gathers into large flocks, often associating with the semipalmated and other species of sandpipers. It is rather partial to marshes, but during migration is often found in flooded fields. It secures its food from mud flats and the margins of shallow pools, is gentle and confiding, and will often allow an observer to approach within a rod or two before taking flight.

Food habits.—This species is known to feed on grasshoppers and on various smaller insects and their larvae, including mosquitoes. Of the 18 stomachs of this bird collected in Alabama, practically all contained larvae or pupae of small flies (Chironomidae); in a few, bits of aquatic beetles were found.

RED-BACKED SANDPIPER: *Pelidna alpina pacifica*
(Coues).

State records.—The red-backed sandpiper is a fairly common winter resident and an abundant migrant on the coast. On Dauphin Island, it was fairly common on February 13, and abundant March 22, 1912. On the latter date, about 50 were seen, most of them in winter dress, but one taken was molting and beginning to show black feathers on the breast; at the same place, May 19, 1911, about 20 birds were seen, all in full summer plumage. On Coffee Island, near Coden, November 12 and 23, 1915, about 8 were present in a large flock of semipalmated sandpipers; and at the same place, December 4, 1916, 4 were seen.

General habits.—The red-backed sandpiper is considerably larger than the least and semipalmated sandpipers, with both of which species it often associates. In the spring plumage it is known as "red-back" or "black-breast," and in winter plumage as "lead-back," all of which names are descriptive of its appearance. The striking difference in the two plumages has led most hunters to regard them as representing distinct species. The birds are found in flocks, often associated with other sandpipers, frequenting mud flats and sandy beaches at the edge of the water.

Food habits.—The food of this species comprises small mollusks, crustaceans, marine worms, fly larvae, aquatic beetles, and occasionally seeds of water plants.

SEMIPALMATED SANDPIPER: *Ereunetes pusillus*
(Linnaeus).

State records.—The semipalmated sandpiper is a common migrant and winter resident on the coast, but is apparently rather uncommon in the interior. At Bayou Labatre and on Dauphin Island, May 15 to 19, 1911, it was abundant in scattered flocks of 10 to 20 individuals. Large flocks of this species and *Ereunetes mauri* were seen on Dauphin Island, February 13, 1912, and small flocks June 1 to 5, 1914. In November, 1915, the species was common all around the shores of the Sound; and on Coffee Island, near Coden, December 4, 1916, two flocks aggregating about 100 birds were seen on a mud flat in the marsh, where they were feeding. McCormack considers this bird rare at Leighton, having observed it only twice—September 17, 1887, and July 23, 1889. Avery collected specimens at Greensboro on May 26, 1888, and May 30, 1891; Golsan took one at Autaugaville, May 23, 1913; and Brannon took several near Montgomery, September 20, 1919. A single bird, apparently a cripple, was shot at Seale, May 22, 1914.

General habits.—This little sandpiper, which closely resembles the least sandpiper in size and general appearance, may be distinguished by its partly webbed toes. It is by nature gentle and unsuspicious, except in regions where it is persecuted by gunners. It is a very sociable species, usually found in flocks of considerable size and often associating with other species of sandpipers. Its favorite feeding grounds are mud flats exposed by the receding tide; but it visits the ocean beaches as well.

Food habits.—Two stomachs of this bird from Alabama contained remains of small mollusks, fly larvae, and beetles. The species is known to feed also on marine worms and mosquitoes.

WESTERN SANDPIPER: *Ereunetes mauri* Cabanis.

State records.—The western sandpiper is known in Alabama only from the coast region, where it occurs as a migrant and winter resident from July to the middle of February and probably later. It is found in company with the semipalmated, and, judging from the number of specimens taken, seems to be more common than that bird. J. S. Gutsell found the western sandpiper fairly common at Bayou Labatre and on Dauphin and Petit Bois Islands from July 22 to September 1, 1911, six specimens having been taken during that period. He collected another at Perdido Bay, September 15. On Dauphin Island, February 13, 1912, I found this sandpiper common, and on July 5, 1913, saw several small flocks and collected two specimens there.

General habits.—This is the western representative of the semipalmated sandpiper, from which it differs in having a longer bill and redder back. In habits the two are practically alike, and are often found associated.

Food habits.—Six stomachs of this bird collected in Alabama showed its food to be minute fly larvae, aquatic beetles and bugs, marine worms, and small snails.

SANDERLING: *Crocethia alba* (Pallas).*

State records.—The sanderling, or "beach snipe" as it is sometimes called, is a common inhabitant of the coast beaches during a large part of the year. It is found on the Gulf coast from late July till the following May, and a few may even linger into June. Small flocks were observed in January, 1912, near the mouth of Perdido Bay and in February on Petit Bois and Dauphin Islands; one was seen also on Petit Bois, November 25, 1915, and two on Coffee Island, November 20, 1915. Specimens were taken by Gutsell on the Islands, July 27 and August 29, 1911; by Holt, July 28, 1913; and by Avery, September 21, 1892. Peters saw five on Dauphin Island, June 3, 1914.

General habits.—This little sandpiper is a true beach bird, feeding in small or medium-sized flocks along the shores, fol-

**Calidris leucophaea* of the A. O. U. Check-list; for change of name see The Auk, vol. 37, p. 443, 1920.

lowing the receding waves, wading in the shallow water, or visiting bare mud flats to pick up its food. The birds run rapidly over the sands, and if alarmed take wing and fly in a compact flock over the surf, uttering shrill whistles. "At high tide they resort to the higher parts of the beach or to some exposed sandbar, where they rest and often sleep, with the head thrust into the feathers of the back."†

Food habits.—The food of the sanderling consists principally of small crustaceans, mollusks, marine worms, fly larvae, and sometimes seeds. Audubon states that in the stomachs of specimens shot while probing the soft sand he found slender sea worms about an inch in length, together with minute shellfish and gravel. "At other times," he says, "when they were seen following the receding waves, and wading up to the belly in the returning waters, I found in them small shrimps and other crustaceans."‡

MARBLED GODWIT: *Limosa fedoa* (Linnaeus).

State records.—The marbled godwit occurs as a rare and irregular migrant. Dr. Avery records a specimen taken in the spring of 1880 near Greensboro, and mentions having seen only three of the birds.* Gutsell secured a single specimen on Dauphin Island, August 21, 1911.

General habits.—The godwits somewhat resemble the curlews in appearance but the bill is curved upward instead of downward. While on its breeding grounds in the North this species resorts to grassy plains in company with the long-billed curlew and the Bartramian sandpiper, or upland plover, but in winter it frequents the mud flats and sandbars along the coast, in company with other species of shorebirds.

[HUDSONIAN GODWIT: *Limosa haemastica* (Linnaeus).

This godwit is rarer than the marbled godwit, but as it is known to occur both in spring and fall on the Louisiana coast, it may be expected to occur also in Alabama.]

†Forbush, E. H., Game birds, wild-fowl, and shore birds, p. 293, 1912.

‡Audubon, J. J., Ornith. Biog., vol. 3, p. 281, 1835.

*Avery, W. C., Amer. Field, vol. 21, p. 545, 1884; vol. 34, p. 584, 1890.

GREATER YELLOW-LEGS: *Totanus melanoleucus*
(Gmelin).

State records.—The greater yellowlegs is a rather common spring and fall migrant, both on the coast and about shallow ponds and marshes in the interior. Avery noted it at Greensboro, September 3 and 16, 1886; and on Dauphin Island, September 21, 1892, where also on March 22, 1912, I saw a flock of about twelve, feeding in shallow pools; at Montgomery one was seen April 19, 1912, and several were reported a few days earlier. Two were seen at Leighton, November 3, 1915; two near Bayou Labatre November 12, 1915, and single birds November 23 and 26, 1915.

North-bound migrants arrive early in spring, one having been seen by Avery at Greensboro, March 20, 1893. At Leighton, McCormack reports the species common in spring from April 15 to May 15, and in fall from July 23 to September 5.

General habits.—This large wader, known to the older ornithologists as the "tell-tale godwit," frequents both fresh and salt water marshes and is occasionally seen in overflowed fields or pastures. It is a noisy bird, constantly on the alert for any danger, and with its loud cries often alarms all the other birds in its vicinity. When alighting it often raises its wings above the body for a few moments before closing them. It may be found singly or in flocks of considerable size.

Food habits.—The food of the greater yellow-legs consists of small fishes, crustaceans, mollusks, and aquatic insects.

YELLOW-LEGS: *Totanus flavipes* (Gmelin).

State records.—The "lesser" yellow-legs occurs as a common spring and fall migrant, both on the coastal marshes and in the interior. Two were collected by Dr. Avery at Greensboro, May 9, 1891, and two September 16, 1891. On Dauphin Island, I saw several small flocks, March 22, 1912, and two single birds July 5 and 6, 1913. Dr. Avery observed a few there September 21, 1892. At Leighton, the species is common, having been noted by McCormack, April 8, 1890 (about 20 birds), and between July 24 and September 6, 1892.

On the latter date about 100 were seen. An occasional bird may pass the winter on the Gulf coast, one having been taken on Dauphin Island, February 13, 1912.

Migration with this species begins usually in March and continues till May. Early migrants arrived at Greensboro, March 15, 1884, and March 25, 1893, but the bird is not ordinarily seen before early April.

General habits.—The lesser yellow-legs, a miniature of the greater yellow-legs, is even more abundant during migration than the larger species and often occurs in large flocks. It frequents wet, short-grass marshes, mud flats, and shallow ponds in cultivated fields. It is of rather a nervous disposition and easily alarmed, but it decoys readily and may sometimes be approached on foot rather closely. Its alarm notes consist of a sharp, mellow whistle of three or four notes rapidly repeated.

Food habits.—This bird feeds mainly on insects, including ants, bugs, flies, and grasshoppers, and on small crustaceans, small fishes, and worms.

SOLITARY SANDPIPER: *Tringa solitaria solitaria*
Wilson.*

State records.—The solitary sandpiper is an abundant migrant, occurring in spring chiefly during April and May and in fall from the middle of July to late in September. The earliest date of arrival is that given by Brown, of birds seen at Coosada, March 28, 1878. At Greensboro first arrivals were noted by Avery, April 15, 1893, and April 18, 1891. At Leighton the bird is common from April 15 to May 10 (McCormack). A very late bird was seen by the writer at Bayou Labatre, May 20, 1911, and Golsan reports several seen at Autaugaville as late even as May 23 (1913). South bound migrants appear in northern Alabama by the middle of July (Stevenson, July 15, 1911; Leighton, July 17, 1893) and are more or less common during late summer. The last seen at Greensboro were noted September 29 (1891). Several speci-

**Helodromas solitarius solitarius* of the A. O. U. Check-list; for change of name see *The Auk*, vol. 37, p. 443, 1920.

mens from the State have been examined and all were found to be of this, the eastern form.

General habits.—This bird is well named, for it scarcely ever gathers into flocks, but is found singly or two or three together about shallow pools in fields, woodland, or marshes. It is a lover of fresh water and is rarely found on the salt marshes or the sea coast. In habits and general appearance it somewhat resembles the spotted sandpiper, but its whistled notes are bolder and in flight the long wings serve to distinguish it. Its breeding habits are little known, but the few known instances indicate that the eggs are laid in abandoned nests of tree-nesting species.

Food habits.—The solitary sandpiper feeds upon worms, spiders, small crustaceans, small frogs, and various insects, including grasshoppers, beetles, caterpillars, and the larvae of aquatic forms.

WILLET: *Catoptrophorus semipalmatus semipalmatus*
(Gmelin).

State records.—The willet is a fairly common summer resident on the coastal islands, where also it occurs occasionally in winter. In the interior it is found rarely in migration. At Leighton, McCormack has observed it on three occasions—September 1 and 30, 1887; and April 2, 1889. Avery observed several on Dauphin Island, September 21, 1892, and I saw two there, July 5, 1913. Three individuals were seen on Grand Batture Island, March 22, 1912; and on Coffee Island, near Coden, November 12, 1915, about six were seen in a flock of smaller sandpipers. In Mississippi Sound scattered pairs breed on most of the small islets and sand reefs; several breeding specimens were taken, May 23, on Grand Batture Island.

General habits.—The willet is one of the larger shorebirds, easily distinguished by its size and the conspicuous white patches in the wings. It is a noisy, restless, and suspicious bird, taking wing at once when alarmed, with loud cries of *pill-y-will-willet*. Largely a bird of the seacoast, it was formerly abundant from Nova Scotia to the Gulf of Mexico, but now is practically exterminated north of Virginia and is much reduced in numbers in the South. It frequents the muddy

bay shores, oyster reefs, and salt marshes, and although nesting on the ground, usually in marsh grass, has been seen to alight on bushes and trees with as much ease as land birds (Audubon). The birds occur usually in pairs or small flocks.

Food habits.—A single stomach of this bird from Alabama contained remains of a small shrimp and of a bivalve mollusk. Audubon says of its food:

The food of the Willet consists of aquatic insects, small crabs, and fiddlers, which they procure either by pursuing them on foot or by probing for them in their burrows, along the mud bars, and in the crevices of the creeks and salt-water ditches. I have also observed it turning over stones and shells to seek for worms beneath them.†

WESTERN WILLET: *Catoptrophorus semipalmatus inornatus* (Brewster).

State records.—The western form of the willet occurs in Alabama only as a transient visitant. I took an immature specimen—evidently a migrant—on the bay shore at Coden, May 17, 1911; and Gutsell took three on the islands—one on Petit Bois, July 26, and two on Dauphin, August 23, 1911.

General habits.—The habits of this race are apparently the same as those of the eastern bird, except that its range extends to the fresh-water marshes of the interior. In migration it is found along the Gulf coast with the eastern race.

UPLAND PLOVER; BARTRAMIAN SANDPIPER:
Bartramia longicauda (Bechstein).

State records.—The upland or field plover (in reality a species of sandpiper and sometimes known as "Bartramian sandpiper") was formerly an abundant migrant over the greater part of the State, but in recent years, through constant persecution, it has become much reduced in numbers. It still occurs as a regular migrant in spring and fall. The earliest recorded date of spring arrival is March 7, 1913, at Barachias, but the birds usually appear there about two weeks later; in 1912 the first were seen there on March 22; and Brown records their arrival at Coosada in 1878 on the same

†Audubon, J. J., Ornith. Biog., vol. 3, p. 513, 1835.

date. Small numbers were seen at Barachias until April 23, 1912, and at Montgomery, on April 19, 1912, a flock of about a dozen was seen in an overflowed meadow opposite the city.

Dr. Avery records the bird as an uncommon spring migrant, arriving about March 31; and E. W. Graves noted one on Sand Mountain (Jackson County), March 29, 1914. The southward migration begins in July and continues until October. The first south-bound migrant was noted at Barachias, July 12, 1912 (B. H. Holt), and near Montgomery, July 28, 1913 (C. N. Hinderer). Golsan and Holt state that a pair once remained all summer on a large hay farm at Barachias.*

General habits.—As its name indicates, the upland plover is a bird of the dry, grassy prairies, and is never found in wet marshes. It is a most attractive bird, very wary of a man on foot but easily approached on horseback or in a wagon. Greatly esteemed as a game bird, it has suffered severely through its misplaced confidence. It breeds in isolated pairs and feeds usually in scattered flocks, though sometimes a considerable number may be found associated. When alarmed the birds run swiftly through the grass, often stopping with necks extended to gaze at their pursuer. They feed both in grass lands and in cultivated fields, often following the plowman to pick up insects in the freshly turned furrows.

Food habits.—The upland plover is a valuable bird to maintain on the farm, since it feeds almost exclusively on insects, particularly the species infesting grass fields, such as grasshoppers, crickets, beetles, and weevils, and it is known also to feed on the boll weevil. The destruction of so valuable a bird for food or sport is an economic mistake, and farmers should join with sportsmen in extending full protection to this species, now threatened with extinction.

SPOTTED SANDPIPER: *Actitis macularia* (Linnaeus).

State records.—The familiar spotted sandpiper is generally distributed over the State in summer. It has been observed in the breeding season in Autauga County, at Stevenson, Seale, Bayou Labatre, Petit Bois Island (one bird, June 1,

*The Auk, vol. 31, p. 219, 1914.

1914), and on the Tensaw River, near Stockton. Two pairs were noted, May 13, 1912, in the Tennessee River near Gunter'sville; and eight birds were seen by E. W. Graves on Sand Mountain, near Pisgah, May 12, 1914. The only fall record is that of a single bird seen at Bon Secour, October 20, 1908.

Migrants from the south arrive on the Gulf coast during the latter part of March and in north Alabama by the first week in April. McCormack has observed them at Leighton between April 3 and May 25, also in July and August, but has never found a nest. Avery records the species as arriving at Greensboro, March 21 (1884) and breeding, but not common.

General habits.—This sandpiper is scarcely ever found in flocks, though several pairs may sometimes be seen together. It is essentially a bird of the upland, frequenting the shores of streams and ponds and is sometimes so gentle that it comes into gardens to search for insects or even to build its nest. In the fall migration it often visits the sea coast, and I have seen well-grown young, when closely pursued, dive and swim beneath the water. It is easily recognized by its peculiar flight, consisting of alternate flapping and sailing, its habit of teetering its body as it stands, or by its cheerful, whistled notes, which resemble the syllables *peet-weet*. The nests are placed on the ground in dry pastures or cultivated fields, usually, but not always, near water.

Food habits.—The spotted sandpiper feeds mainly upon insects, including grasshoppers, beetles, mayflies, cutworms, and various aquatic insects; it is known also to eat crawfish.

LONG-BILLED CURLEW; SICKLE-BILL: *Numenius americanus americanus* Bechstein.

State records.—The largest of our shorebirds, the long-billed curlew, though formerly abundant, is now rare in the eastern United States. It still occurs in small numbers as a migrant on the coast. A. D. Gollott informs me that the bird is occasionally seen about the mouth of Bayou Labatre. On Dauphin Island, March 22, 1912, I saw a solitary bird standing in a shallow pond. It permitted me to approach quite near, but I did not secure the specimen. There are records

of two others seen on Dauphin Island—one by Dr. Avery, September 21, 1892, and one by J. S. Gutsell, August 21, 1911.

General habits.—This curlew breeds in the interior of the continent on dry grassy plains, but in migration visits the shores and marshes of the seacoast. Its great size and long curved bill will usually serve to distinguish it from any other shorebird.

HUDSONIAN CURLEW: *Phaeopus hudsonicus* (Latham).*

State records.—The Hudsonian, or “jack,” curlew is a common migrant on both coasts of North America, but is rare in the interior and not at all common on the Gulf coast. The birds move southward from their breeding grounds early in July and reach the Southern States by the end of the month. The only Alabama record is that of a specimen shot by E. G. Holt from a flock of 9 at the west point of Dauphin Island, July 27, 1913.

General habits.—During migration, this curlew is found in flocks about mud flats and sand bars, where it feeds in company with other species of snipe and sandpipers; when the tide covers the flats it resorts to the uplands and marshes to feed on berries or grasshoppers.

PLOVERS: Family Charadriidae.

BLACK-BELLIED PLOVER: *Squatarola squatarola cynosurae* Thayer and Bangs.†

State records.—The black-bellied plover, often known as “beetlehead,” is a common migrant and winter resident on the coast, and small flocks of nonbreeding birds may be found throughout the summer. It is rarely found in the interior. On Dauphin and Petit Bois Islands, Gutsell observed them in moderate numbers from August 21 to September 1, 1911. I found about a dozen on Dauphin Island, February 13, 1912; about 40, March 22, 1912; half that number, May 18 and 19, 1911; and a flock of about 15, July 5, 1913. Peters saw about

**Numenius hudsonicus* of the A. O. U. Check-list; for change of name see *The Auk*, vol. 35, p. 205, 1918.

†*Squatarola squatarola* of the A. O. U. Check-list; for change of name see *The Auk*, vol. 40, p. 516, 1923.

10 there, June 3, 1914. Occasional birds were seen on the mainland near Bayou Labatre in May, 1911, and a pair on Coffee Island, near Coden, November 20 and 23, 1915. Dr. Avery records the capture of several specimens at Cocke's millpond, near Greensboro, several years prior to 1890.‡

General habits.—This large plover lives, in Alabama, chiefly about the sand bars and mud flats of the outer islands, either in flocks by itself or associated with other species of shorebirds. It is always a wild and suspicious bird and difficult to approach within shooting distance. Its call note is a loud, far-reaching, mellow whistle of three syllables, the first strongly accented.

Food habits.—The food of this bird consists of marine insects, small mollusks, crustaceans, worms, grasshoppers, and, at certain seasons, berries.

[GOLDEN PLOVER: *Pluvialis dominica dominica* (Muller).*

The golden plover, formerly abundant but now very rare, probably occurred in Alabama as a straggler in migration.]

KILLDEER: *Oxyechus vociferus vociferus* (Linnaeus).

State records.—The familiar "killdee" plover is the commonest and best known member of its family. It is generally distributed in the State, in greater numbers in winter than in summer. In the southern part of the State it is rare in summer and there are no records of its breeding. In February, 1912, it was fairly common in pastures near Mobile, but was not at all numerous on the coast beaches, only 4 or 5 being seen at Orange Beach in January, 1912, and December 8, 1915. I saw a flock of 30 or more near Leighton, November 3, 1915. The bird has been observed, also, in winter and in spring at Auburn, Piedmont, Dean, Uniontown, Autaugaville, Jackson, Ashford, and Bayou Labatre. It breeds at Leighton, where eggs have been found May 11 and 19 and June 2; also at Greensboro (eggs, June 5). Several of the birds seen by Holt at Elkmont, July 11 to 16, 1913, were probably breeders.

General habits.—The killdeer is more an upland bird than

‡Avery, W. C., Amer. Field, vol. 34, p. 584, 1890.

**Charadrius dominicus dominicus* of the A. O. U. Check-list; for change of name see The Auk, vol. 37, p. 443, 1920.

it is a shore bird. It is comparatively rare along the coast but is found generally throughout the interior, frequenting wet meadows, pastures, the shores of ponds or lakes, and cultivated fields. It is noisy, rather shy, easily alarmed, and very persistent in scolding intruders. The nest is placed on the ground, sometimes near water, though often in the bed of a cotton- or corn-row in a cultivated field. Killdeer are found in flocks during the greater part of the year, scattering out as they feed in pastures or ploughed fields. They run swiftly and their flight is also strong and rapid.

Food habits.—The food of the killdeer has been studied by W. L. McAtee, of the Biological Survey, and found to consist almost entirely of insects and other animal matter, including such serious agricultural pests as the boll weevil, alfalfa weevil, clover-root weevil, rice weevil, cotton leaf-worm, grasshoppers, crickets, and many others, besides crawfish.†

SEMIPALMATED PLOVER; RINGNECK: *Charadrius semipalmatus* (Bonaparte).‡

State records.—The semipalmated plover, or “ringneck,” as it is usually called, occurs as a rather uncommon migrant in spring and fall. I found about 4 birds on Dauphin Island, May 19, 1911, and Peters noted several small flocks there, June 1 to 5, 1914. Gutsell took a specimen at Bayou Labatre, August 14, 1911, and observed small numbers there and on Dauphin Island during the rest of that month. I saw 4 and shot 2 on Coffee Island, near Coden, November 12, 1915. The only record for the interior is furnished by F. W. McCormack, who saw 5 and collected 1 at Leighton, September 4 and 5, 1892.

General habits.—This little plover is a familiar inhabitant of the coast beaches and mud flats, where it lives in small, loose flocks. It is not particularly shy, but if approached too closely, will run swiftly along the beach or take wing for a short distance. Its call note is a mellow, plaintive whistle of two syllables.

†Farmers' Bull. 497, pp. 14-16, repr. 1917.

‡*Aegialitis semipalmata* of the A. O. U. Check-list; for change of name see *The Auk*, vol. 37, p. 444, 1920.

Food habits.—The food of the semipalmated plover, according to Forbush, "consists largely of small crustacea, mollusks, eggs of marine animals, and insects, which it sometimes gleans from ploughed fields. In the interior it feeds on locusts, other *Orthoptera* and many other terrestrial insects."*

PIPING PLOVER: *Charadrius melodus* (Ord).†

State records.—The piping plover was once an abundant bird along the Atlantic coast, but in many localities it has been almost exterminated. In Alabama it is a characteristic inhabitant of the sandy beaches on the outer islands, where it occurs in some numbers as a transient visitant, arriving in August and remaining until February and probably later. Gutsell noted it common on Dauphin and Petit Bois Islands from August 6 to September 1, 1911, and I found it numerous on Dauphin Island, February 13, 1912. Specimens were taken there August 22 and 23 and February 13.

General habits.—This little plover is most often seen in loose flocks running swiftly over the sands of the ocean beaches, in which situations it is quite inconspicuous. Its call note is described by Chapman as a liquid *peep-peep* or *peep-lo*, having a true piping quality. On Long Island the species is sometimes called by the suggestive name of "quill-toot."

Food habits.—The food of this plover, as indicated by the contents of four stomachs secured in Alabama, consists principally of marine worms, fly larvae, and beetles.

CUBAN SNOWY PLOVER: *Charadrius nivosus tenuirostris* (Lawrence).‡

State records.—The Cuban snowy plover is confined in Alabama to the Gulf beaches, where it occurs as a moderately common winter and summer resident. It is known to breed on the coasts of Texas and Mississippi and undoubtedly breeds in small numbers also on the Alabama islands. On both

*Forbush, E. H., Game birds, wild-fowl, and shore birds, p. 853, 1912.

†*Aegialitis meloda* of the A. O. U. Check-list; for change of name see The Auk, vol. 37, p. 444, 1920.

‡*Aegialitis nivosus* of the A. O. U. Check-list; for change of name see The Auk, vol. 37, pp. 279, 444, 1920.

Dauphin and Petit Bois Islands, July 4 and 5, 1913, I saw a number of these plovers, and on Horn Island, Mississippi, collected breeding adults and downy young. Peters saw about 4 birds on Petit Bois Island, June 1 to 5, 1914, but could not find a nest. On both the islands Gutsell found this plover fairly common late in August. I found it numerous on the west point of Dauphin Island, February 13, 1912, and observed 2 individuals there May 19, 1911. A few were seen also on the beach near the mouth of Perdido Bay, January 25, 1912.

General habits.—This is the palest of the small American plovers and so closely does it resemble the white sands on which it lives that it is with difficulty detected, even when running. As it glides swiftly over the sand it resembles a shadow more than it does a bird. It is ordinarily rather quiet, but its note is described as a soft, musical whistle. Goss found this plover breeding on the salt plains along the Cimararon River, southern Kansas; the nest was a mere depression in the sand, without protection or shelter, and contained 3 incubated eggs on June 18.*

Food habits.—The food of this bird, as shown by examination of 7 stomachs taken in Alabama, consists of small crustaceans, mollusks, marine worms, aquatic insects, and seeds.

WILSON PLOVER: *Pagolla wilsonia wilsonia* (Ord).†

State records.—The Wilson plover is a common summer resident on the islands and sand bars along the coast. Apparently it leaves its summer home rather early, as Gutsell remarked its absence from Dauphin Island after August 10, where previously to that date it had been common. It had not returned from the south when I visited the island on February 13, 1912, but on March 22 I found half a dozen pairs or more in their customary haunts. The birds were common also on the islands in Mississippi Sound, May 16 to 23, 1911, July, 1913, and June, 1914.

General habits.—This plover is a little larger than the piping plover and has a decidedly larger bill. Its notes are

*Goss, N. S., *Birds of Kansas*, p. 217, 1891.

†*Ochthodromus wilsonius* of the A. O. U. Check-list; for change of name see *The Auk*, vol. 37, p. 279, 1920.

harsher than those of the other small plovers and are heard constantly as one approaches the bird's chosen haunts. The birds are found in small, loose flocks, rambling over the sand beaches and mud flats in search of their food. They are not at all shy, and when pressed too hard, fly but a short distance along the beach before again taking to their legs. The nest has not been found in Alabama, but, like those of the other plovers, it is reported to be merely a hollow scratched in the sand, sometimes lined with a few pieces of shell.

Food habits.—Examination of the stomachs of 5 birds taken on the Alabama coast showed their food to consist of crabs and shrimps with a few mollusks and flies.

SURF-BIRDS AND TURNSTONES: Family Aphrizidae.

RUDDY TURNSTONE: *Arenaria interpres morinella*
(Linnaeus).

State records.—The turnstone, one of the larger shorebirds, occurs along the coast as an irregular migrant, chiefly in summer. Gutsell observed 3 or 4 birds August 13, 1911, at Bayou Labatre, and on Dauphin and Petit Bois Islands, August 18 and 29, respectively, the species was fairly common. One was collected from a flock of 4 on Dauphin Island, July 5, 1913; and Peters saw several there, June 1 to 4, 1914.

General habits.—This bird gets its name from its habit of turning over small stones in search of the marine insects and worms on which it feeds. Gutsell says it turns not only stones, but shells, sticks, and great rolls of seaweed. In some localities it is called "brant bird" or "calico-back," and in Wilson's time on the New Jersey coast it was known as "horse-foot snipe," an allusion to its habit of feeding on the spawn of the horse-foot crab. Chiefly a maritime species, it is rarely found in the interior. It occurs singly or in small flocks, frequenting mainly sandy or gravelly beaches.

Food habits.—As already stated, the turnstone feeds on the spawn of the horsefoot crab, and in addition on insects, worms, and small crustaceans.† Wayne says of it in South Carolina:

†Forbush, E. H., Game birds, wild-fowl, and shore birds, p. 361, 1912.

On Caper's Island it frequents live-oak trees which are covered with small mussels, upon which it eagerly feeds. If some of the mussels happen to be on an inclined limb the birds walk, instead of flying, to reach them. I have seen as many as four of these birds, one behind the other, on a small limb out in the surf.*

OYSTER-CATCHERS: Family Haematopodidae.

OYSTER-CATCHER: *Haematopus palliatus palliatus*
Temminck.

State records.—The oyster-catcher was formerly common on the Atlantic and Gulf coasts but is yearly growing rarer. Capt. W. M. Sprinkle states that he saw four of these birds on the east point of Petit Bois Island about the year 1898, and he thinks they nested there.

While waiting for ducks in a blind on Coffee Island bar, near Coden, November 12, 1915, three oyster-catchers circled several times around me; one of them was shot, and though wounded, upon being chased proved to be quite a diver. These birds had been seen there by hunters a few days previously, but we did not see them again, although I remained in that locality two weeks. The fact that they were entirely strange to the local hunters indicates their scarcity in that region.

AMERICAN QUAILS: Family Odontophoridae.

BOB-WHITE; QUAIL; PARTRIDGE: *Colinus virginianus virginianus* (Linnaeus).

State records.—The well-known bob-white, the "quail" of the North and the "partridge" of the South, is abundant and widely distributed in Alabama. It is nonmigratory and breeds in all localities. Specimens from Castleberry, Fairhope, Bon Secour, St. Elmo, Orange Beach, Abbeville, Dothan, and Jackson have been examined and all are referable to the typical form.

Nest building begins late in April and the eggs are laid in May. Two, or even three, broods may be raised in a season, so that the nesting period extends through the summer to the

*Wayne, A. T., *Birds of South Carolina*, p. 62, 1910.

latter part of September. Eggs have been found at Leighton, June 14 (18 eggs) and July 22 (14 eggs); Autaugaville, July 2 (8 fresh eggs) and September 19 (11 fresh eggs); Prattville, May 30 (11 fresh eggs); York, June 9 (17 eggs); Mount Weogufka, May 22 (17 eggs); and Abbeville, June 10 (15 eggs). At Leighton, September 27, 1889, McCormack noted a covey of young hardly able to fly.

General habits.—The bob-white is too well known to need any extended description of its habits. Rearing their young in the meadows of almost every farm in the State, the birds are constantly seen and heard by dwellers in the country and if given complete protection they often become tame enough to feed with chickens in the barnyard. They remain in flocks throughout the winter and until the last of April or even into May. Frequenting both grass fields and cultivated lands, they often take to the woods or swamps when hunted and are then difficult to flush without a good dog.

Bob-white has many enemies to contend with, notably, foxes, snakes, crows, and the Cooper hawk. Many broods are destroyed by mowing machines, and hunting dogs ranging at will over the fields constitute a serious menace to the successful rearing of the young birds. But in spite of these and many other drawbacks, this sturdy little bird has managed to hold its own fairly well. Instances of the male bird assuming the duties of incubation on the death of the female are not unusual. Bendire records one case from Greensboro, on the authority of Dr. Avery,[†] and another instance came under my observation at Abbeville, June 10, 1911. In this case the male bird was shot as it flushed from the nest, the failure of the female to take his place seeming to indicate that she had been previously killed.

Food habits.—An exhaustive study of the food of the bob-white by the Biological Survey showed the bird to be highly beneficial and worthy of protection by the farmer. The bird's food is summarized as follows:

The food for the year as a whole, calculated by volume and determined by analysis of the contents of 918 stomachs, con-

[†]Bendire, Chas., Life histories of North American birds [vol. 1], p. 5, 1892.

sisted of vegetable matter, 83.59 per cent, and animal matter, 16.41 per cent. * * *

The vegetable part of the food consisted of grain, 17.38 per cent; various seeds, chiefly weeds, 52.83 per cent; fruit, 9.57 per cent; and miscellaneous vegetable matter, 3.81 per cent.*

The animal matter consisted largely of beetles, grasshoppers, and bugs and included many serious insect pests, such as the potato beetle, cucumber beetle, squash beetle, cutworms, tobacco worm, army worm, cotton worm, cotton bollworm, Rocky Mountain locust, and chinch bugs.*

GROUSE: Family Tetraonidae.

RUFFED GROUSE; "PHEASANT": *Bonasa umbellus umbellus* (Linnaeus).

State records.—The ruffed grouse, or "pheasant," as it is called in the South, in former times ranged southward along the mountains probably to the point where they terminate. Joel Burgess, who lives at Dean, in the Talladega Mountains, tells me that his father often spoke of having killed "pheasants" in that locality in the days of the early settlement of the country. E. W. Graves states that in the winter of 1909-1910 he saw one of these birds in a gulch on Sand Mountain, southeast of Carpenter. In April, 1912, and October, 1916, Mr. Graves and the writer hunted for several days on Sand Mountain without finding any of the birds, although residents of the region reported seeing them occasionally. One man stated that in the summer of 1913 he had seen an old female with a brood of young in a field at Carpenter. This is probably the last remnant of this splendid game bird in the State, but if birds could be secured from other States there seems to be no good reason why the species might not be re-established in many favorable localities and, if afforded proper protection, in time spread over a large part of the State. The rough, mountainous country along the Warrior River, in northern Tuscaloosa County and southwestern Jefferson County, impressed me as being an ideal situation for such an experiment, and portions of Lookout Mountain are equally favorable.

*Judd, S. D., Biol. Surv. Bull. 21, pp. 27-28, 1905.

General habits.—This grouse lives chiefly in dry, upland woods, seeming to prefer rough hilly regions well covered with timber and underbrush. On Sand Mountain, where a few still remain, their favorite haunts are said to be the dense laurel thickets in the deep rocky ravines, or "gulfs," as they are called.

When flushed the grouse rises with a loud and startling whir of its wings and flies swiftly through the woods, often alighting in a tree, however, before flying far. The species is not of a gregarious nature, but the young of each brood remain with the mother usually throughout the first winter, the old males sometimes joining the coveys at that season.

The drumming of the grouse is perhaps its most characteristic habit. It is produced by the male bird and serves as a call to his mate. Standing on a fallen log or a rock in the woods, he beats the air vigorously with his wings, producing a sound like the measured beating of a drum, beginning with slow thumps and gradually increasing to a rapid roll which has been compared by some to the rumble of a kettle-drum and by others to distant thunder.

Food habits.—Judd summarizes the food habits of the ruffed grouse as follows:

Analysis of the food showed 10.92 per cent of animal matter and 89.08 per cent of vegetable matter. The animal food is almost all insects. The vegetable food consists of seeds, 11.79 per cent; fruit, 28.32 per cent; leaves and buds, 48.11 per cent; and miscellaneous vegetable matter, 0.86 per cent. The insect food proper includes grasshoppers, 0.78 per cent; caterpillars, 1.15 per cent; beetles, 4.57 per cent; and miscellaneous insects, 3.86 per cent. Some miscellaneous matter, made up of spiders and snails, is also eaten.*

The fruits and berries eaten include rose hips, grapes, partridge berries, wild cherries, blueberries, blackberries, elderberries, mulberries, and the fruit of the hawthorn, bayberry, elder, black haw, dogwood, black gum, and Virginia creeper.*

*Judd, S. D., Biol. Surv. Bull. 24, pp. 25-38, 1905.

TURKEYS: Family Meleagrididae.

WILD TURKEY: *Meleagris gallopavo silvestris* Vieillot.

State records.—Wild turkeys are generally distributed over the State, and although rare in many sections, they are still common in favorable situations, particularly in the big swamps of the southern counties and in the mountainous sections of the northern counties.

At Carlton, in March, 1912, Holt saw a drove of about 12 and learned that four men killed 35 birds there in December, 1910. From that locality to the head of Mobile Bay, turkeys are common in the heavy swamps; but in the swamps and hammocks near Orange Beach they have been exterminated within the last decade. Bear Swamp, near Autaugaville, still harbors a good many of the birds, though their numbers are said to have been greatly reduced in recent years. They are reported fairly common at Ashford, Castleberry, and Myrtlewood and are known to occur also at Woodville, Natural Bridge, Mount Weogufka, and on Sand Mountain (near Carpenter). In the Talladega Mountains, near Dean, they are said to be rather numerous, and a drove of 14 was seen there in February, 1912.

On a steep wooded hillside bordering the Warrior River at Lock 14, June 19, 1911, I saw a hen turkey with 5 young ones about the size of grouse, and on April 10, 1912, in nearly the same spot, I saw another brood of 6 or 8 young.

General habits.—The wild turkey is one of the wildest and most suspicious of our native birds, dwelling in the deepest and most inaccessible swamps and on heavily timbered mountain sides. The birds travel in flocks during most of the year, but during the breeding season the males separate from the females and roost by themselves, usually choosing the tallest trees to be found. At this season they frequently may be heard "gobbling," especially in the early morning before they leave their roost. At such times the hunter often is able to lure one within reach by imitating the call of the hen. The species is polygamous and the males take no part in the care of the young. The nest is a slight depression of the ground in the woods at the foot of a tree or under a bush; the complement of eggs is from 8 to 13.

The birds feed in woodland, in mountain-side clearings where blueberries abound, and on prairies adjacent to timber tracts. When alarmed by the approach of a man, they usually run for some distance before taking wing.

Food habits.—Examination of the stomachs and crops of 16 wild turkeys, most of them taken in the Southern States (Virginia to Florida) showed their food to consist of vegetable matter, 84 per cent, and animal matter, 16 per cent. The vegetable matter included fruit (33 per cent), mast and other seeds (25 per cent), and "browse," (25 per cent). The animal food was composed largely of insects, chiefly grasshoppers, of which the bird is very fond. Among the various articles of the turkeys' vegetable diet the following are mentioned by Judd: Pine seeds, acorns, chinquapins, chestnuts, pecans, persimmons, tubers of the ground nut, wild cherries, grapes, mulberries, blackberries, wild strawberries, and berries of the dogwood, juniper, holly, tupelo, spicebush, and wax myrtle. Among the insects eaten are grasshoppers, leaf hoppers, cotton worms, yellow jackets, cucumber beetles, and caterpillars.†

PIGEONS AND DOVES: Family Columbidae.

PASSENGER PIGEON; WILD PIGEON: *Ectopistes canadensis* (Linnaeus).‡

State records and habits.—Wild pigeons, once enormously abundant, are now extinct. They occurred in immense flocks in spring and fall and many spent the winter in the State, roving over the country in search of mast, which formed their principal food. McCormack, describing the last great flight in Colbert County, which occurred in the fall of 1881, says:

During that fall immense flocks of thousands and millions of birds were seen passing every evening and morning to and from their roosting place near Courtland. From about four o'clock until after dark was the time for the evening flight, and during that time not five minutes elapsed that a flock could not be seen in some direction. It was a common thing to see flocks extending as far as the eye could reach from west to east

†Judd, S. D., Biol. Surv. Bull. 24, pp. 49-52, 1905.

‡*Ectopistes migratorius* of the A. O. U. Check-list; for change of name see The Auk, vol. 36, p. 268, 1919.

and passing thus for half an hour at a time. During the day-time scattered flocks could be found everywhere in the woods, and large numbers of them were killed, and at night parties often went to their roost and killed wagon loads of them. Since that year I have not seen a pigeon.*

Avery says of the birds:

Once countless thousands came in winter to feed upon the mast of our forests. Not one to my knowledge has been seen since the winter of 1887, when Mr. Edward Pasteur, of Greensboro, shot a single specimen in the corporate limits of the town. This bird was not accompanied by any other of his species.†

In a later paper Dr. Avery states that a flock of about 200 pigeons were seen at Greensboro the first week in November, 1890.‡

Several reports of the occurrence of the wild pigeon in Alabama indicate that the birds may have persisted there somewhat later than in other parts of the United States. B. O. Peterson, of Abbeville, told me in June, 1911, that he had himself seen a small flock on the upper Choctawhatchee in the fall of 1909. He is a hunter of wide experience and perfectly familiar with the wild pigeon. His report is confirmed by a similar but entirely independent one from Walter J. Hoxie, of Savannah, Georgia, who states in a letter to the Biological Survey (November, 1910) that pigeons were believed to be still found in the upper Choctawhatchee swamp.

WHITE-WINGED DOVE: *Melopelia asiatica asiatica*
(Linnaeus).

State records.—The white-winged dove is of casual occurrence in Alabama, all of the records being from the extreme southern part of the State. H. P. Loding, of Mobile, has furnished records of 3 specimens recently taken in Baldwin County. All of these birds were mounted by a taxidermist of Prichard. One was taken at Daphne, about December 2, 1916, another at Point Clear about December 23, 1916; the third also came from Baldwin County, but the date and place of capture are unknown. A fourth specimen was taken in Baldwin County, near Fairhope, October 28, 1920, by Alfred

*Leighton (Ala.) News, vol. 2, No. 10, May 15, 1891.

†Amer. Field, vol. 34, p. 584, 1890.

‡Amer. Field, vol. 35, p. 55, 1891.

Marshall, who presented it to the Biological Survey. One was shot in Jackson County, Mississippi, about half a mile from the Alabama line, November 13, 1915, by M. Mahorner, Jr., of Mobile.

General habits.—This dove is similar in habits to the mourning dove and is often found in the flocks of the latter species.

MOURNING DOVE; "TURTLE DOVE": *Zenaidura macroura carolinensis* (Linnaeus).

State records.—The mourning dove is an abundant and widely distributed species, occurring in all parts of the State and during every season. It is found in greatest numbers in fall and winter, for at that season many migrants come down from the Northern States. Doves are esteemed as game birds and formerly were permitted to be shot from August 1 to March 1. This long open season resulted in reducing their numbers considerably, but thus far the species has maintained itself in moderate abundance. Under the migratory bird treaty act regulations (effective May 17, 1921), doves may be taken only between October 16 and January 31.

At Leighton, McCormack records this bird as a common resident, and found in small flocks during the late summer, fall, and winter months. On the coast, at Bayou Labatre, and on Dauphin and Petit Bois Islands, Gutsell reported it plentiful in July and August, but in February and March I found it very scarce in all the coast region. Only 5 birds were seen on Petit Bois Island, February 12, and only a few small flocks at Orange Beach in January, 1912. Peters noted a few at Alabama Port in early June. The rarity of these birds in that region is probably accounted for by the scarcity of suitable food in the extensive pine flats which cover a great part of the country. Dr. Avery, however, reports seeing them at Perdido Bay, in September, 1892, feeding on the mast of the longleaf pine.

Eggs have been found at Barachias, April 10; Coosada, May 1; Huntsville (Monte Sano), May 13; Autaugaville, May 28 and July 8; Ardell, June 25; and Petit Bois Island, July 29; young out of the nest were seen at Woodbine, May 10.

General habits.—Mourning doves are most frequently found in cultivated fields, pastures, and stubble fields, where they seek their food of weed seed and waste grain. Except during the nesting season they occur mostly in flocks of varying size. They regularly visit fields containing gravel, which they consume in large quantities and in the summer months about sundown they visit water holes to drink before going to roost. The large flocks which are found during the winter months break up during April, and nesting begins with some pairs early in that month or even in March.

The nest is placed usually on a horizontal limb of a tree from 8 to 12 or occasionally as high as 40 feet above the ground or sometimes on the ground or in low bushes; it is a shallow, loosely-built platform of sticks, pine needles, and grass, and contains two pure white eggs. Several broods are reared, and the breeding season extends through the summer till September.

Food habits.—The food of this species as investigated by the Biological Survey has been described as follows:

The food of the dove consists of seeds of weeds, together with some grain. The examination of the contents of 237 stomachs shows that over 99 per cent of the food consists wholly of vegetable matter, less than 1 per cent being animal. Wheat, oats, rye, corn, barley, and buckwheat were found in 150 of the stomachs, and constituted 32 per cent of the total food. However, three-fourths of this amount was waste grain picked up in the fields after the harvesting was over. Of the various grains eaten, wheat is the favorite, and is almost the only one taken when in good condition. Most of it was eaten in the months of July and August. Corn, the second in amount, was all old, damaged grain, taken from the fields after the harvest or from roads or stock yards in summer. The principal and almost constant diet, however, is the seeds of weeds. These are eaten at all seasons of the year. They constitute 64 per cent of the annual food supply, and show very little variation during any month.*

GROUND DOVE; "MOURNING DOVE": *Chaemepelia passerina passerina* (Linnaeus).

State records.—The ground dove is a local and rather uncommon resident in the southern third of the State. On a

*Beal, F. E. L., Farmers' Bull. 54, p. 6, 1904.

plantation 8 miles west of Montgomery it is reported fairly common, and at Barachias, 9 miles east of Montgomery, it occurs in small numbers. I saw several birds there, June 15, 1912, in tall Johnson grass on the prairie, and they doubtless breed in the vicinity. Golsan reports the species a fairly common breeder at Autaugaville; he took a set of eggs there, May 28, 1911 and a female collected on September 23, 1915, contained well-developed eggs. I saw a ground dove in a road near Prattville, May 30, 1913, and one was reported to me at Teasley Mill, May 15, 1914.

Avery records the species as rare at Greensboro, and mentions having examined several specimens brought to him for identification.† At Leighton, McCormack considers the bird only accidental, he having taken 2 specimens, one on May 4, 1889, and the other on February 24, 1921.

Small doves (single individuals) presumably of this species were reported to me at Bayou Labatre, November 20, 1915, and at Ashford, November 30, 1916.

General habits.—This little dove frequents sandy, cultivated land, old fields, and hay meadows. It is a gentle, unsuspicious bird, often feeding unalarmed in dooryards or gardens. When on the ground it walks gracefully, with its short tail held upright. Its flight is low and usually not very protracted, the brownish markings on the wings serving to distinguish it. It occasionally alights in bushes or low trees, but is most often found on the ground. Its soft, mournful notes—*coo-oo*, *coo-oo*, *coo-oo*—may be heard for long periods during the day.

Wayne states that in South Carolina the bird nests from April to November, rearing perhaps four broods. The nest is placed on the ground or in low trees or bushes. The eggs are white, and two in number.

Food habits.—Like the common mourning dove, this species feeds chiefly on weed seed, grass seed, and various small berries. Two stomachs examined from Alabama contained seeds of sedges and of wood sorrel (*Oxalis*).

†Avery, W. C., Amer. Field, vol. 34, p. 584, 1890.

AMERICAN VULTURES: Family Cathartidae.

TURKEY VULTURE; TURKEY BUZZARD: *Cathartes aura septentrionalis* Wied.

State records.—The turkey buzzard is a common and generally distributed bird over the whole State. On the coast it seems to be slightly less common than in the interior. Being nonmigratory, it is equally numerous at all seasons.

The breeding season begins in March and the nests are located in hollow trees or logs, and in caves and crevices of cliffs. Eggs have been found at Prattville, March 31, 1894; Autaugaville, April 11, 1909; Leighton, April 18 and 29, and May 7 and 15; and at Florence, May 7, 1912. A pair of downy young were found at Guntersville, June 18, 1913.

General habits.—This great bird, ugly and repulsive on the ground, when soaring in graceful circles in the blue ether is an attractive object and one of the most characteristic sights of the Southern landscape. It is well known as a scavenger and has until recent years been considered a beneficial species by reason of its destruction of carcasses. It is now, however, accused of aiding the spread of hog cholera, and as a result has come under the ban of man's disapproval, even to the extent in most of the Southern States of being denied the protection of the law. There is no evidence, however, that the buzzard actually does spread this disease and certain experiments carried on by the Bureau of Animal Industry with pigeons and infected pigs indicate that the virus of hog cholera is probably *not* disseminated by being carried on the feet or feathers of birds.* Furthermore, it has been shown by the State Board of Health of Florida that "the virus of hog cholera is digested in the intestinal tract of buzzards and that the droppings of buzzards fed on the flesh of hogs dead from cholera do not produce cholera when mixed in the feed of hogs."†

Turkey buzzards discover their food by a very keen sense of smell, aided also by the sense of sight. They roost usually in companies on dead trees in a sheltered part of the woods,

*Ann. Rept. Chief Bur. Anim. Ind., U. S. Dept. Agr., p. 48, 1917.

†26th Ann. Rept. State Board of Health of Florida, 1914, p. 204, (1915).

or sometimes, when feeding on a carcass, on fences in the open. The eggs are laid on the ground, in hollow trees, stubs, or fallen logs, or in caves or crevices of cliffs.

BLACK VULTURE; CARRION-CROW: *Coragyps urubu urubu* (Vieillot).‡

State records.—The black vulture, or “carrion crow,” is in most sections of the State fully as common as the turkey vulture, and in the southern part is even more abundant. It has been found nesting at Cedarville (April 1), Autaugaville (April 13, incubated eggs), Barachias (March 29 and April 8); Leighton (March 16 and May 25), and Dean (March 18, 1912, at 2,000 feet altitude); it is reported to breed, also, on Sand Mountain, near Carpenter.

General habits.—This vulture often associates with the turkey buzzard and frequently feeds from the same carcass, but is more inclined to gather into flocks. It is easily distinguished from the latter in flight by its much shorter tail and generally darker color, as well as by its habit of alternately flapping and sailing. At Barachias, on the evening of April 24, 1912, I counted over 100 of these birds flying to their roosting place on dead trees in a slough. The nest is placed in a hollow stump or log, the standing trunk of a decayed tree, or on the ground in the woods. Audubon states that both sexes assist in incubation, and that “each feeds the other by disgorging the contents of the stomach, or part of them, immediately before the bird that is sitting.*

HAWKS, EAGLES, KITES, ETC.: Family Accipitridae.

SWALLOW-TAILED KITE: *Elanoides forficatus forficatus* (Linnaeus).

State records.—The swallow-tailed kite was formerly numerous in the Southern States and the Mississippi Valley, but is now extremely rare. Gosse, writing from Dallas County in 1858, speaks of it as “seen nearly every day [in July] asso-

‡*Catharista urubu* of the A. O. U. Check-list; for change of name see *The Auk*, vol. 37, p. 444, 1920.

*Audubon, J. J., *Ornith. Biog.*, vol. 2, p. 42, 1835.

ciating in little groups." He was shown a nest reported to belong to this species at the top of a tall pine.† Avery, writing in 1890, says of it: "Not common. Once abundant. It may breed along the Warrior River [near Greensboro] where now occasionally seen."‡ At Autaugaville, Golsan has seen the bird but once, about March, 1889. Holt saw one at Barachias, May 1, 1909.** A specimen was shot at Hartford, Geneva County, January 26, 1921, and has been preserved in the collection of the Department of Archives and History at Montgomery.*† The only one I ever observed in the State flew over my head in Chuckvee Bay, May 12, 1911.

General habits.—This handsome kite is easily identified in flight by its long, forked tail and its striking black and white coloration. Its flight is swift, strong, and very graceful; when hunting, the birds fly rather close to the ground, but at other times ascend to great heights. They have the habit of traveling often in small companies of 2 to 10 individuals.

Food habits.—The swallow-tailed kite is highly beneficial, feeding chiefly on insects and reptiles and never molesting small birds. Dr. Fisher states that it is especially fond of wasp larvae, grasshoppers, and dragon flies and Nehrling says that in Texas frequently it was seen in cotton fields feeding on cotton worms.

Its fondness for snakes has given it in some sections the name of "snake hawk." Audubon mentions having examined a bird in which he found a slender snake 19 inches long, together with six lizards and four large coleopterous insects.*

MISSISSIPPI KITE: *Ictinia mississippiensis* (Wilson).

State records.—Although common in portions of Mississippi and occurring, also, in Georgia, the Mississippi kite seems to be rare in Alabama. Gosse, in 1859, recorded it from Dallas County, stating that it was much less common than the swallow-tailed kite.†† Golsan reports the bird as a former breeder near Autaugaville. Four or five pairs nested on the borders

†Gosse, P. H., *Letters from Alabama*, pp. 216-217, 1859.

‡Avery, W. C., *Amer. Field*, vol. 34, p. 584, 1890.

**Golsan and Holt, *Auk*, vol. 31, p. 220, 1914.

*†Brannon, Peter A., *The Auk*, vol. 38, p. 464, 1921.

*Audubon, J. J., *Ornith. Biog.*, vol. 5, p. 374, 1839.

††Gosse, P. H., *Letters from Alabama*, pp. 217-218, 1859.

of Bear Swamp in 1886, but all were killed off about 1889. I have observed the species only twice in the State—at Castleberry, May 31, 1911, when I saw a pair flying high over the timbered bottoms cutting figures in the air, and on the Ten-saw River, near Stockton, May 27, 1914.

General habits.—The Mississippi kite arrives from the south about the last of April and departs early in fall. It is not a shy bird and the ease with which it may be approached doubtless had much to do with the reduction of its numbers. The nests are placed in the tops of tall trees, pines or oaks often being chosen, and are often ornamented with green twigs in leaf. This kite is a swift and strong flyer, often ascending to a great height and suddenly pitching downward nearly to earth with the swiftness of an arrow, but quickly checking its descent and rising again with the same impetus to at least half its former elevation; it sometimes turns completely over in the air like a tumbler pigeon. It feeds while on the wing or in a tall tree, rarely alighting on the ground. In some localities it is known as the "mosquito hawk."

Food habits.—Like the other kites, this is an eminently useful species, feeding, as it does, upon beetles, grasshoppers, locusts, lizards, small snakes, and frogs. Gosse mentions having examined a stomach which contained two cicadas and a large dragonfly.‡

MARSH HAWK: *Circus cyaneus hudsonius* (Linnaeus).*

State records.—The marsh hawk is a common migrant and locally a common winter resident. It may occasionally nest in the State, but there is no breeding record and it is rare in summer anywhere in the Gulf States. Migrants appear quite early in fall and remain until March or April. McCormack records them at Leighton, September 19 and 23 (1893); October 7 to 19 (1891). Avery shot specimens at Greensboro, March 17 (1888), September 17 (1889), and September 23 (1890). Golsan observed the species at Autaugaville, November 9, 1912. Gutsell noted 1 at Orange Beach, Septem-

‡Gosse, P. H., Letters from Alabama, pp. 217-218, 1859.

**Circus hudsonius* of the A. O. U. Check-list; for change of name see The Auk, vol. 35, p. 206, 1918.

ber 15, and 5 or 6, September 21, 1911. During January and February, 1912, in Baldwin and Mobile Counties, I found this hawk scarce, noting only 1 at Orange Beach, January 27, 1 at Mobile, February 6, and 1 on Petit Bois Island, February 12. At Bayou Labatre, November 17 to 26, 1915, I noted the bird in small numbers nearly every day. Holt saw one at Barachias, January 10, 1909, and I saw one there, March 29, 1914. Miss Carrie Parkhurst reports seeing one at Talladega, in February, 1903, and another in December, 1907.

General habits.—The marsh hawk may easily be recognized in flight by the conspicuous white patch on its rump. Its long wings and tail make it appear much larger than it really is. It is a graceful flyer and tireless hunter, coursing ceaselessly at no great height over the marshes and upland meadows in search of its food, now hovering for a few seconds over some suspected spot or suddenly dropping to the ground for its prey. Having satisfied its appetite, it will retire to a stake or post and remain quietly perched on it for a considerable time.

Food habits.—The food habits of this hawk class it as mainly beneficial; it feeds in large part on mice and other rodents, grasshoppers and other insects, frogs, lizards, and snakes. Dr. Fisher says that it is probably the most active and determined foe of meadow mice and ground squirrels, destroying greater numbers of these pests than any other species.† It occasionally captures poultry and small birds, chiefly the ground-dwelling sparrows, but these depredations are more than offset by its destruction of noxious rodents.

SHARP-SHINNED HAWK; LITTLE BLUE DARTER:

Accipiter velox (Wilson).

State records.—The sharp-shinned hawk is a rather uncommon resident in all parts of the State. It is recorded by Avery as resident and breeding at Greensboro, specimens having been taken there October 29, 1886, November 11, 1887, and November 5, 1891. McCormack has noted it at Leighton, December 17, 1889, and July 30 and November 26, 1891, but

†Fisher, A. K., Bull. 3, Div. Ornith. and Mamm., p. 29, 1893.

he considers it rare in that vicinity. Golsan reports it fairly common at Autaugaville, where one was taken December 11, 1911. Graves reports it a common breeder on Sand Mountain. I saw one at Orange Beach, January 24, and one at Florence, May 4, 1912. Holt took a specimen at Jackson, February 23, 1912, and Peters saw two birds near Ardell in June, 1914.

General habits.—This little hawk is well known under the names of "bullet hawk" or "little blue darter." It is a swift flyer and full of dash and courage, often attacking birds as large as itself, such as the quail, mourning dove, flicker, purple grackle, and robin. It feeds extensively also on such smaller birds as the various native sparrows, warblers, wrens, and thrushes. As the little hawk flies along the hedgerows or darts into a thicket or brier patch in pursuit of its victim, consternation reigns among the smaller birds, who well know the danger from this bold and persistent hunter. Nuttall tells of seeing, near Tuscaloosa, "a pair of these birds furiously attack the large red-tailed hawk, squalling very loudly, and striking him on the head until they had entirely chased him out of sight."*

The nest of this hawk is rather bulky, placed in trees, usually evergreens, 15 to 40 feet from the ground.

Food habits.—This is one of the few injurious species of hawk. It feeds mainly upon small birds and young chickens and occasionally captures mice, grasshoppers, or small reptiles. Dr. Fisher identified 46 birds in the stomachs of this species; of 150 stomachs examined, 6 contained poultry or game birds; 99, other birds; 6, mice; 5, insects; and 52 were empty.

COOPER HAWK; BIG BLUE DARTER: *Accipiter cooperii*
(Bonaparte).

State records.—The Cooper hawk is generally distributed over the State and is rather more common than the sharp-shin, though nowhere abundant. It is recorded breeding at Leighton, Greensboro, Autaugaville, and Sand Mountain, and has been observed, also, at Hayneville and Teasley Mill, Mont-

*Nuttall, Thos., *Manual ornith., land birds*, p. 89, 1832.

gomery County. Fresh eggs were taken at Leighton, April 29, 1887 and April 10, 1889.

General habits.—This hawk well deserves the name of “chicken hawk,” which, however, is commonly applied to the larger and less harmful species—the red-tailed and red-shouldered hawks. It is a bold and dashing marauder, and does not hesitate sometimes to snatch up a fowl from before the very eyes of the owner. Dr. Avery, writing of this bird, says:

This hawk seems to be the greatest enemy of domestic fowls. But above all birds he seems to prefer the tame pigeon. Two or three times a week my pigeons have to fly for their lives. When very hungry a Cooper’s hawk will make repeated attempts at capturing his quarry before he will desist. Several years ago I fired both barrels of my gun at one of these hawks while in pursuit of my pigeons. In less than thirty minutes he returned and carried off a pigeon.†

On Henry Golsan’s farm near Autaugaville, in April, 1912, one of these hawks visited the poultry yard quite regularly and carried off a chicken every few days. The usual haunts of this bird are “moderately timbered districts, interspersed with cultivated fields and meadows” (Bendire). The nest is placed in trees, usually saddled in a fork close to the trunk. Old nests of crows or of the larger hawks are often utilized.

Food habits.—The food of this species comprises, besides poultry and pigeons, wild birds from the size of robins and meadowlarks and smaller; small mammals, as squirrels, chipmunks, rabbits, mice, etc.; reptiles, amphibians, and insects.

RED-TAILED HAWK: *Buteo borealis borealis* (Gmelin).

State records.—The red-tail (fig. 3) is one of the largest hawks and is one of several known as “hen hawk” or “chicken hawk.” It is a permanent resident in the State, but its numbers are considerably augmented in winter by the arrival of migrants from more northern regions. A number of specimens, from Greensboro, Autaugaville, Montgomery, Barachias, and Guntersville, have been examined and all are typical

†Avery, W. C., Amer. Field, vol. 34, p. 584, 1890.

borealis. Dr. Avery noted this bird at Greensboro chiefly as a winter resident, but never found in breeding. McCormack records it as rare at Leighton, taken only once, March 17, 1891; I noted a pair there, April 21, 1914, and a pair near Mount Weisner, October 23, 1916. It has been seen also on Sand Mountain near Carpenter (April), at Ardell (May), Mount Weogufka (June), and at Dean, among the Talladega Mountains (March and June). Eggs have been taken at Prattville, March 4, 1893, and at Autaugaville, April 9, 1909. There are no records of the bird for the coast region, but it probably occurs there, at least in winter.

General habits.—This hawk is found in timbered regions, both in wet bottom lands and on rocky mountain slopes. It is a shy bird and not partial to thickly settled districts. The adults are easily recognized in flight by the bright red tail and by the large size. The call is described by Chapman as a long-drawn, squealing whistle, suggesting the sound produced by escaping steam. The nests are bulky, placed in tall trees.

Food habits.—The prejudice against all hawks, persisting through ignorance of their true relation to mankind, has resulted in relentless persecution and great diminution in the numbers of this species. Extended investigation of its food habits has demonstrated that the domestic fowls eaten constitute only about 10 per cent, while mice and other rodents constitute about four-fifths of the total food.

Of 562 stomachs examined [in the Biological Survey] 54 contained poultry or game birds; 51, other birds; 278, mice; 131, other mammals; 37, batrachians and reptiles; 47, insects; 8, crawfish; 13, offal; and 89 were empty.*

The stomach of one killed near Montgomery, December 11, 1915, contained 80 grasshoppers. It is evident from the above statements that this bird is far from being the enemy of the farmer it is commonly supposed; on the contrary, it should, save in exceptional cases, be considered a beneficial bird on the farm.

*Fisher, A. K., Bull. 3, Div. Ornith. and Mamm., U. S. Dept. Agr., p. 50, 1893.

FIG. 3.—Red-tailed Hawk.

RED-SHOULDERED HAWK: *Buteo lineatus lineatus*
(Gmelin).

State records.—The northern form (*lineatus*) of the red-shouldered hawk occurs irregularly in Alabama, chiefly as a winter visitant, but a single summer record indicates that it may straggle southward even at that season. It is known at present from 5 specimens collected as follows: 3 by Dr. W. C. Avery, at Greensboro, August 19, 1889, January 28, 1890, and December 27, 1893; 1 by William Matthews, at Castleberry, November 25, 1911; and 1 by L. S. Golsan, at Autaugaville, January 14, 1912.

FLORIDA RED-SHOULDERED HAWK: *Buteo lineatus allenii* Ridgway.

State records.—The Florida red-shouldered hawk is one of the commonest and most widely distributed of the birds of prey, and is one of the species commonly known as "hen hawk." Specimens have been examined from Leighton (July 13), Greensboro (May 25, August 10, September 28, November 26, December 23), Auburn (October 3), Barachias (November 27), Seale (May 20), Bon Secour (October 25), and Bayou Labatre (February 9).

Nesting begins early in March and by the last of the month the eggs are laid. Nests with eggs were found at Leighton, March 25, April 9, and April 18; at Prattville, March 28, 1909; and at Barachias, April 11, 1909 (hatching).

General habits.—This hawk is found in every tract of swampy or bottom-land timber and in such situations it seeks its food and rears its young. It often lives rather close to human habitations and is not found to any extent in the mountains. Rarely does it extend its visits to the barnyard, though it occasionally picks up a fowl which has wandered into the brush or woodland. Its alarm notes, which are frequently uttered, are loud and piercing, resembling the syllables *kee-ah, kee-ah*. These are often imitated by the blue jay.

The nest is usually placed in a deciduous tree, from 30 to 60 feet above the ground, and is composed of sticks, lined with Spanish moss, bark, green leaves, pine needles, etc.

Food habits.—On the theory that it is an habitual chicken thief, the red-shouldered hawk is relentlessly persecuted by farmers and hunters alike. All the evidence, however, goes to show that it rarely attacks poultry, but feeds almost entirely on mice and other small mammals, snakes, insects, crawfish, and occasionally small birds. Only 3 of the 220 stomachs examined in the Biological Survey contained poultry, while 102 contained mice; 40, other mammals; 20, reptiles; 39, batrachians; 92, insects; 16, spiders; 7, crawfish; and 12 contained other birds.† An immature bird of this species, shot by F. W. McCormack, at Leighton, July 13, 1912, contained in its stomach two whole frogs and remains of others.

BROAD-WINGED HAWK: *Buteo platypterus platypterus* (Vieillot).

State records.—The broad-winged hawk occurs in Alabama in moderate numbers as a summer resident, being rather more numerous in the hill country than on the coastal plain. Saunders noted its arrival at Woodbine, March 25, 1908, after which it soon became abundant; a nest was reported to him the latter part of May.* I have observed the species during the breeding season on Sand Mountain (near Carpenter), at Guntersville, Muscle Shoals, Melville, Ardell, Fort Payne, Talladega Mountains, Lock 14 Warrior River, Barachias, Point Clear, and Dog River, Mobile Bay. Golsan took a specimen at Autaugaville, September 2, 1911, and Avery records one taken at Cedarville.** Bendire states that Dr. A. K. Fisher saw a pair near Mobile in May, 1886.‡ Incubated eggs were found at Booth, May 22, 1912.

General habits.—This medium-sized hawk is found in dry, upland woods, seeming to prefer timbered hillsides. Its note is a shrill, high-pitched whistle, quite different from that of the larger buteos. It is a gentle and unsuspicious bird, often allowing a person to approach within a few yards before taking flight. Although rather sluggish and heavy on the wing, it often soars in circles at a considerable height.

†Fisher, A. K., Bull. 3, Div. Ornith. and Mamm., U. S. Dept. Agr., p. 70, 1893.

*The Auk, vol. 25, p. 417, 1908.

**Avery, W. C., Amer. Field, vol. 34, p. 584, 1890.

‡Bendire, C., Life Hist. North Amer. Birds [vol. 1], p. 242, 1892.

The nest is placed in the fork of a tree usually 25 to 50 feet above the ground, though sometimes lower; old nests of the crow or of a squirrel are sometimes utilized.

Food habits.—This is one of the wholly beneficial hawks. It never attacks poultry and rarely takes small birds. Its food consists principally of insects, small mammals, reptiles, and batrachians.

GOLDEN EAGLE: *Aquila chrysaetos* (Linnaeus).

State records.—The golden eagle is at present a rare bird in the eastern United States, but is known to breed infrequently in the wilder parts of New England and in the Alleghenies south to North Carolina. Occasional wanderers, therefore, may be looked for in Alabama, but on account of similarity in appearance the immature bald eagle is often mistaken for the golden eagle, and only such records as have been carefully substantiated can be accepted as correct.

There are three recent records of this bird's occurrence in the State, two in the northern and the other in the southern part. Dr. G. Clyde Fisher has recorded the first, a specimen poisoned by a sheep owner at Florala, January 17, 1908, where the bird, with another, was reported to have killed some sheep and lambs.* The second record, a specimen killed near Florence in March, 1911, is from Delos H. Bacon, who examined the bird and vouches for the correctness of the identification. The third record is furnished by Mrs. Bessie R. Samuel of Guntersville, who examined and identified a specimen killed near Preston in November 1921.

BALD EAGLE: *Haliaeetus leucocephalus leucocephalus*
(Linnaeus).

State records.—The bald or white-headed eagle is a fairly common resident on the Gulf coast of Baldwin county and occurs locally also in the interior, chiefly along the Tennessee River. Dr. Avery records one individual, the only one ever noted by him, at Greensboro, in 1882.† Golsan and Holt record it as rare and irregular in Autauga County and

*Wilson Bull., vol. 20, No. 1, p. 55, 1908.

†Avery, W. C., Amer. Field, vol. 34, p. 607, 1890.

describe meeting one in Bear Swamp on December 18, 1913.† J. E. Isbell has in his possession a mounted specimen in immature plumage killed in the vicinity of Tuscumbia, in November, 1910. He reports another one killed about the same time at Russellville. Mrs. B. R. Samuel also has an immature specimen taken near Guntersville. At Florence, May 7, 1912, I observed an adult bird flying downstream close to the top of the river bluffs. The species is reported to nest near Muscle Shoals, a short distance above Florence. In October, 1908, I saw 3 or 4 bald eagles about Little Lagoon, Baldwin County; and in September, 1912, Gutsell saw an adult pair soaring over Perdido Bay. The birds are reported to breed in that vicinity. At Chuckvee Bay, February 7, and again March 16, 1912, I saw a pair of old birds circling high over the Bay. Two were seen on Petit Bois Island, November 24, 1915, and one in Duckers Bay, December 3, 1915.

Immature birds of this species have the feathers of the head brown, like the rest of the body feathers. For this reason they are frequently mistaken for golden eagles. The latter bird, however, may always be distinguished by its legs, which are feathered down to the toes; in the bald eagle the lower third of the leg is naked.

General habits.—The bald eagle is found chiefly near large bodies of water and is most common along the sea coast. It is at all times suspicious of man and avoids thickly settled regions. Its favorite perch is the top of a tall dead tree overlooking a river, pond, or bay, from which vantage point it watches for an opportunity to plunder the osprey of its catch, or to launch out after a passing duck, or to dive for a fish which it has perceived beneath the surface.

Although ordinarily of rather sluggish flight, the eagle when hunting its prey is capable of remarkable speed and agility, seemingly having no difficulty in overtaking and capturing the swiftest-flying waterfowl. It picks up also many wounded ducks and subsists to a considerable extent on dead fish or other carrion found on the shores of rivers or bays.

†The Auk, vol. 31, p. 221, 1914.

The nest is an immense structure, often 5 or 6 feet in diameter and nearly as high, placed in or near the top of a tall tree, usually a pine. The eggs are laid in winter, from December to February.

Food habits.—The food of this eagle is chiefly fish, taken both dead and alive. In addition, it captures such larger birds as ducks and coots, and many small mammals, including opossums, raccoons, rabbits, rats, and mice. Dr. Ralph found in a nest examined in Florida the remains of 13 coots (*Fulica americana*), and states that in that region the eagles were living largely on waterfowl, though occasionally taking fish. The birds occasionally prey upon the young of domestic animals, notably lambs and pigs.* Dr. G. Clyde Fisher states that they are accused of killing sheep in the region about Florala, and many have been poisoned during the past few years by sheep owners in that section.†

FALCONS, ETC.: Family Falconidae.

DUCK HAWK: *Rhynchodon peregrinus anatum* (Bonaparte).‡

State records.—The duck hawk occurs rarely as a migrant and winter resident and a few pairs still breed in the high cliffs along the Tennessee River (Pl. IV, fig. 1). Writing from Greensboro, in 1890, Dr. Avery says of this bird: "Rare. Generally seen in autumn and winter, in the wake of the wild duck."** He describes the capture of a tame pigeon by one of these birds, and in an earlier paper mentions having seen duck hawks on several different occasions at Greensboro and describes their capture of a killdeer and their pursuit of a quail and of a black duck.*† Two specimens were collected by him, September 10, 1886, at Greensboro, and one was seen, September 21, 1892, at Little Lagoon, Baldwin County. F. W. McCormack tells me that in former years he used frequently to see a pair of duck hawks about the steep bluffs on the

*See Oberholser, H. C., Biol. Surv. Bull. 27, 1906.

†Wilson Bulletin, vol. 20, p. 55, 1908.

‡*Falco peregrinus anatum* of the A. O. U. Check-list; for change of name see The Auk, vol. 35, p. 207, 1918.

**Am. Field, vol. 34, p. 607, 1890.

*†Orn. and Ool., vol. 12, pp. 74-75, 1887.

Tennessee River, at Florence. He believes they nested there in 1892, but since that date none have been seen.

At Fort Deposit, Marshall County, on the Tennessee River, I saw two duck hawks, June 18, 1913, and was informed by a resident of the locality that the birds had nested for many years in the high cliffs along the river. One of the birds observed was flying over the river, the other was flushed at dusk from the face of the cliff.

General habits.—This splendid falcon has been greatly reduced in numbers during recent years, especially in thickly settled regions. It lives chiefly near large bodies of water, where its favorite food of ducks is easily procured, but in winter it sometimes takes up its abode in cities, where it preys upon tame pigeons. Its flight is exceedingly swift and it has no difficulty in overtaking and striking down any bird up to the size of a duck.

The nest is placed usually on a ledge of a cliff or, rarely, in cavities in tall trees.

Food habits.—The duck hawk preys almost exclusively on birds, chiefly waterfowl and shorebirds. Small land birds are occasionally eaten as also are domestic fowls and pigeons whenever opportunity offers. This falcon is very destructive, but it is now so rare in the East as to be of little economic importance. It is to be hoped that the few birds now remaining in the State may be saved from extermination.

PIGEON HAWK: *Tinnunculus columbarius columbarius*
(Linnaeus).*

State records.—The pigeon hawk occurs as a rather uncommon migrant and winter visitant from September to March. Dr. Avery observed the species at Greensboro on three occasions—in 1889; October 6, 1891; and December 22, 1893. Gutsell took a single specimen on the shore of Perdido Bay, September 21, 1911. I observed single individuals near Montgomery, December 11, 1915; Autaugaville, December 14, 1915, and November 21, 1916; and Dothan, November 26, 1916.

**Falco columbarius* of the A. O. U. Check-list; for change of name see *The Auk*, vol. 35, p. 207, 1918.

R. H. Dean saw one at Anniston, February 6, 1916. Graves reports the bird fairly common on Sand Mountain.

General habits.—This little falcon somewhat resembles the sparrow hawk in its manner of flight, but has less of the erratic, butterfly style of locomotion characteristic of the latter; nor does the pigeon hawk hover when seeking its prey, but flies with quick, nervous strokes of the long wings or dashes swiftly into thickets in pursuit of the smaller birds, which furnish its principal food. It sometimes attacks birds larger than itself and has been known to kill the swift-flying passenger pigeon. It is usually quite unsuspicious of man.

Food habits.—The food of the pigeon hawk, according to Dr. A. K. Fisher, consists mainly of small and medium-sized birds, especially the gregarious species, insects, and occasionally small mammals. Among the birds found in the stomachs examined were the flicker, bobolink, thrushes, vireos, warblers, swallows, and numerous species of sparrows. The insects eaten include dragonflies, grasshoppers, crickets, and beetles.† This bird occasionally proves destructive to tame pigeons and young chickens, although usually it confines its depredations to wild birds.

SPARROW HAWK: *Cerchneis sparveria sparveria*
(Linnaeus).‡

State records.—The northern and larger race of the sparrow hawk occurs not uncommonly all over the State during the winter season, mingling freely with the southern race (*paula*). In the breeding season it is found only in the northern part, south of Coosa County. Graves reports the bird a common breeder on Sand Mountain, and McCormack records it common during late summer, fall, and winter, at Leighton, one instance being known of its nesting on La Grange Mountain. Two specimens taken in the breeding season are in the Biological Survey collection, one taken by Gutsell at Mount Weogufka, June 17, 1911, and one by Peters at Ardell, June 17, 1914, both being typical examples of *sparveria*. The species is reported by Saunders "quite abundant" in the Weo-

†Fisher, A. K., Biol. Surv., Bull. 3, Div. Ornith. and Mamm., p. 110, 1893.

‡*Falco sparverius sparverius* of the A. O. U. Check-list; for change of name see The Auk, vol. 34, p. 201, 1917.

gufka region, young out of the nest having been seen June 3, 1908. It has been observed in June in the Talladega Mountains, at Searles, Logan, Ardell, and near Tuscaloosa. Wintering individuals of this race have been taken at Greensboro (October 2, November 21 and 28, December 13 and 26); Barachias (November 21, 1911); Autaugaville (November 30, 1911); Carlton (February 29, 1912); Whistler (February 6, 1912); and Baldwin County (October 2, 1892). On Sand Mountain, during a ten days' trip by wagon, late in October and in November, only two were seen—one near Dutton, October 31, and one near Oleander, November 7, 1916.

General habits.—This is our smallest hawk, easily recognized by its small size and peculiar, butterflylike flight. In the South it is found most frequently about deadenings, where an abundance of rotting stubs furnishes attractive nesting sites. It is usually rather shy and on the approach of danger flies off swiftly with loud cries of *killee, killee*. A fire started in a grass field is sure to attract a number of these little hawks, who come to capture the grasshoppers thus driven out.

The bird's usual method of hunting is to perch on a stub, fence post, telephone pole, or similar point of vantage and there await the appearance of game on the ground below or in a near-by thicket. When some desirable object is espied, the hawk flies over the spot and hovering for a moment drops lightly to the ground, seizes the prey—mouse, grasshopper, or lizard—in its talons, and returns to its perch to devour it. Small birds, or sometimes even birds nearly as large as itself, are captured by a swift dash into the brush.

The eggs are laid in cavities in hollow trees, usually in a dead stub standing in a field. In some sections of the West the bird occasionally makes its nest in ledges or in holes of cliffs or cut banks or sometimes in old nests of the crow or magpie.

Food habits.—The sparrow hawk is the most useful of all the hawks, and the practice of shooting it wantonly simply because it belongs to the hawk family is much to be deplored from the standpoint of either the nature lover or the farmer.

Dr. A. K. Fisher, after an exhaustive study of its food, found it to be almost exclusively insectivorous. Grasshoppers and crickets are preferred by the hawks and only when these insects become scarce do they turn their attention to other sources of food. Beetles, spiders, mice, shrews, small snakes, lizards and occasionally small birds are included in the bird's fare.

Of 320 stomachs of this bird examined by Dr. Fisher in the Biological Survey, 215 contained insects; 29, spiders; 89, mice; 12, other mammals; 12, reptiles or batrachians; and 54, other birds.*

LITTLE SPARROW HAWK: *Cerchneis sparveria paula*
Howe and King.†

State records.—The smaller form of the sparrow hawk occupies the southern half of the State, from Autauga County southward, where it is locally common, both in winter and summer. Specimens have been examined from Autaugaville (January 21, November 23, December 8), Barachias (November 21), Dothan (June 12), Castleberry (June 1), and Orange Beach (September 20, January 30). The bird doubtless breeds at all these localities, and has been seen also at Jackson, Brewton, Mobile, Nigger Lake, Headland, Fairhope, Bayou Labatre, and on Dauphin Island (May 18). Golsan records a nest with fresh eggs found at Autaugaville, April 11, 1910.‡

General habits.—The habits of this bird are essentially the same as those of the northern race; like it, the little sparrow hawk is partial to cultivated lands and pastures, especially where there are numerous hollow trees which may serve as nesting sites.

OSPREYS: Family Pandionidae.

OSPREY; FISH HAWK: *Pandion haliaetus carolinensis*
(Gmelin).

State records.—The osprey, or fish hawk, is a fairly common resident on the coast; in the interior it occurs locally as

*Biol. Surv. Bull. No. 3, p. 127, 1893.

†*Falco sparverius paulus* of the A. O. U. Check-list; for change of name see The Auk, vol. 34, p. 201, 1917.

‡Golsan and Holt, The Auk, vol. 31, p. 222, 1914.

a migrant. Dr. Avery observed a good many about Perdido Bay in September, 1892, and saw a number of nests in pines and cypresses on Soldier Creek. Gutsell, in 1911, found the birds fairly common in the same region, and saw many nests about the lakes near Orange Beach. I saw a few of the birds, in October, 1908, at Bon Secour, and a few in May, 1911, and March, 1912, fishing in Mississippi Sound; and several also, on Dauphin and Petit Bois Islands, in July, 1913. Single birds were seen at Brewton, October 8, 1908; Chuckvee Bay, May 12, 1911, and July 11, 1913; Orange Beach, January 24, 1912; and on the Tensaw River, near Stockton, June 2, 1914. McCormack records the species at Leighton only twice, once in 1887, when an individual remained about a pond for a week, and again October 4, 1892. He states, further, that the bird is said to be tolerably common along the Tennessee River, one having been killed at Florence, April 17, 1893. Golsan has observed it twice about a millpond near Autaugaville, on June 21, 1911, and March 31, 1912. Dr. Avery mentions having seen it only a few times at Greensboro.

General habits.—The osprey is more gregarious than most of the other hawks, migrating in flocks and nesting frequently in colonies. It is a mild-mannered and inoffensive bird, never attacking other birds except in defense of its nest, and even sometimes permitting the purple grackle to build its nest and rear its young among the crevices of its own domicile.

It is very regular in its migrations, appearing and departing usually at a given station on almost the same day, year after year. At Gardiner Island, New York, where is located the largest known colony, it is reported to arrive March 20 and depart September 20. Since it winters on the coast of Alabama no migration dates are available.

The nests of the fish hawk are bulky affairs, often 6 feet or more in diameter and 4 or 5 feet high, composed of large sticks, bunches of seaweed, cornstalks, pieces of sod, driftwood, rubbish of various kinds, and bleached bones and skulls of mammals. They are placed on trees or rocks and sometimes on the ground.

The osprey secures its food by plunging into the water with great rapidity from a moderate height; grasping its prey in its talons it makes off to a convenient spot to devour it.

Food habits.—The food of this bird is composed exclusively of fish; in Florida, it is said to live almost entirely on catfish, while in other localities it is known to take menhaden, herring, goldfish, sunfish, shad, perch, and trout.

BARN OWLS: Family Tytonidae.*

BARN OWL; MONKEY-FACED OWL: *Tyto alba pratincola* (Bonaparte).†

State records.—The barn owl (fig. 4) is a locally common resident, but by reason of its nocturnal habits is rarely seen. Dr. Avery speaks of it as abundant on a plantation 6 miles south of Greensboro; and E. W. Graves reports it rare on Sand Mountain. Mrs. B. R. Samuel has a specimen taken at Guntersville. It is reported also by Miss C. E. Parkhurst as occurring at Talladega. A specimen taken at Montgomery January 28, 1881, is in the National Museum collection; and one taken at Barachias, June 13, 1911, is in the Biological Survey collection. On the Gulf beach, near the mouth of Perdido Bay, on December 8, 1915, I flushed one of these owls from a pine tree in bright sunlight and later secured it as it rose from a clump of palmetto bushes, a most unusual situation for this bird to select.

General habits.—The barn owl is not often found in the woods but lives chiefly about farm lands and even in towns or large cities. It is almost wholly nocturnal and is therefore rarely seen and little known. It spends the daylight hours concealed in a hollow tree or other cavity, in a church steeple, or the attic of a house or barn. At dusk it sallies forth over the fields or marshes seeking its prey of mice, rats, or other rodents. At such times, according to Bendire, it often utters a peculiar screaming note.

Its nests are placed in deserted buildings, in towers, belfries, hollow trees, or in holes in cut banks. A remarkable feature of its life history is its habit in the South of breeding in autumn or winter as well as in spring. Its eggs have been found in South Carolina in September, and in Florida in

**Aluconidae* of the A. O. U. Check-list; change necessary by reason of change of generic name from *Aluco* to *Tyto*.

†*Aluco pratincola* of the A. O. U. Check-list; for change of name see *The Auk*, vol. 33, p. 430, 1916.

FIG. 4.—Barn Owl.

December.‡ A nest found by Holt in a hollow oak at Barachias, January 8, 1912, contained two well-grown young and one much smaller one; the eggs in this case must have been deposited in November. The eggs, usually 5 to 7 in number, are laid at irregular intervals, so that both fresh eggs and young may be found in the nest at the same time.

Food habits.—This little-known bird is one of the farmer's best friends. Dr. Fisher says of it: "All testimony goes to show that the barn owl is one of the most beneficial of rapacious birds. Its food undoubtedly consists principally of several species of rodents which, from their great numbers and destructive habits, are a curse to the country they inhabit."**

Examination of 200 "pellets" or castings of this species, found in one of the towers of the Smithsonian Institution in Washington, D. C., gave a striking record of the useful qualities of the birds; in these pellets were found 454 skulls—225 of meadow mice, 2 of pine mice, 179 of house mice, 20 of barn rats, 6 of jumping mice, 20 of shrews, and 1 of a mole; only one bird skull was in this collection—that of a vesper sparrow.

In a nest examined at Barachias by Holt, within 200 yards of a farm house, about 20 "pellets" were collected, and on examination proved to contain remains of 22 cotton rats (*Sigmodon hispidus*), 6 house mice, 4 harvest mice (*Reithrodontomys humulis merriami*), 6 least shrews (*Cryptotis parva*), 1 frog, and 1 sparrow. The absence of poultry from these remains is significant, but only serves to emphasize the universal testimony as to the beneficial habits of these owls. They never attack domestic fowls and rarely pigeons or wild birds, but the bulk of their food consists of noxious rodents—field rats and mice, pocket gophers, kangaroo rats, shrews, ground squirrels, house mice, and barn rats. Four pellets sent to the Biological Survey by Dr. Avery, of Greensboro, contained nothing but remains of cotton rats, and Audubon mentions an instance in South Carolina in which these rodents constituted the only food of a brood of young.

‡Wayne, A. T., *The Auk*, vol. 25, pp. 21-25, 1908.

**Fisher, A. K., *Bull. 3, Div. Ornith. and Mamm.*, p. 133, 1893.

HORNED OWLS, HOOT OWLS, ETC.: Family Strigidae.

LONG-EARED OWL: *Asio otus wilsonianus* (Lesson).

State records.—The long-eared owl is apparently a rare and irregular winter visitant in Alabama. Dr. Avery noted it several times at Greensboro in winter, three specimens, taken prior to 1890, being mentioned in his paper. On December 27, 1893, a flock of 8 or 10 were seen in an osage-orange hedge; one specimen was collected on that date and another, March 3, 1894. McCormack has but one record of the bird at Leighton—a specimen taken February 4, 1891; Golsan has seen it twice in Bear Swamp, Autauga County.

General habits.—This medium-sized owl is nocturnal in habit and usually spends the day in a secluded thicket or evergreen tree. It is not a particularly wary bird and often falls victim to the thoughtless hunter. It is, however, a useful species and should everywhere receive protection. It is usually a rather silent bird but according to Bendire, in early spring it calls somewhat like a screech owl, but in more subdued tones.

Food habits.—This owl is one of our most beneficial species, confining its diet largely to meadow mice, pine mice, house mice, shrews, and other small mammals, with a small proportion of wild birds, chiefly sparrows.

SHORT-EARED OWL: *Asio flammeus* (Pontoppidan).

State records.—The short-eared owl occurs in Alabama only as an irregular winter visitant. Dr. Avery says of it: "Tolerably common some years; others not seen at all. Frequently flies about in the daytime, and is flushed from the tall grass of meadows and marshes. A half dozen or more are often seen together. Winter resident."* McCormack records a single specimen taken at Leighton, November 19, 1891. B. H. Holt tells me he frequently sees this species on the prairie at Barachias.

General habits.—This large owl is more diurnal in habit than most other owls, and on cloudy days is often seen flying

*Avery, W. C., Amer. Field, vol. 34, pp. 607-608, 1890.

about. It shuns timbered regions, and is found usually on prairies and marshes or in open fields, where it may frequently be flushed from long grass. It is somewhat gregarious during migration and in winter is often found in small and sometimes in large flocks. Its flight is easy, graceful, and noiseless, and the large wings make the bird appear larger than it really is.

Food habits.—The food of the short-eared owl consists principally of mice and other small mammals, with a small percentage of insects and wild birds. The species, therefore, is one of the most useful of predatory birds.

FLORIDA BARRED OWL; HOOT OWL; SWAMP OWL:
Strix varia alleni Ridgway.

State records.—The barred owl (fig. 5) is common and generally distributed over the State. Specimens examined from Stiggins Lake (near Mount Vernon), Greensboro, Autaugaville, Mount Weogufka, Ardell, and Sand Mountain, near Langston, are referable to the southern form (*alleni*) and indicate that the range of this subspecies includes practically the whole State.

The nesting season begins in February. Golsan found a nest near Autaugaville, March 27, 1910, containing one heavily incubated egg.

General habits.—The barred owl, or "hoot owl" as it is more often called, is found in heavy river-bottom timber or in swamps, where it lives the year round. During the day it remains hidden in a dense thicket or evergreen tree; but if its retreat is discovered by crows or bluejays it is quickly surrounded by a noisy mob composed of most of the feathered inhabitants of the neighborhood, who pursue the unfortunate owl until it has flown to a distant or more secure hiding place. This species is solitary in habit and usually resents the intrusion of a strange individual of its kind. It hunts chiefly by night, but is occasionally seen abroad on cloudy days.

The nest of this owl is usually in a large natural hollow in a tree, the eggs being deposited on rubbish at the bottom of the cavity; rarely an old nest of a hawk or crow is utilized.

FIG. 5.—Barred Owl.

Food habits.—Dr. Fisher, after examining over 100 stomachs of this bird, concluded that it is decidedly more beneficial than harmful. Poultry was found in only 3 of the stomachs examined, while 13 contained other birds; 46, mice; 18, other mammals; 4, frogs; 14, insects; and 9 contained crawfish. The stomach of one of these owls taken at Barachias in December contained crawfish; and one from Autaugaville in the same month, 2 shrews and 5 insects, including a cricket.

FLORIDA SCREECH OWL; SQUINCH OWL; DEATH
OWL: *Otus asio asio* (Linnaeus).*

State records.—The southern race of the screech owl is common and generally distributed over the State. Specimens have been examined from Leighton, Ardell, Sand Mountain (near Carpenter), Greensboro, Autaugaville, and Ashford. Those from Leighton and Sand Mountain are intermediate between the northern and southern races, but are nearer the latter. In the coast region these birds are rather uncommon; a few have been noted, however, at Mobile, Bayou Labatre, and Orange Beach.

The nesting season begins in April, eggs having been found at Barachias, April 7 and April 10, and young birds at Leighton, April 24.

General habits.—Like most of the owls, this little species is strictly nocturnal. It spends the daylight hours in a hollow tree, in a loft or shed, or sometimes in the crotch of a tree or in a thick evergreen. At the farm of J. H. Tharp, near Ashford, in November, 1916, I observed one of these owls which had selected on open shed in the barnyard for a roosting place. The bird was very tame and allowed visitors to watch him at close range as he sat in the darkest part of the shed on a projecting piece of wood near the peak of the roof. One cloudy morning about sunrise I saw him on a post in the yard intently eyeing the ground. Soon he dropped to the ground to pick up something and again resumed his perch in the shed.

The screech owl is partial to open, cultivated country, rather than heavy timber, and is often found in old apple orchards

**Otus asio floridanus* of the A. O. U. Check-list; for change of name see *The Auk*, vol. 34, p. 202, 1917.

and about gardens and farmyards. The eggs, usually 3 or 4 in number, are deposited in hollow trees or old stubs. Its notes, uttered chiefly at night, consist of a tremulous, mournful, whistle, considered by ignorant people to portend disaster or death. When disturbed in its roosting places, the bird utters a hissing noise and snaps its bill with a rattling sound, but does not attempt to bite.

Food habits.—The food habits of the screech owl show it to be in the main a beneficial species. It eats more insects than most other owls, and destroys also large numbers of mice. In addition, it takes crawfish, frogs, toads, lizards, and fish. Wild birds were found in about 15 per cent of the stomachs examined by Dr. Fisher, but of these a large proportion were English sparrows. The native sparrows are sometimes taken, and occasionally birds as large as the owl itself, such as a quail or woodcock.

SCREECH OWL: *Otus asio naevius* (Gmelin).†

State records.—The northern race of the screech owl is not known to breed in Alabama and its inclusion in the list is on the evidence of a specimen in the Avery collection, taken at Greensboro, January 18, 1891. As the breeding form there is *asio*, this bird must have wandered from farther north. The species however is not regularly migratory.

GREAT HORNED OWL: *Bubo virginianus virginianus* (Gmelin).

State records.—The great horned owl is a fairly common resident in all sections of the State. It is reported tolerably common at Leighton by McCormack, rare at Greensboro by Avery, common at Autaugaville by Golsan, and tolerably common on Sand Mountain by Graves. Gutsell took a specimen, September 15, 1911, at Orange Beach, and I saw a pair in the pine woods at Bayou Labatre, February 15, 1912. The species has been observed also, at Melville, Teasley Mill (Montgomery County), and Stiggins Lake (Baldwin County). In Buck

†*Otus asio asio* of the A. O. U. Check-list; for change of name see *The Auk*, vol. 34, p. 201, 1917.

Pocket, near Grove Oak, November 2 to 4, 1916, I heard the birds calling every evening.

The breeding season begins in mid-winter, incubated eggs having been taken by Golsan at Prattville, January 30, 1897. Dr. Avery records an instance of a young bird having fallen from a tree to the ground, January 23, 1890, probably thrown from its nest as the parent bird flew off.

General habits.—This owl, the largest and most powerful of the American species, dwells in deep swamps and other secluded places in heavily timbered regions. It is rather solitary in habit, and usually two pairs are not found in close proximity. It is chiefly nocturnal, spending the day in a thick evergreen or a hollow tree, and is rarely seen abroad by daylight except on cloudy days. Its eyesight is by no means deficient and it is usually on the alert to escape from human enemies. At times, however, it may be approached within gunshot.

Chapman describes the usual call note of the great horned owl as "a loud, deep-toned *who*, *hoo-hoo-hoo*, *who*, *who*. The syllables are all on the same note, and bear some resemblance to a bass-voiced dog barking in the distance."* The eggs of this species are deposited in hollow trees or in old nests of hawks or crows.

Food habits.—In the West, this owl is considered an ally of the farmer by reason of its destruction of ground squirrels, pocket gophers, prairie dogs, rabbits, and other rodents; but in the East, where injurious wild mammals are relatively scarce, it turns its attention to poultry and game birds and often does considerable damage. It destroys also insects (such as grasshoppers and beetles), scorpions, crawfish, fish, and a few small birds.

BURROWING OWL: *Speotyto cunicularia hypugaea*
(Bonaparte).

State records.—The burrowing owl is an inhabitant of the western prairies, ranging east to East Feliciana and Plaquemine Parishes, Louisiana. A related subspecies (*floridana*)

*Chapman, F. M., Handbook of birds of eastern North America, p. 315, 1912.

occurs in southern Florida. The occurrence of this species in Alabama is accidental, and there is but one record—a specimen which I secured February 3, 1912, on Blakely Island, opposite Mobile. This bird was flushed from a bare sandy flat, the only spot on this marshy island seemingly suited to its habits. Its plumage was much discolored with soot, indicating that it had been visiting either coal dumps or burnt marshes.

General habits.—This owl differs from most other species of its family in many respects. It dwells on treeless plains, lives in colonies in burrows in the ground, and is to a certain degree diurnal in habit. It occupies deserted burrows of badgers, prairie dogs, and other animals, but the notion that it dwells in harmony with the prairie dogs and rattlesnakes has been shown to be a fallacy.

PAROQUETS: Family Psittacidae.

CAROLINA PAROQUET: *Conuropsis carolinensis*
(Linnaeus).†

State records.—The Carolina paroquet was formerly common in the South Atlantic and Gulf States and in the Mississippi Valley. It is now exterminated in all its former habitat except, perhaps, in southern Florida, where it is extremely rare. No recent dates of its occurrence are known, and it probably disappeared from Alabama prior to 1880. Early records of this bird are found in several accounts of travelers visiting the State. Saxe-Weimar, while on the Alabama River below Cahaba, January 6, 1826, observed "several hundred paroquets flying around, who kept up a great screaming. Many were shot." Two days later, on the same river below Claiborne, he "saw * * *, on the shores also, numbers of paroquets which make a great noise."‡

Gosse, writing from Dallas County about 1858, says (under date of December 20) :

†In the absence of any specimens from Alabama it is uncertain to which subspecies the paroquets of this State belong (cf. Ridgway, Birds North and Midd. Amer. Bull. 50, U. S. Nat. Mus., Part 7, p. 148, 1916).

‡Bernhard, Duke of Saxe-Weimar Eisenach, Travels through North America, during the years 1825 and 1826, vol. 2, pp. 35, 38, 1828.

In the course of a ride to Selma, a little town a few miles distant, I had the pleasure of seeing a flock of parrots (*Psittacus carolinensis*). The bird is not at all common in these parts, and indeed it was the first occasion on which I had ever seen one of this beautiful tribe in a state of wild nature. There were eighty or a hundred in one compact flock, and as they swept past me, screaming as they went, I fancied that they looked like an immense shawl of green satin, on which an irregular pattern was worked in scarlet and gold and azure.*

Brown, writing from Coosada in 1878, says that this bird was well known to most of the older local sportsmen and is said once to have been common, though none had been seen for many years.† Dr. Avery, in 1890, recorded the bird as formerly common at Greensboro, but not seen for many years.‡

Habits.—Paroquets fed upon various fruits and berries, and sometimes damaged corn or other grain. They were hunted not only as pests, but for their bright plumage. As they traveled much in flocks and were not especially difficult to shoot, they were subject to constant persecution and everywhere disappeared shortly after the settlement of the country.

CUCKOOS, ANIS, ETC.: Family Cuculidae.

YELLOW-BILLED CUCKOO; "RAIN-CROW": *Coccyzus americanus americanus* (Linnaeus).

State records.—The yellow-billed cuckoo is a common and generally distributed summer resident.

Migrants arrive from the south about the middle of April (Autaugaville, April 16, 1912; April 23, 1913) and depart about the first of October (Autaugaville, October 3, 1915). Nesting begins in May and continues until August, indicating that two or more broods are raised. Eggs have been found at Leighton, May 18 and August 10 (McCormack); Autaugaville, June 5 (Golsan); Booth, August 11 (Golsan); Guntersville, June 18; and York, June 24 (Wise). Holt found a nest with young at Barachias, May 19, 1907.

*Gosse, P. H., Letters from Alabama, pp. 298, 299, 1859.

†Brown, N. C., Bull. Nutt. Orn. Club, vol. 4, p. 11, 1879.

‡Amer. Field, vol. 34, p. 608, 1890.

General habits.—Because of its subdued coloration and retiring disposition, this bird is not often seen, but its rather loud notes, popularly supposed to indicate approach of rain, are familiar to nearly everyone living near its haunts. It lives in woodland, especially where there is considerable undergrowth; its movements in the trees are slow and it often remains quiet on one perch for a considerable time, when, even though only partially concealed by foliage, it is exceedingly difficult to see. Its call notes, however, are loud and characteristic, resembling the syllables *kow, kow, kow*, many times repeated, beginning slowly and gradually increasing in speed, then decreasing at the end. Its flight is straightforward, noiseless, and graceful. The cuckoo's nest is shallow and loosely constructed of twigs, placed in a bush or small tree, 4 to 10 feet from the ground.

Food habits.—This is one of the most useful of our insectivorous birds. It is particularly fond of caterpillars and destroys large numbers of them, including even many hairy and spiny species, which to most birds are not acceptable. Dr. Avery mentions having seen this bird feeding on "army worms" (probably cotton leaf worms) in a cottonfield, and I have frequently observed the same habit in other States. Beetles, bugs, ants, wasps, flies, and grasshoppers also are consumed, and occasionally a little fruit, such as elderberries and mulberries.

BLACK-BILLED CUCKOO: *Coccyzus erythrophthalmus*
(Wilson).

State records.—The black-billed cuckoo, a northern-breeding species, occurs in Alabama only as a migrant and not abundantly. McCormack has taken it only once at Leighton, and Mrs. Samuel has a single specimen in her collection, taken at Guntersville. Holt noted one at Barachias, May 4, 1909, another May 2, 1913, and I took one there, April 22, 1912. Golsan took one in Autauga County, October 16, 1898. A specimen was taken at Scottsboro, April 18, 1914, one was seen at Prattville Junction, May 9, and several on Sipsey Fork, near Melville, May 2 and May 5, 1914. I saw one also at Fair-

hope, October 16, 1908, and Miss Parkhurst reports the species from Talladega.

General habits.—This cuckoo is very similar in habits to the yellow-billed species, from which it may be distinguished by the black bill and the much smaller white spots on the tail feathers.

KINGFISHERS: Family Alcedinidae.

BELTED KINGFISHER: *Streptoceryle alcyon alcyon*
(Linnaeus).*

State records.—The kingfisher is generally distributed over the State in summer, but is nowhere very common. In winter most of the birds move southward and few are found in the northern counties. It is recorded by McCormack as remaining at Leighton until the third week in November and possibly all winter on the Tennessee River. I noted it at Reform in September, at Castleberry in October, on Mobile River near Chastang in December, at Orange Beach in December and January, and at Bayou Labatre and on Petit Bois Island in February. It has been observed in the breeding season at Florence, Elkmont, Stevenson, Sand Mountain (near Carpenter), Greensboro, Tuscaloosa, Ardell, Barachias, Tensaw River near Stockton, and Bayou Labatre.

Spring migration begins about March 15, first arrivals having been noted on that date at Woodbine (Saunders), and at Leighton (McCormack). A nest containing 2 eggs was found in the banks of a small "wash" by Holt at Myrtlewood, April 18, 1912. Another nest with 2 eggs was found by Golsan at Autaugaville, April 16, 1910. The usual complement of eggs varies from 4 to 8.

General habits.—Kingfishers frequent the shores of rivers, ponds, and bays; their food is secured almost entirely from the water, but as their home is always in a burrow in a cut bank, they must in some cases fly a considerable distance from their feeding grounds to find a suitable nesting spot. The tunnel is constructed by the birds by scratching with their

**Ceryle alcyon* of the A. O. U. Check-list; for change of name see *The Auk*, vol. 34, p. 202, 1917.

feet, aided by the powerful bill; the mouth of the burrow is usually about 2 feet below the top of the bank, and the tunnel extends horizontally into the bank for a distance of 4 to 8 feet, being somewhat enlarged at the inner end to receive the eggs.

The birds are rather solitary in habit, though several pairs may be found on the same pond; they spend much of their time quietly resting on some favorite stub overhanging the water, scanning intently the water beneath them until a fish is spied; launching into the air, the bird poises on beating wings at a height of perhaps 10 or 15 feet, and when the proper moment arrives plunges into the water with a splash, seizing its prey in its bill. The fish is usually carried to a convenient perch to be eaten, or to the nest to be fed to the young. When flying over the water, the kingfisher gives vent to his characteristic, loud, rattling call.

Food habits.—Barrows says of this bird:

The food of the Kingfisher consists very largely of fish, mainly the young of shallow-water species, principally minnows, chubs, and related fish. Much complaint is made by fishermen about the damage done by the Kingfisher, but this is almost entirely imaginary. In a few cases, persons who are raising gold fish, trout and other fish in large quantities and in exposed situations, may suffer somewhat from the visits of the Kingfisher, but the harm done on open streams and ponds is infinitesimal.*

In addition to fish, this bird consumes crawfish, frogs, lizards, beetles, grasshoppers, crickets, and occasionally berries.

WOODPECKERS: Family Picidae.

IVORY-BILLED WOODPECKER: *Campephilus principalis* (Linnaeus).

State records.—The splendid ivory-billed woodpecker, once numerous in all the large swamps of the Southern States, has been exterminated over the greater part of its range and is undoubtedly extinct in Alabama. In 1859, Gosse, writing

*Barrows, W. B., Michigan bird life, pp. 342-343, 1912.

from Dallas County, stated that neither this species nor the pileated woodpecker can be considered rare, but the pileated is much the more common of the two.†

In 1865 an ivory-bill was taken on the west side of the Tombigbee River, in Marengo County,‡ and in 1866, Dr. Avery shot a specimen in a cypress slough near the Warrior River, 10 miles west of Greensboro,** the only instance known to him of its occurrence in that vicinity. Hasbrouck, in his paper on this species, says:

At Crump Springs, on the Buttahatchie, in the spring of 1886, Mr. G. V. Young observed it nesting in a dead pine, some seventy feet from the ground, and in the fall of 1889 he identified one in Wilcox County while on a deer hunt. It is rare and seldom seen [in Alabama], but confined to the lower swamp country.*†

C. W. Howe, a trapper who has spent many years in the wilder parts of Alabama, tells me that he killed one of these birds about 1907 in the Conecuh swamps north of Troy, the only one he ever saw in the State.

General habits.—The ivory-bill is the largest and wildest of its tribe in the United States. It avoids settled and cultivated districts and seeks the deepest wooded swamps for its abode. It is said to be rather noisy and is easily recognized either by its peculiar nasal voice or by its striking coloration and white bill. Audubon describes its notes as follows:

"It never utters any sound whilst on wing, unless during the love season; but at all other times, no sooner has this bird alighted than its remarkable voice is heard, at almost every leap which it makes, whilst ascending against the upper parts of the trunk of a tree, or its highest branches. Its notes are clear, loud, and yet rather plaintive. They are heard at a considerable distance, perhaps half a mile, and resemble the false high note of a clarionet. They are usually repeated three times in succession, and may be represented by the monosyllable *pait, pait, pait*."*

Food habits.—From the little known of the food habits of this vanishing species, it is believed to be, like most of its con-

†Gosse, P. H., *Letters from Alabama*, p. 93, 1859.

‡Hasbrouck, E. M., *The Auk*, vol. 8, pp. 181, 185, 1891.

**Avery, *Amer. Field*, vol. 34, p. 608, 1890.

*†Hasbrouck, *loc. cit.*, p. 181, 1891.

*Audubon, J. J., *Ornith. Biog.*, vol. 1, p. 343, 1831.

FIG. 6.—Hairy Woodpecker.

genera, a conservator of the forest. Two stomachs collected in Texas contained wood-boring larvae, engraver beetles, pecan nuts, and the fruit of the big magnolia. Audubon says that the food consists principally of beetles, larvae, and large grubs. He adds that the bird eats wild grapes with great avidity, and also takes persimmons and hackberries.†

Gosse mentions having examined two stomachs taken in June, one of which contained nothing but cherries, the other the remains of a large *Cerambyx* and the stones of several cherries.‡

SOUTHERN HAIRY WOODPECKER; "SAPSUCKER":

Dryobates villosus auduboni (Swainson).

State records.—The southern and smaller race of the hairy woodpecker (fig. 6) is the prevailing form throughout the State, occurring in moderate numbers in all timbered regions. Specimens have been examined from Sand Mountain (near Carpenter), Ardell, Cane Creek (Marshall County), Greensboro, Autaugaville, Attalla, Wilsonville, Hayneville, Teasley Mill (Montgomery County), Dothan, Abbeville, and Bayou Labatre. Four specimens from Sand Mountain, in the extreme northeastern corner of the State, are intermediate between *auduboni* and *villosus*, but nearer the former.

Nests with eggs were found at Prattville, March 31, 1894, and March 28, 1916, and a nest containing young was found at Leighton, May 10, 1893.

General habits.—This woodpecker, while not especially shy, seems to prefer the more secluded regions for its home, inhabiting swampy bottoms, heavy upland timber, and wooded mountain sides; more rarely it is found about cultivated lands. It is largely solitary in habit, seeming to resent the encroachment of neighbors on its selected territory. It seeks its food on many different kinds of deciduous trees, and Audubon states that in the salt marshes about the mouths of the Mississippi River he has seen it alight on large reeds and perforate them as it would the trunk of a tree. He tells also of seeing this bird clinging to the stalks of sugar cane, apparently

†Audubon, op. cit., pp. 344-345.

‡Gosse, P. H., Letters from Alabama, pp. 91-92, 1859.

tasting the juice, and states that in the Southern States it frequently in winter visits barnyards or corn cribs.*

This species nests in hollow trees in a cavity excavated by itself; the eggs are laid on chips at the bottom. While the female is incubating, the male is said to excavate a hole nearby which he uses to sleep in at night, and such shelters are used by the birds throughout the winter. Forbush, however, tells of a hairy woodpecker which regularly passed the night clinging to the north side of a tree trunk in a thick grove.†

Food habits.—A study of the food habits of this species by Prof. Beal has demonstrated its usefulness on the farm and in the forest. It feeds largely on insects, among which the larvae of wood-boring beetles constitute a large percentage; ants, caterpillars, and weevils make up most of the remainder of the animal food. The vegetable food taken consists mainly of wild fruit, seeds of a variety of plants, including some weeds, mast, and a little corn, chiefly waste grain taken in winter.‡ Bendire states that the young are fed largely on figs.**

HAIRY WOODPECKER: *Dryobates villosus villosus*
(Linnaeus).

The northern form of the hairy woodpecker probably does not breed in the State; it is known only from a specimen taken at Huntsville, September 4, 1908—doubtless a straggler from farther north.

SOUTHERN DOWNY WOODPECKER; "LITTLE
SAPSUCKER": *Dryobates pubescens*
pubescens (Linnaeus).

State records.—The southern and slightly smaller race of the downy woodpecker is a permanent resident throughout the State. Specimens have been examined from York, Tidewater (Tuscaloosa County), Wilsonville, Natural Bridge, Gunter-ville, Sand Mountain (Jackson County), Scottsboro, Wood-

*Audubon, J. J., Ornith. Biog., vol. 5, p. 165, 1839.

†Forbush, E. H., Useful birds and their protection, p. 260, 1907.

‡Beal, F. E. L., Biol. Surv. Bull. 37, pp. 13-17, 1911.

**Bendire, C., Life histories of North American birds, vol. 2, p. 51, 1896.

ville, Leighton, Florence, Muscle Shoals, Ardell, and Hayneville. In the pine flats of the coast belt it is rather uncommon. Specimens from the extreme northern part of the State are intermediate between *pubescens* and *medianus*, resembling the former in color but approaching the latter in size.

Avery at Greensboro, and McCormack at Leighton report it a common breeder; fresh eggs were found at Leighton, April 20, and at Prattville, April 2, 1894, and April 22, 1916.

General habits.—This is the smallest of our woodpeckers, and is the one usually known as "little sapsucker." It occurs alike in timber tracts and orchards, or along roadsides and hedgerows, though never in large numbers. Not at all shy, it often lives in dooryards, orchards, or hedges around the farm. It renders important service in ridding fruit and forest trees of injurious insects and its presence should always be encouraged around the farm and home buildings. The downy is a sociable little bird, and although rarely found in flocks of its own kind, it seems, especially in winter, to like the company of other small insectivorous birds, such as chickadees and nuthatches. The nests are placed in hollows dug in the trunk or limb of a dead or decaying deciduous tree.

Food habits.—Investigation of the food of the downy woodpecker has shown the bird to be wholly beneficial. Its diet is made up of 76 per cent animal matter and 24 per cent vegetable. Of the insect food, beetles and ants constitute the largest items, each amounting to about 21 per cent; caterpillars form about 16 per cent. Other insects eaten are bugs, scale insects, plant lice, and the eggs of grasshoppers, crickets, katydids, and cockroaches. Fruit amounted to only about 6 per cent of the total food and most of it was of useless wild varieties. Corn in small quantities was found in 20 stomachs.*

RED-COCKADED WOODPECKER; "SAPSUCKER":

Phrenopicus borealis (Vieillot).†

State records.—The red-cockaded woodpecker (fig. 7) is locally common over the greater part of the State but is confined for the most part to tracts of open pine timber. It is

*Beal, F. E. L., Biol. Surv. Bull. 37, pp. 18-22, 1911.

†*Dryobates borealis* of the A. O. U. Check-list; for change of name see Ridgway, Birds of North and Midd. Amer.; Bull. 50, U. S. Nat. Mus., part 6, p. 268, 1914.

FIG. 7.—Red-cockaded Woodpecker.

recorded as breeding at Greensboro, Autaugaville (June 4), Sand Mountain (Jackson County), Wilsonville, Woodbine, Ardell, Dean (1,200 feet altitude), Seale, Hayneville, Castleberry, Dothan, and Bayou Labatre. McCormack has found it only once at Leighton, March 24, 1890, when one was collected from a pair on La Grange Mountain.

The breeding season begins about the last of April and continues till June; Golsan records a set of eggs taken at Prattville, June 4, 1895.

General habits.—This woodpecker is about the size of the hairy and somewhat resembles it in appearance, but it is a more noisy and conspicuous bird. It has a decided preference for pine timber and is rarely found in any other habitat. The birds are almost constantly in motion as they rapidly ascend the trunks of the trees in spirals, or fly from tree to tree, uttering continually their nasal, querulous notes. They are somewhat gregarious, several pairs often being found near together.

The nests are excavated usually in the trunk of a living pine, one having a dead heart being always selected. Wayne states that the bird uses the same tree from year to year, sometimes boring as many as eight holes in one tree.† The entrance hole is from 20 to 70 feet, usually under 35 feet, from the ground.

Food habits.—The food consists mainly of insects and seeds. The insects most frequently taken are ants and the larvae of wood-boring beetles, with the addition of grasshoppers, crickets, caterpillars and spiders. The vegetable food consists of mast (chiefly pine seeds) and seeds of magnolia, bayberry, and poison ivy. This species is not known to frequent orchards or cultivated land, and by reason of its destruction of ants and wood-boring beetles, is considered beneficial.‡

YELLOW-BELLIED SAPSUCKER: *Sphyrapicus varius varius* (Linnaeus).

State records.—The yellow-bellied sapsucker (fig. 8) is a common migrant and winter resident from the last of September to the last of March. It is recorded as occurring through-

†Wayne, A. T., *Birds of South Carolina*, pp. 89-90, 1910.

‡See *Farmers' Bull.* 755, U. S. Dept. Agr., pp. 34-35, repr. 1918.

FIG. 8.—Yellow-bellied Sapsucker.

out the winter at Leighton and Greensboro. It was seen at Piedmont (October), Ashford (November), Orange Beach (January), Jackson (February), Dean (March), Barachias (March 7), Mobile (March 24), Jackson Lake (March 27), Ardell (March 27), Tuscaloosa (April 4), and Sand Mountain near Carpenter (April 10).

The species is recorded as arriving at Leighton, September 28, 1889, and October 1, 1893 (McCormack), at Greensboro, September 28, 1889, and October 8, 1887 (Avery), and at Anniston, October 8, 1916 (Dean). Saunders records it abundant at Woodbine, March 7-24, last seen March 29 (1908).*

General habits.—During its sojourn in the South this bird is rather quiet and inconspicuous. McCormack says of it:

While with us in the winter it is a solitary bird, generally frequenting the high timber in bottomlands, where its mournful, cat-like cry, heard at intervals on a cloudy, winter day from the bare branches overhead, seems strangely in keeping with its surroundings.†

Food habits.—This is the only one of the woodpeckers found in Alabama which in its feeding habits is seriously injurious. As its name indicates, it is a true "sapsucker," and its food consists mainly of the sap and inner bark of orchard and forest trees, including apple, birch, maple, oak, ash, and others. Many insects, chiefly ants, are consumed, as well as a variety of wild fruits and berries. The damage to timber by this bird, especially in the Southern States, is serious. The trunks of trees are frequently girdled with a series of deep punctures, which not only result in disfiguring the wood and reducing its value as lumber, but in many cases cause the death of the trees. The species most often attacked in the South are long-leaf pine, bald cypress, black walnut, hickory, oak, maple, holly, and basswood.‡

If control measures are used against sapsuckers it should be borne in mind that the other small woodpeckers commonly known as "sapsuckers" are not to be included with the present

*Saunders, A. A., *The Auk*, vol. 25, p. 418, 1908.

†Leighton (Ala.) *News*, vol. 2, No. 14, July 15, 1891.

‡Consult McAttee, *Woodpeckers in relation to trees and wood products*: Biol. Surv. Bull. 39, 1911.

species in the category of injurious birds; on the contrary they should be carefully protected.**

PILEATED WOODPECKER; "LOGCOCK": *Phloeotomus pileatus pileatus* (Linnaeus).

State records.—The pileated woodpecker, the largest of its tribe now found in the State, is a generally distributed permanent resident; in most localities it is rather scarce, but in certain of the wilder parts is not uncommon. It is known by a variety of names, including "logcock," "woodcock," "woodchuck," "Indian-hen," and "lord-god."

Dr. Avery, in 1890, speaks of it as "not common, though once abundant" at Greensboro; and McCormack regards it as "not uncommon" near Leighton. Golsan and Holt record it locally common near Autaugaville, and describe a nest with incubated eggs taken there, April 14, 1909.* It breeds commonly on Sand Mountain, Jackson County, as also on the Talladega Mountains and Mount Weogufka, and at Scottsboro, Huntsville, Guntersville, Tidewater, Natural Bridge, Mellville, Hayneville, Reform, Carlton, Castleberry, Mobile, Orange Beach, Dothan, and on Petit Bois Island. The usual number of eggs is 3 to 5, though 6 are occasionally found.

General habits.—The pileated woodpecker is an inhabitant of the wilder and more heavily timbered swamps, river bottoms, and mountain sides. I have always found it shy and difficult to approach, but Chapman and others record it rather unsuspicious in some localities. Its flight is rather slow and steady, without the dippings so characteristic of the smaller woodpeckers. In flight it looks not unlike a crow except for the prominent white patches in the wings. Chapman describes its ordinary call note as "a sonorous *cow-cow-cow*, repeated rather slowly many times, suggesting a somewhat similar call of the flicker's. Like the flicker, it has also a *wichew* note uttered when two birds come together."† The nest is placed

**The yellow-bellied sapsucker may be distinguished from all other woodpeckers in Alabama by the yellow belly (not white), the conspicuous white patch on the wing, and the red patch on the front of the head in combination with a black patch on the breast (McAtee, op. cit., p. 96).

*Golsan and Holt, *The Auk*, vol. 31, p. 223, 1914.

†Chapman, F. M., *Handbook of birds of eastern North America*, p. 328, 1912.

in a hollow excavated by the birds in the main trunk of a tree, usually from 12 to 75 feet from the ground.

Food habits.—The food of the pileated woodpecker consists mainly of ants, beetles, and wild fruits and berries, including sour gum, tupelo gum, dogwood, persimmon, frost grape, holly, poison ivy, sumac, and hackberry.‡ It never injures farm crops but confines its attention to the trees of the forest, where it renders valuable service in the destruction of wood-boring beetles. Unfortunately, as a result of thoughtless shooting, it is growing steadily scarcer.

RED-HEADED WOODPECKER; REDHEAD; WHITE-WING: *Melanerpes erythrocephalus erythrocephalus* (Linnaeus).

State records.—The red-headed woodpecker is locally common in the State, both in summer and winter. McCormack records it from Leighton as "abundant during spring and summer. It leaves our orchards and fences about the 15th of September and returns to them again early in April." During the winter of 1911-12, however, McCormack records that a pair remained in his yard all winter, and in previous winters he has noted a few. Avery, at Greensboro, noted the bird as an abundant summer resident, a few remaining during the winter. Golsan reports it plentiful in winter about Bear Swamp, Autauga County. I found it very scarce in winter in the southern part of the State, noting one at Orange Beach, January 25, 1912, and one at Bayou Labatre, February 16, 1912. It was not to be found at York the last week in February nor at Auburn the first week in March, but by the last of April, it had appeared in numbers at both places. Single birds were seen at Anniston, October 22; Greenbrier Cove (Marshall County), November 7; and Jackson, December 10 (1916). It has been noted in the breeding season at Tuscaloosa, Ardell, Fort Payne, Attalla, Dean, Stevenson, Barachias, Seale, Castleberry, Dothan, Abbeville, Mobile, and Bayou Labatre. Gutsell found it fairly common at Orange Beach and on Dauphin Island late in summer.

‡Beal, F. E. L., Food of the woodpeckers of United States: Biol. Surv. Bull. 37, p. 35, 1911.

As in other parts of its range, this bird seems to be irregularly migratory in winter, usually at that season leaving its summer haunts and appearing in other sections. It is not known to leave the United States, but in parts of Alabama it is certainly less common in winter than in summer. It is recorded as arriving at Woodbine, March 13; Tuscaloosa, April 4; Montgomery, April 5; Coosada, April 21; and Sand Mountain, April 22.

Fresh eggs have been found at Leighton, April 20, May 20, June 17, and June 29, and at Prattville, May 30.

General habits.—This woodpecker is partial to deadenings and cleared tracts in the timber, but is found also about small groves of hardwood timber and along roadsides, where it makes use of telephone poles for drumming stations or sometimes for nesting sites. The birds are noisy, sociable, and frolicsome, the mates spending much time in playing hide-and-seek around dead stubs and telephone poles and chasing one another from tree to tree. Their ordinary note is a loud *tchur-tchur*, resembling the notes of the tree frog (*Hyla versicolor*). Most of their food is secured from rotten stubs or from the ground, but the birds are rather expert flycatchers, and secure a good many insects on the wing.

The nests are placed in hollows in a great variety of deciduous trees and rarely in evergreens, from 8 to 80 feet above the ground; frequently, nesting sites are drilled in telephone poles.

Food habits.—About two-thirds of the food of the red-head consists of vegetable matter and one-third of insects. The vegetable matter is composed principally of corn and other grains, fruits, berries, and mast (acorns, beechnuts, etc.) Prof. Beal, after treating exhaustively of this bird's food, gives the following summary of its economic status:

No species of woodpecker in this country, with the possible exception of the yellow-bellied sapsucker (*Sphyrapicus varius*), has been the subject of so much adverse criticism as the red-head. It has been accused of eating nearly every variety of cultivated fruit from strawberries to oranges, of pecking corn from the ear, of eating the eggs of poultry and pigeons, of pecking open the skulls and devouring the brains of young poultry, and of destroying the eggs or young of eaves swallows and other birds. These accusations are well grounded, but the habits are

probably only local. These reports have been received from hundreds of localities, but in thousands of other places where the bird abounds no such acts have been observed. Stomach examination confirms to some extent the corn-eating habit, and to a less degree the fruit-eating, but fails entirely to show that the bird habitually eats young birds or eggs. Where this bird has done appreciable harm, it has probably been due to new and unusual conditions likely to be temporary. * * * On the whole, there seems to be no reason to condemn the woodpecker except under very unusual conditions.*

RED-BELLIED WOODPECKER; ZEBRA WOODPECKER;
"GUINEA SAPSUCKER": *Centurus carolinus*
(Linnaeus).

State records.—The red-bellied woodpecker (fig. 9) is one of the commonest and most widely distributed of its family in the State, inhabiting usually timbered bottoms, swamps, and upland groves. Being nonmigratory it is about equally common in summer and winter. At Hollins, Saunders saw a female feeding young in the nest, April 27, and at Prattville Golsan found fresh eggs July 11. Evidently two broods are reared in a season, since nests have been found at Leighton on April 16 and July 27.

General habits.—Heavy, bottomland timber is the favorite habitat of this species in the South, though in some regions it is found in upland groves or orchards, and even about door-yards and gardens. It is usually rather shy and in habits and call notes resembles the red-headed woodpecker. It is a rather noisy bird, giving frequent vent to its emphatic *churr-churr* or *chow-chow*.

The nesting site usually is a hollow in a decayed stump or tree, the softer varieties, such as elm, poplar, willow, sycamore, chestnut, and pine, being preferred; telegraph poles also are sometimes utilized. The nest holes range from 5 to 70 feet from the ground and are usually 10 or 12 inches deep.

Food habits.—This woodpecker feeds upon both insects and vegetable matter, but the latter forms more than two-thirds of the total food. Mast (acorns, beechnuts, hazelnuts, and

*Beal, F. E. L., Biol. Surv. Bull. 37, p. 42, 1911.

FIG. 9.—Red-bellied Woodpecker.

pecans) furnishes the largest single item in the food (about 30 per cent) and a large variety of wild fruits and berries with a little corn make up the rest of the vegetable food. The bird is known to attack oranges and sometimes does considerable damage to that crop. Many insects are destroyed, also, including ants, grasshoppers, eggs of cockroaches, and caterpillars.†

FLICKER; YELLOWHAMMER: *Colaptes auratus auratus* (Linnaeus).

State records.—The flicker is probably the most abundant of the woodpeckers, particularly in winter, when large numbers of northern birds sojourn in the State. The southern race (*auratus*), during the breeding season, occupies the whole of the State except the extreme northern part. Breeding specimens have been examined from Sand Mountain (near Carpenter), Ardell, and Autaugaville. It was tolerably common at Dothan, but scarce at Castleberry and in the coast belt generally. Wintering individuals have been collected at Jackson, February 19; and at Carlton, February 29 (1912). Eggs have been taken at Barachias, April 20, 1908, and at York, June 17, 1887.

General habits.—The flicker is much less arboreal than the other woodpeckers, and seeks its food very largely on the ground, in pastures and cultivated fields. It prefers partly open country both for foraging and for its nesting site and, although usually rather shy, often makes its home in orchards or along public roads, and not infrequently drills a hole in the weatherboarding of a dwelling house, barn, or church.

The birds are sociable and often gather into loose flocks when feeding. Their notes are all pleasing and characteristic. The ordinary call is a mellow, resonant *cuh, cuh, cuh, cuh*, rapidly repeated, and most often heard in spring. Another call or alarm note, heard at all seasons, is a loud, squealing, *chee-ah, chee-ah*. In the mating season, the birds indulge in a variety of curious antics and love notes, including the

†Consult Beal, F. E. L., Food of the woodpeckers of United States: Biol. Surv. Bull. 37, pp. 47-52, 1911.

whick-ah, whick-ah call which gives them their common name.

The nest of this bird is usually excavated in a hollow in a tree, but is sometimes in a natural hollow; soft wood trees, as poplar, willow, apple, elm, sycamore, and pine, are preferred. The entrance hole may be as high as 60 feet from the ground or as low as 3 feet. The usual number of eggs is from 5 to 9.

Food habits.—The flicker takes a great variety of food, which extensive stomach examinations have shown to consist of approximately 61 per cent animal matter and 39 per cent vegetable. Ants seem to be the favorite food and are eaten in every month. They constitute almost exactly half of the total food and were found in 524 of the 684 stomachs examined. Ninety-eight stomachs contained no other food. Prof. Beal mentions one stomach and crop filled with very small ants, which he estimated to number over 5,000. The flicker's fondness for these insects doubtless furnishes the principal reason for its habit of feeding on the ground. The remainder of the animal food is made up of beetles, grasshoppers, and crickets, with a few caterpillars, spiders, myriapods, crustaceans, and snails.

The vegetable food consists mainly of small wild fruits, of which 31 species have been identified. Mast is taken only occasionally, chiefly in winter, and corn was found in only 17 stomachs. Summing up the economic position of this bird, Prof. Beal says:

From the point of view of the food analyst, the farmer and horticulturist have very little quarrel with the flicker. It eats only a few predacious ground beetles. The remainder of the animal food is entirely of harmful species. In its vegetable diet, grain and fruit are the only useful products eaten, and the quantities are insignificant. The bird, like many others, has the bad habit of sowing broadcast the seeds of the poison *Rhus*, but there seems no remedy for this.*

NORTHERN FLICKER: *Colaptes auratus luteus* Bangs.

State records.—The northern race of the flicker breeds in the extreme northern counties and occurs as an abundant

*Beal, F. E. L., Biol. Surv. Bull. 37, pp. 52-58, 1911.

winter resident all over the State, being apparently more numerous at that season than the resident form (*auratus*). A breeding specimen has been examined from Elkmont, Limestone County; and wintering individuals from the following localities: Castleberry, October 10, 1908; Autaugaville, November 12, 1911; Jackson, February 21, 1912; Dothan, March 13, 1912; Tensaw River (near Hurricane), March 20, 1912; Greensboro, January 22, 1890, and March 24, 1891. Two specimens taken at Leighton, March 30, and April 1, 1912, and two from Woodville, March 10, 1915, are referable to this form and may have been either migrants or resident birds.

According to McCormack, migrants arrive at Leighton from the north during the third week of September and leave during the first week of April.

NIGHTHAWKS, WHIP-POOR-WILLS, ETC.: Family Caprimulgidae.

CHUCK-WILL'S-WIDOW; "DUTCH WHIP-POOR-WILL":
Antrostomus carolinensis (Gmelin).

State records.—The chuck-will's-widow (Pl. V), universally but incorrectly called "whip-poor-will" in the South, is a common and generally distributed summer resident. It breeds nearly throughout the State, but is less common in the mountainous parts, where it occurs in the same localities with the true whip-poor-will (*Setochoalcis vocifera*). It is known to occur in the breeding season at Castleberry, Abbeville, Bayou Labatre, Wilsonville, Squaw Shoals, Guntersville, Logan, Natural Bridge, Leighton, and Sand Mountain (Jackson County). At the last mentioned place it is rare, its place being largely taken by the whip-poor-will.

The first migrants in spring appear during the early part of April, having been noted at Barachias, April 3 (1909), and April 6 (1908); Greensboro, April 5 (1888); Woodbine, April 9 (1908); Autaugaville, April 10 (1913); Rendalia, April 15 (1894); and Sand Mountain (near Carpenter), May 3 (1914). Eggs have been found at Autaugaville, May 9; Prattville, May 15; Woodbine, May 24; and Greensboro, May 5 and June 11.

Nighthawk (*Chordeiles minor*); Whip-poor-will (*Setochoalcis vocifera*);
and Chuck-will's-widow (*Antrostomus carolinensis*).

General habits.—This nocturnal bird is of shy and retiring habits, spending the hours of daylight in a dense, secluded thicket and coming forth at dusk to utter its peculiar weird call. At such times it frequently may be seen winging its way silently from one copse to another, or skimming through the air in pursuit of its prey. No nest is made, the eggs being deposited on the bare ground or on dry leaves, usually on a brush-covered hillside; the eggs, two in number, are elliptical-oval in shape, and handsomely marked. Dr. Avery says of this bird:

When frightened from its nest, or when flying late in the evening, it utters a harsh note at times, and this resembles, to my ear, the syllable *baw! baw! baw!* These notes apparently of displeasure or alarm, are low and cannot be heard at a great distance, while, during a still night, the “chuck-will’s-widow,” or call note, rapidly repeated, may be heard for a mile or more. These notes, during the mating season at least, are uttered from dusk to about 9 p. m., and while singing they usually sit on the ground, on a log or rock, or occasionally on a fence rail, or on a low limb of a tree, and in such a position they usually sit lengthwise, not crosswise, on the limb.*

Audubon states that on one occasion he witnessed the removal by the birds of their eggs, each parent taking one egg in its capacious mouth,† but this habit seems thus far to be unconfirmed.

Food habits.—The food of this bird consists mainly of the large night-flying moths, with beetles, winged ants, and other insects. It has been known to capture small birds, such as hummingbirds, warblers, and sparrows, and these it is enabled to pass through its capacious gullet entire.

WHIP-POOR-WILL: *Setochalcis vocifera vocifera*
(Wilson).‡

State records.—The whip-poor-will is mainly a northern bird and in Alabama occurs as a summer resident only in the mountains. During migration it may be found in all parts

*Quoted by Bendire, Life histories of North American birds [vol. 2], p. 143, 1896.

†Audubon, J. J., Ornith. Biog., vol. 1, p. 276, 1831.

‡*Antrostomus vociferus vociferus* of the A. O. U. Check-list; for change of name see The Auk, vol. 34, p. 203, 1917.

of the State (fig. 10). On Sand Mountain it is an abundant breeder; farther south on the mountains it occurs rarely in summer, having been noted by us on Lookout Mountain, near Fort Payne, in June, and by Dr. Avery on the mountains near Anniston in July.** We listened for it in the Talladega Mountains but failed to hear any.

This species is a fairly common migrant, arriving from the south about the first of April and departing in September. First arrivals were noted at Barachias, March 29 (1909 and 1914); Smelley, March 31 (1885); Autaugaville, April 5 (1912 and 1913); and Sand Mountain, March 22 (1911), and April 6 (1912). In fall migration the first one was seen at Autaugaville, September 12 (1915).

General habits.—Like its near relative, the chuck-will's widow, this bird is strictly nocturnal and very shy, so it is very little known. Much confusion is occasioned in the South both by failure to distinguish between this bird and the larger chuck-will's widow, and also by the prevalent notion that the whip-poor-will and the nighthawk ("bull bat" in the vernacular) are one and the same. The whip-poor-will has a rounded tail, and bristles on the bill, is of mottled brown color, and is never seen abroad in daylight. The nighthawk has a forked tail, white patches on the wings, no bristles on the bill, is banded below with brown and white, and often seeks its food in bright sunshine.

The whip-poor-will spends the day in some secluded thicket in the border of woodland; if startled from its retreat it flies but a short distance and settles down again. At dusk it comes into the open and begins to feed, securing its food mainly on and near the ground. During the breeding season, especially on moonlight nights, and to a less extent throughout the summer, the birds sing for several hours in the early evening and again shortly before daylight. The notes of the whip-poor-will are well expressed by its common name; they are louder and more vigorous than those of the chuck-will's-widow and are instantly recognizable to one who knows both species. The whip-poor-will makes no nest, but lays its eggs on the

**Bendire, Life histories of North American birds [vol. 2], p. 147, 1896.

FIG. 10.—Breeding area of the Whip-poor-will (*Setochoalcis vociferas*) in Alabama.

ground, usually selecting a dry spot in brushy woodland; the eggs, two in number, are laid about the first of May.

Food habits.—The whip-poor-will feeds mainly on nocturnal beetles and moths, caterpillars, ants, mosquitoes, and other insects. It has been known to eat the potato beetle and also the Rocky Mountain locust.

NIGHTHAWK; BULL-BAT: *Chordeiles minor minor*
(Forster).*

State records.—The nighthawk, known everywhere in the South as the "bull-bat," is an abundant spring and fall migrant and locally a common summer resident. In former years immense flights occurred in the migratory season, particularly from the last of August through September, but wholesale shooting of the birds for sport or for food has reduced their numbers very considerably. Fortunately, since the passage of the Federal law protecting them at all seasons, this destruction has largely ceased, and the birds are beginning to regain their former numbers.

The breeding ranges of the two races of this species are not definitely known, and there is no breeding record of the northern form (*minor*) in the State. Probably, however, it will be found as a summer resident in some of the northern counties. The bird has been seen in the breeding season at Stevenson, Leighton, Ardell, and Sand Mountain (Jackson County), but at that season is everywhere rather rare and local.

The spring migration takes place during April and early May. First arrivals were noted at Spring Hill, April 6, Rendalia, April 9 (1894); Smelley, April 16 (1889); Leighton, April 18 (1892); and Sand Mountain (Jackson County), April 20 (1917). Transients are seen up to the middle of May, having been noted at Auburn, Jasper, York, and Barachias. The first southbound migrants appear in the northern part of the State about the first of August; the species becomes abundant by the last of that month and passes south in large numbers during most of September. The last birds were seen at Leighton, October 8 (1891). Large flights were

**Chordeiles virginianus virginianus* of the A. O. U. Check-list; for change of name see *The Auk*, vol. 35, p. 208, 1918.

noted there August 23 and September 9 (1889), and at Greensboro, September 11, 12, 22, and 23 (1887).

General habits.—Unlike its relatives, the whip-poor-will and the chuck-will's-widow, the nighthawk is both nocturnal and diurnal. It does most of its hunting in the early morning and evening, but it is not at all unusual to see many of the birds feeding in bright sunshine; their notes may be heard, also, more or less throughout the night.

It is a most graceful and accomplished flyer and secures its prey entirely on the wing. When feeding, the flight is erratic and batlike, but when migrating or passing from one section to another, the bird flies swiftly, with steady, straight-forward strokes. Its note when feeding sounds like the syllables *be-erd*. During the nesting season it frequently mounts to a considerable elevation and thence dives with lightninglike speed toward the earth, arresting its progress suddenly by a quick movement of the wings, which produces a loud, booming note, resembling the noise made by blowing into the bunghole of an empty barrel.

During the heat of the day, the nighthawk usually rests on the limb of a tree, a log, a fence rail, or the ground; and in all these situations its colors usually harmonize so well with its surroundings as to make it comparatively inconspicuous. When perched on a limb it always sits lengthwise.

The nighthawk makes no nest, but lays its two eggs on the bare ground or on the flat roof of a house.

Food habits.—It would be hard to find a bird that is of more service to man than the nighthawk. Provided with an enormous mouth and a stomach capable of great distention, and feeding as it does wholly upon insects, the good it accomplishes in the course of a year in keeping down the swarm of insect pests is incalculable. Winged ants are a favorite food, having been found in nearly half the stomachs examined by Prof. Beal, in the Biological Survey. Other insects frequently eaten are May beetles, leaf hoppers, grasshoppers, gnats, and mosquitoes. Potato beetles and squash beetles are occasionally taken, as well as the destructive cotton-boll weevil. This pest has been found in a number of stomachs and doubtless is

taken sometimes in large numbers at the season when the weevils are flying.

FLORIDA NIGHTHAWK; BULL-BAT: *Chordeiles minor chapmani* Coues.*

State records.—The southern race of the nighthawk is the breeding form over the greater part of Alabama, north at least to Hale and Shelby Counties and probably farther in the lowlands and river valleys. Breeding specimens have been examined from Dauphin Island, Petit Bois Island, Bayou Labatre, Abbeville, Wilsonville, and Greensboro, and the bird has been seen, also, in the breeding season at Dothan, Castleberry, Seale, Autaugaville, Coosada, Anniston, and Guntersville. It is a common summer resident over most of its range, but is scarce or absent from some seemingly favorable localities. On the outer islands it is especially abundant.

Spring migrants appeared at Autaugaville, April 17 (1912); Greensboro, April 18 (1891); the last were seen in fall at Autaugaville, October 11 (1910). It is, of course, impossible to separate the migration records of the two races, and doubtless some of the records given under *minor* refer to this form.

Eggs have been found at Autaugaville, May 16, 1909 (Golsan), and at Greensboro, June 10, 1891 (Avery). Holt found young birds in a cotton field at Wilsonville, June 5, 1913.

General habits.—This subspecies does not differ in habits from the northern bird (*minor*). Its eggs are laid on the bare ground, either in pine woods or in cultivated fields.

SWIFTS: Family Micropodidae.

CHIMNEY SWIFT; "CHIMNEY-SWALLOW"; "CHIMNEY-SWEEP": *Chaetura pelagica* (Linnaeus).

State records.—The familiar swift or "chimney swallow," as it is usually called, is an abundant summer resident in all parts of the State. Its habit of nesting in chimneys results in its being more numerous about towns and cities than in the

**Chordeiles virginianus chapmani* of the A. O. U. Check-list; for change of name see The Auk, vol. 35, p. 208, 1918.

open country, but it is found, as well, in thinly settled regions and even in the mountains.

First arrivals from the South appear about the last of March, having been noted at Barachias, March 21; Autaugaville, March 28; Woodbine, March 30; Leighton, March 31; and Greensboro, April 4. In fall the last swifts were seen at Autaugaville, October 5; at Leighton and Greensboro, October 13; and at Piedmont, October 19. Eggs have been found at Barachias, May 18 and 22; at Leighton, June 1; and at Autaugaville, June 20.

General habits.—The chimney swift is an accomplished flyer and spends the greater part of the daylight hours on the wing, coursing rapidly back and forth, often at a great height, in search of its insect food, uttering constantly sharp, twittering notes. It never alights on the branch of a tree, but only on the inside of a chimney or hollow tree. Swifts are very sociable birds, breed to some extent in small companies, and for several weeks prior to their departure in fall gather into large flocks and roost at night in a body in some large chimney or hollow stub. When about to enter a chimney their flight is arrested suddenly and with wings raised high above the body the birds drop perpendicularly into the opening. The noise produced by them as they enter resembles the rumbling of distant thunder.

Though formerly nesting in large hollow trees, the swift now places its nest in unused chimneys, or rarely on the inside of a barn or in the shaft of a well. The nests are shallow, shaped like a half saucer, constructed of twigs which the birds break from a tree while in flight, glued together and to the side of the chimney by the birds' saliva. No lining is used, and the eggs are laid on the bare twigs. Eggs have been found at Barachias, May 18 and May 22; at Leighton, June 1; and at Autaugaville, June 20. The young remain in the nest about two weeks, and for two weeks longer remain in the chimney clinging to the sides with their feet.

Food habits.—The food of the swift consists of various insects which it captures in the air; these include flies, mosquitoes, winged ants, beetles, bugs, and grasshoppers.

HUMMINGBIRDS: Family Trochilidae.

RUBY-THROATED HUMMINGBIRD: *Archilochus colubris*
(Linnaeus).

State records.—The hummingbird, the smallest of our birds, is a common summer resident in all parts of the State.

It arrives from its winter home in the Tropics about the first of April and departs for the South again usually by the last of September. First arrivals were noted at Mobile, March 24; Autaugaville, March 29; Woodbine, March 29; Leighton, April 13; and Sand Mountain, April 13. The last in fall were seen at Smelley, September 29, Anniston, October 4 (1916), and Leighton, October 11. Incubated eggs were found in Autauga County, May 19, 1912 (Golsan).

General habits.—The hummingbird is a sociable little creature and often takes up its abode in dooryards and town gardens; it is found also in upland woods and on timbered mountain sides. Its movements are so swift and so extremely active is the bird that it is difficult to follow it with the eye. Its food is sought in the blossoms of various flowers, preference apparently being given to those with tubular corollas and of bright colors, particularly red. E. A. McIlhenny of Louisiana states:

It is quite a common occurrence here for the ruby-throated hummer to get drunk on the nectar of the flowers of the china tree (*Melia azedarach*). It sometimes imbibes so much of the nectar that it becomes stupefied and falls from the tree, when it can be readily taken in the hand, and offers no resistance. I have also taken them by putting a little brandy and honey in honeysuckle and jasmine blossoms; they readily take this, and become so intoxicated that they are easily caught.*

The nest of the hummingbird is a beautiful little structure, composed of plant downs and fibers, bound with spiders' web and ornamented on the outside with lichens; it is saddled on a horizontal limb of a tree, or sometimes on a bush or vine, usually from 10 to 40 feet above the ground, and firmly glued to the limb with the birds' saliva. The eggs, two in number, are pure white and only slightly larger than a navy bean.

*Bendire, G., Life histories of North American birds, vol. 2, p. 194, 1896.

Food habits.—The food of this tiny bird consists in part of the nectar of flowers and in part of minute insects and spiders. Examination of 59 stomachs in the Biological Survey showed the contents to be mainly composed of spiders, 43 per cent; Hymenoptera (ants, bees, etc.) 36 per cent; Hemiptera (leaf-hoppers, etc.), 8 per cent; and Diptera (gnats), 2 per cent. A little vegetable food was found in four stomachs.†

FLYCATCHERS: Family Tyrannidae.

SCISSOR-TAILED FLYCATCHER: *Muscivora forficata*
(Gmelin).

State records.—The scissor-tailed flycatcher is a western species, found normally no farther east than Oklahoma and western Louisiana. The only record of its occurrence in Alabama is furnished by L. S. Golsan, who informs me that in the spring of 1889 or 1890 he shot one of these birds in a field near Autaugaville. He failed to record the date, but thinks it was late in May. The capture of such a striking bird made a strong impression on his mind, and although he did not at the time know what it was, on looking later at a description of it, was able instantly to recognize the species.‡

KINGBIRD; BEE-MARTIN: *Tyrannus tyrannus tyrannus*
(Linnaeus).

State records.—The kingbird is a common and generally distributed summer resident.

It arrives in the southern counties during the latter part of March, having been seen at Spring Hill, March 18; Bayou Labatre, March 22; and Bay Minette, March 28. The average date of arrival at Greensboro is about April 10. The earliest seen at Coosada was on March 30, and at Autaugaville, March 26. Holt saw a very early migrant at Barachias, March 22, 1913. Migration in fall begins the last of August and usually all have left by the third week of September; the last were seen at Leighton, September 18, 1891. Nesting begins late

†Beal, F. E. L., *Farmers' Bull.* 506, pp. 13-15, repr., 1918.

‡Golsan and Holt, *The Auk*, vol. 31, p. 225, 1914.

in May and continues into July. Fresh eggs have been found at Barachias, May 25, June 6, June 25, and July 25.

General habits.—The kingbird lives about the farm, frequenting orchards, pastures and cultivated fields in which are scattering trees. At some seasons it is found on the marshes and the open pine flats of the coast region.

As indicated by its common name, it is something of a tyrant, but confines its attacks chiefly to hawks, crows, and jays. When one of these appears in sight, one or more kingbirds instantly give chase and worry this intruder until he has left the neighborhood. By reason of this habit, it is much appreciated about the farm as a protection to the poultry yard, but its habit of occasionally visiting the beehive has put it in bad favor with some.

The bird is rather noisy and restless, and not at all shy. It is an expert flycatcher and takes most of its food on the wing. Perched on a dead limb of a tree, a fence post, or even a mullein stalk, it quietly surveys the nearby landscape, and so soon as an insect appears in sight launches into the air in pursuit, returning after each sally to the same perch. Its notes are ordinarily rather harsh and unmusical, but occasionally something resembling a song may be heard.

The nests are strongly built of twigs, rootlets, plant down, twine, hair, etc., placed in trees, usually well out on a limb and from 10 to 20 feet above the ground. The eggs, 3 or 4 in number, are white, handsomely marked with shades of brown and lavender.

Food habits.—The food of this member of the flycatcher family, as might be expected, consists principally of insects, including beetles, cotton-boll weevils, grasshoppers, butterflies, bees, wasps, flies, mosquitoes, and caterpillars. It hardly merits the name "bee bird," given it because of its habit of visiting the hive in search of these insects, for in over 600 stomachs examined in the Biological Survey, only 22 contained bees, to the number of 61, and of these the great majority were drones. It takes, also, a small percentage of wild fruits and berries, such as chokecherries, wild black cherries, elderberries, mulberries, blackberries, huckleberries, pokeberries, bayberries, frost grapes, and the fruit of the

sassafras, dogwood, Virginia creeper, buckthorn, and red cedar.

NORTHERN CRESTED FLYCATCHER: *Myiarchus crinitus boreus* Bangs.*

State records.—The crested flycatcher is a generally distributed summer resident, but is somewhat less common than the kingbird and is of more retiring habits. Migrants appear from the South early in April and leave early in September. First arrivals were noted at Woodbine, March 30 (1908); Autaugaville, April 3 (1912); Jackson, April 6 (1912); Montgomery, April 7 (1908 and 1913); Leighton, April 14 (1890); and Sand Mountain, April 10 (1913). The last one seen at Leighton in fall was on September 7 (1891). Fresh eggs have been found at Leighton, May 15 and June 3; and at Autaugaville, May 26.

General habits.—This flycatcher frequents heavy timber, both in river bottoms and on hillsides, and is found to some extent in open deciduous groves and in pine flats. Its large size and prominent crest serve to distinguish it from the other flycatchers.

It is a shy bird and rather solitary in its habits, living chiefly in the "upper stories" of the woods. Its call note is a loud, spirited, and not unmusical whistle given with a rising inflection, besides which it has several other equally characteristic notes. The birds are said to be quarrelsome among themselves, even to the extent of sometimes plucking a tail feather

*Described in *The Auk*, vol. 15, p. 179, 1898. Varying opinions have been expressed as to the validity of a southern race of this bird and as to the proper identification of the type subspecies. After Mr. Bangs had recognized the existence of a different race in Florida, Mr. R. H. Howe contended that birds from South Carolina, representing the typical race, were nearer the northern form, and accordingly named the Florida race *Myiarchus crinitus residuus* (see *Contrib. North Amer. Ornith.*, vol. 1, p. 30, May 21, 1902) and this opinion has been endorsed by Oberholser (see *The Auk*, vol. 34, pp. 194-195, 1917). Recently, however, as a result of collections made by the writer in southern Florida, and by Dr. E. A. Mearns and Mr. J. H. Riley, near Mount Pleasant, South Carolina, it has been possible to compare for the first time a considerable series of breeding birds from Florida with similar series from New England and from South Carolina (the type region of *crinitus*). With the assistance of Dr. Oberholser I have carefully measured and compared this large series, with the following results: In size of bill and wing the South Carolina birds are almost exactly intermediate between the northern birds and the Florida birds; but in addition to these characters, there proves to be a marked difference in the color of the back, the Florida birds being decidedly more greenish (less brownish) than the northern birds, and in this character, the South Carolina birds (which are, of course, typical *crinitus*) are distinctly nearer to the southern race. Therefore, the name *Myiarchus crinitus crinitus* should be applied to the southern race breeding throughout Florida and north to the coast of South Carolina (*residuus* of Howe becoming a synonym of this); while the northern race should be called *Myiarchus crinitus boreus* Bangs.

from a rival, and while they never chase hawks or crows as the kingbird does, they resent the presence of the smaller birds in the vicinity of their nests.

These nests are placed in hollow trees or sometimes in bird boxes. Natural cavities are preferred, but deserted woodpeckers' nests are also used. The cavity is first filled with a mass of rubbish, the nest proper being composed of dry leaves, grasses, rootlets, strips of bark, feathers, hair, and almost invariably a cast-off snake skin. The eggs, 4 to 6 or rarely 8 in number, are heavily and curiously marked with irregular, longitudinal streaks of brown and lavender.

Food habits.—The food of the crested flycatcher consists very largely of insects, with a few spiders and a small quantity of wild fruit. Prof. Beal has examined 265 stomachs in the Biological Survey, and finds animal matter formed 93.7 per cent of the total, and vegetable matter, 6.3 per cent. Among the insects eaten are beetles, weevils, sawflies, horseflies, stinkbugs, cicadas, leafhoppers, grasshoppers, crickets, katydids, caterpillars, and moths. The vegetable food is largely wild fruit, as mulberries, pokeberries, blackberries, huckleberries, elderberries, chokecherries, grapes, and the fruit of the sassafras, Virginia creeper, and dogwood.†

PHOEBE; BRIDGE-PEWEE: *Sayornis phoebe* (Latham).

State records.—The familiar phoebe, or "bridge pewee," is the hardiest member of its family and the only one found in the State in winter. At that season it is generally distributed, but in the breeding season is confined to the northern counties, where it finds suitable nesting sites on cliffs or river bluffs. In the breeding season it has been noted at Elkmont, Natural Bridge, South Lowell, Huntsville (Monte Sano), and along the high cliffs on the Tennessee River between Guntersville and Hobbs Island. Old nests have been seen at Logan, Sipsey Fork (near Mellville), and Ardell. Nests with eggs or young have been found on Sand Mountain, near Carpenter (April 14), at Florence (May 7), and on La Grange Mountain, south of Leighton, (April 16, May 18).

†Beal, F. E. L., Biol. Surv. Bull. 44, pp. 24-27, 1912.

In winter it has been seen at Piedmont, Anniston, Sand Mountain (near Rosalie), Greenbrier Cove (Marshall County), Carlton, Uniontown, Auburn, and Ashford. On the coast the bird is fairly common, having been noted at Orange Beach in January and at Bayou Labatre in February.

Migrants from the North reach the State in October and remain until the last of March. First arrivals were noted at Brewton, October 8 (1908); Greensboro, October 9 (1891); and Autaugaville, October 11 (1915). The last in spring were seen at Dothan, March 13; Mobile, March 18; Dean, March 20; and Barachias, March 21.

General habits.—During the nesting season, the phoebe is rather closely restricted to localities affording nesting sites, which in Alabama are found chiefly in rough, hilly country where there are cliffs or steep banks. In winter, however, it ranges more widely and may be found in old cornfields or about the borders of woodland, but usually in open country.

The nest is placed under a bridge or culvert, on the face of a cliff, on the sill or under the eaves of a house or outbuilding, or in a niche in a clay bank; it is usually protected from the weather by an overhang of rock or in some other way, and being rather firmly fastened to the support, often persists for more than one season. If attached to the face of a cliff or a building, it is composed largely of mud, strengthened with rootlets and dry grass and is semicircular in shape; if on top of a sill or post it is circular and often composed largely of moss; in either case the outside is covered with moss and the inside lined with silky fibers and horse hair.

Phoebe is a typical flycatcher, spending much time on some low perch, such as a weed stalk, fence post, or dead limb of a tree, scanning the surroundings keenly, and frequently making a sally for some passing insect. Immediately on alighting and frequently as he sits on his perch, the bird drops its tail with a characteristic flirt. Its notes also serve to distinguish it, the alarm note being a metallic *tschip* and the ordinary song an abrupt, vigorous, *phe-be* with a peculiar roll.

In the South, the phoebe is said to alight on the backs of cattle and to catch insects which live on the animals—a habit which has given it the local name of tick-bird.

Food habits.—The food of the phoebe, as shown by the studies of Prof. Beal in the Biological Survey, consists of animal matter, 89.23 per cent and vegetable matter, 10.77 per cent. The animal food is composed of spiders, ticks, millipeds, and a large variety of insects, including ants, flies, mosquitoes, stinkbugs, leafhoppers, click-beetles, May beetles, boll weevils, grasshoppers, crickets, locusts, moths, and caterpillars. The vegetable food includes a large number of fruits and seeds, such as the berries of juniper, greenbrier, wax-myrtle, hackberry, pokeweed, sassafras, wild cherry, sumac, poison ivy, poison sumac, holly, Virginia creeper, dogwood, and elder.* The bird is everywhere considered a useful and attractive addition to the life of the farm.

OLIVE-SIDED FLYCATCHER: *Nuttallornis borealis*
(Swainson).

State records.—The olive-sided flycatcher is probably a regular migrant in the State on its journeys to and from its breeding grounds in the North. Only two instances of its occurrence are known, however, the first a bird seen by A. A. Saunders, at Woodbine, May 9, 1908;† the second a specimen taken by L. S. Golsan, at Autaugaville, October 17, 1915.

General habits.—This flycatcher is a bird of the wilderness, dwelling in summer chiefly in coniferous or mixed forests of the Canadian Zone. It has the habit of perching often on the topmost twig of some tall evergreen, whence it gives its loud, vigorous call, *put-pee-wee*.

WOOD PEWEE; TICK-BIRD: *Myiochanes virens*
(Linnaeus).

State records.—The wood pewee is one of our commonest and best known flycatchers, found in summer in all parts of the State. It arrives from the South about the first or second week in April. The first migrants were noted at Greensboro, April 6 (1893); Thomasville, April 8 (1912); Autaugaville, April 10 (1913); and Leighton, April 18 (1891). In fall the birds linger late, having been seen at Leighton, October 11 (1891), and October 21 (1892); Anniston, October 15 (1916);

*Beal, F. E. L., Biol. Surv. Bull. 44, pp. 30-35, 1912.

†Saunders, A. A., The Auk, vol. 25, p. 418, 1908.

Greensboro, October 24 (1890) ; and Bon Secour, October 19 (1908). Golsan has found eggs at Autaugaville on May 30, and McCormack records them from Leighton on June 15 and July 5.

General habits.—This is a gentle, confiding bird, much beloved for its attractive ways. It is partial to dry upland woods, and often lives in groves and orchards close to dwelling houses. Its song is a soft, plaintive, drawling whistle, sounding like the syllables “*pee-a-wee.*” It is a most persistent singer, heard at all hours of the day, even in the heated period of midsummer, when most birds are silent. In the early morning and late evening hours the song is delivered with more vigor and with considerable variations. It captures most of its food on the wing, after the manner of the other flycatchers, and rarely descends to the ground.

The wood pewee builds an artistic nest of grasses, covered with lichens, which it saddles firmly on a horizontal limb, sometimes quite near the ground, again at a considerable height. Dr. Avery mentions a nest found at Greensboro, May 24, 1890, in a hickory, 60 feet above the ground, and another, May 6, 1893, 100 feet up in a pine.

Food habits.—Nearly 99 per cent of the food of this bird is composed of animal matter, chiefly insects, with a few spiders. Examination in the Biological Survey of 359 stomachs of this bird showed that Hymenoptera (including ants, bees, wasps, and related insects) made up over 25 per cent of the total food, and Diptera (including house flies, horse flies, and other species) about 30 percent. Moths, caterpillars, grasshoppers, bugs, and beetles made up the remainder of the insect food. The vegetable food is composed of a few kinds of wild berries, including poke berries, elderberries, blueberries, and berries of the dogwood and poison ivy.‡

YELLOW-BELLIED FLYCATCHER: *Empidonax flaviventris* (W. M. and S. F. Baird).

State records.—The yellow-bellied flycatcher is a rare and inconspicuous member of the fauna of Alabama, occurring only as a migrant in spring and fall. McCormack records a

‡Beal, F. E. L., Biol. Surv. Bull. 44, U. S. Dept. Agr., pp. 44-49, 1912.

single individual taken at Leighton, May 5, 1890,* and Avery mentions the capture of two at Greensboro, September 20 and 23, 1890.†

General habits.—This flycatcher may be found most frequently in low undergrowth along streams and the borders of swamps. In its summer home in the northern wilderness it lives in deep, moist, coniferous or mixed forests. By reason of its quiet and retiring ways the bird is little known. In its migrations, it is usually silent and hence doubly difficult to identify.

ACADIAN FLYCATCHER: *Empidonax virescens*
(Vieillot).

State records.—The Acadian flycatcher is a characteristic southern bird—the only member of its genus breeding in the State. It is common and generally distributed as a summer resident. First arrivals from the South were seen at Woodbine, April 13 (1908); Greensboro, April 18 (1891); Autaugaville, April 15 (1912); and Leighton, April 20 (1892). In fall I found this bird at Castleberry as late as October 10 (1908). Eggs have been found at York, May 14; Leighton, May 26 and June 4; and Autaugaville, May 28 and June 12, the last about ready to hatch.

General habits.—This little flycatcher is found chiefly in swampy timber and moist, wooded ravines. It is shy and rather quiet, not readily distinguished from the wood pewee by its colors, but easily recognized by its harsh, abrupt call, sounding like *qu-reep*, the two syllables closely connected, and the last strongly accented. Another note, uttered as the bird flies from one perch to another, “resembles the soft murmuring of whistling wings” (Chapman). It is inclined to be solitary in habit, usually resenting the presence of others of its kind near its nest.

The nest is a frail, shallow structure hung from the forks of a horizontal limb, usually over or near a stream, and from 4 to 20 feet above the ground. It is constructed of dark-colored rootlets, catkins of oak or beech, strips of bark, or

*Leighton (Ala.) News, vol. 2, No. 17, Sept. 1, 1891.

†Avery, W. C., Amer. Field, vol. 35, p. 8, 1891.

sometimes of Spanish "moss." The eggs, 3 or 4 in number, may usually be seen through the nest from beneath.

Food habits.—Examination of 100 stomachs of this bird in the Biological Survey shows that its food consists almost entirely of insects. The animal portion constituted 97 per cent of the whole; of this only about 3 per cent was made up of spiders and millipeds, the remainder being insects. Wasps, bees, and ants are the most important item, furnishing 40 per cent of the bird's food. Moths and caterpillars are next in importance and amount to nearly 19 per cent. Beetles are frequently eaten and grasshoppers and crickets occasionally. A small amount of wild fruit is consumed.†

TRAILL FLYCATCHER: *Empidonax traillii traillii*
(Audubon).*

State records.—The Traill flycatcher is probably a regular but rather uncommon migrant in certain parts of the State, but it has been detected only once—a single individual which I saw in a hedge bordering a field at South Florence, May 7, 1912. I watched the bird at close range for several minutes but was unable to secure it.

General habits.—Like the other small flycatchers, this species is difficult to identify, except by aid of its notes, which are characteristic. Its ordinary call note, which answers also for a song, is a three-syllabled utterance which has been written, *eaze-we-up*. It frequents alder thickets and other low growths along streams and in wet meadows.

LEAST FLYCATCHER: *Empidonax minimus*
(W. M. and S. F. Baird).

State records.—The least flycatcher probably occurs regularly in migration in Alabama, but is apparently rare, as we searched for it several seasons before finding any. The only record is that of a single bird collected by the writer in a hedge in a field close to the south bank of the Tennessee River near Muscle Shoals, April 24, 1914.

†Beal, F. E. L., Biol. Surv. Bull. 44, pp. 58-60, 1912.

**Empidonax traillii alnorum* of the A. O. U. Check-list; for change of name see The Auk, vol. 36, p. 268, 1919.

General habits.—In its summer home, this flycatcher lives about cultivated lands, in orchards, hedgerows, and shade trees along country roads. Its abrupt note, sounding like “*che-bec*,” easily calls attention to it and readily distinguishes it from any other bird.

LARKS: Family Alaudidae.

HORNED LARK: *Otocoris alpestris alpestris* (Linnaeus).

State records.—McCormack records the horned lark as a rare winter visitor, and says of it:

During an extreme cold snap in January, 1888, a large flock of these birds appeared here [at Leighton] and were seen every day from the 19th to the 28th. During this time the ground was covered with snow to the depth of several inches, and the cold was severe all over the Northern States.†

At Greensboro, January 19 and 20, 1893, Dr. Avery observed a flock of about a dozen horned larks feeding in the snow close to the railroad depot. Six specimens taken at that time are in his collection and prove to be of the typical race. Miss Carrie E. Parkhurst reports the appearance of horned larks in numbers at Talladega, January 8 to 15, 1910. A specimen taken at Point Clear a number of years ago furnishes the most southern record of the species—a mounted bird preserved in a case of birds in the Point Clear Hotel; its sub-specific identity could not be determined at the time it was examined.

General habits.—The horned lark is a bird of the open country, feeding on the ground in flocks, chiefly in cultivated fields or sometimes in village or city streets. It is hardy, nesting early in spring, often while snow still remains on the ground. Its southward distribution in winter is governed largely by the severity of the season, and only in very cold winters does it reach the Southern States.

The notes of this bird, uttered in flight or while feeding, are a soft and lisping *tseep, tseep*, somewhat like the notes of the pipit, or titlark (*Anthus rubescens*). Although for the most part strictly terrestrial, the horned lark indulges during the breeding season in a flight song after the manner of the famous skylark of Europe.

†Leighton (Ala.) News, vol. 2, No. 17, Sept. 1, 1891.

Food habits.—Nearly four-fifths of the horned lark's food consists of vegetable matter, about half of which is grain—mainly wheat and oats—and the remainder weed seed. Insects constitute about one-fifth of the total food, and include beetles, butterflies, moths, grasshoppers, ants, flies, and wasps. The birds occasionally damage newly sown grain fields, but in the main are considered beneficial in their food habits.‡

PRAIRIE HORNED LARK: *Otocoris alpestris praticola*
Henshaw.

State records.—McCormack speaks of the prairie horned lark as a common winter resident at Leighton, "arriving about the first of November and remaining until March, frequenting weedy fields and pastures." As he has not preserved any specimens, however, it is impossible to say which of the two subspecies, *alpestris* or *praticola*, is the more common. From a flock at Greensboro, January 20, 1893, Dr. Avery took a single specimen of this form—the only definite record from the State.

CROWS, JAYS, ETC.: Family Corvidae.

SOUTHERN BLUE JAY: *Cyanocitta cristata cristata*
(Linnaeus).*

State records.—The southern and smaller race of the blue jay occupies the whole of Alabama and is one of the most abundant birds at all seasons. Breeding specimens have been examined from Monte Sano (near Huntsville), Sand Mountain (Jackson County), Guntersville, Elkmont, Leighton, Wilsonville, and Choccolocco Mountain (near Anniston); specimens have been taken at other seasons at Mobile, Orange Beach, Catherine, Autaugaville, Greensboro, and Auburn. Specimens taken at Leighton, March 30, 1912, and at Muscle Shoals, April 23 and 24, 1914, are intermediate between this form and the northern race (*bromia*). At the last-named locality, blue jays were very abundant on the dates mentioned, on the tim-

‡Consult McAtee, Biol. Surv. Bull 23, 1905.

**Cyanocitta cristata florincola* of the A. O. U. Check-list; for change of name see The Auk, vol. 38, p. 83, 1921.

bered hillsides, where droves of them were rollicking in noisy fashion through the woods or flying up the river. The impression made at the time was that they were migrating, but none of the specimens collected could be referred to the northern race.

Fresh eggs have been found at Leighton April 20 and May 14; Barachias, April 22; Autaugaville, April 26; Coosada, April 28; and York, May 8.

General habits.—The blue jay is most numerous in dry, deciduous woodland where there is an abundance of mast, but it frequents also cultivated lands and the shade trees in town and village streets. During the greater part of the year the birds are noisy, restless creatures, roving about the woods in loose flocks, but during the nesting season they become more quiet and retiring. They have a variety of characteristic notes and are likewise good mimics, being especially proficient in imitating the cry of the red-shouldered hawk. They are mistrusted by all the smaller woodland birds, and with good reason, for many a nest of vireo, warbler, or sparrow is despoiled of its eggs or young by these heartless freebooters. The jays take great delight in worrying owls or hawks whose retreats they may discover. The nest is a rather bulky structure, placed in the crotch of a tree, usually near the trunk, at a distance varying from 10 to 30 feet above the ground; pine trees are preferred, but deciduous trees and vines are sometimes used. Nest building begins by the first of April.

Food habits.—Examination of over 500 stomachs of the blue jay in the Biological Survey showed its food to be composed mainly of vegetable matter, of which mast forms the largest item—about 43 per cent; acorns are the nuts most frequently eaten, but beechnuts, chestnuts, chinquapins, hazelnuts, and pecans are also taken. Wild fruits are eaten during the summer and fall and constitute about 7 per cent of the food of the year; cultivated fruits are taken from June to the end of the year and in July form 15 per cent of the food of that month. Corn furnishes about 18 per cent of the total food, and is taken every month, but in greater quantities during winter and early spring, when much of it is necessarily waste.

Insects constitute about 22 per cent of the yearly food, three-fourths of this amount being injurious species, such as grasshoppers, caterpillars, and beetles. Small quantities also of other animal food, such as spiders, millipeds, mollusks, crustaceans, mice, and fish are eaten, and the eggs and young of wild birds are occasionally destroyed.

Prof. Beal sums up the economic status of the jay as follows:

The blue jay probably renders its best service to man in destroying grasshoppers late in the season and in feeding on hibernating insects and their eggs, as they do in the case of the tent caterpillar and brown-tail moth. Such forest insects as buprestid beetles and weevils of various kinds also fall as their prey.

The blue jay's vegetable food, with the exception of some cultivated fruit and corn in the fall, is largely neutral. The severest criticism against the species is the destruction of other birds and their eggs. Where we wish to attract the latter in large numbers about our dooryards, in our parks, and in game preserves, it will be well not to allow the jays to become too abundant.†

SOUTHEASTERN RAVEN: *Corvus corax europhilus* Oberholser.*

State records.—The southeastern raven occurs sparingly along the Alleghenies as far south as the northern parts of Georgia and Alabama. It is a dweller in wild, mountainous districts, far from civilization, and in the United States is rapidly growing scarce. In former times ravens probably were plentiful over the greater part of the mountainous region of northern Alabama, but within recent years their numbers have been greatly reduced and they are now on the verge of extinction. They are known to breed in only one locality—the rocky bluffs along Sipsey Fork and its tributaries in southeastern Winston County and the adjacent parts of Walker and Cullman Counties—but have been seen occasionally at a few other places. R. R. Bottoms, of Logan, Cullman County, tells me that ravens have been known to breed in the hills to the

†Beal, F. E. L., *Farmers' Bulletin* 630, rev. ed., p. 22, 1918.

*For use of this name see *The Auk*, vol. 36, p. 269, 1919.

westward of that place as recently as 1905, but since that date very few have been seen. In June, 1913, E. G. Holt made a trip from Logan to Jasper in search of the birds, but failed to see any. One was reported to have been seen near Logan in the summer of 1912 and a pair was said to have nested in the spring of 1913 in the bluffs on Sipsey Fork, near Ardell. A few were reported to him also at Natural Bridge.

In May, 1914, J. L. Peters and the writer camped four days on Sipsey Fork near the mouth of Rock Creek (East Fork of Sipsey) and with the assistance of a local hunter, explored the cliffs on all the streams in that vicinity, but failed to find a nest or even to see a raven, although single birds were twice seen by other people during that time and we were shown a nest which had been occupied the previous year. Returning in June, Peters made another unsuccessful attempt to secure specimens, seeing at that time three ravens which had been attracted by the carcass of a yearling calf which had fallen from a cliff. In 1915, L. J. Goldman visited the same region and after considerable searching located, on April 4, a raven's nest on Sipsey Fork a short distance above the mouth of Rock Creek. The nest was placed in a crevice on the sheer face of a cliff, about 60 feet from the ground, was strongly built of sticks and lined with grass and what appeared to be goat's hair, and contained two nearly featherless young, quite helpless, but able to make themselves heard. Reaching the nest by sliding down a rope lowered from above, Mr. Goldman placed several steel traps on and about the nest and retired to a safe distance to watch developments. After several hours one of the old birds returned but did not approach closely, and in a short time flew away. The following morning the male bird was found caught in a trap, the female never having returned. This specimen, the only one known from Alabama, has recently been made the type of a new subspecies, as indicated above.

In April, 1914, I visited Sand Mountain, in the extreme northeastern corner of Jackson County, camping for four days near the rim of Long Island Creek gulch, in which locality E. W. Graves had seen a few ravens in May, 1912, and April, 1913. In company with Mr. Graves, I explored the gulches

in this vicinity carefully but failed to find any sign of ravens nesting. On April 16, however, as we sat on the rim looking down to the mouth of the cove we saw a pair sailing leisurely over the middle of the gorge. They passed within about 200 yards of us, then began to soar higher and passed out over the Tennessee Valley toward the Cumberland Mountains of Tennessee. A resident of Carpenter, in the valley, later told me that ravens are known to nest in these mountains, near Ketchall, Marion County, Tennessee.

General habits.—The raven is a wild, unsocial bird, choosing for its home the most rugged and inaccessible portions of the country and avoiding the habitations of man. In the East it is exceedingly wary and very difficult to approach, but in the West, where it is usually unmolested by man, it is remarkably unsuspicious, frequenting slaughter pens and ranch buildings with no sign of timidity.

Although resembling the crow rather closely in general appearance, the raven is much larger and may always be identified by his harsh guttural croak.

Food habits.—The food of the raven is chiefly carrion, varied with small rodents, frogs, mussels, snails, and grasshoppers, crickets, and other insects. The bird is sometimes accused of robbing hen's nests and of picking out the eyes of domestic animals that are sick or helpless.

SOUTHERN CROW: *Corvus brachyrhynchos paulus*
Howell.*

State records.—Crows are generally distributed in the State but seem to be nowhere so abundant as in the Northern States. The form occurring in Alabama is decidedly smaller than the northern crow, and has a much more slender bill. It has recently been described by the writer as a new subspecies.

Specimens have been examined from Florence, Greensboro, Autaugaville, Barachias, Whistler, Bayou Labatre, and Bon Secour. In a grove of oaks near Irvington, November 18, 1915, I found a good-sized flock, but as a rule the species is rather sparsely distributed in the pine flats of the coast region.

*For use of this name see Howell, A. H., Proc. Biol. Soc. Washington, vol. 26, pp. 199-202, 1913; also The Auk, vol. 40, p. 522, 1923.

Nests with eggs have been found at Leighton, March 18, March 28, and April 14; and at Autaugaville, March 23.

General habits.—In habits the southern crow does not differ much from its northern relative. It is partial to open or partly wooded country and seems to prefer pine timber for nesting purposes. Although usually gregarious the southern birds are rarely seen in large flocks. They forage in a great variety of situations—cultivated fields, timber tracts, river shores, and the hammocks and pine flats in the coast region. No such extensive roosts as are found in many localities are known in the State, but Holt reports about 100 birds at Leighton in July, 1913, roosting regularly in a small tract of woodland with little blue herons (*Florida cærulea*). The nests are placed in trees, pines being most often selected, but oaks and other deciduous trees are frequently used; the nest may be in a fork against the trunk or well out on a branch, usually from 20 to 60 feet above the ground.

Food habits.—The food of the crow has been exhaustively studied by E. R. Kalmbach of the Biological Survey. He finds that it is composed of about 72 per cent vegetable matter and 28 per cent animal. The animal food is considered of the greatest economic importance, comprising beetles, grasshoppers, locusts, crickets, caterpillars, cutworms, bugs, and other insects; crawfish, mollusks, fish, snakes, lizards, salamanders, field mice and rats, young rabbits, and the eggs and young of wild birds. Of the vegetable food, corn furnishes the principal item, amounting to over 38 per cent of the total food of adult crows; wheat, oats, and other small grains are eaten to a less extent; wild fruits, including sumac, poison ivy, poison oak, bayberry, wax myrtle, greenbrier, Virginia creeper, sour gum, dogwood, and many others, compose about 14 per cent of the food. After summing up the economic status of the crow, Kalmbach adds:

“The attitude of the individual farmer toward the crow should be one of toleration when no serious losses are suffered, rather than one of uncompromising antagonism resulting in the unwarranted destruction of these birds, which at times are most valuable aids to man.”†

†Kalmbach, E. R., The crow and its relation to man: Bull. 621, U. S. Dept. Agr., pp. 85-86, 1918.

FISH CROW: *Corvus ossifragus* Wilson.

State records.—The fish crow occurs chiefly along the South Atlantic and Gulf coasts, but penetrates the interior along the larger river valleys. It is fairly common about the shores of Mobile Bay and has been observed in small numbers at Bay Minette, Carlton, Jackson, and Stiggins Lake, near Mount Vernon. On Dauphin Island this is apparently the only resident species of crow. I saw about a dozen and shot one there in May, and Gutsell observed some in August. Around the shores of Little Lagoon, Baldwin County, in October, 1908, a flock of about 20 was observed. I found fish crows numerous in the pine woods near Spring Hill, July 10, 1913, and secured one full-grown young bird. On the shore of Mississippi Sound at Coden, May 17, 1911, I found a flock of about a dozen in a small, open pine grove, where they were evidently nesting. Although usually very wary, on this occasion they circled about over my head for some time and I was able to shoot several specimens.

General habits.—This species is difficult to distinguish in the field from the common crow, but is readily recognized by its weak, guttural call. It is rarely found far from the sea and its inlets, or the shores of large rivers near the coast. During the breeding season fish crows usually keep in small companies of their own kind, but at other seasons they mingle freely with the common crows. Around the shores of Mobile Bay and Mississippi Sound this species is more numerous than the common crow; there they feed on the mud flats at the edge of the water and pick up refuse animal matter brought in by the tide. The fish crow nests later than the common crow, the eggs being laid usually in May; the nests are in either pines or deciduous trees, usually in a crotch against the trunk.

Food habits.—The fish crow, as indicated by its common name, feeds to some extent on fish, which it is reported to be able to capture alive. It consumes also various other products of the sea, as small crabs, shrimps, and mollusks. It is very destructive to other birds' eggs, particularly those of herons, terns, rails, the willet, and the Wilson plover, and when opportunity offers it takes the eggs of domestic fowls as well.

Many kinds of wild fruits and berries enter its diet, including pokeberries, mulberries, hackberries, huckleberries, grapes, and the fruit of the holly, sour gum, catbrier, dogwood, red cedar, palmetto, papaw, and red bay. Some corn, oats, and wheat are consumed, but this is chiefly waste grain gleaned in winter. Carrion is frequently taken, as well as crawfish and a few insects, as grasshoppers and ants.

STARLINGS: Family Sturnidae.

STARLING: *Sturnus vulgaris vulgaris* Linnaeus.

State records.—The first record of the starling in Alabama is that given by Peter A. Brannon of a bird killed near Montgomery, January 14, 1918, by being blown against a barn during a rainstorm. The specimen has been mounted and placed in the Museum of the Department of Archives and History.* On January 4, 1920, near the junction of the Coosa and Tallapoosa Rivers, 2 specimens were shot from a flock estimated to contain 150 or 200 birds.† In view of this bird's rapid extension of range it seems probable that it will soon become established in the State.

General habits.—The starling lives both in cities and in the open country, nesting in crevices of buildings, bird boxes, or hollow trees. It is strongly gregarious, traveling for a large part of the year in flocks, often of considerable size. During late summer and fall the birds resort nightly to roosts in shade trees in towns or cities or sometimes in a cattail marsh. As winter approaches they abandon these roosts and seek shelter in church towers, barns, or other buildings.

Nesting begins in the latitude of Washington about the middle of April and two broods are usually raised in a season. Chapman describes the call of the male as "a high, clear, rather long-drawn, ascending whistle" and its song as "a choking, gasping, guttural soliloquy, with imitations of the notes of other birds interspersed."‡

*Brannon, P. A., *The Auk*, vol. 35, p. 224, 1918.

†Brannon, P. A., *The Auk*, vol. 37, p. 298, 1920.

‡Chapman, F. M., *Handbook of Birds of Eastern North America*, rev. ed., p. 356, 1912.

Kalmbach and Gabrielson speak of the bird as "a mimic par excellence," and mention a considerable number of native species which it imitates, among which are the wood pewee, bluebird, quail, flicker, blue jay, red-winged blackbird, and Carolina wren.**

Food habits.—In their study of the economic status of the starling in the Northern States, Kalmbach and Gabrielson find that a large share of the bird's food for the year (41½ per cent) is composed of insects, principally beetles, grasshoppers, crickets, and caterpillars; millipeds are extensively eaten, and spiders frequently. The most serious damage done by the starling is in its destruction of cultivated cherries, which in June furnished 17 per cent and in July about 15 per cent of the total food of adults.

Apples are also damaged to some extent and sometimes grapes or other small fruits. Corn is occasionally attacked but the damage to this crop is not serious and much less than that caused by the grackle and other native blackbirds.

Wild fruits form the largest single item in the starling's yearly food, amounting to nearly 24 per cent of the total. Those most frequently eaten are mulberries, blackberries, June berries, wild black cherries, chokecherries, elderberries, bayberries, and the fruit of the sour gum, Virginia creeper, sumac, and poison ivy. As a result of their studies, Kalmbach and Gabrielson sum up the status of the starling in part as follows:

A thorough consideration of the evidence at hand indicates that, based on food habits, the adult starling is the economic superior of the robin, catbird, flicker, red-winged blackbird, or grackle. It is primarily a feeder on insects and wild fruit—less than 6 per cent of its yearly food being secured from cultivated crops. What damage it does inflict is due not so much to the character of its food habits as to the fact that the flocking habit has allowed some minor trait to be emphasized to a point where local damage results. The decidedly beneficial character of the food habits of one, two, or sometimes three broods of nestlings, numbering 4 to 6 to the nest, adds materially to the favorable economic status of the species.*

**Kalmbach, E. R., and I. N. Gabrielson, Economic value of the starling in the United States: Bull. 868, U. S. Dept. Agr., p. 9, 1921.

*Kalmbach, E. R., and I. N. Gabrielson, op. cit., p. 58.

BLACKBIRDS, ORIOLES, ETC.: Family Icteridae.

BOBOLINK; RICE-BIRD; OAT-BIRD: *Dolichonyx oryzivorus* (Linnaeus).

State records.—The bobolink is a regular and not uncommon spring migrant, but is rare in the fall. It summers chiefly in the Northern States and southern Canada and in autumn migrates southward along the Atlantic seaboard. Migrants from the south appear during the latter part of April and linger till the middle of May. First arrivals were noted at Leighton, April 21 (1891), and April 30 (1893), some remaining each year till May 16. On May 14, 1889, Mr. McCormack saw an immense flock in an oat field at Leighton and over 100 were shot. At Barachias the birds appeared April 23, 1912, and at Auburn, April 25, 1912. Dr. Avery noted a few at Greensboro, May 11 and 15, 1889, and a few on Dauphin Island September 21, 1892, the latter being the only autumn record of the species. At Mobile, May 9, 1911, about 20, mainly females, were seen in the marshes, and a few stragglers were noted there as late as May 13. A small flock, consisting of females, was seen in an oat field at Seale, May 22, 1914, and the following day two birds, a male and a female, at Fitzpatrick.

General habits.—The bobolink in its summer home lives in the rich hay meadows of the Northern States, where it is greatly appreciated for its rollicking, exuberant song, delivered as the bird floats on quivering wings over the nesting grounds. In early fall the birds begin their southward migration and, having assumed a new and different plumage, are known by the names of "reed-bird" in the middle districts and "rice-bird" in the South. They gather into immense flocks in the tidal marshes of the Atlantic coast and grow very fat upon the wild rice and other native grasses as well as on cultivated rice and other grains. At this season, thousands are shot for food and sport, and before the cultivation of rice ceased in South Carolina (about 1906) large numbers were destroyed by the rice planters in efforts to protect their fields.

Returning late in April and May from their winter sojourn in South America, they again visit the grain fields of the

Southern States as they pass northward to their breeding grounds. At this season the sexes travel for the most part separately, the males arriving a few days before the females.

Food habits.—During its breeding season the bobolink feeds almost exclusively on insects, taking among others, beetles, wasps, ants, and caterpillars. The animal food found in nearly 300 stomachs amounted to about 58 per cent of the total, but unfortunately this creditable record for a large part of the year is offset by the serious damage caused in grain fields during the spring and fall migrations.

In the rice fields of the South, particularly in South Carolina, the bobolink was a serious pest when rice was the principal crop. In Alabama the bird does some damage to fields of wheat and oats. On the Experiment Station farm at Auburn, April 29, 1912, I observed a flock of fully 200 feeding in the small patches of wheat and oats; examination of the wheat showed many heads nearly stripped of grain. The birds were reported to visit these fields regularly, and the authorities were obliged to keep a man shooting them every day for a week or two during the spring migration.

COWBIRD: *Molothrus ater ater* (Boddaert).

State records.—The cowbird occurs as a common but somewhat irregular winter resident; so far as known, however, it does not breed in the State. Avery speaks of it as abundant at Greensboro from middle July to April, and McCormack records it as a common winter resident at Leighton from September 25 to April 9. Holt saw a flock of 10 at Bay Minette, March 28, 1912. Golsan saw a small number at Autaugaville in the winter and spring of 1912-1913, and took specimens there, February 22, 1914, and September 15, 1915. He records it also, as occurring occasionally in July and August.* Miss Parkhurst reports the birds seen in numbers, at Talladega, January 8 to 15, 1910, and R. H. Dean reports 5 seen at Anniston, March 19, 1916.

General habits.—This species is found during the greater part of the year in flocks either of its own kind or associated

*Golsan and Holt, *The Auk*, vol. 31, p. 226, 1914.

with other species of blackbirds. It feeds mainly in pastures; often associating with a herd of cattle and sometimes alighting on the backs of the animals to search for insects. The flight of the cowbird is undulatory and a flock may often be identified at some distance by their rising and falling motions.

This is the one parasite among North American birds; it never constructs a nest, but deposits its eggs in the nests of other smaller birds and trusts the foster parents to care for the eggs and young. The usual result is that the cowbird's eggs hatch first and the young, by reason of greater size and vigor, crowd out the young of the bird thus imposed upon. Not infrequently, also, the cowbird throws out some of the eggs of the rightful owner of the nest to make room for her own. Often several cowbird's eggs are found in one nest, even to the number of 7, which Bendire records as having been found in an ovenbird's nest. Besides the latter species, the birds most often imposed upon are (according to Bendire) the phoebe, song sparrow, towhee, indigo bunting, and yellow-breasted chat; while upwards of 85 species are in the list of birds parasitized by the cowbird.

Food habits.—Prof. Beal, after examining 544 stomachs of this bird, summarized its food habits as follows:

- (1) Twenty per cent of the cowbird's food consists of insects, which are either harmful or annoying.
- (2) Sixteen per cent is grain, the consumption of which may be considered a loss, though it is practically certain that half of this is waste.
- (3) More than 50 per cent consists of the seeds of noxious weeds, whose destruction is a positive benefit to the farmer.
- (4) Fruit is practically not eaten.†

RED-WINGED BLACKBIRD: *Agelaius phoeniceus predatorius* (Wilson).‡

State records.—The red-wing, or marsh blackbird, is locally common throughout the State. This northern race occupies during the breeding season the northern part of the State from Autauga County northward (fig. 11). In winter its numbers are greatly augmented by migrants from the North.

†Beal, F. E. L., Biol. Surv. Bull. 18, p. 29, 1900.

‡*Agelaius phoeniceus phoeniceus* of the A. O. U. Check-list; for change of name see The Auk, vol. 34, p. 204, 1917.

FIG. II.—Breeding areas of Red-winged Blackbirds in Alabama.

1. *Agelaius phoeniceus predatorius*.
2. *Agelaius phoeniceus phoeniceus*.

Breeding specimens have been examined from Leighton, Attalla, Greensboro, and Autaugaville; and wintering individuals from Uniontown and Barachias. Avery reports the species abundant in winter at Greensboro, and Brown speaks of seeing immense flocks at Coosada at that season. Nesting begins about the first of May; eggs were found at Autaugaville, May 11.

General habits.—During the breeding season, these blackbirds are largely restricted to marshes or low, boggy fields, but in winter they congregate in immense flocks, roving about the country in search of food and often flying long distances to gather into a common roost at night. For this purpose they select a reed-grown marsh, and spend the night well concealed in the thick reeds. During the winter and early spring the sexes keep for the most part in flocks by themselves, and in the spring migration the males precede the females by two weeks or more. The gregarious habit prevails to some extent in the breeding season and the species is more or less polygamous, a single male often mating with 2 or 3 females.

The alarm note of the red-wing is a sharp *chuck*; the song is liquid and resonant, and though not ranking high as a musical production is nevertheless pleasing.

The nests are basketlike structures woven of reeds or grasses placed in bushes or reeds, usually 2 or 3 above the ground, but occasionally as high as 10 feet. The eggs are usually 3 or 4 in number, curiously scrawled and blotched with brown or black.

Food habits.—The food of the red-winged blackbird has been studied by Prof. Beal, of the Biological Survey, from examination of more than a thousand stomachs. The food was found to consist of 26.6 per cent animal matter, chiefly insects, and 73.4 per cent vegetable. The insects eaten are principally beetles, grasshoppers, and caterpillars, with a few wasps, ants, flies, bugs, and dragonflies. The vegetable food consists mainly of grain and seeds of grasses and weeds. "Grain collectively amounts to 13.9 per cent of the food of the year, and its distribution * * * leads to the conclusion that at least half of it is waste." Oats, corn, and wheat are the grains usually eaten, and where rice is grown that crop

is often considerably injured by these blackbirds. Weed seed is apparently the favorite food of the red-wings, since the total amount of grass and weeds is 54.6 per cent, more than half of the year's food, and more than four times the total grain consumption. Summing up the bird's status, he says:

"Judged by the contents of its stomach alone, the red-wing is most decidedly a useful bird. The service rendered by the destruction of noxious insects and weed seeds far outweighs the damage due to its consumption of grain. The destruction that it sometimes causes must be attributed entirely to its too great abundance in some localities.*

FLORIDA RED-WING: *Agelaius phoeniceus phoeniceus*
(Linnaeus).†

State records.—The Florida red-wing occupies the southern part of Alabama as far north as Russell County. It differs from the northern subspecies (*predatorius*) in smaller size and intergrades with that form in the central part of the State. It is moderately common in the wet marshes of Mobile Bay and Perdido Bay, and very numerous on Grande Batture and Petit Bois Islands. Specimens have been examined from Petit Bois Island, Alabama Port, Mobile Bay, Dothan, and Seale. Nests with eggs were found at Grande Batture, May 23, 1911, and at Seale, May 22, 1914.

NORTHERN RED-WING: *Agelaius phoeniceus arctolegus*
Oberholser.‡

The northern red-wing—the form breeding in western Canada and south to Minnesota and Michigan—is known in Alabama only from a single specimen collected by the writer at Barachias, March 25, 1912. Further collecting will doubtless show it to occur more or less regularly as a winter visitant.

*Beal, F. E. L., Biol. Surv. Bull. 13, pp. 33-34, 1900.

†*Agelaius phoeniceus floridanus* of the A. O. U. Check-list; for change of name see The Auk, vol. 34, p. 204, 1917.

‡For use of this name, see The Auk, vol. 36, p. 269, 1919.

MEADOWLARK; FIELD LARK: *Sturnella magna magna*
(Linnaeus).

State records.—The northern race of the meadowlark, (*magna*) occurs as an abundant winter resident in the northern part of the State, but just how far south it goes it is impossible to determine until more specimens are available from various localities. It will probably be found in winter in nearly all sections except the extreme southern counties. E. W. Graves reports it as a common winter visitant on Sand Mountain, near Carpenter. In Dr. Avery's collection are 4 specimens of this race, taken at Greensboro, February 21, March 28, and October 18 and 25; and the Biological Survey collection contains specimens taken at York, February 27, 1912; Uniontown, March 1, 1912; Woodville, March 9, 1915; Ardell, March 28, 1915; and Leighton, April 20, 1914.

McCormack says of this bird:

The well known field or meadow lark is one of our most abundant winter residents, and a few remain all the year. The bulk of migrants arrive during the first week in October, and from this time until the first week in April every old field and pasture abounds with them.*

General habits.—The meadowlark, as its name implies, is a bird of the fields and is never found in timber tracts, except those of a very open nature. In the breeding season it is largely confined to upland grass fields, but in winter it visits wet marshes and old cotton and corn fields and often follows the plowman to pick up grubs. It is a sociable bird, several pairs usually breeding near together, and in winter it is found in loose flocks, sometimes of considerable size.

The alarm notes are a sharp *dzit* and a harsh, metallic chatter; the song is a clear, mellow whistle of several notes.

Food habits.—The meadowlark is one of our most useful birds, feeding chiefly on insects, these forming nearly three-fourths of its food for the year. Says Prof. Beal:

Of the various insects eaten, crickets and grasshoppers are the most important, constituting 26 per cent of the food of the year and 72 per cent of the food in August. Of the 1,514

*Leighton (Ala.) News, Vol. 2, No. 18, September 15, 1891.

stomachs collected at all seasons of the year, 778, or more than half, contained remains of grasshoppers, and one was filled with fragments of 37 of these insects.†

Among other important insects eaten by the meadowlark may be mentioned beetles, caterpillars, cutworms, and the cotton-boll weevil. This bird is particularly valuable as a destroyer of this last-mentioned pest, since it feeds regularly upon the insect during the winter months, thus reducing very materially the numbers which might otherwise descend upon the cotton crop the following season. The vegetable food of the bird consists of grain (most of which is waste, eaten in winter and early spring) and of weed seed.

SOUTHERN MEADOWLARK; FIELD LARK:

Sturnella magna argutula Bangs.

State records.—The southern race of the meadowlark (*argutula*) is the prevailing form in summer and breeds more or less commonly in nearly all sections. Most of the birds are probably resident in the localities where they are reared, but some may wander more or less in the winter. Many flocks at that season doubtless contain representatives of both the northern and southern races. Specimens of this form have been taken at Orange Beach, Fairhope, Bon Secour, Castleberry, Barachias (June and November), Hayneville, Auburn, York, Uniontown, Leighton, Woodville, and Elkmont. It doubtless breeds at all of these localities. It is scarce or absent in mountainous districts and only moderately common in the pine flats of the coast region. As a breeder it occurs most commonly in the open grass lands of the Central Prairie Belt. Eggs have been taken at Booth, May 15, 1910 (Golsan), and at Barachias, June 2, 1907 (Holt).

General habits.—The habits of this race are essentially the same as of those of the northern form; the nests are placed on the ground in meadows in a slight depression, usually well concealed by a tussock of grass, weed, or a small bush, and often domed over with grasses.

†Beal, F. E. L., U. S. Dept. Agr., Farmers' Bull. 630, pp. 14-15, 1915.

ORCHARD ORIOLE: *Icterus spurius* (Linnaeus).

State records.—The orchard oriole is an abundant and generally distributed summer resident. Migrants from the south appear the first or second week in April, having been noted at Greensboro, April 6 (1890), April 12 (1891), and April 9 (1893); at Montgomery, April 11 (1908), and at Leighton, April 12. In the fall this species departs early, and is rarely seen after the 15th or 20th of August. Nesting begins late in May, fresh eggs having been taken at Leighton May 20 and June 5; and at Barachias May 25 and June 6.

General habits.—The orchard oriole is found about nearly every village and town, frequenting orchards, dooryards, hedges, and cultivated fields where there are suitable trees in which it may nest. On account of its habit of fastening its nest near the extremity of a slender limb, it is sometimes called "swinger." The bird is of a sociable nature and often nests in the same tree with the kingbird, robin, chipping sparrow, or other species. It is a restless, impulsive creature, pouring forth its rich song with great ardor, often as it flies from tree to tree. The song has a peculiar metallic quality which distinguishes it at once from that of the Baltimore oriole.

The nests are deeply cup-shaped, deftly woven of wiry grasses picked while green, sometimes lined with plant down; placed in small trees or bushes from 6 to 40 feet from the ground. In the South the nests are not infrequently built in bunches of Spanish "moss."

Food habits.—The food habits of this oriole show it to be one of the most useful birds on the farm. Its diet is composed principally of insects, including caterpillars, Mayflies, grasshoppers, beetles, rose bugs, cankerworms, cabbage worms, and ants. It is a persistent hunter of boll weevils, and is one of the few birds that has learned to seek out and destroy this pest where it hides in the cotton squares. Nearly one-third of the stomachs of this species taken in the Texas cotton fields contained boll weevils; the average number of weevils found in a stomach was 2 and individuals birds had eaten as many as 13 weevils at a meal. With such a record, this bird should receive all the protection possible.

BALTIMORE ORIOLE: *Icterus galbula* (Linnaeus).

State records.—The Baltimore oriole, often known as fire-bird or hang-nest, is rather rare in Alabama, occurring as a spring and fall migrant and breeding sparingly in the northern half of the State. It is recorded as breeding in moderate numbers at Leighton and rarely at Bridgeport and Smelley. At Greensboro, Dr. Avery states that it bred rather commonly prior to 1870, but by 1890 was not to be found, except in autumn migration. The species is recorded as arriving in spring at Leighton, April 18; Smelley, April 19; Sand Mountain (Jackson County), April 20; York, April 29; and Hollins, May 1. It leaves for the South in fall during September, the last having been noted at Greensboro, September 23 (1890). Incubated eggs were found at Leighton, May 15 and fresh eggs, May 20.

General habits.—The Baltimore oriole is a lover of tall trees, particularly elms and sycamores, to the long pendant branches of which it hangs its nest, out of reach of practically every enemy. It is fond of the society of man and regularly makes its home in dooryards or along village streets. Its song is a loud, prolonged, cheerful warble, often uttered while on the wing, and between the strains of the song the bird keeps up a more or less continuous series of *chirrup*s or whistles. The young while in the nest cry almost continuously for food, and even after leaving the nest keep up their monotonous whining.

The nest is a deep, purse-shaped bag, woven of plant fibers, twine, horse hair, or similar material and swung from near the extremity of a slender limb, from 10 to 40 feet above the ground. It is deeper than that of the orchard oriole, being sometimes as deep as 9 inches, and is almost always truly pen-sile, not supported on sides or bottom.

Food habits.—Like the orchard oriole, this species is a great destroyer of insect pests. It is especially fond of caterpillars, and consumes, also, large numbers of beetles, weevils, wasps, bugs, flies, grasshoppers, and locusts. About one-sixth of its food consists of vegetable matter, mainly fruit, with some grain and weed seed. Cherries, raspberries, mulberries, huckleberries, elderberries, and June berries have been found

in their stomachs, but scarcely any damage to cultivated fruit is ever reported. As a destroyer of boll weevils it rivals the orchard oriole, nearly half of the Baltimore orioles taken in the Texas cottonfields having fed on this insect.

RUSTY BLACKBIRD: *Euphagus carolinus* (Muller).

State records.—The rusty blackbird is an irregular winter visitor, but occurs at times in considerable numbers. McCormack records it as rare at Leighton, having been seen only twice—November 28, 1887 (3), and November 24, 1891 (1). Dr. Avery likewise found it rare at Greensboro, having seen one there, November 16, 1891, and collected one, 12 miles southwest of the town, on February 28, 1891. Brown records the species "not very common" at Coosada, where it was seen as late as the middle of April.* In Autauga County, Golsan reports that flocks of 20 to 40, or sometimes as many as 150 are frequently seen between November 8 and March 9. I observed a small flock at Speigner, December 13, 1916.

General habits.—The rusty blackbird is about the size of the red-wing and often associates in flocks with that or other species of blackbirds. It frequents wet pastures, the borders of swampy woodland, and sometimes cultivated fields or barnyards. It feeds chiefly on the ground in moist situations. Its alarm note is a low *chuck* and the song, as described by Langille, resembles that of the red-wing, "but far less musical, being more of a sharp, metallic clatter, interspersed with loud squealing, and almost destitute of the liquid, warbling notes so peculiar to that species."†

Food habits.—More than half the food of this blackbird consists of animal matter, chiefly insects, among which beetles, grasshoppers, and caterpillars are most frequently taken. Corn and other grain, and weed seed, make up the bulk of the vegetable food. As the bird occurs in the South only in winter, it does no damage to crops, and since it is known to eat the boll weevil it is to be considered a beneficial species and worthy of protection.

*Brown, N. C., Bull. Nuttall Ornith. Club, vol. 4, p. 10, 1879.

†Langille, J. H., Our birds in their haunts, p. 221, 1884.

PURPLE GRACKLE; CROW BLACKBIRD: *Quiscalus*
quiscula ridgwayi Oberholser.‡

State records.—The purple grackle is common in nearly all parts of Alabama, but is much more abundant in winter than in summer. It occurs over the greater part of the State as a breeder, at least as far south as Autauga and Montgomery Counties, and from there southward gradually merges into the subspecies *quiscula*, which occupies the coast region. Breeding specimens have been examined from Florence, Leighton, Auburn, Greensboro, Attalla, and Autaugaville, and Ridgway furnishes breeding records at Anniston and Coosada.** A specimen taken at Carlton, February 29, 1912, should probably be considered a migrant. The birds breeding at Leighton and Florence and intermediate between *ridgwayi* and *aeneus* but nearer the former.

McCormack states that most of the grackles disappear from Colbert County during July and hardly any are seen during August, September, and the first half of October. He adds:

Large flocks arrive in fall as soon as cool or disagreeable weather sets in, or about the last week in October, and from that time until the following spring, particularly in the coldest weather, immense flocks may be met with. By the middle or latter part of March, the greater number have left for the North.*

This species nests in scattered colonies; the breeding season begins in April, eggs having been found at Greensboro, April 25 (Avery); Autaugaville, April 28 (Golsan); and Leighton, May 14 (McCormack).

General habits.—In the breeding season these blackbirds are not very conspicuous, being dispersed over the country in pairs or small colonies and occupied with the care of their young. By midsummer, however, when the young are strong of wing, they begin to gather into flocks and roam about the country in search of good feeding grounds, and in fall when cold weather sets in, their numbers are greatly augmented by the arrival of

‡*Quiscalus quiscula quiscula* of the A. O. U. Check-list; for change of name see The

**Ridgway, R., Bull. 50, U. S. Nat. Mus., Part 2, p. 216, 1902.
Auk, vol. 36, p. 269, 1919; and vol. 37, p. 280, 1920.

*Leighton (Ala.) News, vol. 2, No. 19, Oct. 1, 1891.

large flocks from the northern States. Dr. Avery, in his notes, says of this bird: "Not so common as it was when the country was first settled; 45 years ago [1842], it was one of the greatest pests the planter had to encounter; it pulled up acres of corn as soon as the leaves appeared above the ground. Children were employed to scare the crow blackbirds from the cornfields and numbers were shot, without apparent diminution of the individuals composing their ranks."

Grackles feed in a variety of situations, pastures, cultivated fields, barnyards, open woodland, and the shores of ponds. They roost at night, except during the breeding season, in great companies, usually in a reedy marsh, but sometimes in willows or evergreen trees. The nests are usually placed in the upper branches of evergreens, more rarely in tall bushes or in hollow stumps (as observed at Autaugaville).

The alarm note of this bird is a harsh *chuck*, similar to that of the red-wing, but louder and lower-pitched; the song is likewise rather harsh and unmusical, resembling somewhat the creaking of a rusty hinge.

Food habits.—These birds sometimes do considerable damage to corn, both at planting time and when "in the milk." Corn is eaten during every month in the year and furnishes over one-third of their food, but the greatest quantity is taken in fall and winter, and is doubtless mainly waste grain. The animal food of the grackle amounts to nearly one-third of the total, and as most of this consists of injurious insects, it must stand to the credit of the bird. Among the insects eaten are beetles, grubs, caterpillars, grasshoppers, and boll weevils. The birds are particularly fond of following the plowman and picking up from the furrows larvae of ground beetles and other insects. Most of the boll weevils taken are secured from rubbish in the fields during winter or early spring. Crawfish also are frequently captured, and Dr. Avery records observing grackles carrying these crustaceans a distance of a mile to feed to their young. Prof. Beal, in summarizing the economic relations of this bird, says:

The examination of the food of the blackbirds has shown that they * * * are most emphatically useful birds—so useful

that no general war of extermination should be waged against them. This does not mean that they do no harm, or that they should be permitted to do harm without restraint. A bird whose diet contains 46.5 per cent of grain must be capable of considerable damage in any section of the country where grain is an important crop; and when blackbirds descend upon a corn or wheat field in flocks of hundreds or thousands, they inflict a real loss, from which the farmer should protect himself by any practicable means * * * The local ravages they commit are usually due to overcrowding in a restricted area, and when this occurs there is no doubt that their numbers should be reduced.*

FLORIDA GRACKLE: *Quiscalus quiscula quiscula*
(Linnaeus).†

State records.—The Florida grackle occurs in moderate numbers as a resident along the coast. Breeding specimens have been examined from Dothan, Bayou Labatre, and Dauphin Island. In fall and winter these grackles gather into flocks, but are not nearly so numerous as the other races farther north. At Nigger Lake, November 30, 1915, I saw a flock of 100 or more and in Duckers Bay, December 3, 1915, about 50 were noted flying to roost at dusk. Five or six birds were seen at Bayou Labatre, February 16, and about ten at Bay Minette, March 28 (1912). In a slough on Dauphin Island, May 18, 1911, a small colony was found nesting in bunches of moss in trees; the old birds were feeding young in the nest. At Dothan, June 6, 1911, good-sized young were flying about.

General habits.—The habits of the Florida grackle are very similar to those of the more northern races. During the breeding season the birds are found chiefly around small wooded swamps on cultivated lands; they feed both in fields and on the muddy shores of the bays and inlets.

BRONZED GRACKLE; CROW BLACKBIRD: *Quiscalus quiscula aeneus* Ridgway.

State records.—The bronzed grackle—very similar in appearance to the purple grackle—is found as a migrant over

*Beal, F. E. L., Biol. Surv. Bull. 18, p. 69, 1900.

†*Quiscalus quiscula aglaeus* of the A. O. U. Check-list; for change of name see The Auk, vol. 36, p. 269, 1919.

the greater part of Alabama. Specimens of typical *aeneus* have been examined from Uniontown (March 1); Autaugaville (April 2); Prattville (February 25, December 26); Barachias (November 18); Greensboro (July 17, December, January, February); Carlton (March 5, 7); Woodville (March 10), and Leighton (April 20); a bird taken at Leighton April 30 is intermediate between this form and *ridgwayi*, but nearer *aeneus*. A specimen in the Avery collection, taken at Greensboro, July 17, 1889, was probably a wanderer from some more northern locality. Doubtless the large flocks found in the State during autumn and winter contain a considerable proportion of individuals of this subspecies.

The habits of this race are closely similar to those of the purple grackle, *Quiscalus q. ridgwayi*.

BOAT-TAILED GRACKLE; "JACKDAW:" *Megaquiscalus major major* (Vieillot).

State records.—The boat-tailed grackle (fig. 12) is a fairly common resident on the coast, but so far as known does not range into the interior. In Mobile Bay and the smaller bays at its head the bird is locally common, and it breeds also at Alabama Port and in suitable situations in the other bays and on the outer islands. Numbers were seen on Petit Bois Island in June, 1914 (Peters), July and August, 1911 (Gutsell), and on February 12, 1912. Dr. Avery noted a few on Dauphin Island, September 21, 1892, and I saw several small flocks in Bay John in October, 1908. At Bayou Labatre, in November, 1915, the bird was frequently seen on the shores of the Sound, and in Duckers Bay, December 2 to 4, 1915, it was common. In Polecat Bay, May 9, 1911, I found 3 nests and in Chuckvee Bay, May 12, several colonies, one numbering 10 or 12 nests. Most of the nests at this date contained 3 eggs in which incubation was slightly advanced; several, however, contained 3 young a few days old, and one, 4 young just hatched.

General habits.—This large grackle is in Alabama a strictly maritime bird and feeds chiefly about the coast marshes, the shallow bays, and the shores of Mississippi Sound. Like the other grackles, it is gregarious in habit and nests in small

FIG. 12.—Boat-tailed Grackle.

colonies in small patches of reeds or rushes growing in shallow water. The nests are rather bulky structures, composed of dry rushes with an inner layer of mud and a lining of grasses. When feeding, the birds travel in small and rather loose flocks, and most of their food is secured on the ground. They are rather noisy and their notes somewhat harsh, though less so, perhaps, than those of the purple grackle; one of these notes is described as "a noisy, clucking *clac-clac-clac*, frequently followed by a long-drawn whistle like *who-it, who-it*" (Bendire).

Food habits.—The food of this grackle, as might be expected from its littoral habits, contains a rather large element (15.6 per cent) of sea-food, crawfish, crabs, shrimps, snails, etc. A few lizards, batrachians, and small mammals are eaten, as also are many insects, including beetles, moths, grasshoppers, cotton-boll worms, and boll weevils. Corn was found in stomachs taken at all seasons, but most of those examined came from Texas, where the bird ranges in cultivated fields much more than it does in Alabama. Wherever abundant, however, this grackle is likely to do some damage to the corn crop. It takes some fruit also, such as figs and wild grapes, and occasionally eats pecans or other nuts.

FINCHES, SPARROWS, GROSBEAKS, ETC.: Family Fringillidae.

ENGLISH SPARROW: *Passer domesticus domesticus* .
(Linnaeus).

State records.—The English sparrow was first introduced into this country at Brooklyn, N. Y., in 1850. At first it spread rather slowly, but by 1880 it had reached northern and eastern Alabama, appearing in that year at Athens, Talladega, and Union Springs. In 1882, four birds were introduced at Eufaula and in 1883 the species appeared at Auburn, Anniston, Clayton and Tuscumbia.* It was first seen at Leighton in the summer of 1886 (McCormack). Since that time it has spread with marvelous rapidity and now occupies practically the entire State.

General habits.—The habits of the English sparrow are too well known to require any extended description. Essentially domestic, the bird occupies not only all the cities and towns,

*Ewing, H. E., The Auk, vol. 28, pp. 335-340, 1911.

but spreads far into the country and is found about practically all the farms. The species is strongly gregarious and in summer and fall large flocks visit the grain fields and consume great quantities of ripening grain. The birds roost in colonies in thick vines, crevices, and sheltered nooks about buildings, and when no better site can be found, in the bare branches of trees.

The nests are bulky structures of dry grass, straw, twine, and feathers; they are placed in a great variety of situations—bird boxes, nooks about the eaves of houses and barns, or vines climbing over a building being preferred; natural hollows in trees or old holes of woodpeckers also are used, and in many instances the nests are placed in the branches of trees. The eggs are 4 to 7 in number and three or more broods are reared each season.

Food habits.—This species is everywhere considered a pest on account of its destruction of grain, fruit, and garden crops, its defacement of buildings, its pugnacious disposition, and its attacks on the native wild birds. Within recent years, it has been found guilty on another charge—that of aiding in the dissemination of chicken mites, a serious pest in poultry yards.* It is possible, by concerted action on the part of any community, greatly to reduce the number of sparrows in a given locality, either by poisoning or trapping. Directions for destroying the birds are given in a publication prepared in the Biological Survey.†

PURPLE FINCH: *Carpodacus purpureus purpureus*
(Gmelin).

State records.—The purple finch is a rather uncommon winter resident in Alabama and a regular spring and fall migrant. McCormack observed it at Leighton from January 4 to March 16, 1890. I collected a specimen there, May 10, 1912, and saw another, April 22, 1914. Near Town Creek, December 19, 1915, I saw a flock of about 10 in an osage-orange hedge. Brown, at Coosada, says of it: "Rather uncommon during the winter; most numerous about the middle of March, when

*Ewing, H. E., *The Auk*, vol. 28, pp. 335-340, 1911.

†Dearborn, Ned., *The English sparrow as a pest*: Farmers' Bull. 493, U. S. Dept. Agr., repr. 1917.

the males begin to sing; stragglers seen a month later.”† At Auburn, March 4 to 7, 1912, I saw 4 birds in a dooryard in town feeding mainly on the lawn, and on the lower Tensaw River, March 20, observed a flock of 20 or more feeding in maple trees in the swamp. Miss Parkhurst reports the birds common at Talladega, especially when the elms are blooming; they were seen there in numbers, February 14, 1911. Graves reports them fairly common on Sand Mountain between March 17 and April 15, and Dr. Avery, at Greensboro, found them common some years, in others, rare. He took specimens there, December 13, 1889, March 2, 1890, and March 19, 1893. Dean reported the bird common at Anniston between January 30 and March 26, 1916.

General habits.—In the South this bird occurs mainly in good-sized flocks. It is most conspicuous during the spring migration, at which season the flocks visit the blossoming fruit, maple, and elm trees and indulge in a medley of music. The song is a prolonged and spirited warble, quite similar to that of the warbling vireo, but louder and richer. In its summer home in the North the bird prefers orchards and door-yards, placing its nest in an evergreen tree.

Food habits.—The purple finch has a pronounced fondness for the buds and blossoms of various trees, and is often seen feeding on maple, elm, apple, cheery, or other fruit trees. While in some cases slight damage may result from this habit, usually a moderate pruning of the blossoms is a benefit rather than an injury to the fruit crop. Many seeds and berries are eaten also, including juniper, mountain ash, and dogwood berries, beechnuts, thorn apples, frost grapes, mulberries, and the seeds of ash, elm, sycamore, tulip, ironwood, and hemlock. The bird destroys some weed seed, such as burdock and rag-weed.

CROSSBILL: *Loxia curvirostra pusilla* Gloger.‡

State records.—There are only two records of the crossbill from Alabama, but the species doubtless occurs frequently in

†Brown, N. C., Bull. Nutt. Ornith. Club, vol. 4, p. 7, 1879.

‡*Loxia curvirostra* minor of the A. O. U. Check-list; for change of name, see The Auk, vol. 40, p. 681, 1923.

cold winters. L. S. Golsan states that a flock of 25 or 30 appeared in a juniper tree near his home, 4 miles from Autaugaville, about 1883; several were shot and caused considerable comment by their crossed bills.** E. W. Graves observed a flock of about 8 at his home on Sand Mountain, near Carpenter, the last of January, 1913.

General habits.—The crossbills are birds of curious habits and are very erratic in their movements. They breed usually late in winter or very early in spring, when snow covers the ground, but occasionally later in spring or in summer, and wandering companies of nonbreeding birds often remain south of their breeding grounds until May or June.

The birds are usually rather shy, but, on the contrary, are sometimes so tame as to permit of their capture with the hand or a butterfly net. They travel in small flocks and always seem restless and nervous, flying frequently from place to place, uttering the while a sharp chipping note. They are very partial to evergreen trees, upon the seeds of which they feed. The crossed bill is used not only to tear open the cones, but also, after the manner of parrots, to aid in climbing.

Food habits.—This species feeds mainly on the seeds of various evergreens—pines, firs, spruces, tamarack, arborvitae, and hemlock; Knight states that he has seen the birds eating larvae of a butterfly (*Vanessa antiopa*) and small green lice, and has known them to take the buds of elm, maple, birch, poplar, and willow.*

REDPOLL: *Acanthis linaria linaria* (Linnaeus).

State records.—The redpoll occurs only very irregularly in Alabama. F. T. Park records the capture of a specimen near Stevenson, in September, 1874,† but the early date of this record suggests the possibility of error. F. W. McCormack tells me that on January 20, 1893, during a severe cold spell, he observed two redpolls at Florence. These are the only records of the bird in the State.

General habits.—This hardy little bird, a member of the sparrow family, visits the United States only in winter. In

**Golsan and Holt, *The Auk*, vol. 31, p. 227, 1914.

*Knight, O. W., *Birds of Maine*, p. 378, 1908.

†Park, F. T., *The Auk*, vol. 10, p. 205, 1893.

habits it somewhat resembles the goldfinch, occurring in flocks in gardens, orchards, and dooryards. Its notes are described by Langille as *cree-cree-cree-cree*, *shree*, *shree*, *shree*, *shree*, in soft, lisping tones.

GOLDFINCH; "WILD CANARY;" THISTLE-BIRD:

Astragalinus tristis tristis (Linnaeus).

State records.—The goldfinch is a common migrant and winter resident over most of the State, and a moderately common breeder in the northern part. At Leighton, according to McCormack, it is rarely seen during the latter part of September and October, but appears in great abundance in November, and is common in flocks all winter and until late in April. It occurs there also during the breeding season, which extends usually from about June 20 through July and August. It is known also at that season at Elkmont, Stevenson, Fort Payne, Sand Mountain, Weogufka, Erin (Clay County), Anniston, Natural Bridge, Autaugaville, Greensboro, and other places. I found it scarce in winter along the coast, noting only a few at Orange Beach (January) and at Bayou LaBatre (February 9). On April 8, 1912, near Tuscaloosa, I observed a large flock, singing, and on April 27, at Auburn, a flock of about 20. Saunders records it very abundant at Woodbine in spring (March-June),† and Brannon states that it is usually seen at Montgomery in migration during the latter part of February.‡

The nesting season is late, extending from about June 20 to the last of August or even into September.

General habits.—The goldfinch is well known and generally beloved on account of its cheerful and confiding disposition. During winter, spring, and early summer it is found in flocks, visiting fields, gardens, hedges, and open groves. Its undulatory flight is characteristic, as are the notes uttered while on the wing—*per-chick-a-ree* or *I've cheated ye*. In summer, while still in flocks, the birds often indulge in a merry chorus, which is both vivacious and pleasing, the songs somewhat resembling those of the tame canary. The nests are placed in trees or bushes, from 5 to 30 feet from the ground.

†Saunders, A. A., *The Auk*, vol. 25, p. 419, 1908.

‡Brannon, P. A., *The Auk*, vol. 38, p. 464, 1921.

Food habits.—This species, like most of its relatives in the sparrow family, subsists largely on seeds. Its fondness for the seeds of the thistle has earned for it the name of “thistle-bird,” while in some sections it is known as “lettuce-bird” for a similar reason. Barrows says that in winter it eats the seeds of the birch and alder. Forbush says of it:

The food of the Goldfinch is largely that of a typical Sparrow, as it feeds much on the seeds of weeds * * * The seeds of wild clematis, wild sunflowers, and ragweed are much sought by them. Goldfinches feed their young largely on plant lice, caterpillars, small grasshoppers, and beetles. During the spring * * * they feed considerably on canker-worms. * * * They subsist largely in winter on the seeds of birches and those of the button-bush, as well as on weed seeds.*

PINE SISKIN: *Spinus pinus pinus* (Wilson).

State records.—The siskin, or pine linnet, occurs as a rather uncommon or irregular winter visitant. According to Avery it is abundant some years and rare others. He met with it at Greensboro chiefly in spring migration, seen March 29, 1888, and specimens taken February 24 and April 14, 1890. At Auburn, March 6 and 9, 1912, I observed a flock of about a dozen in deciduous trees on the grounds of the Experiment Station. On Sand Mountain, in Jackson County, I saw several flocks of 6 to 20, October 26 and 31 and November 3, 1916; and at Abbeville, November 23, 1916, a flock of 6. Holt saw two at Jackson, April 3, 1912, and Miss Parkhurst reports seeing numbers of siskins at Talladega, November 29, 1908, and January 1, 1909. On Sipsey Fork, near Mellville, May 1 to 5, 1914, Peters observed a flock of about 20 on several occasions, and secured one specimen. L. S. Golsan took one, also, at Prattville, April 25, 1914, from a flock of 10 or 15, and two near Booth, November 18, 1916, from a flock of about 30. Apparently there was a large invasion of these birds during the winter of 1922-23, for at Anniston, between December 24, 1922 and May 11, 1923, R. H. Dean observed them in flocks varying from 3 to 100 or more.† At Auburn, between Feb-

*Forbush, E. H., *Useful birds and their protection*, pp. 222-223, 1907.

†Bird-Lore, vol. 25, pp. 394-395, 1923.

ruary 26 and March 7, 1923, 99 skins were banded on the grounds of the Alabama Polytechnic Institute.†

General habits.—This bird is very erratic in its movements, appearing irregularly in winter throughout the greater part of the United States. It resembles the goldfinch in habits, but remains in more closely massed flocks and lacks the cheery musical notes of its brightly colored relative.

Food habits.—The skin feeds largely on seeds, as those of the sweetgum, alder, birch, fir, larch, pine, and juniper; also buds of spruce and maple; and weed seeds, including those of thistle, dandelion, ragweed, and sunflower.

VESPER SPARROW: *Poocetes gramineus gramineus*
(Gmelin).

State records.—The vesper sparrow, grass finch, or bay-winged bunting (fig. 13), as it is variously called, is an abundant winter resident over most of the State. At Leighton, McCormack has recorded it between November 1 and April 9; and at Greensboro, Dr. Avery gives it as an abundant winter resident. The species was not common in the coast region in January and February and only a few were seen at Bayou Labatre, March 23, 1912, and November 19, 1915. It was seen in numbers, however, at Carlton in March, and at Abbeville and Ashford in November. At Auburn, March 4 to 10, 1912, it was abundant.

Avery reports the arrival of fall migrants at Greensboro between October 21 and 25, and Golsan saw the first at Autaugaville October 22 (1915). The last birds were seen at Leighton on April 9; a very late migrant was taken at Auburn, May 7, 1914.

General habits.—The grass finch is a bird of the open, upland country, found in winter often in large flocks in pastures and cultivated fields and along roadsides. The birds run rapidly on the ground, and upon taking flight, display the white outer tail-feathers. At Auburn, March 4 to 10, 1912, many were singing in concert, though not so strongly as they do later in the season on their breeding grounds. The song

†Robinson, Wilson Bull., vol. 35, p. 112, June, 1923.

FIG. 13.—Vesper Sparrow.

is a short, simple, plaintive melody, delivered from a fence post or low limb of a tree, often many times repeated from the same perch.

Food habits.—The food of this sparrow, as studied in the Biological Survey, consisted of insects (31 per cent), grain (11 per cent), grass seed (16 per cent), and weed seed (42 per cent). Of the insect food, beetles, grasshoppers, and caterpillars form the largest part. Like most of its tribe, it is a beneficial bird on the farm.

SAVANNAH SPARROW: *Passerculus sandwichensis savanna* (Wilson).

State records.—The Savannah sparrow (fig. 14) is a common winter resident and in migration is often abundant. Four or five were seen on Petit Bois Island, February 12, 1912, and several at Bayou Labatre, February 15, 1912, and November 19, 1915. It is more common in the interior than on the coast, having been observed at York (February), Carlton (March), Uniontown (March), Auburn (March), Jackson (April 3, December 10), Barachias (December 12, April 24 to May 6), and Leighton (October 18 to April 30).

Migrants from the north arrive in the fall about the middle of October and remain until the last of April. Stragglers may be seen even in May, Dr. Avery having taken two at Greensboro, May 11, 1889. He notes the Savannah sparrow's arrival there in autumn, October 18, 1888, and October 30, 1889. I saw several at Fairhope, October 16, 1908.

General habits.—This little sparrow is found in winter in scattered companies in meadows and cultivated fields, where it runs about like a mouse with lowered head and tail, and when hard pressed flies only a short distance. It rarely seeks a higher perch than a fence post or stone wall, from which it delivers its weak, insectlike song—described by Hoffman as *tsip-tsip-tsip, tseeeeee, tse-ee-ee*.

Food habits.—The food contents of 119 stomachs of this bird examined in the Biological Survey consisted of 46 per cent of animal matter (insects and their allies), and 54 per cent vegetable (practically all seeds). Beetles constituted the most important element of the insect food, having been

FIG. 14.—Savannah Sparrow.

taken at all seasons, but chiefly during the warmer months. The bird is fond also of weevils, and consumes a good many cotton-boll weevils during the winter months. One bird collected in a Louisiana cotton field had eaten 7 of these insects, and others smaller numbers. Wherever it is numerous, the Savannah sparrow is highly beneficial to the cotton grower. Its consumption of seeds is likewise of a beneficial nature, since it takes mainly grass and weed seed and only a very small proportion of waste wheat and oats.

GRASSHOPPER SPARROW: *Ammodramus savannarum australis* Maynard.

State records.—The grasshopper sparrow is locally distributed as a summer resident, and sparingly present, also, in winter. McCormack has found it at Leighton only in summer; Avery records it as common in the "black lands" in southern Hale County, and he took specimens at Greensboro, November 30, 1891, and in January or February, 1890. Holt collected one at Jackson, February 20; one at Carlton, March 7; and one at Barachias, November 17 (1912). I saw a pair at Auburn, March 6, and a pair at Dothan, March 12 (1912). L. J. Goldman noted the species frequently at Ardell, March 20 to April 5, 1915. At Montgomery, April 19, 1912, there seemed to be a flight of the species, as I saw a dozen or more in a pasture on the river's edge opposite the town. Single individuals were collected at Ashford, November 30, 1916, and Coffee Island, near Coden, December 4, 1916.

Avery found a nest of this species on the prairie in southern Hale County, May 11, 1889, and McCormack has taken eggs at Leighton on June 15 and July 15. The bird breeds rather commonly in hay meadows on the prairie at Barachias, and young able to fly were seen there June 14, 1911.

General habits.—This little sparrow is a very inconspicuous member of the fauna; it is even shyer and more averse to taking flight than the Savannah sparrow, and rarely chooses a higher perch than a weed stalk or a fence from which to deliver its song. It lives in dry, upland grass fields and is rather local in distribution. Its weak, insectlike song, written by Chapman as *pit-tuck, zee-e-e-e-e-e-e-e-e*, gives the bird

its name of grasshopper sparrow. The nest is placed on the ground in a meadow, well concealed in the vegetation; it is composed of grasses and is arched over with them.

Food habits.—Although named grasshopper sparrow from its song, stomach examinations have shown this bird to merit the name also from its food habits, for grasshoppers constitute nearly one-fourth of its food. Caterpillars amount to 14 per cent of the total, and more than half of these are cut-worms. The army worm also is frequently eaten. The total animal matter in the stomachs examined amounted to 63 per cent.

Judd, after examining 170 stomachs, sums up the bird's economic relations as follows:

As a destroyer of insect pests the grasshopper sparrow is most efficient, * * * and both the vegetable and animal food considered, it seems to be individually the most useful species of bird whose food habits have thus far been investigated.*

HENSLOW SPARROW: *Nemospiza henslowii susurrans* (Brewster).†

State records.—The Henslow sparrow (fig. 15) is apparently an uncommon winter resident in the southern half of the State, but its shyness and retiring habits probably account in part for its apparent rarity. N. C. Brown took 10 specimens at Coosada between February 18 and April 4, 1878, in old fields of rice and broom sedge.‡ Dr. Avery found it rare and took only a single specimen, January 12, 1890, 12 miles southwest of Greensboro. One was taken by C. P. Rowley, at Gallion, April 26, 1894, one by Golsan at Autaugaville, March 11, 1915, one by Holt at Bay Minette, March 30, 1912, and several were seen by Holt and myself at Orange Beach, January 30, 1912.

General habits.—This little sparrow lives in fields of dense, matted grass, where it hides with great persistence, and when flushed flies only a few yards, then seeks shelter again under the vegetation and swiftly runs out of sight. It is rather

*Judd, S. D., The relation of sparrows to agriculture: Biol. Surv. Bull. 15, p. 63, 1901.

†*Passerherbulus henslowi henslowi* of the A. O. U. Check-list; for change of name see *The Auk*, vol. 35, p. 210, 1918; and vol. 36, p. 270, 1919.

‡Brown, N. C., Bull. Nuttall Ornith. Club, vol. 4, p. 8, 1879.

partial to wet situations, but is found to some extent in dry fields of broom sedge. The bird is a ground dweller and rarely aspires to a higher perch than a weed stalk or a small bush. Its song is very weak and inconspicuous, consisting of only two syllables, like *tee-wick*, which can be heard but a few rods away.

Food habits.—Little is known of the food habits of this bird; 4 stomachs from Virginia examined by Judd contained beetles, cut worms, grasshoppers, bugs, and blackberries.*

LECONTE SPARROW: *Passerherbulus lecontei*
(Audubon).

State records.—The LeConte sparrow is probably a rare and local winter visitant; it has been detected only once—by Nathan Clifford Brown—who took 7 specimens at Coosada, 3 during the latter half of February, and 4 during the first three weeks of March, 1878.

General habits.—This a very shy and elusive bird, and most difficult to flush from its retreats in thick grass. Loomis found them in winter in South Carolina living in neglected old fields, grown up to briars and broom sedge. He says: "When not concealed, but in short grass, they are very tame, allowing one to approach within a few feet, and then running off a little way and stopping to look back."†

In its summer home on the prairies of Dakota, Coues found the birds "in the deep green sea of waving grass that rolled over an extensive moist depression of the prairie."‡

Food habits.—Little is known of the food habits of this species. Loomis examined a number of stomachs in South Carolina and found in them several kinds of small seeds and gravel.

NELSON SPARROW: *Ammospiza caudacuta nelsoni*
(Allen).**

State records.—The Nelson sparrow, the interior form of the sharp-tailed sparrow, is a moderately common winter visi-

*Judd, S. D., Biol. Surv. Bull. 15, p. 63, 1901.

†Loomis, L. M., The Auk, vol. 2, p. 191, 1885.

‡Coues, Elliott, Birds of the Northwest, p. 185, 1874.

***Passerherbulus nelsoni nelsoni* of the A. O. U. Check-list; for change of name see The Auk, vol. 35, p. 210, 1918.

FIG. 15.—Henslow Sparrow.

tor, chiefly on the coast. In migration it is likely to be found almost anywhere in the State. It was common in dry, grassy spots around the marshes on Dauphin Island, February 12, 1912, and several specimens were secured on that date. Several were taken also near Bayou Labatre, May 16, 1911, and November 23 to 26, 1915, and one at Orange Beach, September 21, 1911.

General habits.—This species is a ground dweller and confined mostly to wet marshes or the dry grass bordering the marsh. It is shy and very averse to leaving the cover of the marsh grass, among which it runs like a mouse. During their stay in the South, these birds scarcely ever utter any notes. The song is described by Goss as "a short, weak, unmusical twittering warble."

Food habits.—Seven stomachs of this bird examined in the Biological Survey showed the food to consist of caterpillars, flies, weevils, crickets, army worms, small mollusks, and the seeds of grasses, including wild rice.

HOWELL SEASIDE SPARROW: *Thryospiza maritima howelli* (Griscom and Nichols).†

State records.—The Howell seaside sparrow, recently described from Alabama, is not generally distributed, but occurs in more or less isolated colonies along the coast. In the breeding season (May) I found none in any of the big marshes about Mobile Bay or at Bayou Labatre. It breeds commonly, however, at Alabama Port, and abundantly on Grande Batture Island, living in wet marshes and in low bushes growing on the beach. After the breeding season was over, in July and August, Gutsell found it abundant in the Bayou Labatre marshes and fairly common on Petit Bois Island. On Dauphin Island it breeds commonly and occurs also in winter; 8 to 10 were seen there on February 13, 1913. Several were secured at Bayou Labatre, February 15, 1912, and November 23, 1915. A few were seen at Bon Secour in October, 1908, and about 6 on Coffee Island near Coden, December 4, 1916. Although

†*Passerherbulus maritimus howelli* Griscom and Nichols, Abstr. Proc. Linnaean Soc. New York, No. 32, p. 22, November 3, 1920; type from Dauphin Island, Ala.

this bird is apparently less common in winter than in summer, it is not known to migrate regularly.

General habits.—Seaside sparrows are well named, for they are strictly confined to the salt or brackish marshes of the seashore or the rivers near the coast. The birds remain concealed in the dense marsh grass or rushes most of the time, but during the breeding season may be seen making short flights over the marsh, while the males frequently sing as they cling to the tops of the rushes. When flushed from their retreats they fly for only a short distance, just above the tops of the rushes, then suddenly drop into the cover of the marsh.

On warm days in winter occasional weak, squeaky, chippering songs may be heard from these sparrows; the full song is sweet, and though rather weak, may be heard at some little distance. It suggests a weak, distant song of the red-wing and has somewhat the same form as a meadowlark's song.

The nest of the seaside sparrow is rather bulky, constructed of coarse grasses, and placed on the ground in a bunch of marsh grass or in low bushes; no nests have as yet been found in Alabama.

Food habits.—The food of this sparrow consists mainly of insects inhabiting the salt marshes, among which are included grasshoppers, crickets, caterpillars, flies, moths, wasps, and weevils. Spiders, snails, small crabs, and mollusks are eaten, as well as some weed and grass seed.

LOUISIANA SEASIDE SPARROW: *Thryospiza maritima fisheri* (Chapman).‡

State record.—The Louisiana seaside sparrow breeds on the coast of Louisiana and eastern Texas; a single specimen was taken at Bayou Labatre, February 15, 1912, doubtless a straggler from its normal range.*

LARK SPARROW: *Chondestes grammacus grammacus* (Say).

State records.—The lark sparrow occurs as a rare and local summer resident. Dr. Avery found it breeding in southern

*Cf. Griscom and Nichols, Abstr. Proc. Linnaean Soc. New York, No. 32, p. 24, 1920.

‡*Passerherbulus maritimus fisheri* of the A. O. U. Check-list; for change of name see The Auk, vol. 35, p. 210, 1918.

Hale County, where he speaks of it as uncommon, occurring chiefly in the "black lands." He observed young birds with their parents in July, and took specimens August 1, 1890 (adult), and September 11, 1890 (young). C. S. Brimley took 4 specimens near Greensboro, August 16, 1890. Gutsell took 1 specimen, probably a migrant, on Petit Bois Island, August 30, 1911. Near Leighton, July 4, 1913, Holt picked up a dead specimen in the road, and the next day saw 2 more of the birds near the Tennessee River. I saw one near Leighton, April 25, 1914.

General habits.—The favorite haunts of this bird are prairies and meadows, but it is said to have a fondness, also, for cornfields. It lives on or near the ground and somewhat resembles the vesper sparrow in habits and appearance, though its rounded tail with white-tipped feathers suggests the mourning dove. The nest is placed on the ground at the foot of a weed or corn stalk, more rarely in a low bush.

The song, according to Ridgway—

is composed of a series of chants, each syllable rich, loud, and clear, interspersed with emotion trills. At the beginning the song reminds one somewhat of that of the Indigo Bird (*Passerina cyanea*), but the notes are louder and more metallic, and their delivery more vigorous.†

Food habits.—The food of this sparrow is composed of insects (27 per cent), and the seeds of grasses, weeds, and grain (73 per cent). Judd says of it: "The lark sparrow is, with the exception of the dickcissel and grasshopper sparrow, the most valuable grasshopper destroyer of all the native sparrows. More than half of its animal food (14 per cent of the total) consists of these insects, and in June they constitute 43 per cent of the diet."‡ In some sections of Illinois, according to H. K. Coale, this sparrow is called the "potato bird" from its habit of feeding on potato bugs. Mr. Coale adds that few survive the Paris green which they eat with the potato bugs.* If this habit is prevalent in Alabama, it may in part account for the rarity of the species there.

†Ridgway, R., Ornith. Illinois, vol. 1, pp. 263-264, 1889.

‡Judd, S. J., Biol. Surv. Bull. 15, p. 67, 1901.

*Coale, H. K., in Ridgway, op. cit., p. 264.

WHITE-CROWNED SPARROW: *Zonotrichia leucophrys*
(J. R. Forster).

State records.—The white-crowned sparrow migrates chiefly throughout the Mississippi Valley and westward, but is of casual occurrence in the Atlantic States. It is apparently very rare in Alabama, only two instances being known: R. H. Dean observed one bird at Anniston, November 12, 1916, and E. W. Graves saw one on Sand Mountain, near Carpenter, April 26, 1917.

General habits.—This species is similar in habits to the well-known white-throated sparrow. In winter it is found in small flocks, frequenting hedges, thickets, and low grounds grown up to rank grass and weeds.

WHITE-THROATED SPARROW: *Zonotrichia albicollis*
(Gmelin).

State records.—The white-throated sparrow occurs as an abundant migrant and winter resident. It has been observed in numbers at Jasper, Tuscaloosa, Autaugaville, Auburn, Dothan, Jackson, York, Ashford, and other places. Near the coast it is less common, only one having been seen at Orange Beach (December 8, 1915), and only a few at Mobile (March 24, 1912). James Newton Baskett, however, found the bird abundant in winter at Mobile.†

Migrants from the north are recorded as arriving at Greensboro, October 14 (1889), October 25 (1890), and October 27 (1893); and at Autaugaville, October 17 (1915). In spring the bulk of the birds leave by the last week of April, but a few linger even into May. I found them common at Leighton, May 1, saw a few at Florence, May 8 (1912), and one at Prattville Junction, May 9 (1914).

General habits.—The white-throat is found in winter in scattered flocks, chiefly in hedges, brush piles, thickets, and the borders of woodland. It is a quiet, industrious bird, spending much of its time in thickets scratching for food among the dry leaves. If alarmed, the birds fly up into the underbrush and give their characteristic metallic alarm note.

†Wilson Bull., vol. 6, p. 36, 1899.

During the spring migration the plaintive whistled song is frequently heard.

A single instance of this species summering in Alabama is recorded by L. S. Golsan, who observed a pair near Prattville on several occasions in June, 1921. No evidence of nesting, however, was found.‡

Food habits.—This sparrow feeds largely upon seeds of grass and weeds and on wild fruits and berries. It is particularly fond of berries, which in summer and autumn compose about a fourth of its food. At this time it eats the fruit of the blueberry, wild cherry, mountain ash, greenbrier, strawberry, spice bush, wild sarsaparilla, elder, blackberry, dogwood, and high bush cranberry. The principal weed seeds destroyed are those of ragweed and bindweed, these two elements forming a fourth of the food of the year. During October, ragweed alone constitutes 45 per cent of the food (Judd). The insect food comprises wasps, beetles, ants, and weevils, including the boll weevil.

[TREE SPARROW: *Spizella arborea arborea* (Wilson).*

The tree sparrow is a northern bird, breeding in northern Canada and wintering in the United States as far south as Arkansas and possibly northern Alabama. E. W. Graves has recorded it as common on Sand Mountain, near Carpenter, in December,† but he now believes that these records were based on erroneous identifications.]

CHIPPING SPARROW: *Spizella passerina passerina* (Bechstein).

State records.—The chipping sparrow is a common resident in nearly all sections. It is migratory in the northern part of its range, and during winter considerable numbers move southward into Alabama and other Southern States. At that season the species is abundant in the northern and middle parts of the State, but is rather less numerous on the coast. Large flock were seen at Auburn the first week in March and on Sand Mountain in April and November, smaller numbers at Jackson (February), Carlton (March), Barachias (Decem-

‡Golsan, L. S., *The Auk*, vol. 39, p. 263, 1922.

**Spizella monticola monticola* of the A. O. U. Check-list; for change of name see *The Auk*, vol. 37, p. 231, 1920.

†*Bird-Lore*, vol. 12, p. 30, 1910; vol. 14, p. 33, 1912.

ber and March), Autaugaville (April), Tuscaloosa (April), and Leighton (November). At Orange Beach, January 30; Whistler, February 5, 1912; and Bayou Labatre, December 3, 1916, small flocks were seen in the open pine flats. The bird occurs in the breeding season over most of the State, south at least to Castleberry. Fresh eggs have been found at Leighton April 2 and May 11, and at Autaugaville, May 17; a second brood is usually reared in July.

General habits.—The chipping sparrow is a sociable bird, often living in dooryards and village gardens and placing its nest in trees or vines close to a dwelling. It frequents also orchards and dry, open woodland, and feeds mainly on the ground in plowed fields, pastures, and farm land generally. The song is a monotonous and rather unmusical trill—a series of chips rapidly repeated. The nest is placed in a tree, bush, or vine, usually on a horizontal limb; it is generally of rather slight construction, made of grass stems or rootlets, and always well lined with hair; the eggs, 3 to 5 in number, are greenish blue with brownish or blackish markings. Late in summer and throughout the fall and winter these birds gather into loose flocks and visit pastures and cultivated lands, where they associate with other ground-dwelling sparrows.

Food habits.—Caterpillars are the favorite animal food of this sparrow and these include such pests as canker worms, currant worms, tent caterpillars, and the larvae of the gipsy moth, browntail moth, and tussock moth. In June, 93 per cent of the food consists of insects, of which 36 per cent is of grasshoppers, 25 per cent caterpillars, and 6 per cent leaf beetles. Of the vegetable food the greater part is grass seed, principally crabgrass—that pest of the lawn and garden—with the seeds of other weeds, and a small portion of grain.

FIELD SPARROW: *Spizella pusilla pusilla* (Wilson).

State records.—The field sparrow (fig. 16) is a common summer resident over the greater part of the State, with the exception of the coast region. In winter it is generally distributed and moderately numerous. It is known to breed at Elkmont, Huntsville, Fort Payne, Ardell, Dean, Auburn,

Montgomery, Autaugaville, Tuscaloosa, Greensboro, and Abbeville. The last-named place marks approximately the southern limit of the breeding range, and the species is rare so far south. In winter it has been observed in considerable numbers at Auburn, Coosada, Autaugaville, Hollins, Leighton, Sand Mountain, Jackson, and York. A few were seen at Ashford in November and a small flock at Orange Beach in January. Fresh eggs have been found at Leighton, April 22, May 9, June 4, and July 18; McCormack states that the nesting season continues until late in August.

General habits.—The field sparrow is well named, for it is a typical inhabitant of old, worn-out fields and bushy pastures. In winter it associates much with the chipping sparrow and other ground feeding species. It is much more shy and retiring than the chipping sparrow, and during the breeding season is found in wilder parts of the farm. The nest is placed on the ground or in low bushes; it is composed of grasses, weed stalks, rootlets, etc., and is lined with fine grasses and hair. The bird is a persistent and pleasing singer, rendering its simple lay at all hours of the day, even in the heat of midsummer. Its song is written by Langille: "*free-o, free-o, free-o, free-o, free, free, free, free, free, free*; the first four [notes] loud, well prolonged, and on a higher key, while the remaining notes run rapidly to a lower pitch, growing softer and weaker to the end, the last being barely perceptible at a short distance."*

Food habits.—The food habits of this species are similar to those of the chipping sparrow, but since it forages more in waste lands than in gardens it is of less economic importance. Nearly half of its food consists of animal matter, including various species of beetles, caterpillars, grasshoppers, leafhoppers, ants, flies, wasps, and spiders. Most of the vegetable food consists of the seed of grasses, as crabgrass, pigeon-grass, broom sedge, etc. A small quantity of grain is eaten, chiefly oats taken in summer on stubble.

*Langille, J. H., *Our birds in their haunts*, p. 379, 1884.

FIG. 16.—Field Sparrow.

SLATE-COLORED JUNCO; SNOWBIRD; *Junco hyemalis hyemalis* (Linnaeus).

State records.—The junco, or snowbird, as it is most often called, is a common winter resident from late in October to the middle of April. The species was found in abundance in winter and spring at Woodville, Florence, Ardell, Sand Mountain, Auburn, Autaugaville, Carlton, and Jackson, and in smaller numbers at York, Uniontown, and Dean. None were seen in the coast region.

First migrants from the north arrived at Leighton October 21 (1893), and at Greensboro October 25 (1890) and October 26 (1893). The last seen at Greensboro were noted by Avery, April 8 (1893), and the last at Leighton by McCormack, April 12 (1891). A few stragglers were noted by Holt at Myrtlewood, April 16, 1912, and by the writer on Sand Mountain (Jackson County), April 12 to 17, 1914.

General habits.—During the winter season the junco occurs in loose flocks, frequenting hedges, weedy fields, and the borders of woodland. It feeds largely on the ground and scratches among the dead leaves in its search for food. The flocks easily take alarm at the approach of a person and as they flit away they display their white outer tail feathers and utter their characteristic *tsip*. Langille describes the song as "a prolonged tintinnabulous twitter—a more musical rendering of the monotonous strokes in the plain melody of the chipping sparrow. Sometimes, however, one may surprise it in a soft, low warble, as if indulging in a musical soliloquy."*

Food habits.—During its stay in the South, the junco feeds almost entirely upon the seeds of various weeds and grasses, including amaranth, pigweed or lamb's-quarters, ragweed, crabgrass, pigeon-grass, purslane, broom sedge, Russian thistle, etc. A small proportion of grain is eaten, but not enough to counterbalance the good effect of the consumption of weed seed.

*Langille, J. H., *Our birds in their haunts*, p. 83, 1884.

BACHMAN SPARROW: *Peucaea aestivalis bachmanii*
(Audubon).

(PLATE I, FRONTISPIECE.)

State records.—The Bachman sparrow (see frontispiece) is a fairly common summer resident over most of the State and a rare winter resident in the southern part. N. C. Brown, writing from Coosada, says this bird is very rare in winter, but increases in numbers about the first week in March and becomes rather common. Its song was first heard on March 8. Dr. Avery, at Greensboro, took specimens throughout the winter (December 13; January 12; February 7) and found the bird abundant in summer. I saw two single birds at Ashford late in November. The species is known to breed at Elkmont, Sand Mountain (Jackson County), Guntersville, Ardell, Anniston, Wilsonville, Auburn, York, Woodbine, Autaugaaville, Weogufka, Erin (Clay County), Dothan, Castleberry, and Mobile. Avery found a number of nests at Greensboro and took eggs on April 30, May 8, June 6 and 23, and July 14. Fresh eggs were found at Leighton, July 3, and incubated eggs at Barachias, June 15.

General habits.—This sparrow inhabits open pine woods and pastures grown up with bushes or small trees. It is a quiet, retiring species but not very suspicious, and will often allow an observer to approach within a few feet. When startled from its nest in preference to flying it runs along the ground like a mouse, and utters a sound like the hissing of a snake. The nest, placed on the ground in dry, grassy fields, often among scattered old field pines, is composed of dry grasses, and lined with fine grass tops; it is cylindrical in shape and neatly roofed over; the eggs, 3 to 4 in number, are pure white.

The song, delivered at any time of day from a somewhat elevated perch, is easily the finest of any of the native sparrows' songs, being ranked by Chapman as even above the song of the hermit thrush. To my ear it suggests the song of the Bewick wren, but is louder and richer. The form frequently varies in a single individual and as it is pitched in several different keys, this adds to its musical effectiveness. In winter

the bird is very quiet and less conspicuous than ever, but is often seen feeding about fallen logs in open tracts of pine timber.

Food habits.—The food of this sparrow, as indicated by examination of 10 stomachs from Alabama, consisted of 58 per cent animal matter, and 42 per cent vegetable. The animal food included leaf-beetles, 9.3 per cent; other beetles, including weevils and longicorns, 23.1 per cent. Bugs constituted 12 per cent and the other food items were grasshoppers and crickets (5.7 per cent) with some snails, spiders, and millipeds. The vegetable food consisted principally of grass seed and the seeds of sedges; wood sorrel and Indian strawberry made up the remainder.

SONG SPARROW: *Melospiza melodia melodia* (Wilson).

State records.—The song sparrow (fig. 17) occurs in Alabama only in winter, when it is abundant in all sections except the coast region. It was found in numbers at Anniston (October 22), Sand Mountain (October 27), Autaugaville (November), Ashford (November), York (February), Auburn (March), and Dothan (March 13). Only two were observed at Orange Beach in January, two on Petit Bois Island, February 12, and two at Bayou Labatre, February 16 (1912). First arrivals in fall appeared at Leighton, October 17 (1891), Greensboro, October 24 (1890), and Autaugaville, October 17 (1915). The last in spring were seen at Leighton March 30 (1889), and at Anniston, March 26 (1916).

General habits.—During its stay in the South, the song sparrow lives in thickets, hedges, and brushy fields, particularly in low, wet spots overgrown with broom sedge or briars. It feeds chiefly on the ground, and when startled from an elevated perch always makes a dive for a thicket or brier patch. It is found in loose companies, but never in compact flocks. It sings a little on warm days in fall and early spring, but reserves most of its vocal efforts until it has reached its breeding grounds in the North. There it is well known and beloved for its sociable habits and its cheery song—one of the first to be heard at the breaking up of winter.

FIG. 17.—Song Sparrow.

The song is rendered in great variety—in fact, one scarcely ever hears two songs exactly alike from this species. It usually opens with three loud, resonant tones, often bell-like, sometimes double tones on the same pitch, followed by a somewhat confused warble, and ending with one or more single resonant notes or a trill. Although so endlessly varied, it has a characteristic quality easily recognized.

Food habits.—The food of this sparrow, as indicated by examination of over 400 stomachs, consists of 34 per cent animal matter, insects with occasionally a spider or snail; and 66 per cent vegetable matter, mostly seeds. Judd says of this bird's food:

Insects amount to about one-third of the annual diet, and from May to August, inclusive, when they are eaten most freely, compose more than half of the food. * * *

Of the vegetable portion * * * of the year's food, 3 per cent consists of ragweed, 5 per cent of grain, 16 per cent of polygonum [bindweed] and related seeds, 24 per cent of grass seed, and 18 per cent of miscellaneous seeds, such as those of wild sunflower, amaranth, lamb's-quarters, clover, gromwell, rib-grass, wild solanum [nightshade] purslane, spurge, wood sorrel, dandelion, chickweed, dock, and sheep-sorrel.*

LINCOLN SPARROW: *Melospiza lincolnii lincolnii*
(Audubon).

State records.—In southeastern United States the Lincoln sparrow occurs only as a migrant, and in Alabama there is but one record—that of a bird which I saw at Florence, May 4, 1912. This was closely observed through a field glass, but was not secured. Andrew Allison found the species not uncommon in spring migration in Tishomingo County, Mississippi, between April 23 and May 15, 1904.†

General habits.—The Lincoln sparrow much resembles the song sparrow in appearance and habits.

SWAMP SPARROW: *Melospiza georgiana* (Latham).

State records.—The swamp sparrow is a common winter resident throughout the State. Avery records it common at Greensboro, where he has observed it between October 25 and

*Judd, S. D., Biol. Surv. Bull. 15, pp. 83-84, 1901.

†Allison, A., The Auk, vol. 24, p. 21, 1907.

May 3. McCormack has seen it at Leighton at intervals between October 18 and April 25. I saw one at Fairhope, October 16, and several at Bon Secour, October 18 to 25, 1908. At Orange Beach, in January, 1912, it was fairly common in wet swamps. About 6 were seen on Petit Bois Island, February 12, 1912. The last seen in spring at Barachias was on May 1 (1913).

General habits.—This sparrow is found not only in swamps, but also in fields overgrown with brush and briers and particularly in wet patches of broom sedge. It feeds chiefly on the ground and threads its way silently through the brush like a mouse; it is frequently taken by mammal collectors in mouse traps set in weedy fields or in broom sedge. In its summer home in the North it lives in swamps and marshy meadows and places its nest on the ground or in a tussock of sedges. The song is described by Langille as a trill—"in a clear, whistling tone, sounding like *tswee-tswee-tswee-tswee-tswee-tswee-tswee-tswee*, quite sibilant, the notes being essentially the same as those of the chipping sparrow, only in much more prolonged and musical tones—a sort of enlarged and improved edition of it."‡

Food habits.—More than half the food of the swamp sparrow consists of the seeds of sedges, grasses, and weeds, chief among which are seeds of bindweed (*Polygonum*) and giant ragweed. The insect food includes grasshoppers, caterpillars, leaf beetles, weevils, bugs, ants, and flies.

FOX SPARROW: *Passerella iliaca iliaca* (Merrem).

State records.—The fox sparrow occurs sparingly as a winter resident. Brown records it rather common at Coosada and mentions seeing stragglers in an old rice field until the third week in March. McCormack found it rare at Leighton, where it was seen November 19, December 17, and March 17. Avery observed it at Greensboro on numerous dates between November 19 and February 7. Graves records it from Sand Mountain (March 27), Dean from Anniston (December 25), Saunders from Weogufka (March 11), Golsan from Prattville

‡Langille, J. H., *Our Birds in their Haunts*, pp. 199-200, 1884.

(December 3, February 15), and Miss Parkhurst from Talladega. Specimens were taken at Auburn, March 4, 1912; Woodville, March 12, 1915; Barachias, January 9, 1913; and Greenbrier Cove (Marshall County), November 8, 1916.

General habits.—This large and handsome sparrow is found chiefly along hedges and in thickets, in company with other species of sparrows. It feeds on the ground and is a persistent and vigorous scratcher among the dry leaves and rubbish. Its ordinary note is a faint *tsip* but when alarmed it utters a sharp *chuck*. Occasionally snatches of its beautiful song may be heard early in spring. This is described as being among the finest songs of any of the sparrows, loud, clear, and silvery toned.

Food habits.—Judd, in writing of the food habits of this sparrow, says:

The vegetable food differs from that of most other sparrows in that it contains less grass seed (only 1 per cent), less grain, and more fruit, ragweed, and polygonum. Half the food consists of ragweed and polygonum and more than a quarter of fruit * * *. It does no damage to cultivated fruit, though it occasionally eats the buds of peach trees and pear trees.*

It has been known to eat cedar berries, pokeberries, holly berries, and frost grapes.

TOWHEE; CHEWINK; JOREE: *Pipilo erythrophthalmus erythrophthalmus* (Linnaeus).

State records.—The northern race of the towhee, or chewink, is not known to breed in the State, but in winter may be found generally in all sections. Wintering individuals have been taken at Greensboro, December 29, 1891; Auburn, March 9, 1912; Orange Beach, January 31, 1912; Battle Wharf, April 27, 1892; Teasley Mill (Montgomery County), March 31, 1914; Ardell, March 28, 1915; Scottsboro, April 18, 1914; and Sand Mountain (near Carpenter), April 12, 1914.

General habits.—The towhee lives in bushy pastures, thickets, and brushy borders of woodland. It is a ground-dwelling bird and seeks its food largely in thickets and brush

*Judd, S. D., Biol. Surv. Bull. 15, p. 88, 1901.

piles, where it scratches vigorously among the dead leaves. Active, nervous, and rather shy, it flies when disturbed from bush to bush with a whirring of its short, rounded wings and a flashing of its white tail-feathers. Its alarm note is a sharp, ringing *che-wink* or *jo-ree*. In the nesting season the male bird mounts to a moderately high perch in a tree or bush and delivers its simple melody many times without moving. The song is melodious, but musically of no very striking character; it begins usually with two short, whistled notes, followed by a rather prolonged trill on a higher pitch.

Food habits.—The animal food of the towhee consists of beetle larvae, ants, moths, caterpillars, cockroaches, grasshoppers, flies, and earthworms. Its vegetable food consists largely of wild fruits and berries and weed seed. It has been accused of pulling up newly planted corn, but it is doubtful if any serious damage is done in this respect.

ALABAMA TOWHEE: *Pipilo erythrophthalmus canaster* Howell.†

State records.—The Alabama race of the towhee, only recently distinguished as a subspecies, occurs nearly throughout the State, both summer and winter, breeding locally in moderate numbers. Specimens have been examined from Orange Beach, Spring Hill, Dauphin Island, Castleberry, Seale, Wilsonville, Tuscaloosa, Jasper, Ardell, Anniston, Woodville, Leighton, and Elkmont. Those from the most northern counties are intermediate between *canaster* and *erythrophthalmus*, but rather nearer the former. Eggs have been taken at Autaugaville, May 7 and June 23; and at Florence, April 27 and May 12.

General habits.—The resident form of the towhee has red eyes, like the northern bird, but differs from it in having less white on the tail feathers and (in the females) grayer colors on the back. The songs and call notes are noticeably different from those of the northern race and the call note—*jo-ree*—is rendered practically as one syllable. Like the northern subspecies, this bird lives in brushy thickets, but in the

†*Pipilo erythrophthalmus canaster* Howell, Proc. Biol. Soc. Washington, vol. 26, p. 202, 1913; type from Spring Hill, Alabama.

coast region is most often found in the small wooded swamps which occur at frequent intervals. The nest, placed on the ground, usually at the foot of a small bush, is rather bulky, composed of dead leaves, strips of bark, and fine grasses.

CARDINAL; REDBIRD: *Richmondia cardinalis cardinalis* (Linnaeus).*

State records.—The cardinal is one of the most abundant and widely distributed birds of the State, and being non-migratory, is found in about equal abundance at all seasons.

According to N. C. Brown, mating begins about the middle of February, and the songs of the males are first heard at that time. Nest building does not begin, however, until April. Eggs have been found at Barachias, April 10; Leighton, April 13, May 17, and June 24; York, April 27; Woodbine, April 12; Autaugaville, April 18 and May 28; Castleberry, June 3; Sand Mountain (Jackson County), June 26; Greensboro, August 5, and Hayneville, August 6.

General habits.—The favorite haunts of the cardinal are brushy swamps and river-bottom thickets, and in such situations it is often abundant. Many birds, however, take up their abode in village or town dooryards, where they are much prized for their bright colors and sprightly songs. The species is not gregarious, but frequently several pairs occupy the same piece of woods. On several occasions the cardinal has been noted by the writer as the first bird to sing at daybreak. The song is quite varied, consisting of a series of clear, resonant whistles, the notes sometimes slurred, sometimes double, and often repeated rapidly 20 or more times. The nest is placed in a bush, usually 3 to 6 feet from the ground.

Food habits.—The food of the cardinal, as studied by McAtee, consists of about seven-tenths vegetable and three-tenths animal matter. Of the vegetable food, weeds and other seeds compose the largest part—about 36 per cent; wild fruit amounts to 24 per cent, and grain nearly 9 per cent. Most of the grain eaten is corn, with some oats, wheat, sorghum, and rice. Of the seeds and berries of wild fruit, those most

**Cardinalis cardinalis cardinalis* of the A. O. U. Check-list; for change of name, see The Auk, vol. 35, p. 500, 1918.

commonly eaten are wild grapes, dogwood berries, blackberries, raspberries, mulberries, hackberries, pokeberries, cherries, and the seeds of the spice bush, prickly pear (cactus), sumac, and poison ivy. McAtee, treating of the food habits of the cardinal, says:

The cardinal has been accused of pilfering certain grains, notably corn, to an injurious extent, which charge the evidence from stomach examinations [nearly 500 were examined] neither proves nor disproves. But in view of the fact that only 8.73 per cent of the total food is grain, and that more than half of that amount is waste, the loss is greatly overbalanced by the destruction of weed seeds alone, which compose more than half of the vegetable food. * * * since the cardinal, by its general food habits, does at least 15 times more good than harm, it must be classed among the very useful species. The following list of important pests the bird has been shown to prey upon is in itself sufficient proof of the cardinal's value. The list includes the Rocky Mountain locust, 17-year cicada, potato beetle, cotton worm, boll worm, cotton cutworm, cotton-boll weevil, codling moth, rose-beetle, cucumber beetle, fig eater, zebra caterpillar, plum scale, and other scale insects. A host of minor insect pests are attacked and the seeds of many noxious weeds are destroyed. The cardinal much more than pays its way and deserves and should receive strict protection.*

ROSE-BREASTED GROSBEAK: *Hedymeles ludoviciana*
(Linnaeus).†

State records.—The rose-breasted grosbeak occurs in Alabama as an uncommon migrant. McCormack has noted it only twice at Leighton—a pair April 25, 1890, and a male a few days later. Avery records it as a rare autumn migrant at Greensboro, seen September 23 and 25, 1890, September 26 and October 4, 1893. Holt saw it at Barachias, April 26, 1909, and May 2, 1913, and I took a male there, April 24, 1912. Several were seen or heard on Sipsey Fork, near Mellville, May 2 to 5, 1914, and one at Prattville Junction, May 9, 1914. Saunders found a few at Hollins between April 25 and May 4, 1908; Miss Parkhurst records one at Talladega, May 3, 1908; Graves saw one on Sand Mountain, May 7, 1911, and three

*McAtee, W. L., Biol. Surv. Bull. 32, pp. 24-25, 1908.

†*Zamelodia ludoviciana* of the A. O. U. Check-list; for change of name see *The Auk*, vol. 40, p. 523, 1923.

males, May 1, 1913; and Dean noted the species at Anniston, April 30 and May 7, 1916. There are three specimens in a collection of mounted birds taken at Point Clear.

General habits.—In its summer home in the North, this handsome bird dwells in woodlands, and is said to prefer second-growth timber which is somewhat wet or swampy. It nests also in orchards and parks and does not shun the vicinity of dwellings, but in spite of its conspicuous markings it is so shy and retiring that it is not often seen. Its ordinary call note is a thin, sharp *eeek*, not very noticeable, but quite unlike that of any other species. The song "strongly resembles the finest performance of the robin—only the warble is much more copious, continuously prolonged, and finely modulated with a peculiar richness, purity and sweet pathos in the tones * * *" (Langille). The male assists in incubation and often sings while on the nest.

Food habits.—According to Barrows, this grosbeak has a fondness for the buds and blossoms of fruit trees. It also helps itself to cherries, strawberries, and green peas. However, it is one of the few birds that regularly feeds on the potato-bug and is useful, also, in destroying other leaf-eating beetles.‡

McAtee found the food to be composed of about equal parts animal and vegetable matter; among the pests recorded as destroyed by this bird he mentions cucumber beetles, the hickory borer, plum curculio, Rocky Mountain locust, cankerworms, tent caterpillars, army worms, gipsy and brown-tailed moths, and the chinch bug.*

BLUE GROSBEAK: *Guiraca caerulea caerulea* (Linnaeus).

State records.—The blue grosbeak is a fairly common summer resident, but of somewhat local distribution. It has been found in nearly all parts of the State, but is rare in the northern counties as well as in the coast region; it is most numerous in the Central Prairie Belt. At Greensboro it is a common breeder, and at Montgomery and Barachias it is abundant. At Leighton it has been seen but twice—April 28, 1890, and

‡Barrows, W. B., *Michigan Bird Life*, p. 535, 1912.

*McAtee, W. L., *Biol. Surv. Bull.* 32, p. 57, 1908.

May 1, 1912. Graves saw one at Carpenter, in the Tennessee Valley, July 25, 1913. A pair was seen at Auburn, April 28, 1912, and again, May 7, 1914, evidently intending to breed. The bird has been seen in the breeding season, also, at Anniston, Ardell, Tuscaloosa, Erin (Clay County), Fitzpatrick, Hayneville, Castleberry, and Dauphin Island.

First arrivals in spring were noted at Greensboro April 18 (1891); at Barachias, April 18 (1908) and April 20 (1909); the last seen in fall at Greensboro was on September 26 (1890). Eggs have been found at Autaugaville, June 6; Greensboro, June 18 and August 2; and Montgomery, July 3.

The blue grosbeak is found about the borders of woodland and in fields grown up to bushes, briars, and weeds, seeming to prefer the vicinity of a stream. In central Alabama it lives on the prairies, and is frequently seen along the roadsides. In spite of its bright colors, it is not very conspicuous. Its voice is described by Ridgway as follows: "The usual note is a strong harsh *ptchick*, and the song of the male a very beautiful, though rather feeble, warble, somewhat like that of the Purple Finch, but bearing a slight resemblance also to that of the Rose-breasted Grosbeak."† The nests are placed in low trees, bushes, or blackberry briars, from 2 to 7 feet from the ground, constructed of leaves, paper, weeds, grass, etc., and lined with rootlets and hair.

Food habits.—The food of the blue grosbeak, as determined by McAtee from stomach examinations, is composed of two-thirds animal matter (insects) and one-third vegetable. Grain constitutes 14.25 per cent of the diet, but on account of the scattered distribution of the birds, no appreciable damage is done during most of the summer. Later, when they forage in flocks, they are said to do considerable injury. Weed seeds constitute 18 per cent of the total food, thus forming the principal element in the vegetable portion of the diet. The animal food consists mainly of snails, spiders, and various insects. Among the important pests eaten are grasshoppers, weevils, the purslane sphinx, and the cotton cutworm. Crickets and shorthorned grasshoppers are eagerly consumed, composing

†Ridgway, R., Ornith. of Illinois, vol. 1, p. 299, 1889..

27.2 per cent of the total food. Thirty-two of the 51 blue grosbeaks ate them, several taking nothing else. They are fed to the nestlings in generous measure, and without doubt are the most important single article of diet.‡

INDIGO BUNTING: *Passerina cyanea* (Linnaeus).

State records.—The indigo bird is an abundant summer resident in the northern and middle portions of the State. It does not breed in the southern counties, nor has it been seen there in migration. In the Talladega Mountains it ranges to the tops of the ridges, 1,800 feet altitude. It has been noted in the breeding season at Florence, Huntsville, Elkmont, Sand Mountain (Jackson County), Fort Payne, Erin (Clay County), Tuscaloosa, Greensboro, Seale, Barachias, and Autaugaville.

Migrants were noted as arriving at Greensboro, April 6 (1887) and April 15 (1893); Coosada, April 6 (1878); Barachias, April 13 (1909); Leighton, April 17 (1891); and Scottsboro, April 18 (1914). Most of the birds depart in September and the last are seen about the middle of October. Eggs have been found at Autaugaville, May 22; Barachias, June 4; Leighton, May 16, June 24, July 22, and August 12.

General habits.—This handsome little sparrow dwells in bushy pastures, second-growth sprout lands, and similar situations. It is in many sections very abundant but, in spite of its bright colors, attracts little attention. The male is a persistent singer throughout the season, even in the heat of the midsummer days; the song, delivered from a rather elevated perch on a tree or telegraph wire, has been described as "a sort of hurried warble, quite fluent, and yet seeming to stick in the throat a little" (Langille). The plain, brown-streaked female may be recognized by the peculiar *chink*, characteristic of the species. The nests are placed in bushes or blackberry briars, 3 to 4 feet from the ground.

Food habits.—Forbush states that the indigo bird feeds on caterpillars, grasshoppers, measuring worms, the larvae of butterflies and moths, and small beetles. "The larger part of its food consists of seeds, many of which are those of weeds.

‡McAtee, W. L., Biol. Surv. Bull. 32, pp. 78-85, 1908.

During its short stay with us it is one of the few useful species seen much about the garden, and is of some service in the orchard."*

PAINTED BUNTING; NONPAREIL: *Passerina ciris ciris* (Linnaeus).

State records.—The painted bunting, or nonpareil, although occurring in Mississippi and in the coast region of Georgia, is found in Alabama only as a rare straggler. The only records of its occurrence are from the vicinity of Mobile. Dr. A. K. Fisher observed a single male of this species, May 13, 1886, in the northern suburbs of Mobile. A bird answering the description of this species was reported to me from the vicinity of Mobile by A. B. Taylor, who stated that he observed it every spring near his home. This brilliant little bird has long been prized as a cage bird and many thousands were formerly trapped for that purpose. Whether this accounts for its scarcity in Alabama is not known.

General habits.—The painted bunting is said to inhabit thickets, hedges, and the borders of woodland, preferring the neighborhood of streams. Its song, according to Nuttall, much resembles that of the indigo bird, but is more feeble and concise.

DICKCISSEL: *Spiza americana* (Gmelin).

State records.—The dickcissel, or black-throated bunting, has a rather restricted distribution in Alabama. It occurs commonly as a summer resident in the Central Prairie Belt, but outside of this area is recorded only from Leighton and Talladega. It breeds at both these places and also in southern Hale County and at Autaugaville (rarely) and Barachias (abundantly). McCormack, writing in 1891, speaks of it as formerly rare at Leighton but increasing in numbers. Within a few years, however, the bird disappeared, probably because the clover fields in which it bred were turned to other crops; McCormack has not observed it in recent years, and I failed to find it there on several visits between 1911 and 1914. A

*Forbush, E. H., *Useful Birds and Their Protection*, p. 298, 1907.

specimen taken at Point Clear a number of years ago is now on exhibition in the mounted collection of James K. Glennon in the Point Clear Hotel.

McCormack noted this bird's arrival at Leighton on May 2 (1891), and states it is rarely seen after July. Avery saw the first arrivals at Greensboro on May 1 (1888).

General habits.—The dickcissel is of local distribution and of fluctuating abundance in the Eastern States; it is a prairie-loving bird, but also lives to some extent in clover fields and pastures in wooded regions. It dwells chiefly on or near the ground, and is usually satisfied with a low perch from which to render its song. The bird is not at all shy and is rather conspicuous by reason of the habit of sitting on top of a weed, bush, or stake, repeating its simple song many times in succession with characteristic emphasis. Ridgway writes it, *see, see,—dick, dick—cissel, cissel*, and this rendering has given the bird the name by which it is now known. "The nest is built of grasses, weed stalks, and leaves, lined with finer grasses and hair, and is placed usually in rank clover or among weeds and coarse grasses within a foot or two of the ground. Occasionally it is built in a rose bush or other small shrub, but always very low."*

Food habits.—Examination of 152 stomachs of this bird in the Biological Survey showed that the food consisted of 70 per cent animal matter (insects, with a few spiders); and 30 per cent vegetable. The vegetable food consisted mainly of millet, oats, and pigeon and other grasses. The insect food was chiefly grasshoppers, crickets, beetles, and moths. Speaking of its destruction of grasshoppers and crickets, Judd says: "From June to August, inclusive, half of its diet consists of these destructive insects. It feeds eagerly on short-horned grasshoppers (Acrididae), longhorned grasshoppers (Locustidae), and crickets (Gryllidae). The stomachs examined contained more crickets and long-horned grasshoppers than those of any other bird whose food habits have yet been investigated by this Department."† Prof. Forbes investigated the food of 11 specimens of this bird taken in an orchard in Illinois. Three-fourths of the stomach contents consisted of canker-

*Ridgway, R., *Birds of Illinois*, pp. 303, 304, 1889.

†Judd, S. D., *Biol. Surv. Bull.* 15, p. 91, 1901.

worms, cutworms, and other caterpillars, 9 per cent of beetles, and 7 per cent of snails.‡

TANAGERS: Family Tangaridae.

SCARLET TANAGER: *Piranga olivacea* (Gmelin).*

State records.—The scarlet tanager occurs sparingly as a migrant and as a breeder in the mountainous parts of Alabama (fig. 18). It is fairly common in summer on Sand Mountain, Lookout Mountain, Talladega Mountains, and Mount Weogufka. I saw several on Choccolocco Mountain near Anniston (June 8), one on Monte Sano near Huntsville (May 13), one at Squaw Shoals (June 3), and several near Guntersville (June 18). Holt observed one at Ardell, June 26, 1913. At Teasley Mill, Montgomery County, a male was observed daily from May 11 to 16, 1914, and the species may possibly have been breeding there. A male taken in spring (date not known) at Point Clear is in the mounted collection of James K. Glennon.

McCormack reports this species a rare spring migrant at Leighton, seen May 5, 1890, and April 27, 1893. I observed first arrivals there, April 22, 24, and 25, 1914. Avery found it at Greensboro both in spring and fall, noted April 27 and May 3, 1893; October 16, 1890; and September 18 to October 2, 1891. First arrivals in spring were reported at Shelby, April 16 (1898); Sand Mountain (near Carpenter), April 15 (1912), and April 19 (1914); Anniston, April 23 (1916); and Barachias, April 28 (1909), and April 24 (1912).

General habits.—This handsome bird is a dweller in deciduous woodland, and although not particularly shy, it is rarely found close to habitations. It is partial to oak or hickory timber and often lives in small groves or hedgerows. It is distinctly an arboreal species, ranging in the "upper stories" of the woodland and rarely descending to the ground. The song resembles that of the robin, but has a characteristic metallic twang to it, a ringing quality that appears also in the common alarm note—*chip-ch-r-r-r*. The nest is a rather frail,

‡Forbes, S. A., Amer. Agr., vol. 40, pp. 482-483, 1881.

**Piranga erythromelas* of the A. O. U. Check-list; for change of name see The Auk, vol. 37, p. 282, 1920.

shallow structure of small twigs and weed stalks, lined with fine rootlets or blossom stems, placed on a horizontal limb of a deciduous tree, from 7 to 30 or even sometimes 40 feet above the ground.

Food habits.—Forbush speaks of this tanager as “the appointed guardian of the oaks” and states that it captures many moths and other insects which infest these forest trees. He adds:

“As a caterpillar hunter the bird has few superiors. It is often very destructive to the gypsy moth, taking all stages but the eggs. * * * Leaf-rolling caterpillars it skillfully takes from the rolled leaves, and it also digs out the larvae of gall insects from their hiding places. Many other injurious larvae are taken. Wood-boring beetles, bark-boring beetles, and weevils form a considerable portion of its food during the months when these insects can be found. Click beetles, leaf-eating beetles and craneflies are greedily eaten.”†

This tanager occasionally takes a little fruit, as cherries, strawberries, mulberries, or huckleberries, but in the main it is insectivorous in its diet, and as indicated by the above quotation, decidedly beneficial.

SUMMER TANAGER; SUMMER REDBIRD; BEE-BIRD:
Piranga rubra rubra (Linnaeus).

State records.—The summer tanager is much commoner than the scarlet tanager and is generally distributed as a summer resident, but in the pine flats of the coast belt occurs only sparingly. First arrivals from the south appear usually the first week in April, having been noted at Coosada, March 31; Greensboro, April 3; Autaugaville, April 4; Tuscaloosa, April 7; Smelley, April 10, and Sand Mountain, April 12. The last seen in fall at Leighton was on October 8 and at Bon Secour on October 19. I took an adult male at Piedmont, October 20, 1916. Eggs have been found at York, May 14; Leighton, May 17 and June 8; Autaugaville, May 19; and Prattville, May 27.

General habits.—This tanager is found in rather open pine woods and seems to prefer tracts having an undergrowth of

†Forbush, E. H., *Useful Birds and their Protection*, pp. 213, 214.

FIG. 18.—Breeding area of the Scarlet Tanager (*Piranga olivacea*) in Alabama.

small oaks and hickories. It is not a shy bird and is more often found on the lower branches of trees than is the scarlet tanager. The alarm note is characteristic, written by Nuttall, "*tshicky-tukky-tuk*;" the song resembles that of the scarlet tanager, but is sweeter and lacks the metallic quality of the latter. The nest is placed on a horizontal limb of a tree, from 5 to 35 feet above the ground; it is rather shallow, composed of grasses and weed stalks, and is often so thin that the eggs may be seen from the ground beneath.

Food habits.—The food habits of this bird are not well known. Many observers have reported its habit of visiting bee hives and destroying the bees. It is said to feed also on beetles, wasps, tomato worms, and spiders, and on certain small wild fruits, as blackberries and whortleberries. Examination in the Biological Survey of 6 stomachs taken in Alabama showed that the bird has a decided preference for *Hymenoptera* (bees, wasps, etc.), these insects being present in 5 of the 6 stomachs in proportions varying from 70 to 98 per cent of the total content.

SWALLOWS AND MARTINS: Family Hirundinidae.

PURPLE MARTIN; BLACK MARTIN; GOURD MARTIN:
Progne subis subis (Linnaeus).

State records.—The purple martin is a common summer resident in all parts of the State, and is known to breed at Elkmont, Sand Mountain, Stevenson, Fort Payne, Guntersville, Natural Bridge, Ardell, Tuscaloosa, Abbeville, Dothan, Seale, Castleberry, Mobile and Bayou Labatre. It is one of the earliest of the spring migrants to arrive, having been noted at Carlton, March 4 (1912); Carrollton, March 9 (1887); Longview, March 9 (1917); Autaugaville, March 12 (1913); Coosada, March 13 (1878); Leighton, March 19 (1890); and Sand Mountain (near Carpenter), March 15 (1913). Late in summer, martins gather into flocks preparatory to their southward flight, which takes place quite early in fall. McCormack observed thousands of them feeding over a pasture at Leighton, August 3, 1889, and during the last few days of that month they were even more abundant; the last seen in

that locality were noted September 11. Holt observed a flock of several hundred at Tuscaloosa, July 22, 1913, gathered late in the afternoon over the center of the town. Eggs of this species have been found at Autaugaville, May 28, and at Barachias, June 14.

General habits.—The martin is a bird of the open country, found in abundance everywhere in cultivated regions of the State. Nesting as it does about dwellings and farm buildings, it is well known and universally beloved. Practically every farmyard has some provision for these birds in the way of nesting boxes, and even the rustic cabins of the negro field hands are not without their string of hollow gourds hung on a pole for the accommodation of the birds—a practice, Gosse tells us, learned from the Indians. At present this bird is mainly dependent for its nesting sites upon boxes or gourds put up for its accommodation; it is said, however, occasionally to nest in woodpecker holes.

Like the other members of its family, the martin takes its food entirely on the wing, coursing swiftly over pastures and cultivated lands in its pursuit of insects. The birds frequently alight on dead trees and just prior to the autumn migration they gather into large flocks and spend much time on these perches and about the spires of churches or other town buildings. At this season they roost at night in willows or other deciduous trees, or in long grass and reeds in marshes, retiring to the roost at dusk and leaving at break of day.

Food habits.—The food of the martin as determined by Prof. Beal, consists entirely of insects, with a few spiders. Hymenoptera—ants, bees, and wasps—furnish the largest item, amounting to 23 per cent of the total. The bird has frequently been accused of destroying honey bees, but examination of over 200 stomachs showed only 5 containing these insects, all of them drones. Flies, including many long-legged tipulids and some of the house-fly family, are eaten to a considerable extent, forming about 16 per cent of the food. Hemiptera, or bugs, including stink-bugs, tree hoppers, negro bugs, and one squash bug, were found in the stomachs and formed nearly 15 per cent. Beetles amounted to about 12 per cent and included May beetles, ground beetles, dung

beetles, the cotton-boll weevil, clover weevil, and other species destructive to nuts and seeds. Small moths are frequently eaten and butterflies occasionally. Dragonflies are a favorite food, having been found in 65 of the stomachs examined, 7 containing no other food.*

CLIFF SWALLOW: *Petrochelidon albifrons albifrons*
(Rafinesque).†

State records.—The cliff, or eaves, swallow is a common spring and autumn migrant, arriving on the coast about the last week in March and reaching the northern counties the first week in April. Migration continues during April and May and stragglers may be seen even as late as the first of June. At Leighton, April 30, 1912, I observed a flock of about a hundred of these swallows flying high over the fields. Small numbers were seen at Jasper, May 5, Auburn, May 7, and Autaugaville, May 10; a flock of 12 was seen at Seale May 19, and 1 bird, May 22 (1914). Peters saw one on Petit Bois Island, June 1, 1914, a very late date. Dr. Avery noted the bird only in spring at Greensboro, and his collection contains 1 specimen taken May 1, 1890. McCormack at Leighton noted its arrival in southward migration, July 22, 1891, and found it abundant from August 7 to 31, 1887. He states that it remains till the second week in September. The only place in the State where this bird is known to breed is on the high cliffs bordering the Tennessee River near Fort Deposit, where a colony of about a hundred pairs have established themselves. On June 18, 1913, large young could be seen in the nests of this colony.

General habits.—Cliff swallows are very sociable and unsuspicious birds, always found in rather large colonies, and often selecting for their nesting sites a building on the busy street of a town or the low eaves of a barn near which people are constantly passing. The nests are gourd-shaped structures of mud, plastered to the face of a cliff or the side of a building, usually protected from the weather by an over-

*Beal, F. E. L., Bull. 619, U. S. Dept. Agr., pp. 3-6, 1918.

†*Petrochelidon lunifrons lunifrons* of the A. O. U. Check-list; for change of name see The Auk, vol. 34, p. 205, 1917.

hanging ledge or by the projecting eaves. Telegraph wires are favorite perches, and often hundreds of the swallows may be seen at once perched on the wires in close ranks. They feed over pastures, cultivated lands, ponds, and rivers, taking their food chiefly on the wing; occasionally they alight on the ground to pick up food and to secure the mud used in constructing their nests. In the colony on the Tennessee River a pair of duck hawks were living in the same cliff, but no indication was evident of disagreement between the hawks and the swallows.

Food habits.—The food of the cliff swallow consists almost entirely of insects, most of them taken on the wing. Beetles, ants, bees, wasps, flies, and bugs make up the greater part of the food, and include such destructive species as the chinch bug and the cotton-boll weevil. During late summer and fall, when these swallows are moving southward in large flocks, they capture immense numbers of boll weevils over the cotton fields. Thirty-five birds shot in Texas in September had eaten a total of 678 weevils, one bird having consumed 48 of the insects at a single meal. Honey bees (all drones) were identified in 13 of the 375 stomachs examined.*

BARN SWALLOW: *Hirundo rustica erythrogastris*
Boddaert.†

State records.—The barn swallow occurs abundantly as a migrant and casually as a breeder in the northern part of the State. It is probably the most numerous of any of the swallows and remains for a longer period than the others. Migrants arrive in spring about the middle of April and are common for about a month. The southward movement begins the latter part of July and continues until the middle of September. McCormack records the bird at Leighton between April 15 and May 15 and between August 6 and September 13. Avery noted it at Greensboro during practically the same periods. First arrivals were seen at Sylacauga, April 14 (1908), Barachias, April 21 (1912), and Sand Mountain

*Cf. Beal, F. E. L., Food Habits of the Swallows; Bull. 619, U. S. Dept. Agr., pp. 6-11, 1918.

†*Hirundo erythrogastra* of the A. O. U. Check-list; for change of name see The Auk, vol. 35, p. 212, 1913.

(near Carpenter), April 22 (1911). Late migrants (single birds) were noted at Seale, May 19 and 20 (1914); Mobile, May 28 (1914), and Alabama Port, May 30 and June 5 (1914). Gutsell observed the first southbound migrants at Bayou Labatre, August 8, and found the species common at Orange Beach, September 9 to 21 (1911). Holt saw two migrating birds at Petit Bois Island between July 26 and 30 (1913).

Only one instance of this bird's breeding in the State is known. Under a bridge at Tuscumbia, May 15, 1892, F. W. McCormack found a nest with eggs. As the species is known to breed as far south as Nashville and Athens, Tennessee, it may again be found breeding occasionally in northern Alabama.

General habits.—The barn swallow is a familiar bird in the North, living about cultivated lands and entering with confidence the buildings of the farmer. The birds spend most of their daylight hours coursing swiftly over the fields, usually rather close to the ground, in pursuit of their insect prey. They develop greater speed and show more skill and grace in their evolutions than any of the other swallows. From time to time small parties gather on the ridge pole of a barn or some similar situation, where they preen their feathers, play together, and carry on a conversational twittering. The song, delivered both from these perches and on the wing, is a series of musical twitterings interspersed with a variety of liquid or guttural notes, the whole performance animated, cheerful, and very pleasing.

Breeding originally in caves and cliffs, the barn swallow now depends for nesting sites almost wholly upon farm buildings and bridges. The nests are semicup-shaped and rather shallow, constructed of alternate layers of mud and fine grasses and thickly lined with feathers.

Food habits.—The food of the barn swallow, as shown by the investigations of Prof. Beal, is composed almost entirely of animal matter—insects, with a few spiders and snails. *Diptera*, or flies, constitute the largest item, amounting to almost 40 per cent of the total. Beetles, including weevils, are next in order, reaching about 16 per cent of the total; the destructive cotton-boll weevil is eaten in considerable numbers

in the summer and fall, at the time when the insects are flying about considerably. Ants formed nearly 10 per cent of the food, and other Hymenoptera about 12 per cent; Hemiptera, or bugs, furnished 15 per cent, and included stink bugs, chinch bugs, plant lice, and leaf hoppers. Dragonflies are captured in some numbers.*

Forbush states that this bird is very serviceable in destroying the moths of the smaller cutworms found on grass lands. He adds that the birds gather codling moths, cankerworm moths, and tortriad or leaf-rolling moths from the orchard and that they catch also horseflies, house flies, mosquitoes, gnats, and crane flies.† Barrows states that barn swallows are very fond of the fruit of the bayberry or wax-myrtle and sometimes, during their autumn migration, alight by thousands on the low bushes and gorge themselves on the berries.‡

TREE SWALLOW; WHITE-BELLIED SWALLOW:

Iridoprocne bicolor (Vieillot).

State records.—The tree, or white-bellied, swallow occurs irregularly, but often in considerable numbers, in migration. It is the hardiest of its tribe and a few remain all winter on the Gulf coast. McCormack states that it reaches Leighton about the last week in March and remains in greater or lesser numbers during the whole of April. He has not observed it in fall. Golsan took one at Autaugaville, October 3, 1914, and I observed small flocks at Theodore, November 11, and at Bayou Labatre, November 19, 1915. A few were observed in Grand Bay, March 22, and several near Mobile, March 24 (1912). At Chuckvee Bay, Baldwin County, February 7, 1912, I saw 3 of these swallows and at the same place, March 16, a flock of about fifty. Four individuals were seen near Jasper, April 30, 1914, in a flock of barn swallows.

General habits.—In the North, this swallow is widely distributed, nesting not in colonies but in scattered pairs in woodpeckers' holes, in hollow trees and stumps, and also in bird boxes and in crevices about the eaves and corners of buildings.

*Beal, F. E. L., Bull. 619, U. S. Dept. Agr., pp. 11-15, 1918.

†Forbush, E. H., Useful birds and their protection, pp. 345-346, 1907.

‡Barrows, W. B., Michigan bird life, pp. 543-549, 1912.

Immediately after the breeding season, even by the first of July, these swallows gather into flocks and roost by night in the reeds in the marshes. Chapman says: "They migrate by day, leaving their roosting-ground in flocks which sometimes contain myriads, and, after attaining a great height, pursue their journey to the south."* Their flight is ordinarily performed at a moderate height, but not so low as the barn swallow. They do not fly so swiftly as the latter bird, and are much given to sailing about in circles. In the South in winter and during migration the birds feed about pastures, marshes, rice fields, and over bodies of water. Especially do they frequent tracts of bayberry or wax-myrtle bushes, the fruit of which in winter forms in some regions their principal food.

Food habits.—The tree swallow differs from the other swallows in that it feeds to a considerable extent on berries as well as insects. Examination of 343 stomachs in the Biological Survey showed the food of this species to consist of about 80 per cent animal matter and 20 per cent vegetable. Prof. Beal states that the vegetable food is made up of a few varieties of seeds and berries, but more than nine-tenths of it consists of the fruit of a single shrub, the bayberry, or waxberry (*Myrica carolinensis*). These berries were found in 70 stomachs, 30 of which contained no other food, and as they are eaten all the summer, at a time when insects are abundant, it is evident that they form a standard article of diet and are not a makeshift for lack of better food.†

Other berries, including those of the red cedar, dogwood, and Virginia creeper, are occasionally eaten. The habit of feeding on the berries of the wax myrtle makes it possible for the tree swallow to remain all winter in cold climes, even as far north as New Jersey. Of the insect food, flies comprise the largest item—over 40 per cent of the total. These include crane flies, horse flies, and house flies, the last being most numerous. Beetles, including the cotton-boll weevil and other destructive weevils, are extensively eaten. Other insects

*Chapman, F. M., *Handbook of Birds of Eastern North America*, p. 419, 1912.

†Beal, F. E. L., *Bull.* 619, U. S. Dept. Agr., p. 16, 1918.

taken by this swallow are ants, wild bees, wasps, leaf hoppers, plant lice, chinch bugs, dragonflies, and moths.‡

BANK SWALLOW; SAND MARTIN: *Riparia riparia riparia* (Linnaeus).

State records.—The bank swallow probably occurs regularly in migration, but is apparently not at all common. It should be carefully distinguished from the rough-winged swallow, which also nests in banks. The spring migration should bring the birds to Alabama by the last of March or first of April, but the only record in spring is that of two birds which we saw near Jasper, April 30, 1914—one of which we secured. Gutsell noted their appearance at Bayou Labatre, August 7, 1911, and found them there irregularly during that month. L. S. Golsan reports finding a small colony breeding in the bluffs along the Alabama River, at Washington Ferry, Autauga County, May 5, 1895, the only instance at present known. He caught one bird in his hand on the nest and carefully identified it.*

This species, as its name indicates, nests in holes in cut banks, usually in rather large colonies. The burrows are always at some distance from the foot of the bank, often within a few feet of the top, and usually 3 feet or more in depth; at the end of the cavity a nest of grasses and feathers usually is constructed in which the 4 to 6 white eggs are laid.

General habits.—The bank swallow, the smallest of its family, is a strongly gregarious species, found in flocks both in the breeding season and in winter. In migration it often travels with other species of swallows, flying usually at no great height with a rather unsteady, flickering flight. The birds frequent pastures and cultivated lands and are especially attracted by bodies of water.

Food habits.—The food of this swallow consists almost wholly of insects, with a few spiders. As with most of the other swallows, flies constitute the most important element, amounting to over one-fourth (26 per cent) of the total; house flies and crane flies are the kinds commonly taken. Beetles

‡Beal, *Op. cit.*, pp. 16-18.

*Golsan and Holt, *The Auk*, vol. 31, p. 230, 1914.

form nearly 20 per cent of the total and include such destructive species as the cotton-boll weevil, alfalfa weevil, rice weevil, and plum curculio. Twenty-five birds taken over the cotton fields of Texas in September were found to have eaten a total of 68 boll weevils, one bird having taken 14 of them.† Other insects eaten by the bank swallow are ants and other Hymenoptera, leaf hoppers, plant lice, dragonflies, Mayflies, and a few caterpillars.‡

ROUGH-WINGED SWALLOW; SAND MARTIN; GULLY
MARTIN: *Stelgidopteryx serripennis serripennis*
(Audubon).

State records.—The rough-winged swallow, the only swallow which nests regularly in the State, is a generally distributed and fairly common summer resident.

It arrives from the south the last of March or first of April. McCormack noted the first one at Leighton, April 6 (1893), and Avery records the first at Greensboro, April 15 (1893). Brown, at Coosada, noted its arrival on March 22, but states that it was not generally distributed until the first week in April. It probably leaves in autumn about the last of September.

General habits.—The rough-wing is not so gregarious as its relative the bank swallow, breeding usually in small colonies or in isolated pairs. It is the common "bank swallow" of the South, found usually in the vicinity of streams or ponds in nearly every locality. It spends much of its time in the air in search of food, but is often seen resting on telegraph wires or the dead branches of trees. Its flight is rather slow and somewhat erratic. Its notes are harsh and squeaky but not loud. In autumn the birds are said to gather into large flocks and to roost at night in their burrows.

The nests are placed in holes in cut banks, or in crevices in stone walls or cliffs. A most remarkable site selected by one or more pairs of these birds for their nest was on a buttress beneath the deck of a transfer steamboat which made daily trips on the Tennessee River from Guntersville to Hobbs:

†Howell, A. H., Biol. Surv. Bull. 29, p. 14, 1907.

‡Beal, F. E. L., Bull. 619, U. S. Dept. Agr., pp. 21-25, 1918.

Island, a distance of 24 miles, leaving at 10 a. m. and returning at 6 p. m. The birds, of course, followed the boat all the way to feed their young. A nest examined on the boat, June 19, 1913, contained young.

Food habits.—The food of the rough-winged swallow consists principally of insects, with a few spiders. Flies composed nearly one-third (32.89 per cent) of the total. Ants and other Hymenoptera are extensively eaten, and bugs to a lesser extent. Beetles amounted to nearly 15 per cent of the food and included the cotton-boll weevil, alfalfa weevil, rice weevils, and flea beetles. A few moths, caterpillars, dragonflies, Mayflies, and an occasional grasshopper make up the remainder of this bird's food.*

WAXWINGS: Family Bombycillidae.

CEDAR WAXWING; CEDAR-BIRD; "SEAL:"

Bombycilla cedrorum Vieillot.

State records.—The cedar waxwing, often called cedar-bird, is an irregular, though sometimes not uncommon, winter visitant and often remains late in spring. McCormack records it common at Leighton, where it arrives in small flocks from October 1 to 15, and remains till May 25. Avery found it common also at Greensboro, between October 9 and April 18. Brown reports it of irregular occurrence in small flocks at Coosada between January and April; and Saunders records small flocks at Woodbine, May 7 to 17. Golsan and Holt record it as a winter resident in Autauga and Montgomery Counties, remaining until June.† The birds were observed in flocks, numbering from 6 to 25 individuals, at Tuscaloosa, April 3; Stinson, April 18; Muscle Shoals, April 25; Jasper, April 29; Ardell, May 5; Auburn, May 7; and Seale, May 20 (1914).

General habits.—Although destitute of song and uttering only a faint, lisping note, this bird easily attracts attention by its soft, delicate coloring and its jaunty appearance. It is found in flocks during the greater part of the year and in winter feeds largely in hackberry, cedar, and other berry-

*Beal, F. E. L., Bull. 619, U. S. Dept. Agr., pp. 25-27, 1918.

†Golsan and Holt, The Auk, vol. 31, p. 230, 1914.

bearing trees. The birds are great gourmands and often gorge themselves to such an extent that they are unable to fly. They move in compact flocks with a rather swift and somewhat undulatory flight.

Food habits.—The cedar-bird feeds to a considerable extent on fruit, both wild and cultivated, and its fondness for cherries has gained for it in the North the name of "cherry bird." Examination of 152 stomachs, however, showed that 74 per cent of the food consisted of wild fruit and only 13 per cent of cultivated fruit, while cherries were found in only 9 of 41 stomachs taken in June and July. The bird is said to be particularly fond of raspberries, blueberries, serviceberries, and buffalo berries and relishes all kinds of wild cherries. Barrows says:

On the other hand we have no bird which is more valuable to the horticulturist as an insect eater, for it not only eats insects freely and at all seasons when they are obtainable, but it seems to be partial to the farmer and fruit grower. Thus it eats caterpillars of many kinds and sometimes almost confines itself to a diet of canker worms when they are unusually abundant.†

During its stay in the South this species feeds to a large extent on cedar berries and hackberries. It takes, also, the berries of the haw, sumac, bittersweet, chokecherry, black alder (*Ilex verticillata*), and greenbrier.

SHRIKES: Family Laniidae.

LOGGERHEAD SHRIKE; FRENCH MOCKINGBIRD;

BUTCHERBIRD: *Lanius ludovicianus ludovicianus*
Linnaeus.

State records.—The shrike (fig. 19), known in the South as loggerhead or "French mockingbird" (and sometimes erroneously as "catbird"), is a fairly common resident in the southern half of the State, from Tuscaloosa and Shelby Counties to the coast (fig. 20). It is of somewhat local distribution and is most abundant in the Central Prairie Region. In the vicinity of Montgomery dozens of the birds may be seen any day along the roadsides. Avery reported it common also

†Barrows, W. B., Michigan bird life, p. 557, 1912.

FIG. 19.—Loggerhead Shrike (Butcher Bird).

at Greensboro; Saunders saw a pair feeding young at Stewartsville, Coosa County, May 4, 1908;* Holt collected 2 specimens (adult male and young) at Wilsonville, June 4, 1913; and I saw 3 and took 1 young bird at Tuscaloosa, June 2, 1913. Dean saw one at Anniston May 18, 1916—probably a breeding specimen of this race. I found the bird rather common in May on the coast at Coden, and in June observed a few at Dothan and Abbeville. It has been seen in the breeding season also at Seale, York, Myrtlewood, Bay Minette, and Mobile. In winter it has been observed in small numbers at Ashford, Orange Beach, Bayou Labatre, Petit Bois Island, Jackson, Carlton, and Uniontown. Specimens were taken at Auburn, October 1, 1908, and March 7, 1912. Dr. Avery found a nest with incubated eggs at Greensboro, April 25, 1887. Fresh eggs have been taken at Barachias, April 4 and May 26 (Holt), and incubated eggs at Autaugaville, April 2 (Golsan). Palmer records eggs taken at Gastonburg, March 29, 1888.†

General habits.—The shrike is a bird of open farming country and is usually of frequent occurrence along roadsides, where the telephone wires afford it convenient perches while it is on the lookout for its prey. It resembles the mockingbird in general appearance but may be distinguished by its shorter tail and shorter, hooked bill. The shrike does not hunt for its prey, but remains motionless on some elevated perch until it spies something desirable—grasshopper, beetle, or mouse—when it drops lightly to the ground and seizes its quarry with its claws and kills it with its strong beak. Many of its victims are impaled on thorns or barbed wires, which probably aid the bird in tearing them apart and affords an opportunity to return later to the feast if nothing better offers.

The notes of the shrike are harsh and unmusical. Chapman describes them as "a series of guttural gurgles, squeaky whistles, and shrill pipes."

The nest is a rather bulky structure, composed of small sticks, rags, cotton, weed stalks, and feathers, placed usually in thorny bushes or hedges, 7 to 15 feet from the ground. Two or sometimes three broods are reared in a season.

*Saunders, A. A., *The Auk*, vol. 25, p. 421, 1908.

†Palmer, W., *The Auk*, vol. 15, p. 251, 1898.

FIG. 20.—Breeding area of the Loggerhead Shrike (*Lanius ludovicianus ludovicianus*) in Alabama.

Food habits.—In its food habits the shrike is both carnivorous and insectivorous. Examination of 88 stomachs in the Biological Survey showed the food to consist of vertebrates (mammals, birds, and a few fish) 28 per cent, and invertebrates (insects, spiders, and snails), 72 per cent. Insects form the bulk of the food during the warmer months, while in winter the greater part consists of mice and small birds. Mice are taken at all seasons and in winter compose half the food; birds make up only 8 per cent of the food for the year. I once shot a shrike in the act of eating a lizard.

According to Judd, the larger part of the insect food of this shrike consists of *Orthoptera* (grasshoppers and crickets), and the remainder is principally beetles. In summer, when grasshoppers are abundant, the loggerhead does not seem to attack birds. Grasshoppers and crickets were found in three-fourths of the stomachs examined and 14 of the 88 shrikes had fed exclusively upon these pests.† Cankerworms, cutworms, and other caterpillars, together with wasps and spiders, are destroyed to a moderate extent. As a result of his investigations, Judd concluded that the loggerhead is a decidedly beneficial bird and in this opinion he is supported by all who have studied the bird's habits.

MIGRANT SHRIKE: *Lanius ludovicianus migrans*
W. Palmer.

State records.—The northern race of the shrike occurs in moderate numbers as a fall and winter visitant in the northern parts of Alabama. Specimens have been examined from Woodville, March 9; Ardell, March 28 and April 1; Leighton, November 3 and 5 (1915), and Oleander, November 7 (1916). McCormack states that migrant shrikes do not pass the nesting season at Leighton, but appear there about the middle of August and remain in moderate numbers till about April 10. I saw two individuals at Tuscumbia, September 16, 1908 and R. H. Dean reports seeing the species at Anniston on various dates from September 17 to January 25.

†Judd, S. D., Biol. Surv. Bull. 9, p. 22, 1898.

VIREOS: Family Vireonidae.

RED-EYED VIREO: *Vireosylva olivacea* (Linnaeus).

State records.—The red-eyed vireo, known to many as "hanging bird," is one of the most common and widely distributed of our summer birds. On the pine flats of the coast region, however, it is seen only rarely, in migration. It arrives from the south about the first of April, the earliest birds having been noted at Greensboro, March 27 (1891); Barachias, March 31 (1909); Autaugaville, April 2 (1912); and Jackson, April 4 (1912). First arrivals were noted at Sand Mountain (near Carpenter) April 15 (1917), and at Anniston, April 16 (1916). The species was particularly abundant near Muscle Shoals, April 20 to 22, 1914. In fall, the latest birds were seen at Leighton, October 2 (1891), and at Greensboro, October 18 (1890). Nests with eggs have been found at Leighton, May 6, at Weogufka, May 21, and at Autaugaville, May 26.

General habits.—This familiar bird is found in deciduous woodland, both in wet river bottoms and on dry mountain sides, and often takes up its abode in shade trees along village streets. It is gentle and unsuspicious, and often remains on its nest until almost touched by the hand. It is deliberate in its movements and lives for the most part well up in the trees. The song is a smoothly flowing, melodious warble and the bird is a most persistent singer even in the hot days of midsummer. The continuous and rather monotonous style of performance has earned for the bird the name "preacher."

The nest is cup-shaped and pensile, fastened to the forks of a horizontal limb of a bush or tree, commonly 4 to 5 feet above the ground, but sometimes as high as 25 feet. It is neatly and compactly woven of strips of bark, paper, plant down, leaves, etc.

Food habits.—This vireo is one of our most useful woodland birds. Forbush, speaking of its destruction of caterpillars, says:

In the discovery of this kind of game the bird has few superiors. * * * It is most astonishing to see him pick up caterpillar after caterpillar from twigs and foliage, where with

the best of glasses our untrained eyes can discern "nothing but leaves."**

Its insect food also includes moths, butterflies, ants, beetles, weevils, grasshoppers, katydids, locusts, chinch bugs, dragonflies, horseflies, and mosquitoes. Many spiders are consumed and a large quantity of wild fruit, such as raspberries, blackberries, mulberries, pokeberries, elderberries, and wild grapes, as well as seeds of the magnolia, dogwood, sassafras, and prickly ash.

PHILADELPHIA VIREO: *Vireosylva philadelphica*
Cassin.

State records.—The Philadelphia vireo is one of the rarer vireos; it occurs in the Mississippi Valley as a regular though uncommon migrant and will doubtless be found occasionally in Alabama. Thus far there is but one definite record of its occurrence, that of a specimen which I collected May 6, 1912, in oak woods on top of a bluff bordering the Tennessee River at South Florence.

General habits.—This species closely resembles the red-eyed vireo in habits and song, but has more the appearance of the warbling vireo. It may be recognized by the pale, greenish-yellow color of the underparts.

WARBLING VIREO: *Vireosylva gilva gilva* (Vieillot).

State records.—The warbling vireo, although a common summer resident in the Northern States and found throughout the Mississippi Valley, apparently is of rare occurrence in Alabama. Saunders records having heard one singing at Sylacauga, April 16, 1908.† One was secured by J. L. Peters near the Tennessee River, north of Leighton, April 24, 1914, and one by E. W. Graves on Sand Mountain (near Carpenter), May 4, 1914. Further investigation doubtless will show it to be more or less regular in occurrence at that season.

General habits.—This vireo shows a decided preference for tall shade trees, particularly elms. It remains near the tops of the trees and is therefore difficult to observe. Its song is

*Forbush, E. H., Useful birds and their protection, p. 205, 1907.

†Saunders, A. A., The Auk, vol. 25, p. 421, 1908.

a sprightly, musical warble, very similar to that of the purple finch and quite unlike that of the other vireos.

YELLOW-THROATED VIREO: *Lanivireo flavifrons*
(Vieillot).

State records.—The yellow-throated vireo is a moderately common summer resident in the northern and central portions of the State, but becomes rarer toward the coast. It is recorded in the breeding season as far south as Abbeville and Castleberry.

The species arrives from the south at about the same time as the red-eye, earliest migrants having been noted at Autaugaville, March 20 (1913); Shelby, March 27 (1898); Greensboro, March 28 (1893); Jackson, April 3 (1912); Tuscaloosa, April 4 (1914); Sand Mountain (near Carpenters), April 6 (1911 and 1912); and Leighton, April 8 (1891). In fall it was last seen at Leighton, September 26 (1891). A nest with fresh eggs was found by Golsan at Booth, April 25, 1916, and a nest with young near Autaugaville, May 15, 1910.

General habits.—The yellow-throated vireo dwells in upland woods and groves of deciduous timber, spending most of its time in the upper stories of the woods. It sings a rich alto song, similar to that of the red-eye, but distinguished from it by the upward inflection of some of its phrases. It has, also, a loud, harsh, scolding note which is frequently uttered during the nesting season. The nest resembles that of the red-eyed vireo, and is usually decorated on the outside with lichens, plant down, shreds of cotton or paper, bits of bark, insect cocoons, and like material. It is hung in the forks of a limb, usually from 10 to 40 feet above the ground.

Food habits.—This vireo, according to Forbush, feeds upon pests of the household, forest and orchard.

Common houseflies and mosquitoes are eaten. In the orchard it attacks the apple plant lice, the hairy tent, gipsy, and tussock caterpillars, as well as moths of many species. It is quite destructive to the larvae of butterflies, also, while weevils and

other beetles, grasshoppers, and leaf-hoppers are eaten to a less extent. This species eats a few unimportant wild berries, such as the fruit of the red cedar.*

Other observers have noted it feeding on cankerworms, tobacco worms, ants, and spiders.

BLUE-HEADED VIREO: *Lanivireo solitarius solitarius*
(Wilson).

State records.—The blue-headed, or solitary vireo occurs as an uncommon migrant and winter visitant. Brown observed it in some numbers at Coosada, where he noted the males beginning to sing on March 6; all had departed by March 20.† I collected a specimen at Bayou Labatre, February 7, 1912, the only one seen during the season. A migrant was reported at Shelby, April 4, 1898, and one was seen by Golsan at Autaugaville, November 25, 1912.‡ Specimens were also taken by him at Autaugaville, December 3, 1915, and at Prattville, January 23, 1916, and February 5, 1916.

General habits.—This vireo resembles the yellow-throated vireo in habits but lives rather in the lower stories of the woodland. Its song which is occasionally heard in spring migration, is rich and sweet, and similar to that of the yellow-throat. In winter the bird may be found in swampy thickets or other low situations.

MOUNTAIN SOLITARY VIREO: *Lanivireo solitarius*
alticola (Brewster).

State records.—The mountain solitary vireo, a race of the blue-headed vireo, is apparently rare in the State, there being only two records of its occurrence. There is one specimen in the Avery collection, taken October 23, 1890, at Greensboro. Saunders records the species as arriving at Woodbine March 14, 1908, and common there from March 21 to April 12; one specimen collected by him proved to be of this form.**

*Forbush, E. H., *Useful Birds and their Protection*, p. 208, 1907.

†Brown, N. C., *Bull. Nutt. Ornith. Club*, vol. 4, p. 7, 1879.

‡Golsan and Holt, *The Auk*, vol. 31, p. 231, 1914.

**Saunders, A. A., *The Auk*, vol. 25, p. 421, 1908.

WHITE-EYED VIREO; HANGING-BIRD: *Vireo griseus griseus* (Boddaert).

State records.—The white-eyed vireo is a common summer resident in nearly all parts of the State. A few individuals winter in the extreme southern United States, and one seen by Holt at Barachias, February 21, 1913, was doubtless a wintering bird. First arrivals in spring were noted at Weogufka, March 17 (1908); Mobile, March 18 (1912); Autaugaville, March 27 (1913); Greensboro, March 28 (1891); Sand Mountain (near Carpenter), April 1 (1914); and Leighton, April 2 (1890). The last in autumn was seen at Leighton, September 20 (1891); Anniston, September 24 (1916), and Greensboro, October 18 (1890). Nesting begins in April, eggs having been found at Coosada, April 20; Leighton, April 24 and May 10; Autaugaville, May 1; and on Sipsey Fork near Mellville, May 3.

General habits.—This species is of very different habits from the other vireos, dwelling nearer the ground and preferring dense thickets for its home, usually in swamps or low, wet bottoms. It is not particularly shy, but the nature of its haunts prevents easy observation of the bird. Its song, however, is loud and very characteristic, being quite unlike that of any of the other species. It is a sprightly and varied ditty, strongly accented, suggesting different translations to almost every listener. Ridgway interprets it as *chick'ty-beaver, lim'ber, stick*; while Burroughs writes it: *chick-a-re'r-chick*. The bird has, also, a peculiar mewing, scolding note and is at times an accomplished mimic; in the seclusion of his haunts it sometimes gives voice to a remarkable and varied medley which includes the notes of many other birds. The nest is placed in thickets or swampy woodland, usually 3 or 4 feet above the ground; it is deeply cupshaped and heavily ornamented on the outside with such material as lichens, mosses, shreds of bark, paper, and spiders' webs.

Food habits.—The food of this vireo includes cankerworms, cutworms, tobacco worms, ants, beetles, bugs, and house flies. Some fruits and berries are eaten, such as blackberries, raspberries, mulberries, and the fruit of the sassafras and palmetto.

WOOD WARBLERS: Family *Compsothlypidae*.*BLACK AND WHITE WARBLER: *Mniotilta varia*
(Linnaeus).

State records.—The black and white warbler (fig. 21), sometimes known as the black and white creeper, is a common migrant and a moderately common summer resident in the northern half of Alabama (fig. 22). It is recorded in the breeding season at Florence, Leighton, Elkmont, Sand Mountain, Guntersville, Woodbine, Talladega Mountains, Ardell, Autaugaville, and Greensboro.

Migrants from the south arrive by the middle of March, having been noted at Coosada, March 13; Woodbine, March 14; Shelby, March 18; Sand Mountain (near Carpenter), April 1; and Leighton, April 9. In fall, migrating birds have been observed at Leighton, October 2; Autaugaville, October 16; and Castleberry, October 10. Eggs were taken by Golsan near Autaugaville, April 25, 1891, and Holt saw a pair of the birds feeding large young on Gunters Mountain, June 17, 1913.

General habits.—This warbler lives chiefly in deciduous woodland and is rarely seen away from its favorite habitat. In habits it resembles the creepers but structurally is a true warbler. Its mode of progression is by a series of hops by which it ascends the trunk or limbs of a tree, often in a spiral course, searching in the crevices of the bark for its insect food. It clings with ease to the under side of a branch after the manner of the nuthatch. Its song, though not loud, is incisive and easily recognized. Langille writes it: "*Ki-tsee, ki-tsee, ki-tsee, ki-tsee*, as slender to the ear as 'hair-wire' to the eye * * *."† The second syllable of each note is strongly accented.

The nest is placed on the ground in deciduous woods, at the base of a tree, bush, or stump, or beside a log or stone; it is quite bulky and sometimes partially roofed over.

Food habits.—According to Forbush this species feeds on wood-boring insects, bark beetles, click beetles, curculios,

**Mniotiltidae* of the A. O. U. Check-list; for change of name see *The Auk*, vol. 37, p. 444, 1920.

†Langille, J. H., *Our birds in their haunts*, p. 276, 1884.

FIG. 21.—Black and White Warbler.

caterpillars, and moths. He reports it "very destructive at times to hairy caterpillars, eating large quantities of them."‡

PROTHONOTARY WARBLER: *Protonotaria citrea*
(Boddaert).

State records.—The prothonotary warbler, known often as the golden swamp warbler, is a fairly common summer resident throughout the State. It is recorded as common at Leighton and at Greensboro; it breeds at both these places and also at Mobile, Seale, Tuscaloosa, Squaw Shoals, Ardell, Guntersville, Castleberry, and Abbeville. The bird was common in the overflowed bottoms at Jackson Lake, April 19, 1912, and probably breeds there.

First arrivals in spring were noted at Coosada, April 12 (1877); Greensboro, April 13 (1889); and Scottsboro, April 18 (1914). Incubated eggs were taken by Golsan at Autaugaville, June 16.

General habits.—The favorite haunts of this brilliant warbler are wet river bottoms or wooded swamps (Pl. VI, fig. 1). It remains close to the ground, feeding much of the time in low bushes over the water, where its brilliant colors are displayed to best advantage. It is a very active bird, almost constantly in motion, and in the breeding season a frequent singer as it flits from bush to bush. The song is quite loud and penetrating, sounding like the syllables *peet*, *tsweet*, *tsweet*, *tsweet*, all on the same tone. The nest is placed in a hollow stub or the deserted nest of a chickadee or downy woodpecker, usually over water, and from 4 to 15 feet above the surface.

Food habits.—The food habits of the prothonotary warbler are not well known, but probably the bird feeds mainly on insects; J. Percy Moore states that it catches various flies, beetles, and caterpillars and Audubon says he found small snails in its stomach.

‡Forbush, E. H., *Useful Birds and their Protection*, p. 192, 1907.

FIG. 22.—Breeding area of the Black and White Warbler (*Mniotilta varia*) in Alabama.

SWAINSON WARBLER: *Limnothlypis swainsonii*
(Audubon).*

State records.—The Swainson warbler was first recorded from Alabama by Nathan Clifford Brown, who, in 1878, discovered three singing birds in the vicinity of Coosada.† Dr. Avery observed the species only once at Greensboro, September 6, 1890, when he collected a young female specimen.

In the big river swamps above Mobile, in May, 1911 and 1914, and July, 1913, I heard at different points at least 9 singing birds of this species, but on account of the impenetrable character of the vegetation was not able to collect any. In Catoma Swamp, near Teasley Mill, Montgomery County, I heard the song of this bird several times on April 1, 1914, and again in May. Specimens were taken at Tuscaloosa, June 2, 1913; on Sipsey Fork, near Mellville, May 1, 1914; at Prattville Junction, May 9, 1914; and in Bear Swamp near Autaugaville, May 24, 1913. The bird was frequently heard in Bear Swamp and in other swamps near Autaugaville, and has also been noted on the upper Choctawhatchee, near Edwin (June), and at Muscle Shoals, on the Tennessee River (April 24).

On an island in the Tennessee River near Florence, in May, 1912, I found 2 nests and saw 3 or 4 of the warblers. Both nests were in rather open canebrakes in heavy timber, on dry ground, but close to the border of a small slough. They were loosely fastened in the upper branches of cane stems, about 4 feet above the ground. One nest, found May 5, contained 2 eggs; May 8 it held 3 eggs and the female parent was incubating; she allowed me to approach within 4 feet of her before she flew off and quickly disappeared. The other nest was found the same day but was empty, though apparently just completed. The eggs are pure white, unspotted.

General habits.—This is one of the least known of the warblers, being confined in the breeding season to the deep swamps and river-bottom woods where canebrakes are found. Though by no means generally distributed, in many localities

**Helinaia swainsoni* of the A. O. U. Check-list; for change of name see *The Auk*, vol. 37, p. 444, 1920.

†Brown, N. C., *Bull. Nuttall Ornith. Club*, vol. 3, pp. 172-173, 1878.

it is not rare. Its secretive habits effectively conceal it from all but the most persistent observers. Perched motionless in some thick tangle of vines in the depths of the swamp, it pours forth its rich, though simple, song for many minutes at a time, but its dull-brown coloration harmonizes so well with its surroundings that it is one of the most difficult of all birds to locate. The song resembles in tone quality and form that of the Louisiana water-thrush, but is shorter and less vigorous. It opens with three slurred phrases on the same pitch, and closes with two shorter notes on a slightly lower pitch. It also closely resembles certain songs of the hooded warbler, which fact makes it doubly difficult to identify with certainty.

Food habits.—Four stomachs of this bird from Alabama contained remains of caterpillars, spiders, and Hymenoptera (ants, bees, etc.).

WORM-EATING WARBLER: *Helminthos vermivorus*
(Gmelin).

State records.—The worm-eating warbler occurs as a common migrant, apparently more abundant in fall, and as a rare and local breeder in the northern part of the State. It has been observed at Shelby, May 27 and 31, 1898; Ardell, June 25, 1913; Sipsey Fork near Mellville, May 1, 1914; and Natural Bridge, July 19, 1913, at all which places it probably breeds. Golsan took a specimen at Autaugaville, September 18, 1915, and Dr. Avery took several at Greensboro in August and September.

Migrants from the south were noted at Hollins, April 21 (1908); Leighton, April 22 (1914); Oakchia, April 23 (1912); and Barachias, April 24 (1912) and May 1 (1913). McCormack found the species rather common in fall migration at Leighton, frequenting swamps. The first migrant (in 1889) was noted July 19; the next on August 5, after which they increased in numbers till the 15th, then decreased until September 9.* Dr. Avery observed the bird at Greensboro only during the autumn migrations, between August 9 and September 19. The only breeding record for the State is

*McCormack, F. W., *Ornith. and Ool.*, vol. 15, p. 125, 1890.

furnished by McCormack, who collected a set of 5 fresh eggs on Lagrange Mountain near Leighton, April 29, 1890.

General habits.—The worm-eater is a characteristic bird of heavy, moist, deciduous woodland, usually choosing a hillside near a stream. It is a very inconspicuous bird, deliberate in its movements, and with a weak song, so that it is rarely noticed except by those who are looking for it. It feeds much on the ground and on fallen logs, but ascends to a moderate height to deliver its song, often remaining motionless on its perch for a considerable time. The song is a short, simple trill, very much like that of the chipping sparrow, but less vigorous in its delivery. The nest is placed on the ground in heavy, deciduous woodland, generally on a hillside. It is composed of dry leaves and lined with stalks of hair moss or with fine grass or horsehair.

Food habits.—Little is known of the food of this species, but it seems doubtful whether it lives up to its name of "worm-eater." Two stomachs of this bird from Alabama contained remains of weevils, beetles, bugs, caterpillars, and Hymenoptera.

BACHMAN WARBLER: *Vermivora bachmanii* (Audubon).

State records.—The Bachman warbler is one of the rarest and least known of the warblers. It is perhaps most common in summer in the Sunken Lands of Missouri and Arkansas, where it lives in the extensive wet swamps of the region. The few records of its occurrence in Alabama indicate that it breeds sparingly at several widely separated localities. A. A. Saunders took a single male specimen at Woodbine, March 20, 1908, the first record from the State.† In a small swamp near Autaugaville, April 16, 1912, I secured a singing male which was probably breeding in the vicinity, but his mate was not discovered.‡ Two years later, on May 10, 1914, in Bear Swamp, not far from the spot where I secured the first specimen, J. L. Peters collected another male in full song and undoubtedly breeding. On Sipsey Fork, near Mellville, May 2 and 3, 1914, we secured two more males, possibly migrants.

†Saunders, A. A., *The Auk*, vol. 25, p. 421, 1908.

‡Golsan and Holt, *The Auk*, vol. 31, p. 231, 1914.

and on the Tensaw River, a short distance below Mount Vernon, Peters collected another, May 27, 1914, this being the sixth specimen taken in the State. This bird was probably breeding, but no female was seen. L. S. Golsan reports seeing an immature individual of this species near Autaugaville, August 26, 1912, and a female which seemed to be nesting near Prattville, May 21, 1916. He also heard one singing at Longview, April 7, 1917. In Bear Swamp, near Autaugaville, May 25, 1919, E. G. Holt discovered a nest and 4 fresh eggs of this warbler—the first ever found in the State.*

General habits.—This warbler is a lover of timbered swamps, but is sometimes found in dry, upland situations. It is not a conspicuous bird, and by reason of this and its fondness for almost inaccessible swamps it is often overlooked and may be more widely distributed than is supposed. It lives chiefly in the "lower stories" of the woods and is usually not at all suspicious of man. A male observed near Autaugaville in April, sat quietly on a limb of a tree and sang with great regularity for 15 or 20 minutes while I was vainly trying to locate him. Finally I discovered him almost above me, about 15 feet above the water. The song is a short, simple, buzzing trill, rapidly repeated on one tone. It resembles the song of the worm-eating warbler in form, but has more the quality of that of the parula warbler.

On Sipsey Fork, in the hill country of Winston County, we found two individuals in a region quite different from the usual habitat of the species. The first was shot from a little clump of willows bordering a field on the river bank, and the second was found in heavy timber a few hundred yards downstream, at a point where the hills rise abruptly from the water's edge, the region being practically devoid of the swamps usually favored by this warbler. This bird was extremely tame and at times came within 15 feet of the observer. Both this and the one observed by Peters in Bear Swamp had the habit of singing on the wing, the song being delivered just before the bird alighted on a perch after a short flight. The flight on such occasions strongly resembles that of the Acadian flycatcher (*Empidonax virescens*).

*Holt, E. G., *The Auk*, vol. 37, pp. 103-104, 1920.

The nest is placed in blackberry briars, low bushes, or canes, 1 to 3 feet above the ground; the eggs, 3 or 4 in number, are pure white, rarely with a few minute dots of brownish. The nest found by Holt in Bear Swamp was—

“a bulky structure of dead leaves of white or red bay (*Magnolia* or *Persea*), some of which were skeletonized by insects, and herbaceous plant stems * * * supported one foot above the ground by the stems of five blackberry briars, three of which were dead. This loose outer nest, 6x7.5 inches by 4 inches deep, was lined with a closely woven cup of fine rootlets and the black skeletons of dead Spanish moss (*Tillandsia usneoides*), 1.75 inches deep by 2 inches in diameter.”†

Food habits.—Five stomachs of this species from Alabama contained remains of caterpillars and a few fragments of Hymenoptera, probably ants.

BLUE-WINGED WARBLER: *Vermivora pinus* (Linnaeus).

State records.—The blue-winged warbler occurs not uncommonly as a migrant and locally as a summer resident in the northern half of the State. At Woodbine, Saunders reports it “abundant throughout the breeding season,”* and at Autaugaville, Golsan mentions a pair observed throughout the early summer of 1912.‡ Graves reports a pair breeding on Sand Mountain, near Carpenter in the summer of 1913. Holt observed 3 and collected one at Natural Bridge, July 21, 1913. McCormack has found it at Leighton late in summer (July 22, August 8, 23, 25) and not common. A specimen (probably a migrant) killed at Point Clear is in the collection of James K. Glennon.

Migrants from the south are reported as arriving at Woodbine, March 27 (1908); Shelby, April 4 (1898); Tidewater (Tuscaloosa County), April 8 (1912); Autaugaville, April 16 (1912); Sand Mountain (Jackson County), April 18 (1914); and Leighton, April 22 (1914). Migrant individuals were observed also at Jasper, April 28 and 29 (1914); on Sipsey

†Holt, E. G., *The Auk*, vol. 37, pp. 103-104, 1920.

*Saunders, A. A., *The Auk*, vol. 25, p. 421, 1908.

‡Golsan and Holt, *The Auk*, vol. 31, p. 231, 1914.

Fork, near Mellville, May 1-4 (1914); and on Ryan Creek, near Ardell, May 4 (1914).

General habits.—This warbler frequents clearings in deciduous woodland, shrubby second growths, and sometimes swampy thickets. It is a rather retiring bird, deliberate in its movements, and has a weak, insectlike song which, however, is very characteristic. The nest is placed on the ground or just above it in a clump of grass or some herbaceous plant or at the foot of a small sapling or rosebush; it is rather deep and bulky, composed of coarse grass, dead leaves, etc., lined with grapevine bark, fine grass stems, or horsehair. Although nesting on the ground, the birds are most often seen in the tall bushes and lower limbs of the trees, and the males seek a rather elevated perch from which to deliver their song. This is described by Burns as "a drowsy, locust-like *swe-e-e-e-ze-e-e-e*, the first apparently inhaled and the last exhaled."†

Food habits.—Dr. B. H. Warren says of this bird:

When the apple and pear trees are in blossom, these yellow-vested insect hunters, singly, or in pairs, frequently visit orchards and gardens, but at other times they rarely, according to my observation, are seen about the habitations of man.

* * * this species subsists, to a considerable extent, on spiders, larvae and beetles.**

GOLDEN-WINGED WARBLER: *Vermivora chrysoptera* (Linnaeus).

State records.—The golden-winged warbler occurs in Alabama not uncommonly in migration. I secured a specimen at Barachias, April 22, 1912, and observed another there the following day; one was taken near Muscle Shoals, April 22, and another was heard singing there, April 24, 1914. Saunders found the bird rather common at Hollins from April 21 to May 7, 1908. McCormack took a single specimen at Leighton, August 23, 1893, and Avery found the species rather common at Greensboro in fall migration and took specimens August 11 and 21, September 11 and 16, and October 4.

General habits.—In its summer home in the Northern States, this warbler inhabits deciduous woodland, preferring

†Burns, F. L., in Chapman, *The Warblers of North America*, p. 70, 1907.

**Warren, B. H., *Birds of Pennsylvania*, 2d ed., p. 276, 1890.

brushy pastures and dry hillsides covered with a mixed second growth of hardwood trees.

NASHVILLE WARBLER: *Vermivora ruficapilla ruficapilla* (Wilson).

State records.—The Nashville warbler migrates chiefly through the Mississippi Valley, and is very rare in the Southeastern States. There is but one record from Alabama—a specimen collected by A. A. Saunders, at Hollins, April 18, 1908.* Mr. Saunders wrote me (April, 1916) that this specimen, being badly mutilated, was not preserved and that he has since felt some doubt as to the correctness of his identification.

ORANGE-CROWNED WARBLER: *Vermivora celata celata* (Say).

State records.—The orange-crowned warbler occurs rarely in Alabama as a migrant and winter visitant. Its usual migration route in spring is through the Mississippi Valley. Brown records two seen at Coosada in 1878—February 12 and April 15†; Saunders saw one at Woodbine, March 27, 1908;‡ I secured one at Orange Beach, January 28, 1912, and one at Ashford, November 29, 1916.

General habits.—Allison, writing of its habits as observed in Mississippi in winter, says:

Its favorite haunts are usually wooded yards or parks, where the evergreen live oak and magnolia can be found; but I have seen it most commonly among the small trees on the border of rich mixed woods, above an undergrowth of switch cane. Coniferous trees it seems not to care for, though I have seen it in the cypress swamps. * * * The only note heard is a sharp, persistent chipping, many times repeated, as the bird moves about the tree, often moving its wings restlessly, like a kinglet.**

*Saunders, A. A., The Auk, vol. 25, p. 421, 1908.

†Brown, N. C., Bull. Nutt. Ornith. Club, vol. 3, p. 173, 1878.

‡Saunders, A. A., The Auk, vol. 25, p. 421, 1908.

**Allison, A., in Chapman, Warblers of North Amer., pp. 88, 89, 1907.

TENNESSEE WARBLER: *Vermivora peregrina* (Wilson).

State records.—The Tennessee warbler occurs regularly in moderate numbers as a migrant in spring and fall. McCormack records it as a fall migrant at Leighton, occurring in limited numbers in September. Specimens were taken by him September 17 and 23, 1889, and September 25, 1890. Avery collected only two specimens at Greensboro—October 4, 1890, and October 18, 1893. Golsan took one at Autaugaville, October 17, 1915, and Saunders mentions seeing one at Woodbine, May 9, 1908.* Holt collected a single specimen at York, April 30, 1912, and at our camp on Sipsey Fork, near Mellville, the bird was noted by Peters and myself on May 1, 2, and 3, 1914, singing frequently high up in the tall trees.

General habits.—During its migrations this little warbler remains well concealed in the thicker parts of the tall trees, and but for its striking song would easily be overlooked. It is an active bird and sings with great frequency a rather loud, harsh, unmusical, sputtering song, which seems to stick a little in its throat. Mrs. Farwell describes it as “a very loud song, beginning with a sawing two-noted trill, rather harsh and very staccato, but hesitating in character, increasing to a rapid trill, almost exactly like a chipping sparrow’s.”†

PARULA WARBLER: *Compsothlypis americana americana* (Linnaeus).

State records.—The parula warbler is a common summer resident over the greater part of the State, but is rare and local in the northern counties. It breeds rather commonly at Castleberry, Abbeville, and Dothan; less commonly at Squaw Shoals, Woodbine, Autaugaville, Barachias, Tuscaloosa, Gunter’sville, Sand Mountain (near Carpenter), and Erin. It probably breeds at Leighton, having been seen there on July 15. Breeding specimens have been examined from Elkmont, Gunter’sville, Ardell, Natural Bridge, Hayneville, Seale, Castleberry, and Gravine Island, Mobile Bay, and a migrant individual from Scottsboro (September 2, 1908).

*Saunders, A. A., *The Auk*, vol. 25, p. 421, 1908.

†Farwell, Mrs. J. V., in Chapman, *Warblers of North Amer.*, pp. 85-86, 1907.

The first migrants in spring were observed in numbers at Mobile, March 18 (1912), on which date 4 males of this race were collected. Other specimens were taken near Hurricane, March 20; Jackson Lake, Elmore County, March 27 and April 19; Teasley Mill (Montgomery County), March 31; Tuscaloosa, April 6; and Sand Mountain (near Carpenter), April 14. Avery noted the first arrivals at Greensboro, March 26 (1892) and March 27 (1891). The first were seen at Barachias, March 20 (1913); Woodbine, March 21 (1908); and Leighton, April 2 (1890). In autumn the last one was noted at Leighton, September 2 (1889); Greensboro, September 19 (1890); and Autaugaville, October 1 (1915). Dr. Avery observed a parula warbler building a nest, on April 9, 1893, at Greensboro and on April 23 he found eggs in the nest.

General habits.—This dainty little warbler, formerly called the blue yellow-back, is found chiefly in swamps and heavily timbered bottoms where there is an abundance of Spanish "moss" on the trees. In the northern part of the State, where the moss is absent, the bird apparently does not breed in any numbers, though it occurs locally. Living chiefly in the upper parts of the trees, it is rather hard to observe. Its notes, however, are characteristic and aid in its identification. It has at least two distinct songs; the commonest, perhaps, is a simple, buzzing trill on an ascending scale ending with an abrupt *zip*. The other, Chapman describes as a "gurgling sizzle, *chip-er, chip-er, chip-er, chee-ee-ee-ee.*"

In the South, the nest of the parula warbler is usually constructed in a bunch of Spanish "moss" and is thus almost perfectly concealed. Allison states that in lower Louisiana the material commonly used for the nest is thistle down, but mentions a nest found at Bay St. Louis, Mississippi, which was made of the blackish, inner fiber of *Tillandsia*.*

Food habits.—The parula warbler, like most of its family, is mainly insectivorous. It has been reported as feeding on spiders, caterpillars, small flies, beetles, plant lice, and the larvae of moths.

*Allison, Andrew, in Chapman, *The Warblers of North America*, p. 104, 1907.

WESTERN PARULA WARBLER: *Compsothlypis americana ramalinae* Ridgway.†

State records.—The western race of the parula warbler occurs in the State, so far as known, only in the extreme southwestern part. It breeds in the vicinity of Mobile, as shown by a typical specimen taken at Spring Hill, May 11, 1911. Several singing males were noted on that date.

CAPE MAY WARBLER: *Dendroica tigrina* (Gmelin).

State records.—The Cape May warbler occurs irregularly in Alabama as a migrant, where it has been recorded by two local observers. Miss Carrie E. Parkhurst noted the species at Talladega, May 4, 1906, May 3, 1909, and May 1, 1910; and R. H. Dean reports it from Anniston, April 16 to May 7, 1916, during which period it was the most numerous of the warblers, seen on brushy hillsides and about ravines.

General habits.—Butler, writing of the bird in Indiana, says:

Some years with us they are found upon the drier uplands, among the oak woods, where they usually keep among the lower branches or upon the high bushes and smaller trees. They are not very active, but keep persistently hunting insects. At other times, we find them among our orchards, even coming into towns, where they occupy themselves catching insects among the foliage and about the blossoms of all kinds of shade and fruit trees.‡

Chapman states that in early May in Florida he has seen the species "actually common, feeding in weedy patches among a rank growth of pokeberries."***

The bird's song is described as being of "a thin and penetrating tone, much like the black and white warbler's."*†

YELLOW WARBLER: *Dendroica aestiva aestiva* (Gmelin).

State records.—The yellow warbler occurs in migration and breeds rarely in the northern part of the State. Dr. Avery records it as an uncommon spring and autumn migrant at

†Described in Bull. 50, U. S. Nat. Mus., Part 2, p. 486, 1902.

‡Butler, A. W., Birds of Indiana, p. 1044, 1898.

***Chapman, F. M., Warblers of North Amer., p. 130, 1907.

*†Thayer, G. H., in Chapman, op. cit., p. 132.

Greensboro; his collection contains specimens taken August 10, 1887, and August 11, 1890, and his notes state that he collected the species in July also. Brimley observed it there August 30 and September 5, 1890. At Guntersville, June 13, 1913, I collected a single breeding male, the only one observed, and Holt took one at Attalla, June 12, 1913, also doubtless breeding. Golsan has found the nest of this species once near Autaugaville (about June 20, 1903),* and Dean reports the bird as a breeder at Anniston. Several were seen at Florence, May 4, 1912, and at Leighton, April 21 to 25, 1914, but the species is not known to breed at those localities.

The earliest record of the bird's arrival in spring is at Leighton, April 6 (1893), but usually it does not arrive before the middle of the month. It was first noted at Greensboro, April 12 (1890) and April 14 (1888); Sylacauga, April 18 (1908); Barachias, April 15 (1909); Sand Mountain (near Carpenter), April 12 (1914), and Anniston, April 14 (1916). Fall migration begins very early, even by the last of July.

General habits.—The yellow warbler is a bird of the open, cultivated country and takes up its abode in orchards, small groves, and in shade trees along village streets; it is found also in swampy thickets and is especially partial to willows fringing the streams. A sociable, unsuspicious bird, it seems to enjoy the society of man. It feeds chiefly in the lower branches of trees and in shrubbery. The song is a loud and cheery whistle, resembling the syllables *sweet, sweet, sweet, sweet, sweetie*, delivered with considerable vigor. The nest is placed in bushes, saplings, or trees, usually from 3 to 8 feet above the ground but sometimes higher; it is a compact, well-built structure of grayish plant fibers, fine grasses, and plant down, lined with soft, cottony plant down, and feathers. This warbler is often imposed upon by the cowbird, and when this occurs the bird very often builds an addition to the nest, covering the eggs of the cowbird, and lays another clutch of its own.

Food habits.—Forbush states that the yellow warbler is almost entirely insectivorous; it feeds extensively on caterpillars, including cankerworms and other measuring worms, and captures bark beetles, boring beetles, and weevils.†

*Golsan and Holt, *The Auk*, vol. 31, p. 231, 1914.

†Forbush, E. H., *Useful Birds and their Protection*, pp. 195-196, 1907.

BLACK-THROATED BLUE WARBLER: *Dendroica caerulescens caerulescens* (Gmelin).

State records.—The black-throated blue warbler occurs as a rare migrant. Brown noticed only one at Coosada, April 26, 1878;† Saunders saw the bird at Hollins, April 19 and May 3, 1908;** and Miss Parkhurst reports it from Talladega. I observed two (male and female) near Montgomery, May 7, 1911. These are the only records thus far obtained.

General habits.—This warbler inhabits the "lower stories" of the woods and has a decided preference for deep, moist timber where there is considerable underbrush. It is an unsuspicious bird, easily observed and recognized by the squarish white patch in the wing or by its drowsy, drawled song—"an insect-like buzzing note repeated three or four times with a rising inflection. It sounds a little like the breath sucked through the teeth."††

MYRTLE WARBLER: *Dendroica coronata coronata* (Linnaeus).

State records.—The myrtle, or yellow-rumped, warbler is one of the most abundant species of its family and is also the hardiest. It winters in moderate numbers over most of the State, and in the pine flats and palmetto hammocks of the Coast Belt is at that season extremely abundant, being indeed the only really abundant bird of the region. At Orange Beach, in January, 1912, and at Spanish Fort, in December, 1915, we found it in large numbers, not only in the woods and clearings, but even on the marshes and sand dunes bordering the Gulf. During a heavy fog, several individuals were noticed feeding on the bare sand flats close to the surf, a situation usually frequented only by sandpipers. On Petit Bois Island, in February, 1912, and November, 1915, the species was extremely abundant. It was common at Bayou Labatre in February, 1912, but conspicuously absent during February and March at Jackson, Auburn, and other points in the interior. It was likewise scarce at Ashford in November, 1916, but was fairly common at Woodville and Florence in March,

†Brown, N. C., Bull. Nutt. Ornith. Club, vol. 3, p. 173, 1878.

**Saunders, A. A., The Auk, vol. 25, p. 422, 1908.

††Paddock, I. M., in Chapman, The Warblers of North America, p. 138, 1907.

and at Barachias in December, 1915. Brown recorded it very numerous at Coosada from January to the middle of April.*

Migrants from the North reach the State early in October. Dean noted the first arrivals at Anniston, October 8 (1916). McCormack noted the first at Leighton about October 10 (1889), and Dr. Avery saw many at Greensboro, October 20 (1890). Northward migration begins in March and continues until late in April or early in May. The last birds were seen at Oakchia, April 24 (1912); Sand Mountain, April 29 (1911); Jasper, April 29 (1914); Leighton, April 30 (1912); and Woodbine, May 2 (1908) (Saunders).

General habits.—During its sojourn in the South this warbler lives in thickets, hedges, and the lower parts of brushy woodland, while on the coast it frequents also the sand dunes and the brushy borders of the marshes. It is an unsuspicious bird, often feeding in dooryards or even about porches, and is easily recognized by its yellow rump patch and its characteristic *tchip* which is frequently uttered as it flits leisurely from one perch to another. Its song, which is occasionally heard during spring migration, is a simple and rather characterless warble. Thayer describes it as "a loud and silvery sleigh-bell trill."

Food habits.—This warbler gets its common name from its habit of feeding on the berries of the wax myrtle. These, with berries of the red cedar, furnish in some localities a large part of its winter food. Weed and Dearborn, who made a special study of the autumn food of this warbler, found that it ate bayberries, caddisflies, various insect larvae, beetles, plant lice and their eggs, house flies and other diptera, and a very few hymenopterous flies.† Forbush says of this bird:

As spring approaches the Myrtle Warbler feeds less on berries and seed but eagerly hunts the early flies, moths and gnats that appear on warm days in sheltered swamps and along water courses. It now becomes of great service to orchard and woodland, for large flights of these birds move slowly northward through the State [Massachusetts], feeding very largely on the tree pests that develop with the opening foliage.‡

*Brown, N. C., Bull. Nutt. Ornith. Club, vol. 3, p. 173, 1878.

†Weed and Dearborn, New Hampshire Col. Agr. Exp. Sta., Tech. Bull. No. 3, Nov. 1901.

‡Forbush, E. H., Useful Birds and Their Protection, pp. 202-203, 1907.

The stomachs of 16 individuals taken in Alabama in winter and spring showed the food to consist mainly of flies, beetles, ants, and other Hymenoptera, caterpillars, aphids, and spiders; some of the birds taken on the coast had eaten wax myrtle berries.

MAGNOLIA WARBLER: *Dendroica magnolia* (Wilson).

State records.—The magnolia warbler occurs commonly as a migrant in spring and fall. McCormack found it in considerable numbers at Leighton between September 16 and October 5 and Avery observed it at Greensboro between September 9 and October 19. Golsan took specimens at Autaugaville, October 16 and 21 (1915). I saw one at Auburn, October 2, and others at Castleberry, October 13 (1908). In spring it seems to be less common and neither Avery nor McCormack has reported it. I saw 2 individuals at Leighton, May 1, and 1 May 10 (1912); 2 at Florence, May 6 and 7 (1912), and several on Sipsey Fork and Ryan Creek, near Ardell, May 2 to 5 (1914). Golsan and Holt record the bird from Prattville in spring.* It was reported, also, from Shelby, May 4, 5, and 12 (1898), and from Sand Mountain (near Carpenter), April 27 (1914), and May 4 and 18 (1912).

General habits.—In its summer home in New England, this warbler is said to frequent second-growth spruce woods, but during its migrations it is found almost anywhere in deciduous woodland. It is quick and nervous in movement and frequently spreads its tail in such way as to display the large white patches on the outer feathers. Altogether it is one of the most attractive and graceful of the large family of warblers. The song is described by Langille as "a loud, clear, whistle, which may be imitated by the syllables *chee-to, chee-to, chee-tee-ee*, uttered rapidly and ending in the falling inflection."†

CERULEAN WARBLER: *Dendroica cerulea* (Wilson).

State records.—The cerulean warbler is a moderately common summer resident in the northern half of the State. The

*Golsan and Holt, *The Auk*, vol. 31, p. 231, 1914.

†Langille, J. H., *Our Birds in their Haunts*, p. 328, 1884.

earliest record of its arrival in spring is on March 26, 1890, at Greensboro, Dr. Avery having taken a specimen on that date. Others were taken there May 10, 1887 and August 14, 1890. McCormack found the bird in small flocks at Leighton between August 8 and September 9, 1889 and Saunders found it locally common at Woodbine between April 10 and June 3, 1908.† Graves reports it as a rare migrant on Sand Mountain, seen April 22, 1911. I found it common in migration at Lock 14, Warrior River, April 6; Squaw Shoals, April 11 and 12 (1912); Muscle Shoals, April 22 to 25 (1914); and on Sipsey Fork, near Mellville, May 1 to 5 (1914); several were heard at Florence, May 5 (1912).

In the breeding season I have observed it at Erin, Monte Sano, Guntersville, Squaw Shoals, Tuscaloosa, and Autaugaville. At Guntersville it was common in heavy deciduous timber along Short Creek, but at the other localities was rather rare. Holt took an immature bird and heard several songs of this species at Ardell, June 27, 1913, and Peters noted a few in the same locality in June, 1914. So far as known, the nest of this warbler has never been found in Alabama.

General habits.—This handsome little sky-blue warbler is a lover of heavily timbered river bottoms and moist mountain slopes, and, as it spends most of its time in the very tops of the tallest trees, it is rarely seen unless the observer is particularly looking for it. In migration, however, it often descends to the lower branches. It has a cheerful, melodious song, which greatly resembles one of the songs of the parula warbler. Langille renders it: "*rheet, rheet, rheet, rheet, ridi, idi-e-e-e-e-e*," beginning with several soft, warbling notes, and ending in a rather prolonged but quite musical squeak. The nest is described as "saddled on a horizontal limb of considerable size, some distance from the tree, and some forty or fifty feet from the ground."*

Food habits.—Examination of 4 stomachs of this species taken in Alabama showed the food to consist of Hymenoptera, beetles, weevils, and caterpillars.

†Saunders, A. A., *The Auk*, vol. 25, p. 422, 1908.

*Langille, J. H., *Op. cit.*, p. 326, 1884.

CHESTNUT-SIDED WARBLER: *Dendroica pensylvanica*
(Linnaeus).

State records.—The chestnut-sided warbler is a common migrant both in spring and fall, apparently more abundant during the latter season. It passes north in spring from the middle of April to the middle of May and in autumn is seen from the last of August to the middle of October. Saunders found it uncommon at Hollins between April 25 and May 3 (1908); Avery observed it at Greensboro, May 4 (1890) and April 27 (1891); Dean noted it at Anniston, April 16 and 23 (1916); and Graves saw one on Sand Mountain, May 2 (1914). I collected one at Barachias, April 23, 1912, and the next day saw another. Holt observed the species there April 29 and 30, 1913, and took a specimen at York, May 2, 1912. I saw several at Florence, May 4 and 7 (1912), and one at Muscle Shoals, April 24 (1914).

In the fall migration Avery noted the bird at Greensboro, August 29 to October 14, 1890; and August 25 and September 5 and 25, 1891. I collected an immature bird at Scottsboro, September 2, and another at Huntsville, September 7 (1908). Golsan took specimens at Autaugaville, October 1 and 2 (1915). At Orange Beach, September 20 (1911), Gutsell found the species abundant in a dense thicket bordering a swamp.

General habits.—This species dwells in scrubby pastures and second growth woodland and is believed to have increased in numbers since the days of Wilson and Audubon. Brewster says of the birds as observed in eastern Massachusetts: "They nest chiefly on the edges of upland woods, in neglected fields and pastures, along the courses of brooks, and on country roadsides. In general terms they may be said to occupy most of the country which the yellow warblers avoid, but in a few localities the two species breed together in the same thickets."† The song bears considerable resemblance to that of the yellow warbler; it is described by Langille as "a warble in a somewhat whistling tone, the notes resembling the syllables,

†Brewster, Wm., *Birds of the Cambridge Region of Massachusetts*, p. 337, 1906.

wee-chee, wee-chee, wee-chee, wee-chee, accent on the first syllable of each repetition, increasing to the last.”†

Food habits.—Forbush speaks of this bird as being “very destructive to many injurious beetles and caterpillars” and an “active consumer of leaf-eating insects.” He mentions also, bark beetles, plant bugs, leaf hoppers, ants, and aphids as a part of the bird’s fare.*

BAY-BREASTED WARBLER: *Dendroica castanea*
(Wilson).

State records.—The bay-breasted warbler occurs as a regular, though rather uncommon spring migrant but it has not been seen in the fall. Its main migration route seems to be through the Mississippi Valley and across the Gulf of Mexico. Dr. Avery took a single specimen at Greensboro, May 3, 1893; Holt secured one at York, May 2, 1912, and I collected one at Muscle Shoals, April 25, 1914. I saw two birds at Florence, May 4 and 7, 1912, and another near Ardell, May 4, 1914. Graves reports the species from Sand Mountain, May 9 and 11, 1912, and April 20, 1914, and Miss Parkhurst reports it from Talladega, April 30, 1906, May 12, 1907, and May 5, 1909. A specimen taken in spring at Point Clear is in the mounted collection of James K. Glennon. The only fall record is that of two birds which I shot in pines on the slopes of Choccolocco Mountain near Piedmont, October 20, 1916.

General habits.—This rather large warbler is quite leisurely in movements and during migration is most frequently found in upland, deciduous timber tracts. In its summer home in the North it is said to frequent the tops of tall trees; nests have been found in hemlocks 15 and 20 feet above the ground. Langille describes its song as “a very soft warble, somewhat resembling the syllables *tse-chee, tse-chee, tse-chee, tse-chee, tse-chee*, but far too liquid to admit of exact spelling.”†

†Langille, J. H., *Our Birds in Their Haunts*, p. 383, 1884.

*Forbush, E. H., *Useful Birds and Their Protection*, p. 194, 1907.

†Langille, J. H., *Our Birds in Their Haunts*, p. 328, 1884.

BLACK-POLL WARBLER: *Dendroica striata*
(J. R. Forster).

State records.—The black-poll warbler is one of the greatest travelers of any of our small land birds. Its summer home is mainly in Canada and Alaska as far as the limit of trees and its winter home in northern South America. Says Professor Cooke: "The shortest journey that any black-poll performs is 3,500 miles, while those that nest in Alaska have 7,000 miles to travel to their probable home in Brazil."‡ Passing northward from South America by way of the Lesser Antilles, the Bahamas, and Florida, the black-polls avoid the Gulf coast almost entirely and most of them pass to the eastward of Alabama or fly directly over the State. The bird is occasionally seen in spring in the northern half of the State, but there is no record of its occurrence in autumn.

It is one of the latest migrants to arrive, and is rarely seen before the last of April. Dr. Avery records one seen at Greensboro, April 23 (1893), and another May 5 (1889). At Shelby, the first was noted April 27 and the last May 12 (1898). In the region about Mount Weogufka, Saunders found it uncommon, first seen April 28 and last seen May 14 (1908).* Holt observed one at Barachias, April 22 (1913). On Sand Mountain, Graves reports it arriving April 27 (1913 and 1914) and common May 9 (1913). At Muscle Shoals, we observed single birds April 22, 23 and 24 and several April 25, 1914.

General habits.—This warbler is very leisurely in its movements and its song is one of the faintest and least musical of any of its tribe. The bird is, however, not shy and its notes are characteristic, so it is easily recognized. The song is a monotonous series of faint, lisping, staccato notes of equal length, resembling the syllables *tsit-tsit-tsit-tsit-tsit-tsit*, usually rendered with a crescendo and diminuendo effect.

In its summer home in the North the black-poll is a dweller in stunted spruce woods, but in migration it frequents all kinds of woodland as well as orchards and city parks, and according to Brewster is "often seen flitting along fences and

‡Cooke, W. W., in Chapman, Warblers of North Amer., p. 15, 1907.

*Saunders, A. A., The Auk, vol. 25, p. 422, 1908.

stone walls that traverse open country or feeding on the ground, in company with various species of sparrows, in grain stubbles and weed-infested fields.”†

Food habits.—Barrows says of the food of this species:

The food consists mainly of insects and the bird eats immense numbers of span-worms and plant-lice at all times of year. In the fall they also eat some seeds and berries, but they are mainly insectivorous and are expert fly catchers, taking much of their food on the wing. Forbes found that two-thirds of the food of those taken in an orchard overrun with cankerworms consisted of those worms, while 19 per cent consisted of beetles, 4 per cent of ants, and 5 per cent of gnats.‡

BLACKBURNIAN WARBLER: *Dendroica fusca* (Muller).

State records.—The Blackburnian warbler is a regular but rather uncommon migrant, occurring chiefly in spring from the first week in April to the second week in May. Saunders says of it: “Not common. Noted at intervals from April 4 to May 10, both at Woodbine and Hollins.”* Graves reports it rare on Sand Mountain, noted April 25 (1912); April 22 and 30 (1914); May 7 (1911), and May 9 (1912). It was observed at Shelby, May 9 and 11 (1898). Avery collected only one specimen at Greensboro, May 3 (1893). Holt saw 3 at Jackson, April 5, and I saw 4 at Florence, May 4 (1912). Single birds were noted, also, at Autaugaville, April 16 and May 12 (1912), and at Muscle Shoals, April 22 and 23 (1914). A male in spring dress taken at Point Clear is in the mounted collection of James K. Glennon. The only autumn record is that of a specimen which I collected at Huntsville, September 7, 1908.

General habits.—In its summer home in the North this warbler inhabits chiefly the tops of tall hemlocks, white pines, or other conifers and builds its nest from 20 to 80 feet above the ground. In migration it is often seen near the ground in low deciduous growth, where its brilliant coloration always arrests attention. It is usually found singly or in pairs.

†Brewster, W., *Birds of the Cambridge Region of Massachusetts*, p. 340, 1906.

‡Barrows, W. B., *Michigan Bird Life*, p. 612, 1912.

*Saunders, A. A., *The Auk*, vol. 25, p. 422, 1908.

YELLOW-THROATED WARBLER: *Dendroica dominica dominica* (Linnaeus).

State records.—The yellow-throated warbler is a common summer resident over the greater part of the State. It has been seen in the breeding season at Florence, Leighton, Sand Mountain (Jackson County), Ardell, Auburn, Anniston, Autaugaville, Woodbine, Squaw Shoals (Jefferson County), Jasper, Tuscaloosa, Natural Bridge, Seale, Coosada, and Castleberry. On Sand Mountain, near Carpenter, it was fairly common late in June and at Squaw Shoals it was the commonest warbler on the pine-covered hills. It was numerous also along the route from Jasper to Ardell, April 30 to May 5, 1914.

Migrants from the south appear about the middle of March, having been noted at Greensboro, March 10, (1893); Coosada, March 13 (1878); Woodbine, March 16 (1908); Autaugaville, March 17 (1913); Mobile, March 18 (1912); and Sand Mountain (near Carpenter), April 1 (1917).

General habits.—This warbler lives in open tracts of pine or mixed timber, particularly about the borders of swamps, and frequents mainly the upper branches of tall trees. It is a vigorous singer, and its song, though rather simple in character, is loud and ringing, somewhat suggesting the song of the Louisiana water-thrush.

The nest may be placed either in pines or deciduous trees and where Spanish "moss" is found, it is usually concealed in a bunch of this lichen. Of 6 nests found by Dr. Avery, at Greensboro, 4 were placed in sweet gums, 1 in a pine, and 1 in an oak. The height of the nest above the ground varied from 15 to 55 feet. All were concealed in the hanging "moss." The birds began to build about the first of April and eggs were found in the nests on April 18 and 24.

Food habits.—Examination of 9 stomachs of this bird from Alabama showed its food to be mainly flies, beetles, ants and other Hymenoptera, and spiders.

BLACK-THROATED GREEN WARBLER: *Dendroica virens virens* (Gmelin).

State records.—The black-throated green warbler occurs not uncommonly as a spring and fall migrant, and breeds

Fig. 1.—Bear Swamp, near Autaugaville. Typical habitat of the Bachman Warbler (*Vermivora bachmani*) and prothonotary Warbler (*Protonotaria citrea*).

Fig. 2.—Cane brake on Catoma Creek. Typical habitat of the Swainson Warbler (*Helinaia swainsoni*).

in the breeding season to coniferous timber, we have found singing males in two instances in June in dry oak woods. The nest has never been found in Alabama, but in the North it is usually placed in evergreen trees—pines, hemlocks, or cedars. Verdi Burch has found 20 or more nests at Branchport, N. Y., and all were in hemlocks, from 10 to 40 feet from the ground.†

The song of this warbler is a characteristic little ditty of four or five notes, which Langille describes thus: "*Wee-wee-su-see*, each syllable uttered slowly and well drawn out; that before the last in a lower tone than the two former and the last syllable noticeably on the upward slide; the whole being a sort of insect tone, altogether peculiar, and by no means unpleasant."‡

Food habits.—Professor Barrows, writing of the food habits of this bird, says: "Both spring and fall it may be found gorging itself with plant lice and searching the twigs and leaves for span-worms, leaf-rollers, and harmful insects of every kind. It eats berries, also, and possibly a few seeds, being particularly fond of the berries of the poison ivy and to a less extent of those of junipers."*

KIRTLAND WARBLER: *Dendroica kirtlandii* (Baird).

State record.—The breeding range of the Kirtland, rarest of the American warblers, is restricted, so far as known, to a comparatively small area in north-central Michigan. The only record of the bird from Alabama is that of A. A. Saunders, who says: "I met with an individual of this species at Woodbine, May 10 [1908], a Sunday afternoon, when I unfortunately had no gun. I watched the bird closely for some 10 or 15 minutes. Its actions resembled those of the pine warbler, but its song was rather like that of the black-throated green."**

General habits.—This rather large warbler is described as a graceful walker, "equally at home on trees or on the ground, where the habit of bobbing its tail is very characteristic." It

†Burch, V., in Chapman, *The Warblers of North America*, p. 161, 1907.

‡Langille, J. H., *Our Birds in Their Haunts*, p. 272, 1884.

*Barrows, W. B., *Michigan Bird Life*, p. 618, 1912.

**Saunders, A. A., *The Auk*, vol. 25, p. 422, 1908.

is said to have several distinct songs, "all of which belong to the whistling type and have the clear ringing quality of the oriole's."†

PINE WARBLER: *Dendroica pinus pinus* (Wilson).**

State records.—The pine warbler is a common resident of all sections of the State where pine timber occurs. It is one of the few warblers that do not leave the United States in winter. At that season the northern-breeding birds of the species move southward and occupy the Gulf States in company with the breeding birds of the same region. The bird has been seen in the breeding season at Jasper, Guntersville, Talladega Mountains, Tuscaloosa, Greensboro, York, Seale, Dothan, Castleberry, Mobile, Bayou Labatre, and Dauphin Island. Nests with eggs have been found at Autaugaville, April 3, 1911 (Golsan); Barachias, April 30, 1909 (Holt); and on Sand Mountain (near Carpenter, April 26, 1914 (Graves).

General habits.—Although never found far from pine timber, this bird occasionally descends to the ground and in winter may frequently be seen feeding in cultivated fields. In the forest it has much the habits of a creeper, and seeks its food almost exclusively on the trunks and branches of the pines.

Nathan Clifford Brown, writing from Coosada, says:

For the first three or four weeks of my stay I found them exclusively in the fields, forming large flocks with Bluebirds and several kinds of Sparrows; and it was not until the latter part of February that they frequented the woods commonly. The females deposited their eggs about the last of March, judging from the appearance of specimens dissected at that time. Young were flying generally by April 27. Throughout the six weeks of winter which I spent at Coosada the Pine Warblers were uninterruptedly tuneful. No other winter birds sang so continuously * * *.†

The song of this warbler is a soft, melodious trill, somewhat like that of the chipping sparrow, but more musical, and easily distinguished from that of any other bird.

†Wood, N. A., in Chapman, *The Warblers of North America*, pp. 207-208, 1907.

***Dendroica vigosii* of the A. O. U. Check-list; for change of name see *The Auk*, vol. 38, p. 280, 1921.

‡Brown, N. C., *Bull. Nutt. Ornith. Club*, vol. 3, pp. 173-174, 1878.

The nest is placed in a pine tree, 12 to 80 feet above the ground; usually on a horizontal limb or sometimes in the terminal twigs of a nearly upright branch; it is rather bulky and solidly constructed of weed stems, the stems of dry leaves, grapevine bark, horse-hair, etc., and plentifully lined with feathers.

Food habits.—C. S. Brimley, writing of the food habits of the pine warbler (in North Carolina) says:

This species feeds on insects and their larvae but like all our resident species consumes a large amount of vegetable food during the winter, e. g., the seeds of the short-leaved and loblolly pines (*Pinus mitis* and *P. taeda*) as well as the berries of dogwood (*Cornus florida*) and Sumac (*Rhus copallina*). During the spring and summer this species feeds mostly in the pine trees; during autumn and winter it also feeds on the ground to a great extent and may then be found almost anywhere.*

PALM WARBLER: *Dendroica palmarum palmarum* (Gmelin).

State records.—The palm, or red-poll, warbler is a common spring and fall migrant throughout the State and a rare winter resident near the coast. Fall migration takes place chiefly during October. Dean saw a number of the birds at Anniston, October 8 (1916). Avery noted them at Greensboro on October 12, 21 and 25; McCormack observed the first at Leighton on October 24 (1891); and Golsan saw two at Autaugaville, October 16 (1915). In the pine flats of the coast region in February I saw only a few individuals of this subspecies. One specimen was taken near Mobile, February 5, and one or two were seen at Bayou Labatre, February 9, 1912; Holt saw a few at Jackson, February 19-26, 1912.

Spring migration begins the last of March or first of April and continues till early in May. I took specimens at Jackson Lake (Elmore County), March 27; Squaw Shoals (Jefferson County), April 12; and Autaugaville, April 16; and noted the bird, also, at Tuscaloosa, April 6 and 7 (1915), and on Sand Mountain, April 11 and 15 (1914). Holt collected one at Myrtlewood, April 19 (1912). Dr. Avery found this bird

*Brimley, C. S., *The Auk*, vol. 8, p. 199, 1891.

common at Greensboro between April 6 and May 6 and his collection contains numerous specimens taken between April 12 and 30. Saunders records it fairly common at Woodbine, April 3-27. At Barachias, April 21-25 (1912), and at Muscle Shoals, April 22-25 (1914), I found it numerous and singing.

General habits.—This warbler differs from most of the other members of the genus in being largely terrestrial in habits. In the South it frequents cultivated fields, gardens, pastures, marshes, and open, brushy timber tracts, and is often found in loose flocks numbering sometimes 40 or 50 birds. It has a characteristic habit of drooping its tail as it sits in a bush or on a weed stalk or a fence, and its sharp chipping note, though not loud, serves to call attention to the bird's presence.

Food habits.—Examination of 15 stomachs of this species from Alabama showed the food to consist of insects, with a few spiders. The insect remains included weevils and other beetles, ants and other Hymenoptera, small bugs, caterpillars, grasshoppers, and ephemerids. W. D. Doan reports finding red ants and house flies in stomachs of this species,* and R. W. Williams, Jr., states that on October 16, 1904, near Tallahassee, Florida, he observed large numbers of the birds feeding on cotton worms.

YELLOW PALM WARBLER: *Dendroica palmarum*
hypochrysea Ridgway.

State records.—The yellow palm warbler, characterized by the greater amount of yellow on the underparts, is a common winter resident in the southern parts of the Gulf States. Writing of the migrations of the two races, Prof. Cooke says: "In central Alabama, *palmarum* appears as a fall migrant and passes on to the southeast, its place being taken by *hypochrysea* as a common winter resident. Early in the spring *hypochrysea* leaves for the northeast and later *palmarum* passes through toward the Mississippi Valley.†

In the pine flats of the Coast Plain the yellow palm (*hypochrysea*) is the prevailing form in winter. Specimens

*West Virginia Exp. Sta., Bull 3, p. 82, 1888.

†Cooke, W. W., Biol. Surv. Bull. 18, p. 96, 1904.

were taken at Orange Beach, January 24 and 30 and at Whistler February 5, 1912. At the latter place the bird was numerous. It was common, also, at Bayou Labatre, in February, 1912, and December, 1916; and at Ashford, in November, 1916. Saunders observed only a few individuals of this form at Woodbine (March 16 and 17, 1908). Brown took specimens at Coosada in winter and early spring, and I took one on Sand Mountain, near Carpenter, April 12, 1914. Avery noted the subspecies only once at Greensboro—April 21, 1890.

Dean records palm warblers to the number of 75 at Anniston, December 25, 1916,[‡] but from what we know of the winter distribution of the two races doubtless most of the birds seen there were of the present form.

PRAIRIE WARBLER: *Dendroica discolor* (Vieillot).

State records.—The prairie warbler is a common summer resident in nearly all parts of the State; it is known to breed at Florence, Stevenson, Sand Mountain, Squaw Shoals, Gunterville, Anniston, Ardell, Erin (Clay County), Greensboro, Autaugaville, Seale, and Abbeville. The first migrants in spring were noted at Woodbine, March 26 (1908); Coosada, March 27 (1878); Autaugaville, March 30 (1913); Sand Mountain, April 3 (1913); Tuscaloosa, April 4 (1914); and Greensboro, April 6 (1890). Fall migration takes place during September and October; one bird was seen by R. H. Dean at Anniston, October 15 (1916). Nests with eggs have been found at Florence, May 9; Woodbine, May 15; Greensboro, June 1; and Autaugaville, May 12 and June 18.

General habits.—This warbler might more appropriately be called the "bush warbler," for it lives in bushy pastures and in second-growth sprout lands rather than on prairies. It seems to prefer rather barren, sandy regions and always avoids dense forests. It feeds in the bushes and the lower branches of the trees and is a rather expert flycatcher. It is a retiring bird, attracting little attention either by its habits or by its song, which is a characteristic and rather pleasing little ditty, consisting of a series of drawled, shrilling notes

[‡]Dean, R. H., Bird-Lore, vol. 19, p. 29, 1917.

on an ascending chromatic scale, uttered rather rapidly, suggesting the syllables, *zee-zee-zee-zee-zee-zee*. The nest is placed in a bush or sapling, from 2 to 5 feet above the ground; oak, hickory, dogwood, sweet gum, elm, or other deciduous trees are most often selected, but in some localities pines or cedars seem to be preferred.

Food habits.—Six stomachs of the prairie warbler from Alabama contained finely ground remains of beetles, bugs, and Hymenoptera, probably wasps or bees. The bird is known to feed also on ants, caterpillars, and spiders.

OVEN-BIRD: *Seiurus aurocapillus aurocapillus* (Linnaeus).

State records.—The oven-bird occurs as a rather uncommon migrant, chiefly in autumn, and as a summer resident in the hills and mountains of the northern counties (fig. 23). It breeds commonly on Sand Mountain and on Monte Sano, near Huntsville; also in the wooded hills about Florence, and rarely at Anniston, where I took a singing male, June 7, 1913.

In spring migration the oven-bird occurs rarely in the northern part of the State, but has never been taken at that season south of Montgomery County. It arrived on Sand Mountain (near Carpenter), where it breeds, April 16, 1911; April 8, 1912, April 17, 1914, and April 18, 1917. Single birds were taken at Barachias, April 24, 1912, and May 1, 1913, and 5 were noted between Jasper and Ardell, May 1 to 5, 1914. In fall the bird has been noted at Leighton between August 10 and October 16; at Greensboro, between August 21 and October 19; and at Castleberry, October 13 (1908). A nest with five eggs was found at Florence, May 7, 1912.

General habits.—This warbler, formerly known as the golden-crowned thrush, is terrestrial in habit, and a dweller in rich, deciduous woodland, almost always in dry hilly regions and never in wet bottom lands. It is a dainty walker and resembles in appearance and habits the true thrushes. Its song, a vigorous and characteristic utterance, is rendered from a fallen log or a low limb of a tree. Burroughs has translated it as *teach-er, teach-er, teach-er, teach-er*, and has dubbed the bird the "teacher bird," but the accent is usually placed on the

FIG. 23.—Breeding area of the Ovenbird (*Seiurus aurocapillus*) in Alabama.

second syllable. In the South, the oven-bird seems to clip the first syllable, thus giving the song a quite different character from that of the northern birds. Here, as elsewhere, the song grows louder with each note and has somewhat of a ventriloquial character. The nest, made of dry leaves and grasses, is placed on the ground in the woods and is domed over in the form of a Dutch oven, hence the popular name of the bird.

Food habits.—Dr. Warren says that the oven-bird “subsists chiefly on various forms of insect life, such as beetles, earthworms, crickets, flies, spiders, and larvae; it also sometimes feeds on small seeds.”* To this list may be added, from the records of the Biological Survey, grasshoppers, weevils, ants, caterpillars, butterflies, moths, millipeds and snails.

WATER-THRUSH: *Seiurus noveboracensis noveboracensis* (Gmelin).

State records.—Both the eastern and western forms of the water-thrush occur in the State in migration, but as there are few definite records based on specimens it is impossible to say which is the more common. The Avery collection contains one specimen of *noveboracensis* taken at Greensboro, September 19, 1890, and Holt took one at York, April 30, 1912. I saw one bird at Leighton, May 1, and several at Florence, May 4, 5 and 6, 1912. Holt observed one at Barachias, April 22, and another April 30, 1913.

General habits.—Although resembling the true thrushes in coloration, the water-thrush is a terrestrial warbler related to the oven-bird. It frequents small streams and sloughs in the woods and may be easily recognized by its habit of tilting the body as it walks. When frightened it flies up from the ground to a low perch, uttering its characteristic sharp, metallic *chip*. Its song, which is occasionally heard during the spring migration, is described by Gerald Thayer as a “ringing, bubbling warble, swift and emphatic, made up of two parts, barely divided, the second lower-toned and diminuendo.”†

Food habits.—Apparently the food of this bird has not as yet been carefully studied. Coues states that it consists of

*Warren, B. H., *Birds of Pennsylvania*, 2d ed., p. 294, 1890.

†Chapman, F. M., *The Warblers of North America*, p. 233, 1907.

aquatic insects, worms, and tiny mollusks and crustaceans;‡ Warren says it is largely made up of beetles, small worms, larvae, and small shells.**

GRINNELL WATER-THRUSH: *Seiurus noveboracensis notabilis* Ridgway.

State records.—The Grinnell water-thrush—a western race—seems to be fully as common in Alabama as the eastern form. Avery took two specimens at Greensboro, September 3, 1892, and August 25, 1893. Saunders collected one at Hollins, April 25, 1908, and noted others of the species there between April 22 and May 3 and at Sylacauga, April 16.* I secured a single specimen at Brewton, October 8, 1908.

LOUISIANA WATER-THRUSH: *Seiurus motacilla* (Vieillot).

State records.—The Louisiana, or large-billed, water-thrush (fig. 24), is a rather uncommon summer resident over the greater part of the State excepting the Coast Belt. It is known to occur in the breeding season at Florence, Stevenson, Sand Mountain (near Carpenter), Guntersville, Woodbine, Greensboro, Barachias, Natural Bridge, Tuscaloosa, Anniston, Seale, Castleberry, and Abbeville. At the two last-mentioned localities it is rare, but the capture of a specimen at Abbeville, June 9, 1911, and observation of several others the same month, both there and at Castleberry, leaves no doubt of its breeding in that region. A bird seen in a swamp near Mobile, July 11, 1913, may have been a migrant.

The species is an early migrant, arriving usually in March. A very early date is furnished by Saunders, who noted the bird at Woodbine, March 9, 1908. Other dates of arrival are March 13 (1878), at Coosada; March 29 (1891), at Greensboro; March 30 (1913), at Autaugaville; April 4 (1890), at Leighton; and April 4 (1914), at Tuscaloosa. McCormack records the last one seen in fall at Leighton on October 12

‡Coues, E., *Chicago Field*, vol. 8, p. 396, 1877.

**Warren, B. H., *Birds of Pennsylvania*, p. 295, 1890.

*Saunders, A. A., *The Auk*, vol. 25, p. 422, 1908.

(1889). A nest with eggs was found by Holt at Attalla, June 12, 1913.

General habits.—The Louisiana water-thrush is found along wooded ravines in the hills and to some extent in river-bottom swamps. The birds feed almost exclusively in or near the beds of small streams or around pools in the bottoms. They are dainty and graceful walkers, and are easily recognized by the habit of continually tilting their body up and down. They are very shy, and on the slightest alarm fly off with a dashing flight and a loud *chip*. The song is rich and resonant, somewhat resembling that of the indigo bird, but more musical. The nest is placed in the side of a bank in a wooded ravine usually only a few feet from a stream, or sometimes among the upturned roots of a fallen tree.

Food habits.—Barrows says that the food of this bird "consists mainly of aquatic insect larvae, but insects and spiders of various kinds are eaten, as well as worms, crustaceans, snails, and other mollusks, and to a lesser extent various seeds and small fruits."*

KENTUCKY WARBLER: *Oporornis formosus* (Wilson).

State records.—The Kentucky warbler is an abundant summer resident in nearly all parts of Alabama. It is recorded in the breeding season at Leighton, Elkmont, Huntsville, Sand Mountain, Fort Payne, Natural Bridge, Autaugaville, Tuscaloosa, Seale, Dothan, Abbeville, Castleberry, and Mobile. It is common as far south as Castleberry, but is rare in the Coast Belt south of there.

The first migrants in spring were noted at Teasley Mill (Montgomery County), March 30 (1914); Greensboro, April 5 (1888); Woodbine, April 7 (1908); Coosada, April 9 (1878); Leighton, April 15 (1891); Anniston, April 16 (1916); and Shelby, April 18 (1898). The last bird in autumn was seen at Greensboro, September 12, and at Leighton, September 13. Nest building must begin very soon after the birds reach the breeding grounds, for Holt found a complement of 4 eggs at Barachias on April 22, 1906. Eggs were

*Barrows, W. B., Michigan Bird Life, p. 633, 1912.

FIG. 24.—Louisiana Water-thrush.

also found at Woodbine, May 19 and June 9; Greensboro, June 4; Ardell, June 26; and at Erin, Clay County, June 27.

General habits.—This warbler is a lover of moist, wooded ravines among the hills and of swampy river-bottom woods. Although keeping for the most part well concealed in the underbrush it is not particularly shy. It is a dainty walker and spends most of its time on the ground, often singing without ascending to a higher perch. The song is a rich, melodious warble, somewhat resembling certain songs of the Carolina wren, but less vigorous. Chapman watched one of the birds for three hours, and says: "During this period, with the exception of five interruptions of less than forty-five seconds each, he sang with the greatest regularly once every twelve seconds. * * * I found him singing and when I departed he showed no signs of ceasing."* The nest is a bulky structure of dead leaves, grasses, grapevine bark, etc., placed on the ground in the woods, usually at the base of a small bush or in a clump of herbaceous plants.

Food habits.—Audubon says that this warbler destroys great numbers of spiders, "which it frequently obtains by turning over the withered leaves on the ground."† Goss states that it occasionally eats pokeberries or other small berries.‡ Two stomachs examined from Alabama contained remains of bugs, beetles, caterpillars, ants, and other Hymenoptera.

[CONNECTICUT WARBLER: *Oporornis agilis* (Wilson).]

The Connecticut warbler breeds in Manitoba, Minnesota, and Michigan and migrates in autumn to South America. It is fairly common in spring migration in the Mississippi Valley and should be found at that season in Alabama. In autumn it migrates chiefly along the Atlantic Coast. It has been observed several times in May at Chattanooga, Tennessee, by Mrs. M. B. Mitchell.]

[MOURNING WARBLER: *Oporornis philadelphia* (Wilson).]

This warbler during the breeding season is an inhabitant of the Northern States from Minnesota to Maine, and of southern Canada. In winter it passes south to Central and South America. It occurs commonly

*Chapman, F. M., *The Warblers of North America*, p. 233, 1907.

†Audubon, J. J., *Ornith. Biog.*, vol. 1, p. 196, 1831.

‡Goss, N. S., *History of the Birds of Kansas*, p. 579, 1891.

in migration in Texas, rarely in Louisiana, and has been reported from Rising Fawn, Georgia (May 14 to 20, 1885). Doubtless it occurs occasionally, perhaps regularly, in Alabama.]

MARYLAND YELLOW-THROAT: *Geothlypis trichas trichas* (Linnaeus).

State records.—The Maryland yellow-throat, with its subspecies, is one of the most abundant and widely distributed birds of the State. It does not ascend very high in the mountains, but is found in all the mountain valleys and in the lowlands generally. The typical race (*trichas*) occupies in the breeding season the northern and mountainous parts of the State from Walker County northward. Breeding specimens have been examined from Leighton, Elkmont, Sand Mountain (near Carpenter), Guntersville, Natural Bridge, and Ardell.

McCormack records the arrival of spring migrants at Leighton, April 7, 1890; one was noted at Anniston, March 26, 1916; and one at Carpenter, April 17, 1914; a migrating specimen of this race was secured by Holt at Oakchia, April 24, 1912; the last in fall were seen at Leighton, September 23, 1893. Fresh eggs were found at Leighton, May 12, June 6, and July 6.

General habits.—The yellow-throat is a lover of brushy clearings, brier patches, and marshy pastures and is a familiar bird about the farm. It lives on or near the ground, feeding in thickets and brier patches and ascending only to a rather low perch to deliver its song. On the approach of danger it dives into the thick brush and is then very difficult to detect. From its retreat it persistently utters its characteristic alarm note—a somewhat reedy *tchib*—and if the observer remains quiet the little fellow will shortly hop out to see if the coast is clear. Thayer calls attention to another call note, “the grating, wren-like *Brrrrrrr*—a little long-drawn snarl—which does not seem often to have been described.”* The song is a vigorous little ditty, often written as *witchity, witchity, witchity*, but subject to much variation. The nest is usually placed on the ground in a bunch of weeds or briars or at the base of a small

*Chapman, F. M., *The Warblers of North America*, p. 256, 1907.

bush; sometimes in bushes or briars a few feet above the ground.

Food habits.—Forbush's account of the food habits of the northern yellow-throat (*brachidactyla*) will doubtless apply equally well to the present race. He says:

In pastures the yellow-throat eats many leaf hoppers, which are abundant among the grass and low-growing herbage that it frequents * * *. The yellow-throat, on account of its destruction of leaf hoppers and grasshoppers, may be ranked among the useful birds of the fields. In orchards it often feeds very largely on cankerworms, going long distances from its nest to get these caterpillars to feed to its young. * * * Case bearers, leaf rollers, and many other destructive caterpillars are greedily devoured and it also catches and eats both butterflies and moths in considerable numbers. Along the borders of woods it is very destructive to many beetles, flies, and especially to plant lice, of some species of which it is very fond. It often goes to grain fields, where, so Wilson says, it eats insects that infest them.†

FLORIDA YELLOW-THROAT: *Geothlypis trichas ignota*
Chapman.

State records.—The southern race of the Maryland yellow-throat occurs as a summer resident over the whole of southern and central Alabama as far north as Tuscaloosa and Shelby Counties (fig. 25). Breeding specimens have been taken on Dauphin Island, and at Mobile, Dothan, Abbeville, Seale, Autaugaville, Hayneville, Hollins,‡ Auburn, Wilsonville, and Tuscaloosa. An immature specimen taken in autumn at Guntersville is in the collection of Mrs. Bessie R. Samuel. This bird is a straggler this far north, as the breeding form at that locality is *trichas*.

A few individuals of the southern yellow-throat spend the winter in the lower counties of the State, but the majority pass on to Florida and Cuba. At Orange Beach, late in January, I saw but one bird of this species; several were seen, February 6, 1912, in the Mobile marshes, and one at Nigger Lake, December 1, 1915. At Coosada a solitary male was re-

†Forbush, E. H., *Useful Birds and Their Protection*, pp. 187-188, 1907.

‡Saunders, A. A., *The Auk*, vol. 25, p. 423, 1908.

FIG. 25.—Breeding areas of Yellow-throats in Alabama.
 (1) Maryland Yellow-throat (*Geothlypis trichas trichas*).
 (2) Florida Yellow-throat (*Geothlypis trichas ignota*).

ported February 7, 1878, but the species did not appear there in numbers until March 5.* The first migrants were noted at Greensboro, March 11 (1890), and March 20 (1887); Shelby, March 11 (1898); Woodbine, March 16 (1908); and Jackson Lake, Elmore County, March 27 (1912, specimen). Eggs were found by Golsan at Autaugaville, May 15, 1910, and by Avery, at Greensboro, April 26 and May 24, 1888.

General habits.—The southern yellow-throat inhabits the same situations as do its northern relatives and in addition is found in the wet marshes along the Gulf coast. It is a slightly larger and darker-colored bird than *trichas* but has essentially the same habits.

Food habits.—Six stomachs of this subspecies taken in Alabama have been examined and found to contain remains of flies, beetles, bugs, ants and other Hymenoptera, caterpillars, and spiders.

NORTHERN YELLOW-THROAT: *Geothlypis trichas*
brachidactyla (Swainson).†

State records.—The northern yellow-throat occurs in Alabama as a migrant and possibly as a winter resident. The Biological Survey collection contains 8 specimens taken in the State, as follows: Auburn, October 2, 1908; April 27, 1912; Fairhope and Bon Secour, October 16, 1908; Jackson Lake (Elmore County), March 27, 1912; Thomasville, April 11, 1912; Florence, May 8, 1912; and Tuscaloosa, April 6, 1914.

YELLOW-BREASTED CHAT: *Icteria virens virens*
(Linnaeus).

State records.—The yellow-breasted chat is a common and generally distributed summer resident, except in the Gulf Strip, where it is rare or absent. It has been observed in the breeding season south to Autaugaville, Seale, and Abbeville. Spring migrants were first seen at Greensboro, April 8 (1893); Hollins, April 11 (1908); Anniston, April 16 (1916); Leighton, April 16 (1891); Autaugaville, April 20 (1913);

*Brown, N. C., Bull. Nutt. Ornith. Club, vol. 3, p. 174, 1878.

†For use of this name see The Auk, vol 36, p. 212, 1918.

and Sand Mountain, April 21 (1911), and April 22 (1917). The bird departs early in fall for its winter home; the last one seen at Leighton was on September 3 (1893). Eggs have been found at Florence, May 11; Autaugaville, May 12; Greensboro, May 21; Montgomery, June 3; York, June 7; and Guntersville, June 17.

General habits.—This bird dwells chiefly in dry thickets and shrubby clearings and is so shy and suspicious of intrusion that it is not very well known. It remains concealed in shrubbery the greater part of the time, but occasionally flies up to deliver its odd song in the air, its legs dangling to their full length and the wings raised high above the body. The song is a curious medley of whistles, cat calls, and chuckles, and is frequently heard at night as well as throughout the day. The nest, placed in a bush, usually about 2 or 3 feet above the ground, is constructed of grasses, leaves, and grapevine bark, lined with finer grasses.

Food habits.—The chat feeds largely on insects, including beetles, bugs, ants, weevils, bees, wasps, Mayflies, and various caterpillars, such as tent caterpillars and currant worms. It is said to be fond of wild strawberries and takes also considerable other wild fruit, as blackberries, raspberries, whortleberries, elderberries, and wild grapes.

HOODED WARBLER: *Wilsonia citrina* (Boddaert).

State records.—The hooded warbler is a fairly common summer resident in all parts of the State from the coastal swamps to the summit of the mountains. It is recorded in the breeding season at Leighton, Elkmont, Monte Sano (near Huntsville), Sand Mountain (near Carpenter), Erin (Clay County), Auburn, Seale, Tuscaloosa, Natural Bridge, Ardell, Dothan, Castleberry, and Mobile. This species arrives from the south late in March or early in April, having been first noted at Mobile, March 24 (1912); Coosada, March 28 (1878); Montgomery, March 29 (1908); Woodbine, April 4 (1908); Greensboro, April 6 (1893); and Leighton, April 8 (1891). In fall it has been observed at Greensboro, September 30 (1893); Castleberry, October 10 (1908); and Bon Secour,

October 19 (1908). Nests with fresh eggs were found at Florence, May 10 (1893), and at Autaugaville, May 28 (1909); and a nest with young at Teasley Mill (Montgomery County), May 15 (1914).

General habits.—The hooded warbler is a lover of canebrakes and swampy thickets in the river bottoms and is found, also, in moist mountain woods. It dwells for the most part near the ground, and as it flits through the shrubbery, displaying the white outer tail feathers, it is a conspicuous and very attractive object. It is an expert flycatcher and takes a large part of its insect prey upon the wing. The alarm note is a characteristic sharp *cheep*, and the song is a loud, whistled, strongly accented ditty, subject to considerable variation. Allison renders the shorter song as, *se-whit, se-wheer*, and the longer one as, *Whee-whee-whee-a-wheer*.* The nest is placed in a small bush or a bunch of cane stalks, usually 2 or 3 feet above the ground; it is compactly woven of strips of bark, plant down, etc., and is lined with fine grasses or dry weed-stems and rootlets.

Food habits.—The bird is said to feed chiefly on beetles, larvae, plant lice, and spiders. Five stomachs examined from Alabama contained remains of bugs, beetles, caterpillars, Hymenoptera, and spiders.

WILSON WARBLER: *Wilsonia pusilla pusilla* (Wilson).

State records.—The Wilson warbler occurs in the Gulf States only as a very rare migrant. It is believed to migrate northward by a long flight across the Gulf of Mexico, not usually alighting until it reaches the southern end of the Alleghenies.† It has been reported from Shellmound, Mississippi, and Rising Fawn, Georgia, and there is one record from Alabama—a bird seen by Saunders, at Hollins, May 2, 1908.‡

General habits.—In migration this warbler is most often found in low copses bordering woodland streams. It is a rather active species, catching some of its food on the wing like a flycatcher, and has the habit of twitching its tail spasmodically up and down.

*Allison, A., in Chapman, *The Warblers of North America*, p. 273, 1907.

†Cooke, W. W., *Biol. Surv. Bull.* 18, pp. 127-128, 1904.

‡Saunders, A. A., *The Auk*, vol. 25, p. 423, 1908.

CANADA WARBLER: *Wilsonia canadensis* (Linnaeus).

State records.—The Canada warbler occurs rather uncommonly as a migrant in spring and fall. Avery noted it but once at Greensboro, August 29, 1890. McCormack took a specimen at Leighton, August 18, 1891, and saw another, September 7, 1891. Saunders noted the bird at Hollins, May 2 and 3, and at Woodbine, May 9 and 14 (1908). Specimens were taken at Barachias, April 25 (1912); York, May 2 (1912); Leighton, April 25 (1914); and Teasley Mill (Montgomery County), May 16 (1914). Several were noted also at Florence, May 6 (1912); on Sipsey Fork, near Ardell, May 2-5 (1914); and one in Bear Swamp, near Autaugaville, May 10 (1914). Judging from these records the bird may be expected to occur regularly.

General habits.—This warbler is a dweller in moist, deciduous woodland, occupying the thickety underbrush and the lower branches of the trees. It is quite secretive and is usually hard to locate. Its song is a rather brief, jumbled utterance, quite characteristic, but very difficult to describe. Thayer describes the bird's habits as follows:

The Canadian is a sprightly, wide-awake, fly-snapping Warbler, vivid in movement and in song; clearly marked and brightly colored. In actions it is like the Wilson's, a sort of mongrel between a *Dendroica*, an American Redstart, and a true Flycatcher. It darts after flying insects like one of the Tyrannidae, and its bill may sometimes be heard to "click" when it seizes something; it has much of the Redstart's insistent nervousness of motion, but is a less airy "flitter;" and, finally, it glides and gleans among leaves and twigs like a true gleaning Warbler.*

REDSTART: *Setophaga ruticilla* (Linnaeus).

State records.—The redstart is a locally common summer resident over the greater part of the State. It has been observed in the breeding season at Huntsville (Monte Sano), Guntersville, Leighton, Tuscaloosa, Squaw Shoals, Autaugaville, Greensboro, Ardell, Seale, and Castleberry. A female was seen on Dauphin Island, May 18, 1911, but this bird may

*Thayer, G. H., in Chapman, *The Warblers of North America*, p. 283, 1907.

have been a migrant. At Castleberry several were noted June 1, 1911, and in the big swamps on the lower Tensaw River between Hurricane and Stiggins Lake I found it fairly common the last week in May. A nest with two fresh eggs was found by L. S. Golsan, near Booth, May 12, 1923.** The first arrivals in spring were seen at Tidewater (Tuscaloosa County), April 6 (1912); Barachias, April 7 (1913); Greensboro, April 13 (1889); Leighton, April 13 (1892); and Sand Mountain (near Carpenter), April 23 (1914). The last in autumn were noted at Leighton, October 11 (1893), and at Greensboro, October 15 (1890).

General habits.—This attractive little warbler is a lover of heavy timber tracts, both in the swampy river bottoms and on the uplands, and dwells chiefly in the higher parts of the trees. It has something of the habits of the flycatchers, but is more active in pursuit of its insect prey, darting and whirling madly about in the foliage, displaying to good advantage the brilliant markings of its plumage. The spreading of the tail, which reveals the orange markings, is especially noticeable, and the trick of half raising the wings adds grace to the bird's movements.

The song is a hurried utterance which Langille aptly compares to the sound produced by blowing through a little circular tin whistle which is held between the lips and teeth, the air being alternately inhaled and exhaled. The notes are all staccato and the last or next to the last usually strongly accented. The nest is placed in the crotch of a small tree or sapling, often next to the trunk, from 6 to 30 feet above the ground. It is compactly woven of plant fibers, shreds of bark, fine grasses, and plant down, and lined with fine grasses, rootlets, and sometimes hair or feathers.

Food habits.—Forbush, writing of the food of this bird, says:

The insect food of the Redstart is perhaps more varied than that of any other common Warbler. Apparently there are few forest insects of small size that do not, in some of their forms, fall a prey to this bird. Caterpillars that escape some of the slower birds by spinning down from the branches and

**Holt, E. G., *The Auk*, vol. 41, pp. 162-163, 1924.

American Pipit (*Anthus spinoletta rubescens*).

hanging by their silken threads are snapped up in mid air by the Redstart. * * * It is an efficient caterpillar hunter, and one of the most destructive enemies of the smaller hairy caterpillars. It catches bugs, moths, gnats, two-winged flies, small grasshoppers, and beetles. It probably secures a larger proportion of parasitic Hymenoptera and Diptera than most other Warblers, occasionally destroying a few wasps; otherwise, its habits seem to be entirely beneficial.†

To this diet list may be added, spiders, plant lice, scale insects, and magnolia seeds.

WAGTAILS AND PIPITS: Family Motacillidae.

**AMERICAN PIPIT: *Anthus spinoletta rubescens*
(Tunstall).***

State records.—The American pipit, or titlark (Pl. VII), is a locally common winter resident, occurring sometimes in large numbers. McCormack records it at Leighton between November 6 and March 17 and states that it is sometimes seen in immense flocks. Avery found it common at Greensboro, and Brown at Coosada; stragglers remained at the latter place till the last of March. Miss Parkhurst reports the bird in numbers at Talladega, January 8 to 15, 1910, and Golsan and Holt record it as a common winter resident in Autauga and Montgomery Counties.‡ On Dauphin Island, February 13, 1912, I found it fairly common on sandy beaches and short-grass marshes. One bird was seen there, also, on March 22. At Bayou Labatre, in November, pipits were seen frequently in small flocks about the marshes and on Coffee Island. Near Mobile, February 5, 1912, they were fairly numerous in weedy fields and open pine flats on the borders of the city. At Uniontown, March 1, I saw about 30 in ploughed fields, and at Auburn, March 6, a flock of about 50 in cultivated fields.

General habits.—The pipit is a strictly ground-dwelling bird and a dainty walker. It closely resembles some of the winter-visitant sparrows, but may be distinguished from them by its slender bill and by its habit of walking instead of hopping. During its stay in the South, from about the first of

†Forbush, E. H., *Useful birds and their protection*, pp. 197-198, 1907.

**Anthus rubescens* of the A. O. U. Check-list; for change of name see *The Auk*, vol. 35, p. 212, 1918.

‡Golsan and Holt, *The Auk*, vol. 31, p. 233, 1914.

November till the last of March, it lives in flocks, mainly in cultivated fields and pastures. During the season of spring plowing the flocks frequently feed on the newly turned furrows, where they pick up large numbers of insects. It is a gentle and unsuspicious bird and when alarmed often flies but a short distance before again alighting. It has a sharp metallic note, uttered while flying, that resembles the syllables *pip-it*—hence its common name.

Food habits.—The pipit is an eminently useful bird, feeding as it does very largely upon insects. Its diet includes weevils, beetles, bugs, grasshoppers, crickets, spiders, small mollusks, and occasionally small seeds and berries. In the destruction of boll weevils, it renders the farmer invaluable service. Examination of 68 stomachs of these birds, taken in Louisiana cotton fields, showed that half of them had consumed boll weevils, the total number destroyed by them being 120. The pipits pick up weevils in the fields throughout the winter, and in spring they follow the plowman and capture both weevils and grubs.

THRASHERS, MOCKINGBIRDS, ETC.: Family Mimidae.

MOCKINGBIRD: *Mimus polyglottos polyglottos* (Linnaeus).

State records.—The mockingbird is an abundant resident in nearly all parts of the State. It is found in all the mountain valleys, but does not ascend the mountain slopes for any distance and is relatively scarce in the hills of Winston and adjacent counties. On Petit Bois Island, where dense yaupon thickets afford ideal cover and nesting sites, it is particularly numerous.

The nesting season begins in April and several broods are raised. At Leighton, McCormack found full sets of eggs on April 12, May 15, and July 26. Brimley saw young just out of the nest at Greensboro, August 8, 1890. I found a set of four eggs at Castleberry, June 3, and Holt found an incomplete set at Wilsonville, June 6. Golsan and Holt give the extreme nesting dates in Autauga and Montgomery Counties as April 16 and June 27.*

*Golsan and Holt, *The Auk*, vol. 31, p. 233, 1914.

General habits.—So universally known and loved is the mockingbird in the South that an account of it seems superfluous. It is partial to cultivated lands and village gardens and is semidomestic in habit. Its charming and wonderfully varied song may be heard during the greater part of the year, at least from February to November, often from the top of the house chimney or from the ridgepole, regularly in the early morning, and frequently on moonlight nights as well. Its nest is placed in small trees, bushes, thickets, or hedges, usually from 6 to 10 feet above the ground, and is composed of small twigs, weed stalks, and similar material, lined with rootlets, cotton, or hair.

Food habits.—The food of the mockingbird, as studied by Judd, consists in large part of fruits and berries, with a small percentage of insects and spiders. The insects eaten included ants, caterpillars, beetles, and grasshoppers, and the vegetable food was composed largely of fruit pulp, and the seeds or berries of sumac, smilax, black alder, poison ivy, Virginia creeper, red cedar, pokeberry, mulberry, and bayberry.† The bird has frequently been accused of injuring cultivated fruit, chiefly grapes, peaches, figs, and oranges, but the extent of the damage has not been thoroughly investigated. It occasionally captures and destroys boll weevils.

CATBIRD: *Dumetella carolinensis* (Linnaeus).

State records.—The catbird is a common summer resident over the greater part of the State, except in the mountains and the Gulf Coast region, and a few individuals spend the winter in the southern counties. Two were noted near Mobile early in May, but none were found at Bayou Labatre, Castleberry, or Dothan at that season. The species breeds abundantly from the latitude of Montgomery northward. A wintering individual was seen at Orange Beach, January 25; one at Bayou Labatre, February 9; 3 on Petit Bois Island, February 12 (1912); and 3 or 4 at Nigger Lake, December 1 (1915); James Newton Baskett mentions seeing the bird frequently in winter near Mobile.‡ Single individuals were ob-

†Judd, S. D., Yearbook U. S. Dept. Agr. for 1895, p. 416, 1896.

‡Baskett, J. N., Wilson Bull., vol. 6, p. 36, 1899.

served by Holt in Montgomery County on March 24, 1912, and January 6, 1913.**

Migrants appeared in spring at Rendalia, April 6 (1894); Smelley, April 10 (1889); Hollins, April 12 (1908); Leighton, April 15 (1891); and Montgomery, April 19 (1912). The last were seen in autumn at Leighton, October 1 (1892); Greensboro, October 6 (1888); and Anniston, October 15 (1916). At Bon Secour, October 24, 1908, I found catbirds very numerous in a brushy magnolia swamp. Eggs were found at Leighton, May 11, 16, and 26 and June 25; Barachias, June 1; and Autaugaville, June 5; and young at Leighton, July 26.

General habits.—The catbird is a lover of thickets and may be found either in low, moist bottoms or in the shrubbery about houses and village gardens. Not naturally suspicious, when afforded protection it becomes very tame and feeds unalarmed close to the house. It is an interesting bird, full of activity, and given to assuming queer poses. Its song, delivered usually from the thick shrubbery, is not loud, but quite sweet, varied, and attractive, and at times may contain distinct imitations of other birds' notes. When the catbird's nest is disturbed or a cat appears near its home it has recourse to a scolding, mewling note which gives it its common name. The nest is placed in thick bushes, vines, or sometimes in thick-foliaged trees, usually within 5 or 6 feet of the ground but occasionally as high as 12 feet. It is a rather loose, bulky structure of grapevine bark, rootlets, leaves, or grasses, lined usually with black rootlets.

Food habits.—The food of the catbird is varied and the economic status of the species is open to some difference of opinion. It is frequently destructive to small fruits, especially when grown in small tracts, as in village gardens. Prof. Beal reports the results of his investigation of the catbird's food as follows:

The stomachs of 645 catbirds were examined and found to contain 44 per cent of animal (insect) and 56 per cent of vegetable food. Ants, beetles, caterpillars, and grasshoppers constitute three-fourths of the animal food, the remainder being

**Golsan and Holt, *The Auk*, vol. 31, p. 238, 1914.

made up of bugs, miscellaneous insects, and spiders. One-third of the vegetable food consists of cultivated fruits, or those which may be cultivated, as strawberries, raspberries, and blackberries; but while we debit the bird with the whole of this, it is probable—and in the eastern and well-wooded part of the country almost certain—that a large part is obtained from wild vines. The rest of the vegetable matter is mostly wild fruit, as cherries, dogwood, sour gum, elderberries, greenbrier, spiceberries, black alder, sumac and poison ivy. Although the catbird sometimes does considerable harm by destroying small fruit, it can not on the whole be considered injurious. On the contrary, in most parts of the country it does far more good than harm.*

Cultivated fruit may be protected from attacks of catbirds and other species by planting mulberries, of which the birds are very fond, in the vicinity of the fruit to be protected. The growing of wild cherry, buckthorn, dogwood, wild grape, and elder is also advised as an aid in escaping the depredations of the birds.

McAtee has listed the various kinds of fleshy fruits preferred by different birds and among those which the catbird frequently takes are mentioned the following which might profitably be planted on farms or along roadsides for the use of the birds: Sumac, holly, black haw, honeysuckle, green brier, June berry, and mountain ash.†

BROWN THRASHER; "BROWN THRUSH": *Toxostoma rufa rufa* (Linnaeus).

State records.—The brown thrasher is a common and generally distributed permanent resident. Although the winter population is increased by the arrival of migrants from the North, the bird seems to be hardly more numerous at that season than in summer. It is less common in the Coast Belt than elsewhere, both in summer and winter. Only 4 or 5 were seen at Orange Beach in January and 2 or 3 at Bayou Labatre in February. Eggs have been found at Leighton on numerous dates from April 13 to May 25 and on July 13; Prattville, April 14; Barachias, April 28, and Ardell, June 25.

*Beal, F. E. L., *Farmers' Bulletin* 630, rev. ed., p. 10, 1918.

†McAtee, W. L., *Community bird refuges: Farmers' Bull.* 1239, pp. 7-8, 1921.

General habits.—The brown thrasher is found in thickets, brier patches, wooded bottoms, and dense hedges about cultivated lands. Always rather shy, he seems in winter to be particularly averse to showing himself. With the first sunny days of spring, however, he mounts to the topmost twig of some tall tree and pours forth a rich, musical medley which compares very favorably with the song of his famous cousin, the mockingbird. His relationship to the latter bird is expressed in the popular name of "sandy mocker," prevalent in some parts of the South. The song is often continued without interruption for an extended period.

Thrashers were singing freely at Auburn the first week in March and at Leighton the last week in that month. The alarm note of the thrasher is a sharp smacking *tshat* which reminds one of the click of a pair of hedge shears. This is often followed by a mournful, whistled, *whee-u*. The nest is placed usually in a thick hedge, a brush pile, or a clump of vines or briars, sometimes on the ground or in a bush.

Food habits.—The food of the brown thrasher, as shown by a study of 266 stomachs in the Biological Survey, is composed of both vegetable and animal matter, the vegetable matter comprising about 63 per cent and animal matter about 37 per cent of the total food.*

Mast, chiefly acorns, constitutes nearly one-fourth (23.7 per cent) of the food of the year, wild fruit composes about one-fifth, and cultivated fruit about 12 per cent. The wild fruits eaten include huckleberries, elderberries, poke berries, and the fruit of the sour gum, holly, hackberry, and Virginia creeper. Domestic fruits eaten by the thrasher comprise blackberries, strawberries, currants, grapes and cherries, some of which, of course, grow also in a wild state, and in such cases should not be charged against the bird as damage to crops.

Grain—chiefly corn, with a little wheat—was eaten to a slight extent and was probably in the main waste. The animal food consists for the most part of insects, of which beetles (including the boll weevil, May beetles, and cucumber beetles)

*Beal, F. E. L., in Farmers' Bulletin 755, p. 14, "Common Birds of Southeastern United States in Relation to Agriculture," rev. ed., June, 1923.

composed 18 per cent, caterpillars about 6 per cent, and grasshoppers about 2 per cent.

WRENS: Family Troglodytidae.

CAROLINA WREN: *Thryothorus ludovicianus ludovicianus* (Latham).

State records.—The Carolina wren (fig. 26), is the commonest and most widely distributed member of its family in the South, and is a permanent resident wherever found. It occurs in practically all localities, from the coastal islands to the tops of the mountains, and is nearly everywhere abundant. Nesting begins the first of April and continues till midsummer. Eggs have been found at Autaugaville, April 8; Leighton, April 23, May 13, June 20, and July 21; Prattville, May 5; Guntersville, June 15; and York, June 28.

General habits.—This wren lives in dense thickets, brush piles, and similar situations and, although partial to low bottomland timber, is found also about farmyards and in town gardens. Indeed, so domestic is it at times that it is often called "house wren," though that name belongs properly to another bird. It forages chiefly on the ground and over fallen logs and is almost constantly active. Its cheery, rollicking song may be heard more or less throughout the winter, as well as at other seasons. The song is subject to a number of variations, but is always a series of loud, ringing whistles in triplet form and easily recognizable. The bird has also a diversity of other notes, scoldings, cackles, musical trills, etc. It places its nest in a variety of situations—on the ground in the woods, in crevices, or on the sills of outbuildings, or in hollow stumps or trees.

Food habits.—Examination of 22 stomachs of this bird taken in Alabama showed the food to consist chiefly of beetles, bugs, ants and other hymenoptera, flies, caterpillars, grasshoppers, and spiders, with a few seeds. This wren is an important enemy of the boll weevil, which it seeks out and destroys in its hibernating retreats under rubbish piles and in similar situations.

BEWICK WREN; "HOUSE WREN": *Thryomanes bewickii*
bewickii (Audubon).

State records.—The Bewick wren (fig. 27), is generally distributed as a summer resident in the northern half of Alabama, but is nowhere so abundant as the Carolina wren. In winter it is found in moderate numbers all over the State. It breeds commonly at Leighton, also on Sand Mountain, and probably in many other localities in the northern counties. I saw several at Florence the first week in May, 1912, and one on Monte Sano, near Huntsville, May 13, 1912. Holt saw several at Elkmont in July. Avery records the bird as a winter resident at Greensboro, and it has been observed also at that season at Orange Beach, Bayou Labatre, Carlton, York, and Dean. Golsan and Holt record it as a common winter resident in Autauga and Montgomery Counties,* and it breeds also casually at Autaugaville.

The first migrants were noted at Greensboro, September 17, 1891, and at Autaugaville, October 1, 1915. I found the species at Brewton, October 7, and at Fairhope, October 16, 1908. In spring it has been recorded from Dothan as late as March 12, 1912. Saunders found a pair building a nest at Woodbine on April 6, and saw a brood of young at Hollins on May 2, 1908. Graves found a nest with fresh eggs on Sand Mountain (near Carpenter), April 27, 1914, and Golsan took a set of 7 fresh eggs at Prattville, March 26, 1916.

General habits.—This wren avoids swamps and seeks the upland and especially the hills for its home. It is even more domestic than the Carolina wren, and because of its habit of nesting about buildings is frequently known in the South as "house wren."† Its favorite perches are the pinnacle of a roof, a dead branch of a tree, or a telephone wire. Like all wrens, it is active and restless, and may be distinguished easily from the true house wren by its long tail, which is constantly in motion. It is a charming singer, scarcely excelled by any of our native birds.

The nest is placed usually in nooks and crevices about out-buildings. It is a bulky structure, usually filling the cavity

*Golsan and Holt, *The Auk*, vol. 31, p. 234, 1914.

†The true house wren (*Troglodytes aedon*) of the northern states occurs in Alabama only as a migrant.

FIG. 26.—Carolina Wren.

in which it is placed, composed of "sticks, straw, coarse feathers, fine chips, etc., matted together with spiders' webs, and lined with tow and soft feathers of barnyard fowls."†

Food habits.—Investigation of the food habits of one of the western forms of the Bewick wren, by Prof. Beal, showed that 97 per cent of its food consisted of animal matter, chiefly insects, and 3 per cent of vegetable matter. The animal food included bugs (31 per cent), beetles (21 per cent), ants (7 per cent), wasps (10 per cent), caterpillars and moths (12 per cent), grasshoppers (4 per cent), flies (6 per cent), and spiders (5 per cent).‡ The food of the eastern subspecies probably does not differ greatly from that of the western. A bird taken in Louisiana in winter had eaten 3 boll weevils.

WESTERN HOUSE WREN: *Troglodytes aedon parkmanii*
Audubon.

State records.—Only two specimens of the western race of the house wren (*parkmanii*) and none of the eastern race (*aedon*) are known from the State, so it is impossible to say which is the prevailing form. On geographical grounds, however, the western race would be expected to be found most frequently. It occurs as a migrant and winter resident, but does not breed in the State.

Saunders records house wrens (under the name *Troglodytes aedon*) "not common" at Woodbine, April 1 to 12, 1908,* but no specimens were collected by him; he informs me that single birds were observed on April 1, 2, 6, 7, 9, and 12, and that on April 6, 7, and 9 the birds were singing. At Orange Beach, January 24, 1912, in scrubby bushes near the outer beach, I collected a single specimen, and at Bon Secour, October 19 to 24, 1908, found the bird fairly common, but did not collect any specimens. L. S. Golsan reports seeing house wrens at Autaugaville, January 14, 1915, January 8, March 5, and October 23, 1916. At Prattville, February 5, 1916, he took a specimen of this race in an old field grown up to broom sedge.

†Ridgway, R., Ornithology of Illinois, vol. 1, p. 98, 1889.

‡Beal, F. E. L., Biol. Surv. BuM. 30, pp. 57-60, 1907.

*Saunders, A. A., The Auk, vol. 25, p. 423, 1908.

FIG. 27.—Bewick Wren.

General habits.—The house wren, in its summer home in the northern States, is a familiar and domestic bird, living in boxes erected for its use or in hollow trees in the orchard or dooryard. It is a most active and vigorous little sprite and constantly bubbling over with song, examining the while every nook and cranny in search of its food. During winter, however, it is quiet and rather shy, frequenting low bushes and weed patches in the fields.

Food habits.—The food of the house wren consists almost wholly of insects and their allies. Judd states, as the result of the examination of 52 stomachs:

Half of the food of the wren consists of grasshoppers and beetles; the other half is made up of approximately equal quantities of caterpillars, bugs, and spiders. * * *

Common grasshoppers, green grasshoppers, and crickets form the most important part of the house wren's food, reaching a maximum of about 60 per cent in August, and practically excluding many heretofore conspicuous elements. The catbird and thrasher stop eating grasshoppers when fruit ripens, but the wren keeps right on with the good work.†

[HOUSE WREN: *Troglodytes aedon aedon* Vieillot.

This race of the house wren breeds in northeastern United States from Kentucky and Virginia northward. No specimens have as yet been taken in the State, but quite probably it occurs rarely as a migrant or winter visitant.]

WINTER WREN: *Nannus troglodytes hiemalis* (Vieillot).‡

State records.—The winter wren occurs regularly but in small numbers as a winter resident. McCormack records it "not common" at Leighton, observed between October 16 and January 18. Brown likewise found it uncommon at Coosada in January and February, 1878, and Saunders saw it occasionally at Woodbine, March 8 to 26, 1908. Holt saw two at Jackson, February 21, 1912, and one at Barachias, January 9, 1913. Single birds were noted by Golsan at Autaugaville, November 26, 1912, and in February, 1913; by Graves on Sand Mountain, April 13, 1914; and by the writer at Muscle Shoals, November 4 and December 19, 1915.

†Judd, S. D., Yearbook U. S. Dept. Agr. for 1895, p. 417, 1896.

‡*Nannus hiemalis hiemalis* of the A. O. U. Check-list; for change of name see The Auk, vol. 37, p. 283, 1920.

General habits.—While in the South, this tiny wren is very quiet and retiring in habits, frequenting brushy woodland, where it creeps about among fallen timber and in brush piles like a little mouse. Being so shy and unobtrusive, and so small as well, it is usually overlooked by the average observer. On November 4, 1915, I spent most of the day, from about 9 o'clock till nearly sundown, on a small island or "towhead," as it is locally termed, in the Tennessee River at Muscle Shoals watching for wild geese. One of these little wrens also spent the day there, dodging about in a pile of brush and running in and out of a log pile. He scarcely moved 10 feet all day and often came within 3 or 4 feet of my face without showing any signs of alarm. Even a number of heavy shots fired at geese did not frighten him away.

In its summer home in the northern forests this wren has a wonderful song, which Mrs. Bailey describes as "a tinkling, rippling roundelay, * * * full of trills, runs, and grace notes."*

Food habits.—This species is probably strictly insectivorous. Its diet includes beetles, bugs, small grasshoppers, and crickets, caterpillars, spiders, etc., and the bird has been known to capture boll weevils.

SHORT-BILLED MARSH WREN: *Cistothorus stellaris*
(Naumann).

State records.—The short-billed marsh wren occurs not uncommonly as a migrant and winter resident. At Bon Secour, October 18 to 25, 1908, it was fairly common in the marshes, especially along the borders next to the uplands. At Orange Beach, January 30 and 31, 1912, I took two specimens, and on Dauphin and Petit Bois Islands, February 12 and 13, 1912, found the birds numerous in dry grassy areas among the marshes. One was seen also near Mobile on February 6, 1912. Brown records a pair taken in an old rice field at Coosada, March 21, 1878; Saunders mentions seeing one "along a little alder-lined creek at Hollins," May 3, 1908; Holt took one at Barachias, January 9, 1913; and Golsan secured one of a pair at Autaugaville, April 29, 1916.

*Bailey, Florence M., in Chapman, Handbook of Birds of Eastern North America, p. 479, 1912.

General habits.—This wren is found in winter in grassy flats, either wet or dry. It is shy and much averse to flushing, and when startled flies only a short distance before dropping down again into thick grass. It differs from the long-billed marsh wren in being decidedly partial to fresh-water marshes, and when living about the salt marshes, as it does during the winter season, it is most likely to be found about the borders of the marsh or in dry grass in the more elevated portions.

Food habits.—The food of this wren, as indicated by the contents of 5 stomachs collected in Alabama, consists mainly of weevils, ants, bugs, grasshoppers, and spiders.

MARIAN MARSH WREN: *Telmatodytes palustris marianae* (Scott).

State records.—The Marian marsh wren is the breeding form of its species on the Gulf coast and is found in small numbers throughout the winter. The bird is abundant in the big marshes in Mobile River and the lower Tensaw River, where numerous specimens were secured, May 13 and 30, 1911, and March 16 and 19, 1912. On May 30 I examined a number of nests but found none containing eggs. Gutsell saw a few of the birds and one nest near Orange Beach in September, 1911, and I took one specimen there, January 27, 1912. Two were taken also, at Bon Secour, October 19 and 21, 1908, and one on Little Dauphin Island, June 5, 1914. Apparently this species does not breed in the extensive marshes about Bayou Labatre or Grande Batture Island, as I could find none of the birds there either in summer or winter.

General habits.—This tiny wren is inconspicuous and easily overlooked by reason of its secretive habits. It dwells exclusively in the wet salt marshes, hiding most of the time in the dense tangle of rushes and marsh grass. In the nesting season its presence is made known by its curious, bubbling song, and the singer occasionally launches a short distance into the air, but usually the birds are very difficult to detect as they flit about under cover of the rank vegetation. All their actions are quick and nervous, and the flight is weak and never protracted. The nest is a globular structure about the size of a coconut, with a small entrance hole on one side; it is

composed of the dead leaves of rushes and marsh grasses, and down from the cat-tails, and the lining is of the latter material and fine grasses. It is fastened to the growing reeds or to small bushes bordering the marsh.

Food habits.—This species is almost wholly insectivorous in its diet. A large part of its food consists of beetles and spiders, and in addition it is known to eat locusts, bugs, leaf hoppers, wasps, ants, flies, and mosquitoes.

LONG-BILLED MARSH WREN: *Telmatodytes palustris palustris* (Wilson).

State records.—The typical race of the marsh wren (*palustris*) occurs rarely in winter on the Gulf coast, a specimen having been taken at Bon Secour, October 21, 1908.

General habits.—In habits this race does not differ appreciably from the resident form (*marianae*).

PRAIRIE MARSH WREN: *Telmatodytes palustris iliacus* Ridgway.

State records.—The prairie marsh wren is the interior form of the long-billed species, breeding in the Mississippi Valley. It may be found in small numbers in Alabama in migration, as well as in winter. Specimens are in the Biological Survey collection, taken as follows: Bon Secour, October 19, 1908; Orange Beach (2), January 24, 1912; Barachias, April 24, 1912; Seale, May 22, 1914 (a very late migrant); and Grand Bay, November 17, 1915. Golsan and Holt record one taken at Autaugaville, October 26, 1913.*

CREEPERS: Family Certhiidae.

BROWN CREEPER: *Certhia familiaris americana* Bonaparte.

State records.—The brown creeper is a moderately common winter resident in all parts of the State. McCormack observed it at Leighton between October 16 and April 13 and Avery noted the first one in fall at Greensboro on October 21.

*Golsan and Holt, The Auk, vol. 31, p. 234, 1914.

Dean recorded its arrival at Anniston, October 9, 1916; Golsan saw one at Barachias, November 18, and five at Autaugaville, November 19, 1911. Brown, writing from Coosada, says of this bird:

Rather common during the winter, associating with other small birds of similar habits. They were most numerous about the third week in March, and at this time sometimes went in flocks by themselves, occasionally as many as a dozen together. On the advent of warm weather, in April, they gradually disappeared.†

At Orange Beach, January 31, 1912, I saw two creepers in pine woods. Single individuals were seen at Mobile, February 6; Auburn, March 6; Dothan, March 13; Jackson Lake, March 27; Ardell, March 28; and Leighton, April 3. Holt saw 3 at Jackson in February and 3 at Carlton in March. Dean noted the last one at Anniston, April 9, 1916.

General habits.—This little bird is a quiet, inconspicuous creature, spending its time creeping in spirals up the trunks and larger limbs of forest trees in search of its insect food. When it reaches a point well up in the tree it flies down to the base of another and begins the ascending spiral again. It is not at all shy and pays little attention to anything but its main business of locating a food supply. The notes of the creeper are as inconspicuous as the bird itself—a series of high-pitched, squeaky notes, which are difficult for many ears to distinguish.

Food habits.—Beal has studied the food of the California creeper and finds that it consists of small beetles (including weevils), wasps, ants, bugs, caterpillars, and a few spiders.‡ Judd examined one stomach of the eastern bird and found in it beetles, sawflies, flying ants, spiders, and seeds of the scrub pine. The species is doubtless mainly beneficial in its food habits.

†Brown, N. C., Bull. Nutt. Ornith. Club, vol. 3, p. 171, 1878.

‡Beal, F. E. L., Biol. Surv. Bull. 30, p. 66, 1907.

NUTHATCHES: Family Sittidae.

SOUTHERN WHITE-BREASTED NUTHATCH: *Sitta carolinensis carolinensis* Latham.*

State records.—The southern race of the white-breasted nuthatch is generally distributed throughout the State, but is nowhere very common. Being nonmigratory, it is found through all the year. Specimens have been examined from Orange Beach, Carlton, Jackson, Autaugaville, Squaw Shoals, Jasper, Ardell, Huntsville, and Sand Mountain (near Carpenter). Most of these are typical *carolinensis*, but the Sand Mountain specimens are intermediate between this race and the northern form (*cookei*). A nest with eggs was found by Golsan in Autauga County, March 17, 1911,† and one with young by the writer at Jasper, May 5, 1914.

General habits.—This nuthatch is an inhabitant of rather open timber tracts. Scattered pairs are found both in pines and deciduous timber, but the bird seems to prefer the latter. In habit it resembles both the creepers and the woodpeckers, but excels them all as a climber. It is equally at home above or below a limb and descends a tree head downwards as easily as it ascends. It is a sociable, cheerful bird, not particularly shy, making its presence known by its resonant notes—*quank*, *quank*, *quank*, in nasal but not unmusical tones. Its nest, composed of leaves, feathers, hair, strips of bark, etc., is placed in a hollow tree, stump, or fence post, from 2 to 60 feet above the ground.

Food habits.—This species feeds extensively upon mast—acorns, hickory nuts, beech nuts, etc., but the proportion of this food taken has not been computed. Nuts are placed by the birds in crevices of the bark of trees or in cracks of fence rails and hammered with the bill until they are cracked. It is from this habit that the bird gets its common name. It takes other vegetable food as well, as corn, pine seeds, sunflower seeds, and berries of the Virginia creeper. The animal food consumed includes spiders, beetles, bugs, weevils, ants, flies,

**Sitta carolinensis atkinsi* of the A. O. U. Check-list; for change of name see The Auk, vol. 35, p. 213, 1918.

†Golsan and Holt, The Auk, vol. 31, p. 234, 1914.

moths, caterpillars, and other insects. Forbush states that the stomach of a nuthatch examined from Massachusetts contained 1,629 eggs of the fall cankerworm moth. He states also that the bird feeds on gipsy caterpillars, forest caterpillars, scale insects, and plant lice.†

RED-BREASTED NUTHATCH: *Sitta canadensis* Linnaeus.

State records.—The red-breasted nuthatch occurs in Alabama as a rare and irregular visitant. Dr. Avery took the species once at Greensboro, October 4, 1888,* and L. S. Golsan observed about 10 individuals at Prattville on various dates from December 22, 1918 to April 23, 1919.† Miss Parkhurst reports it, also, from Talladega, where it was seen in the winter of 1907-8 (exact date not recorded). It has been observed a few times on the coast of Mississippi (Biloxi, October 16, 1903; Bay St. Louis, April 1, 1902), and should therefore be found in southern Alabama.

General habits.—This nuthatch is similar in habit to the white-breasted, but is found almost constantly in coniferous timber, where it feeds to some extent near the ends of the branches and on the pine cones. The notes of this bird are higher pitched, less vigorous, and more drawled than those of the white-breasted huthatch. They have been compared to the sound of "a tiny tin trumpet" and Chapman writes them *yna, yna*.

Food habits.—Barrows says of the food habits of this nuthatch:

The food of this bird is presumably much like that of the White-bellied Nuthatch, yet it seems to be much more fond of the seeds of cones, and possibly does not consume as many insects. It is said to visit the ground much less frequently, but so far as our own observation goes there is little difference; either species goes to the ground freely and hunts for food, sometimes for several minutes at a time.**

†Forbush, E. H., Useful birds and their protection, p. 175, 1907.

*Avery, W. C., Amer. Field, vol. 35, p. 55, 1891.

†Holt, E. G., The Auk, vol. 36, p. 584, October, 1919.

**Barrows, W. B., Michigan Bird Life, p. 691, 1912.

BROWN-HEADED NUTHATCH: *Sitta pusilla* Latham.

State records.—The brown-headed nuthatch (fig. 28), is a common resident locally in the central and southern part of the State, from Cullman County southward. It may range locally somewhat farther north, but has not yet been detected. It is known to occur at Logan, Wilsonville, Anniston, Auburn, Dean (Clay County), Tuscaloosa, Squaw Shoals (Jefferson County), Ardell, Barachias, Seale, Jackson, Castleberry, Bay Minette, Dothan, and Dauphin Island. At Autaugaville, where this bird breeds commonly, Golsan usually finds fresh eggs about April 15; at York, eggs were found on April 6;* and at Greensboro Avery found a nest with fresh eggs, May 2 (1888).

General habits.—This little nuthatch resorts chiefly to open pine woods and old fields along the borders of such timber. It is an active, restless creature, sociable in habit, and although not possessed of song powers, its conversational notes are cheery and of a pleasing quality. Its call notes resemble the syllables *cha-cha-cha*, rapidly uttered. Brown, who observed this bird in abundance at Coosada, says of it:

In winter, when they were particularly numerous, they associated in bands of from six to twenty individuals, and were found everywhere in the tops of the tallest forest firs and amongst the scattered pine saplings which have sprung up in once cultivated fields. They were always full of life and activity, not only destroying their insect prey with great industry, but frequently chasing each other about in pure excess of vitality. I do not think I ever saw one employed in silence for a minute at a time. While busily in search of food they have a subdued, conversational chatter, which almost exactly resembles the notes usually uttered by the Goldfinch when similarly employed. * * * About the beginning of March the birds began to separate into pairs, and by the middle of that month had generally selected their nesting sites and commenced the work of excavating. Rotten pine stubs afforded the favorite situations, and nine-tenths of the nests I found were within six feet of the ground. I opened nests at intervals up to the time of my departure, and found them occupied by one, sometimes by both of the owners, but met with no eggs until April 22; these (four

*Wise, Oologist, vol. 6, p. 14, 1889.

in number) were placed in a natural cavity in a telegraph pole.†

Food habits.—Warren states that he has examined a number of stomachs of this bird from Florida and found the contents to be composed entirely of insects, “chiefly beetles, larvae, and ants.”‡ Ten stomachs from Alabama examined in the Biological Survey contained remains of beetles, bugs, cockroaches, caterpillars, ants and other Hymenoptera, scale insects, and fragments of pine seeds.

TITMICE: Family Paridae.

TUFTED TITMOUSE; TOMTIT: *Baeolophus bicolor* (Linnaeus).

State records.—The tufted titmouse is a fairly common resident in nearly all sections, but is much less numerous in the coast region than elsewhere. It is recorded from Sand Mountain (near Carpenter), Talladega Mountains (seen at 2,000 feet altitude), Natural Bridge, Squaw Shoals, Abbeville, Jackson, Castleberry, and Mobile. A few were seen at Orange Beach in September and January and a few at Bayou Labatre in February. The bird probably breeds sparingly in those localities. Saunders speaks of it as “very abundant” at Woodbine, where he saw the first indications of nest building on April 9. By May 8 the young were nearly full grown. Nests with eggs were found at Leighton, April 13, 23, and 27 and May 6, and at Autaugaville, May 15 and July 9.

General habits.—The tufted tit shows a decided preference for deciduous woodland, which doubtless accounts for its rarity in the pine flats of the Coast Belt. It is found both in heavy bottomland timber and among the scrubby oaks which clothe the mountain sides. In winter it often roves about in bands with other species, particularly chickadees and nuthatches. Its clear, whistled notes are a familiar sound at all seasons of the year, and these have suggested the name “Peter-bird,” by which it is sometimes known. It makes its nest of leaves, grasses, hair, feathers, cotton, etc., and places

†Brown, N. C., Bull. Nutt. Ornith. Club, vol. 3, p. 171, 1878.

‡Warren, B. H., Birds of Pennsylvania, 2d ed., p. 317, 1890

FIG. 28.—Brown-headed Nuthatch.

it in a deserted woodpecker's hole or a natural cavity in a tree or stump, 4 to 12 feet from the ground. Audubon, writing of this bird's habits, says:

It moves along the branches, searches in the chinks, flies to the ends of twigs and hangs to them by its feet, whilst the bill is engaged in detaching a beech or hazelnut, an acorn or a chinquapin, upon all of which it feeds, removing them to a large branch, where, having secured them in a crevice, it holds them with both feet, and breaks the shell by repeated blows of its bill.*

Food habits.—The habit of feeding upon mast mentioned by Audubon is confirmed by stomach examinations. The bird is known to feed, also, on the berries of the dogwood and Virginia creeper, and upon small fruits, such as the mulberry. It consumes many spiders and a variety of insects, including beetles, bugs, and crickets. Judd examined a stomach taken in July and found in it "several blueberries, a longicorn beetle, and a large cutworm."†

CAROLINA CHICKADEE: *Penthestes carolinensis carolinensis* (Audubon).

State records.—The Carolina chickadee (fig. 29), is generally distributed, and in most localities is fairly common. It is recorded from Fort Payne, Sand Mountain (Jackson County), Talladega Mountains, Squaw Shoals, Natural Bridge, Ardell, Woodbine, Auburn, Seale, Abbeville, Castleberry, and Mobile. Fresh eggs have been found at Barachias, March 29; York, April 2; Greensboro, April 16; Autaugaville, April 16; and Leighton, April 4, 18, and 27.

General habits.—The chickadee is not at all particular as to the type of country it inhabits, but may be found in low bottom-land timber and wooded swamps as well as in the drier timber among the hills and in mixed woods. Like the majority of the small birds, it does not frequent the extensive pine flats of the coast region in any numbers. It is a sociable, confiding little bird, and its cheery notes add not a little to the charm of the woods, particularly in winter, when most bird voices are

*Audubon, J. J., Ornith. Biog., vol. 1, p. 199, 1831.

†Judd, S. D., Biol. Surv. Bull. 17, p. 107, 1902.

FIG. 29.—Carolina Chickadee.

stilled. At all seasons it is likely to be found in small flocks or family groups. The nest is placed in a rotten stub or fence post, usually from 2 to 5 feet above the ground, the cavity sometimes being excavated by the birds themselves, and lined with shreds of bark, hair, fur, and feathers.

Food habits.—Seven stomachs of the Carolina chickadee examined by Judd contained insects, including bees, ants, caterpillars, and katydid eggs. Spiders also were found and mulberry seeds, pine seeds, and seeds of ragweed.‡

KINGLETS, GNATCATCHERS, ETC.: Family Sylviidae.

GOLDEN-CROWNED KINGLET: *Regulus regulus satrapa* Lichtenstein.*

State records.—The golden-crowned kinglet is a moderately common winter resident over most of the State. McCormack has observed it at Leighton between October 9 and March 24 and I saw one there March 30 (1912). Avery notes its arrival at Greensboro, October 18 (1893), and October 21 (1890); and Dean found it numerous at Anniston, October 15 (1916); Brown reports it common up to the first of April at Coosada, and Saunders found it abundant at Woodbine, March 7 to 25, 1908. I observed a single bird at Bayou Labatre, February 9, 1912, and four at York, February 28, 1912. Holt saw a few at Jackson and Carlton in February; Goldman took one at Ardell, March 28, 1915; and Dean noted the last at Anniston, March 26, 1916.

General habits.—The kinglet is found during the winter season in loose flocks, often associating with nuthatches, chickadees, and the ruby-crowned kinglet. It is one of our smallest birds, ranking next in size to the hummingbird. It is a hardy species, active, restless, and quite fearless. It prefers coniferous trees, where it feeds much about the ends of the branches, fluttering from tuft to tuft or hovering in front of some particularly attractive bunch of leaves, from which it apparently secures minute insects. During migration it is often found in orchards or shade trees; Wayne mentions seeing a hundred or more in weed-grown fields in November.† It does not sing

‡Judd, S. D., Biol. Surv. Bull. 17, pp. 107-108, 1902.

**Regulus satrapa satrapa* of the A. O. U. Check-list; for change of name see The Auk, vol. 35, p. 214, 1918.

†Wayne, A. T., Birds of South Carolina, p. 197, 1910.

in the South, but has "a high, almost piercing call of four or five notes which it utters very frequently, and which is characteristic, but difficult to describe."‡

Food habits.—Barrows writes of the food of this kinglet as follows:

The food of this bird consists almost entirely of insects and their eggs, and it cannot be doubted that it is decidedly beneficial to the farmer and fruit grower. It is often seen eating plant lice and is a common bird in the orchards during migration, on such occasions spending much time about the opening buds and among the terminal twigs, where it collects large quantities of harmful insects.**

RUBY-CROWNED KINGLET: *Corthylio calendula*
calendula (Linnaeus).*

State records.—The ruby-crowned kinglet is a fairly common migrant and winter resident. Avery noted its arrival from the north at Greensboro, October 26, 1889, and October 19, 1890, and Golsan took specimens at Autaugaville, October 16 and 21, 1915. Dean saw one bird at Anniston, October 8, one October 15, and one December 25, 1916. Brown found the bird numerous at Coosada from January to April, and Saunders observed it commonly at Woodbine, March 9 to 21, 1908. I saw two at Orange Beach, January 31; ten near Mobile, February 6, and one on Petit Bois Island, February 12, 1912. It was also observed throughout March and April, at Carlton, Uniontown, Squaw Shoals, Autaugaville, Tuscaloosa, Sand Mountain, Scottsboro, Leighton, and Auburn (last, April 26).

General habits.—The ruby-crown has about the same habits as the golden-crown but is not often found in flocks. It is a rather lower-ranging bird, most often found rather near the ground in thickets in deciduous woodland. Although very quiet and inconspicuous during the winter season, this little bird in spring often renders snatches of its song, which, although not to be compared with the full song as given on the breeding grounds, is nevertheless a remarkably loud and

‡Barrows, W. B., *Michigan Bird Life*, p. 702, 1912.

**Op cit., p. 703.

**Regulus calendula calendula* of the A. O. U. Check-list; for change of name see *The Auk*, vol. 34, p. 205, 1917.

highly pleasing melody. A rich, varied, full-throated warble, it is scarcely excelled by any of our native birds. While singing the little fellow displays his half-concealed crown-patch to good advantage and renders identification perfectly easy.

Food habits.—Professor Beal, who has investigated the food of this kinglet in California, finds it to be composed of 94 per cent animal matter and 6 per cent vegetable matter. "Hymenoptera, in the shape of wasps, and a few ants, appear to be the favorite food, as they aggregate over 32 per cent of the whole." Bugs were next in importance, constituting nearly 26 per cent of the food; beetles furnished 13 per cent and flies 17 per cent. Caterpillars, moths, butterflies, and spiders made up most of the remainder. The vegetable matter included fruit, principally elderberries, weed seed, and seeds of poison oak.†

BLUE-GRAY GNATCATCHER: *Polioptila caerulea*
caerulea (Linnaeus).

State records.—The blue-gray gnatcatcher is a common summer resident in all sections. It has been recorded in the breeding season at Elkmont, Sand Mountain (Jackson County), Squaw Shoals, Natural Bridge, Seale, Abbeville, Castleberry, Mobile, Dauphin Island, and other places. Migrants from the south appear during March, having been first noted at Montgomery, March 10 (1908); Shelby, March 11 (1898); Woodbine, March 15 (1908); Autaugaville, March 20 (1913); Leighton, March 24 (1890); Anniston, March 26 (1916); and Greensboro, March 27 (1888). The bird has been seen in autumn, at Bon Secour, as late as October 24 (1908), but it probably departs from the northern part of the State in September. It has been rarely reported from the coast of Louisiana and Mississippi in winter, but has not been observed in Alabama at that season. Nest building begins shortly after the birds arrive, and sets of eggs have been found at Booth, April 17; Greensboro, April 24 and May 4; and Leighton, May 26.

General habits.—This gnatcatcher lives in open woodland and in pastures and cultivated lands where there are trees and

†Beal, F. E. L., Biol. Surv. Bull. 30, pp. 81-84, 1907.

shrubs. It has a preference for oaks, and lives much in the upper branches of the trees. It is a very active bird and has a quick, jerky flight, the tail, especially, being constantly in motion. Its call note is compared by Chapman to the twang of a banjo string and in addition the bird utters a variety of rather squeaky, high-pitched notes, none of which are very loud. Its song, said to be a finished performance, is uttered so softly that it attracts little attention. The nest is a beautiful structure, compactly made of plant down, dried blossoms, fine grasses, etc., bound together with spider's webs and ornamented on the outside with grayish colored lichens. It is generally saddled on a horizontal limb, preferably of an oak, sometimes in the fork of a branch, from 12 to 50 feet above the ground.

Food habits.—Judd examined three stomachs of this species and found in them "longicorn beetles, joint-worm flies, caddisflies and several minute flies (unidentified Diptera)."* The bird is also known to eat ants and other Hymenoptera, weevils, bugs, caterpillars, and spiders. Dr. Avery observed it, in September, 1889, feeding on cotton leaf worms. Vegetable food is rarely taken and the bird is considered a decidedly useful species.

THRUSHES, BLUEBIRDS, ETC.: Family Turdidae.

WOOD THRUSH: *Hylocichla mustelina* (Gmelin).

State records.—The wood thrush is an abundant summer resident in all parts of the State, except on the coastal islands. The earliest migrants in spring arrive usually about the first of April. The first were seen at Woodbine, March 25 (1908); Autaugaville, March 31 (1913); Sand Mountain (near Carpenter), March 31 (1914); Greensboro, April 4 (1888), and March 26 (1891); Tuscaloosa, April 6 (1912); Leighton, April 8 (1891); and Anniston, April 9 (1916). The bird was seen in fall at Leighton as late as September 23 (1889), and at Castleberry, October 10 (1908). Nests with eggs were found at Barachias, April 24; Booth, April 27; Hollins, April 28; York, April 30; and Leighton, May 10, June 27, and July 11.

*Judd, S. D., Biol. Surv. Bull. 17, p. 103, 1902.

General habits.—The wood thrush usually selects low wet woods or shady ravines for its home, but is sometimes found in dry upland groves or even in the shrubbery of village gardens. It is not particularly shy and when afforded protection will often regularly visit the dooryard and lawn. Its actions on the ground remind one strongly of its near relative the robin. Its alarm note is a loud, *pip-pip* and its song is one of the most beautiful of any of our woodland songsters—a loud, rich, flute-like melody, delivered leisurely and with apparent musical feeling. The nest, composed of leaves, rootlets, fine twigs, moss, weed stalks, and shreds of paper and bark, with an inner wall of mud and a lining of rootlets, is generally placed in the upright forks of a sapling or on a horizontal limb of a tree, 6 to 10 feet above the ground.

Food habits.—The food of the wood thrush consists largely of insects, principally beetles, caterpillars, and ants, with a smaller proportion of bugs, flies, and grasshoppers. Spiders and myriapods are eaten in considerable quantities, with a few snails and earthworms. Vegetable matter constituted about 40 per cent of the food in the stomachs examined, of which wild fruits formed the greater part. The varieties most frequently eaten are mulberries, blackberries, blueberries, choke cherries, frost grapes, elderberries, spiceberries, and dogwood berries. Cultivated fruit forms less than 4 per cent of the total food.*

VEERY: *Hylocichla fuscescens fuscescens* (Stephens).

State records.—The veery, known also as the Wilson thrush, occurs commonly as a migrant in autumn and less frequently in spring. Avery observed it in some numbers at Greensboro from September 9 to 25, 1890, feeding mainly on the berries of the black gum. He took specimens there on August 26 and September 4, 1891. McCormack records it as a rather common fall migrant at Leighton from September 15 to October 1; he saw it also on May 7, 1892. I took two specimens at Barachias, April 24, 1912, and noted a few at Muscle Shoals, April 23 to 25, 1914; and on Sipsey Fork, near Mellville, May 3 and 4, 1914. Saunders records it as occurring in spring at

*Beal, F. E. L., Bull. 280, U. S. Dept. Agr., pp. 5-8, 1915.

FIG. 30.—Wood Thrush.

Woodbine, Dean observed it at Anniston, October 10, 1916, and Golsan noted it at Autaugaville, September 17 and 18 and October 17 (30 seen) and October 22, 1915.

General habits.—This thrush is a lover of low, damp woodland, but during migration is sometimes found on dry, wooded hillsides. It feeds chiefly on the ground and in the lower branches of the trees. It is a quiet, rather shy bird, rarely singing in the South, but recognizable by its peculiar sweet, liquid whistle—*whree-oo*. In its summer home, the song of the veery is one of the most charming bits of woodland music—a rich, vibrant, metallic trill, rendered by Langille as "*whree-u, whree-u, whree-u*." The common name of the bird—veery—is derived from the resemblance of its song to those syllables.

Food habits.—The food of the veery, as studied by Professor Beal, consists of animal matter 57 per cent and vegetable matter 43 per cent; the animal food comprised chiefly beetles, ants, caterpillars, grasshoppers, and spiders, and the vegetable food consisted mainly of wild fruits, including blackberries, strawberries, blueberries, pokeberries, elderberries, June berries, and berries of the sour gum, dogwood, and greenbrier.†

GRAY-CHEEKED THRUSH: *Hylocichla minima aliciae*
(Baird).‡

State records.—The gray-cheeked, or Alice thrush is a common migrant in spring and fall. There are 10 specimens of this form in the Avery collection, taken at Greensboro between September 10 and October 20. I observed several at Reform, September 24 to 27, 1908, and collected one at Castleberry, October 10, 1908. Specimens were taken also at Barachias, April 23, 1912, and Jasper, April 29, 1914, and a few were observed at Florence, May 5, 1912, and on Sipsey Fork, near Mellville, May 2, 4, and 5, 1914. Saunders took one at Hollins, April 24, 1908.

General habits.—This rather large thrush is found during migration chiefly in dry, upland woods, where it spends much of its time on or near the ground, searching among the leaves

†Beal, F. E. L., Bull. 280, U. S. Dept. Agr., pp. 9-11, 1915.

‡*Hylocichla aliciae aliciae* of the A. O. U. Check-list; for change of name see The Auk, vol. 37, p. 238, 1920.

and rubbish for its food. Save for an occasional low *chuck*, the bird is for the most part silent during its stay in the South.

Food habits.—The food of this species has been found to consist of about three-fourths animal matter and one-fourth vegetable. Beetles composed about a third of the total food; ants, wasps, bees, caterpillars, grasshoppers, and spiders made up most of the remainder of the animal food. Wild fruit comprised the bulk of the vegetable food, 18 different varieties having been found in the stomachs examined.*

BICKNELL THRUSH: *Hylocichla minima minima*
(Lafresnaye).†

State records.—The smaller form of the gray-cheeked thrush, the Bicknell, was found in some numbers in autumn at Greensboro by Dr. Avery‡ and doubtless occurs, also, in spring. There are five specimens in the Avery collection, taken September 17 and October 1, 1890; September 19 and 25, 1891; and September 20, 1893.

OLIVE-BACKED THRUSH: *Hylocichla ustulata swainsoni*
(Tschudi).

State records.—The olive-backed thrush occurs as a migrant, rather rarely in spring, but commonly in autumn. McCormack observed it at Leighton from May 1 to 7, 1890, and once on September 14, 1891. Avery took specimens at Greensboro, May 3, 1893, September 3, 9, 17, 22 and 30, and October 1 and 2, 1890; and Dean noted the species at Anniston, October 8 and 15, 1916. One specimen was taken by Saunders at Woodbine, April 11, 1908. Dean records the first seen at Anniston, April 23, 1916. I saw several near Montgomery, May 7, 1911; others at Florence, May 4 and 7, 1912; Muscle Shoals, April 23 and 25, 1914; and on Sipsey Fork, near Mellville, May 1 and 4, 1914. Holt took specimens at Barachias, April and May 2, 1913.**

General habits.—The olive-back has much the same habits as the other migrant thrushes—the veery and the gray-

*Beal, F. E. L., Bull. 280, U. S. Dept. Agr., pp. 11-13, 1915.

†*Hylocichla aliciae bicknelli* of the A. O. U. Check-list; for change of name see The Auk, vol. 37, p. 284, 1920.

‡Avery, W. C., Amer. Field, vol. 35, p. 55, 1891.

**Golsan and Holt, The Auk, vol. 31, p. 235, 1914.

cheeked—and, indeed, is often found associated with them in the woods during their migrations. The present species is tamer than either of the others and one may often approach near enough to distinguish the buffy breast, cheeks, and eye-ring—characters which separate it from the gray-cheek. Not infrequently in spring it renders snatches of its beautiful song. Dr. Avery frequently observed this bird in autumn with other species of thrushes, feeding on the berries of the black gum.

Food habits.—The food of this thrush, as studied by Prof. Beal, consisted of animal matter 63½ per cent, and vegetable matter 36½ per cent. The animal portion comprised beetles, weevils, ants, wild bees, wasps, caterpillars, crickets, flies, bugs, and spiders. The vegetable food consisted of small fruit, including cherries, frost grapes, elderberries, blackberries, pokeberries, and the fruit of the dogwood, sumac, and many other species.*

HERMIT THRUSH: *Hylocichla guttata faxoni*
Bangs and Penard.†

State records.—The hermit thrush (fig. 31), is one of the hardiest of the thrushes and most individuals of the species remain all winter in the Southern States. It is fairly common in Alabama from about the middle of October to the middle of April. McCormack observed the bird at Leighton between October 16 and April 8; Avery found it at Greensboro between October 24 and April 3, and Saunders noted it at Woodbine till April 13. At Orange Beach, in January, and Bayou Labatre, in February, I found it fairly numerous in swamps and palmetto scrub. It was noted by E. G. Holt and myself on numerous dates in February, March, and April at Carlton, Jackson, York, Auburn, Dothan, Montgomery, Autaugaville (last April 16), and on Sand Mountain (near Carpenter).

General habits.—During the winter season this thrush is found in wooded swamps, river-bottom thickets, and to a less extent in dry, upland timber, when it lives chiefly on or near the ground. It is a quiet bird, retiring and solitary in habit,

*Beal, F. E. L., Bull. 280, U. S. Dept. Agr., pp. 13-18, 1915.

†*Hylocichla guttata pallasi* of the A. O. U. Check-list; for change of name see The Auk, vol. 38, p. 433, 1921.

FIG. 31.—Hermit Thrush.

but not so shy as most of the other thrushes. In its northern home it is famed for its wonderful song, and both Brown and Saunders speak of hearing the song occasionally in Alabama in spring. Its alarm note is a low, soft *chuck*, in harmony with the bird's quiet, unassuming character. Wayne states that the hermit thrush can not endure sudden changes of weather and that hundreds have been known to perish in South Carolina during severe weather in January and February.†

Food habits.—During the winter this thrush feeds largely on wild fruits and berries, which constitute more than a fourth of its total food and include upwards of 40 different varieties. Sumac seeds, including those of poison ivy and poison oak, are a favorite article of this bird's diet, having been found in 49 of the 551 stomachs examined. Other fruits and seeds most often eaten are dogwood berries, pokeberries, service berries, holly berries, blueberries, and seeds of the greenbrier and Virginia creeper. Insects compose more than half of the food, the greater number being eaten in summer. Those most frequently taken are beetles, ants, bees, wasps, caterpillars, bugs, flies, and crickets.**

ROBIN: *Turdus migratorius migratorius* Linnaeus.†

State records.—The robin is a common winter resident in Alabama from about the middle of October to the middle of April. It is usually most abundant from the last of November to the last of March, and few are seen even later. It ranges into the mountain valleys as well as the lowlands and is sometimes seen even on the summits. McCormack has noted the earliest arrivals in fall at Leighton on October 7 (1889) and the latest in spring were seen April 29 (1890). Avery observed the first ones in fall at Greensboro on October 19 (1890) and Golsan saw the first at Autaugaville, October 22 (1911). At Bayou Labatre, a few were seen November 19 (1915), and on the 22d they appeared in large numbers. At the same locality and at Orange Beach I found robins only moderately numerous in January and February, 1912. On

†Wayne, A. T., *Birds of South Carolina*, p. 202, 1910.

**Beal, F. E. L., *Bull.* 280, U. S. Dept. Agr., pp. 18-23, 1915.

†*Planesticus migratorius migratorius* of the A. O. U. Check-list; for change of name see *Proc. Biol. Soc. Washington*, vol. 34, p. 105, 1921.

Petit Bois Island, February 13, 1912, only about 10 were seen. In the big swamps about Nigger Lake, on the lower Tensaw River, they were abundant in early December, 1915. Holt found them common in the swamps at Carlton in early March, 1912, and numerous also in the Talladega Mountains, near Dean, March 14-21, 1912; Graves reported robins present in large numbers on Sand Mountain (near Carpenter) in January, 1915. Brannon states that the northward migration took place at Montgomery in 1921 during the latter part of February.* About 10 birds were seen at Dothan, March 13, and single individuals at Squaw Shoals, April 11, and Autaugaville, April 17 (1912). Some of these may have been of the southern race (*achrusterus*).

Specimens of the northern form (*migratorius*) have been examined from Orange Beach (January 27); Carlton (March 1); Uniontown (March 1); Auburn (March 6); and Ardell (April 1).

General habits.—The robin is one of the most characteristic and widely distributed winter birds of the South. It occurs in loose, straggling flocks, frequenting pastures, hedgerows, clumps of cedars, and in particular wooded swamps, where an abundance of wild berries may be found. During fall and winter the swamps attract them most and in the big swamps of the lower Tensaw River, in December, they are so numerous as to be constantly in sight, their combined calls, conversational chatterings, and half-suppressed songs filling the somber woods with life and good cheer. Later in the season, when the supply of berries is considerably reduced, they frequent plowed lands and pastures and pick up quantities of insects and earthworms. The notes of the robin are varied, the most familiar one being the loud, angry *pimp*, uttered when the nest is disturbed. The song is a strong, clear, resonant warble, full of cheer and inspiration.

Food habits.—In the South, the robin feeds very largely upon wild fruits and berries, including china berries, persimmons, hackberries, holly berries, cedar berries, and the fruit of the greenbrier, Virginia creeper, black gum, and sumac.

*Brannon, P. A., *The Auk*, vol. 38, p. 464, 1921.

Vegetable matter, as determined by the examination of over 1,200 stomachs, constituted 57.6 per cent of the bird's total food, and included, besides the varieties already mentioned, cherries, currants, blackberries, mulberries, blueberries, chokecherries, pokeberries, serviceberries, grapes, and others—in all about 65 species of wild fruit having been identified. In the North, during the nesting season, robins consume a considerable quantity of cultivated fruit and at times become a pest when a good supply of their natural food of wild fruit is not available. Animal matter, chiefly insects, made up 42.4 per cent of the robin's food, the forms most commonly eaten being caterpillars, beetles, and grasshoppers.†

SOUTHERN ROBIN: *Turdus migratorius achrusterus*
(Batchelder).**

State records.—The southern robin, a smaller and paler race, occurs not uncommonly as a migrant and winter resident and very rarely as a breeder in the northern part of the State. Specimens of this form have been examined from Orange Beach (January 27, 1912); Mobile (February 5, 1912); Carlton (March 6, 1912); Autaugaville (March 22, 1914); and Woodville (March 10 and 12, 1915). McCormack states that the robin rarely nests near Florence, and that he observed one at Leighton about June 30, 1911. Gutsell learned that it nests in small numbers at Bridgeport, at least two pairs having been noted there in July, 1911. Graves noted the bird on Sand Mountain, near Carpenter, as late as May 22 (1914), and quite probably it was nesting there at the time. Dean reports that it nested at Anniston in 1916. At Jasper, April 29, 1914, we found a robin's nest in a pine grove on the outskirts of the town, the female being seen on the nest; in June of the same year, Peters visited the spot again and observed both the old birds and their young flying about. Avery reports an instance of breeding at Montgomery in 1890, as follows:

Two pairs of robins nested the past season in the yard of John L. Cobbs, state treasurer, in the city of Montgomery. The young were reared and they remained with their parents in the

†Beal, F. E. L., Bull. 171, U. S. Dept. Agr., 1915.

***Planesticus migratorius achrusterus* of the A. O. U. Check-list; for change of name see Proc. Biol. Soc. Washington, vol. 34, p. 105, 1921.

yard of Mr. Cobbs all the Summer and were still there in October, as was reported to me on inquiring. This is the first instance known to me of the robins nesting so far South.*

The species is not known to have nested again in Montgomery until 1921, in which year, according to Peter A. Brannon, at least a dozen instances of nests and eggs in or near the city were reported.

General habits.—This race of the robin is entirely similar in habits to the northern form (*migratorius*) the two subspecies often being found in one flock during the winter season. The nest of the robin, composed of dry grasses and rootlets with an inner wall of mud and a lining of fine grasses, is placed in a variety of situations, usually in a crotch or on a horizontal limb of a tree, from 5 to 50 feet from the ground, sometimes on a projecting plate or rafter of a porch, out-building, or bridge.

BLUEBIRD: *Sialia sialis sialis* (Linnaeus).

State records.—The bluebird is a common bird in all parts of the State and at all seasons. By reason of the influx of migrants from farther north, it is somewhat more numerous in winter than in summer. During severe winters, bluebirds sometimes suffer considerably, and many are frozen or die of starvation. The winter of 1894-95 was particularly hard on them in some sections, and for a year or two after that many observers reported a marked reduction in their numbers. Apparently the cold weather of January, 1912, did not seriously affect the species in the South, for in the following spring it was observed at various places in the State in moderate numbers. McCormack records eggs found at Leighton, March 29, April 7, and May 6; Saunders found nests with eggs at Woodbine, April 2 and June 5, and saw numerous broods of young from April 30 to May 4. Fresh eggs were found at Prattville, April 15 (Holt), in Bear Swamp, May 31 (Golsan), and at Ardell, June 25 (Holt). It has been seen in the breeding season on Dauphin Island.

General habits.—Bluebirds are found most frequently about fields, roadsides, and the borders of woodland, and are par-

*Avery, W. C., Amer. Field, vol. 35, p. 55, 1891.

ticularly fond of cleared lands where there are numbers of dead snags still standing. Indeed, they are dependent upon hollow trees and stubs, bird boxes, or hollow fence posts, for nesting sites, and where such are not available bluebirds are not found. These retreats are utilized, also, for roosting places in the winter season. The bluebird feeds chiefly on or near the ground; from a low perch, such as a fence post or old stub, the bird scans surrounding territory with care and frequently drops to the ground to capture a grasshopper or other insect which it has espied. During the late summer and fall the birds gather into loose, straggling flocks, and from that season on throughout the winter are frequently seen in numbers on the telephone wires along roadsides. Their mellow, plaintive whistle is a familiar sound throughout the season, and in spring the rich, sweet, warbling song is heard about the nesting grounds. Gentle and confiding in its nature, with a voice of plaintive tenderness, this bird has endeared itself to all who know it.

Food habits.—The food of the bluebird, as shown by examination of 855 stomachs in the Biological Survey, consists of about 68 per cent animal matter (insects, with a few spiders, myriapods, etc.) and 32 per cent vegetable. The insects eaten include Orthoptera (grasshoppers, crickets, and katydids), 22 per cent; beetles, 20 per cent; Lepidoptera (caterpillars, with a few moths), 10 per cent; and smaller quantities of ants, wasps, bees, flies, and bugs. The vegetable food is composed largely of fruit, chiefly wild species, including bayberries, cedar berries, hackberries, pokeberries, blackberries, blueberries, elderberries, and the fruit of the sumac, poison ivy, holly, inkberry, Virginia creeper, and dogwood. Professor Beal remarks in this connection:

The fruit-eating period of the bluebird is not in summer when the fruit is fresh on the tree, but from October to February, inclusive, during which months three-fourths of its fruit eating is done. From this it appears that fruit is really the winter food of the bluebird, tiding it over until insects are again abundant, and taking the place of seeds eaten by so many birds at this season.*

*Beal, F. E. L., Bull. 171, U. S. Dept. Agr., p. 24, 1915.

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A STUDY OF THE RED-WINGED BLACKBIRDS OF
SOUTHEASTERN UNITED STATES.

BY ARTHUR H. HOWELL AND A. J. VAN ROSSEM.

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SOUTHEASTERN UNITED STATES.¹

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THE nomenclatural status of the Red-winged Blackbirds of eastern United States is at present somewhat in confusion, due chiefly to the lack of adequate breeding specimens from critical localities. Mearns, in 1911,² stated that the typical race (*phoeniceus*) was the form breeding from South Carolina southward through middle Florida; he therefore revived the name *predatorius* for the northern race (formerly called *phoeniceus*), and relegated *floridanus* (which was currently applied to the Florida race) to synonymy. Our studies have demonstrated, however, that the typical race (*phoeniceus*) is the form breeding throughout eastern United States south to northern Florida, and that *floridanus* is restricted to the southern tip of the peninsula, thus leaving the bird of middle Florida without a name.

In the course of field work for the U. S. Biological Survey in 1926 the senior author collected a small series of breeding Red-winged Blackbirds on Santa Rosa Island, Florida, which appeared to represent an undescribed race. To this series, through the coöperation of Mr. Francis M. Weston of Pensacola, Florida, we have since added a number of specimens from the shores of Pensacola Bay.

The junior author, in connection with a revision of the genus *Agelaius*, has recently examined large series of Redwings in the principal collections in eastern museums and during his visit to Washington it developed that the two authors had reached practically identical views with reference to the races of the Redwing in Florida and the other Gulf States. It seemed desirable, therefore, to work out the problems in coöperation.

Our decisions have been based entirely on breeding specimens, and in the present discussion, wintering birds have been ignored.

¹ Joint contribution from the Bureau of Biological Survey and the California Institute of Technology.

² Proc. Biol. Soc. Washington, vol. 24, p. 226, 1911.

***Agelaius phoeniceus phoeniceus* (Linnaeus)**

EASTERN RED-WINGED BLACKBIRD

[*Oriolus*] *phoeniceus* Linnaeus, Syst. Nat., ed. 12, vol. 1, p. 161, 1766
(based on *Sturnus niger, alis superne rubentis* Catesby, Nat. Hist.
Carolina, vol. 1, p. 13, pl. 13, 1731).

Sturnus predatorius Wilson, Amer. Ornith., vol. 4, p. 30, plate 30, 1811.

Subspecific characters.—Compared with *mearnsi* (see *postea*): Size larger; bill slightly shorter and decidedly thicker at base; females with upper parts more blackish (less brownish); under parts clearer white (less buffy), with dark streaks more blackish.

Remarks.—When Dr. Mearns assigned the name *phoeniceus* to the Redwings of the Florida Peninsula and revived *predatorius* of Wilson for the northern race, he based his decision on a small series of breeding birds from the vicinity of Charleston, South Carolina. This series, collected by Mearns, Riley, and Brown is still available in the U. S. National Museum collection and has been reexamined by the writers in the present connection. Of the 9 males, only 3 are adult, the other 6 being one year old birds. It can not be too strongly emphasized that one year old males have decidedly shorter wings and tails than adults, and due to the preponderance of young males in the series examined by Mearns, the average measurements come closer in these particulars to the measurements of Florida adults than to those of the northern race; however, when the adults and immatures are separated the 6 one year old birds are found to closely approximate in measurements immature specimens from the north, and the same is true of the adults. Furthermore, it seems clear to us that Mearns was in error in stating that Catesby's plate represents the slender-billed bird of Florida, for measurements of the figure give the culmen a length of 21 mm.; the bill is shown open, but the combined measurements of maxilla and mandible give the bill a depth at base of 13.2 mm. There is, of course, no certainty that Catesby intended to figure his bird exactly life size, but the proportions of the bill certainly apply only to the northern race.

In color, breeding females from the coast of South Carolina and Georgia are clearly referable to the race ranging throughout the northeastern States, and show no approach in this character to the brownish birds of the Florida peninsula. Specimens from the extreme southern part of the range, however, show intergrada-

tion in measurements with *mearnsi* of the Florida peninsula, as would be expected.

It is generally admitted that the bulk of Catesby's collecting was done in the coast region of South Carolina, and since no more definite locality than "North America" was designated by Linnaeus for this species, we hereby select Charleston, South Carolina, as the type locality of *phoeniceus*. This subspecies ranges from the southern border of Georgia on the coast and from Gainesville, Florida, northward throughout the eastern United States.

Material is lacking from the northeastern coast of Florida to show which form breeds there. A single female specimen from Pellicer's Creek, St. John County, is nearer to *phoeniceus* than to *mearnsi*, being identical with the former in color and intermediate in measurements (as are the Gainesville birds), but on the basis of one specimen, we reserve decision as to the prevailing form in that region.

Specimens examined.—Total number, 56, from localities as follows:

Florida: Gainesville, 4.

Georgia: Cumberland Island, 8; St. Marys, 2; Chatham County, 3; Macon, 1; Athens, 3; Roswell, 2; Toccoa, 1; Margret (Fannin County), 2; Chatsworth, 4.

South Carolina: Wayne's Place, near Mt. Pleasant, 12; Port Royal, 1.

Alabama: Autaugaville, 4; Barachias, 1; Seale, 1; Attala, 2; Leighton, 1.

Mississippi: Duck Hill, 1; Minter City, 1; Cedar Bluff, 1; Raymond, 1.

In addition to the above, approximately 200 breeding specimens from the general range of the subspecies have been examined and measured.

***Agelaius phoeniceus littoralis* subsp. nov.**

GULF COAST REDWING

Type, ♀ adult, No. 298,920, U. S. Nat. Mus. (Biological Survey collection); collected on Santa Rosa Island, opposite Mary Esther, Florida, April 19, 1926, by A. H. Howell; original number, 2102.

Range.—Gulf coast region, from Choctawhatchee Bay, Florida, westward at least to Galveston, Texas.

Subspecific characters.—Compared with *Agelaius phoeniceus phoeniceus* of northeastern United States: Coloration of females darker, both above and below, particularly on the rump; general tone of upper parts in breeding plumage fuscous-black, with median crown stripe and buffy edgings on nape and interscapular region nearly obsolete; ground color of under parts less buffy (more whitish), the dark streaks broader and averaging more blackish; wing and tail slightly shorter; bill slightly more slender in lateral profile. Compared with *A. p. mearnsi*: Coloration of females throughout very much more blackish (less brownish), the brown and buff edgings to the feathers of the head, nape, interscapular region, and wings very much reduced; streaks on under parts decidedly more blackish, the ground color less buffy (more whitish); bill shorter, and thicker at base; wing averaging slightly longer.

Remarks.—This subspecies, the darkest of all the eastern races, apparently ranges little, if any, above the tidewater region. It appears to be more closely related to *phoeniceus* than to *mearnsi* or *megapotamus*,¹ but material is lacking to show with certainty the area of intergradation with any of these races.

The birds from Whitfield, Florida are not typical; 3 females taken February 13, 14, and March 21 agree with *littoralis* in color but have slenderer bills, thus indicating approach to *mearnsi*; the four males (taken December 30, February 24, March 18 and 23) seem to be typical *littoralis*; one female, taken February 19, is apparently a transient, nearest to *phoeniceus* in characters.

The large series from Gueydan, Louisiana, including both breeding and wintering individuals, are not typical, being slightly paler both above and below, but agreeing in measurements and proportions with typical *littoralis*.

Specimens examined.—Total number, 67, from localities as follows:

Florida: Whitfield, 3; Santa Rosa Island, 6; Pensacola Bay, 8.

Alabama: Mobile, 2.

Mississippi: Bay St. Louis, 3; Jefferson Parish, 1.

Louisiana: Breton Island, 3; Bel Air, 3; Lake Borgne, 1; Timbalier Island, 1; Morgan City, 2; Avery Island, 5; Gueydan, 28.

Texas: Galveston, 1.

¹ Oberholser, Wilson Bull., vol. 31, p. 20, March, 1919; from southern Texas and northeastern Mexico.

***Agelaius phoeniceus mearnsi*¹ subsp. nov.**

FLORIDA REDWING

Agelaius phoeniceus floridanus Ridgway (not of Maynard) Birds North and Middle Amer., pt. 2, p. 333, 1902 (part).

Agelaius phoeniceus phoeniceus Mearns (not of Linnaeus) Proc. Biol. Soc. Washington, vol. 24, p. 227, October 31, 1911 (part).

Type, ♀ adult (breeding), No. 176,936, U. S. Nat. Museum. Collected at Alligator Bluff, Kissimmee River, Florida, April 27, 1901, by Edgar A. Mearns; original number, 12,560.

Range.—Greater part of the Florida peninsula, south to the lower Kissimmee Valley and the Caloosahatchee River; north at least to Putnam County (San Mateo) and Anastasia Island; west on the Gulf coast to Apalachicola.

Subspecific characters.—Compared with *phoeniceus*: Size smaller; bill longer and more slender, both actually and relatively; coloration of upper parts in females more brownish (less blackish); under parts more buffy (less whitish), the dark streaks more brownish.

Remarks.—In the present race, the maximum brownish suffusion found in *Agelaius phoeniceus* is attained; this character at once distinguishes *mearnsi* from all the other races occupying the Caribbean area (*bryanti*, *floridanus*, *littoralis*, *megapotamus*, and *richmondi*).

Specimens from the Gulf Coast of Florida, particularly from the northern portion, have somewhat thicker bills than those from central and eastern Florida, thus indicating a gradual approach in this character to *littoralis* of the western Gulf Coast. Specimens from the Caloosahatchee Valley (Alva and Ft. Myers) show approach in paler coloration to *floridanus*, of south Florida.

Breeding material is lacking from the lower St. Johns Valley, hence the area of intergradation with *phoeniceus* is not definitely known; quite probably this race will be found to range northward nearly or quite to Jacksonville.

Specimens examined.—Total number, 144, from localities as follows:

Florida: Anastasia Island, 2; San Mateo, 1; Big Lake George, 1; northern Brevard County, 5; Merritt's Island, 6; Banana River, 5; Canaveral, 3; Lake Jessup, 1; Enterprise, 1; Orlando, 2; Blue Spring, 1; Lake Kissimmee, 4; Lake Arbuckle, 2; Kissimmee

¹ Named for the late Dr. Edgar A. Mearns, whose extensive collections have enabled us to discriminate this subspecies.

River, 18; Ft. Bassenger, 2; Kissimmee (24 miles southwest), 1; Southport Canal (Osceola County), 1; Ft. Thompson, 3; Alva, 9; Ft. Myers, 20; Pine Island, Charlotte Harbor, 11; Gulfport, 6; Seminole, 1; Pasadena, 2; Pass-a-Grille, 8; Indian Rocks (Pinellas Co.), 4; Clearwater, 3; Seven Oaks, 1; Port Richey, 3; Chassahowitzka River, 2; Cedar Keys, 3; Sumner, 3; Lukens, 4; Grassy Island, Taylor County, 2; Aucilla River (mouth), 2; Apalachicola, 1.

***Agelaius phoeniceus floridanus* Maynard**

MAYNARD'S REDWING

Agelaius phoeniceus floridanus Maynard, Birds East. North Amer., 2nd ed., part 40, p. 698, 1895 (Key West, Florida).

Agelaius phoeniceus bryanti Ridgway, Birds North and Middle Amer., Bull. 50 U. S. Nat. Mus., part 2, pp. 334-335, 1902 (part; specimens from Lake Worth, Miami, and Key West).

Range.—Resident on the Florida Keys and the southern end of the Florida Peninsula, north at least to Lake Worth on the east coast and to Everglade, Collier County, on the west coast.

Subspecific characters.—Compared with *mearnsi*: In size and proportions practically identical; coloration of upper parts in females paler, less brownish, and more extensively marked with whitish; superciliary stripe averaging broader and more whitish (less buffy); underparts more whitish (less buffy). Compared with *bryanti*: Size similar; bill of similar proportions but averaging shorter; coloration of females decidedly more brownish (less whitish) below and more brownish and less extensively flecked with whitish above. This race is thus intermediate in color between the strongly brown race of central Florida (*mearnsi*) and *bryanti*, the whitest of all the races of *phoeniceus*.

Remarks.—Described by Maynard in 1895 from Key West, this race was accepted by Ridgway in his 'Birds of North and Middle America' (part 2, p. 333, 1902), but by a strange inconsistency the range assigned to it definitely excluded its type region, whereas the Keys birds were referred to *bryanti*. Following this it was introduced into the third edition of the A. O. U. 'Check-List,' where the same error was perpetuated, its range being given as "Florida (except the southeastern coast and Keys), and west along the Gulf coast at least to Galveston, Texas."

When Mearns, in 1911, applied the name *phoeniceus* to the central Florida form, he relegated *floridanus* to synonymy. Recent collections from extreme south Florida and the Keys, however,

serve to show that *floridanus* is a well marked race, differing from both *bryanti* of the Bahamas and *mearnsi* of central Florida.

Through the kindness of Dr. Thomas Barbour and Mr. Outram Bangs of the Museum of Comparative Zoology, we have been enabled to examine the two cotypes (♂ and ♀) of this subspecies.¹ The female, although taken in midwinter (Nov. 19, 1870), is unmistakably of the pale resident Keys race and the male (Dec., 1870), although showing no diagnostic characters, is likewise in no way distinguishable from breeding birds from the Florida Keys.

One female specimen from Everglade is a typical *floridanus*; another (March 12) is darker above and apparently an intergrade toward *mearnsi*. Evidently, intergradation with *mearnsi* takes place between Everglade and the Caloosahatchee River.

Specimens examined.—Total number, 77, from localities as follows:

Florida: Key West, 5; Big Pine Key, 1; Little Pine Key, 1; Bamboo Key, 1; Cave Key, 1; Cape Sable, 9; Flamingo, 3; East Fox Lake, 1; Bear Lake, 2; Alligator Lake, 2; Royal Palm Hammock, 7; Shark River, 2; Everglade, 5; Coconut Grove, 1; Cutler, 3; Lemon City, 3; Tamiami Trail (20 miles west of Miami), 4; Palm Beach, 10; Lake Worth, 5; Monroe County, 2; Miami, 1.

MEASUREMENTS OF ADULT MALES

Agelaius phoeniceus phoeniceus (Linnaeus)

50 adult males from: Penn. (19); New Jersey (2); New York (11); Mass. (18).

Wing	Tail	Culmen	Depth	Tarsus	Mid-toe (with Claw)
113.5–128.5	86.0–98.0	21.9–25.0	11.3–13.3	27.0–30.3	19.4–22.2
(120.7)	(91.3)	(23.7)	(12.5)	(29.0)	(20.7)

12 adult males from: Charleston, South Carolina (3); Georgia (interior, 3; Camden County, 5; and Savannah, 1).

113.5–122.5	86.0–98.0	23.3–25.7	11.8–13.5	29.0–30.0	19.0–22.0
(119.2)	(92.0)	(24.6)	(12.6)	(29.5)	(21.0)

2 adult males from Gainesville, Florida.

116.0–117.5	86.0–91.0	24.8–24.9	12.2–12.4	29.2–30.0	20.3–22.0
(116.8)	(88.5)	(24.9)	(12.3)	(29.6)	(21.2)

¹ Nos. 13963, 13976, Mus. Comp. Zool.

Agelaius phoeniceus mearnsi Howell & van Rossem

35 adult males from interior and eastern central Florida.

109.0-118.5	81.0-93.5	23.8-27.2	10.5-12.1	27.2-30.0	19.0-22.0
(113.1)	(87.4)	(25.0)	(11.2)	(28.7)	(20.3)

Agelaius phoeniceus floridanus Maynard

26 adult males from southern Florida and Keys.

107.5-119.0	76.5-92.5	23.2-27.0	10.2-12.0	25.7-29.5	18.6-21.3
(113.2)	(86.2)	(25.1)	(11.0)	(27.8)	(20.2)

Agelaius phoeniceus littoralis Howell & van Rossem

2 adult males from Santa Rosa Island and Pensacola, Florida.

113.0-116.0	85.5-86.0	23.8-24.0	12.1-12.1	27.5-29.5	19.4-21.2
(114.5)	(85.8)	(23.9)	(12.1)	(28.5)	(20.3)

13 adult males from coast of Louisiana.

110.0-118.0	85.0-93.0	23.2-27.0	11.4-13.1	28.3-30.2	20.3-22.3
(114.5)	(88.8)	(25.2)	(12.0)	(29.2)	(21.2)

One year old males of all races average about 9% smaller.

ADULT FEMALES

Agelaius phoeniceus phoeniceus (Linnaeus)

40 adult females from: Penn. (18); New York, (3); Mass. (16); Conn. (3).

Wing	Tail	Culmen	Depth	Tarsus	Mid-toe
95.0-104.0	67.0-78.0	18.1-21.4	10.0-12.1	24.5-27.7	17.1-19.4
(98.9)	(72.7)	(19.9)	(10.7)	(25.8)	(18.3)

16 adult females from: South Carolina, (Charleston, 3); Georgia, (interior, 8; Cumberland Island and Savannah, 5).

92.0-102.0	68.0-77.5	19.0-22.9	9.9-11.3	24.3-27.0	17.2-19.2
(96.5)	(72.0)	(20.4)	(10.8)	(25.8)	(18.6)

1 adult female from Gainesville, Florida.

93.5	74.0	19.8	10.0	25.4	18.8
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Agelaius phoeniceus mearnsi Howell & van Rossem

20 adult females from interior and eastern central Florida.

89.0-96.5	66.5-74.5	19.4-22.2	8.9-10.3	24.2-26.0	16.8-19.8
(92.8)	(70.9)	(21.0)	(9.7)	(25.2)	(17.9)

Agelaius phoeniceus floridanus Maynard

18 adult females from southern Florida and Keys.

89.0-96.5	65.5-74.5	19.2-21.5	8.8-9.8	23.8-25.8	17.0-18.5
(93.2)	(70.2)	(20.3)	(9.4)	(24.8)	(17.6)

Agelaius phoeniceus littoralis Howell & van Rossem

9 adult females from Santa Rosa Island (5) and Pensacola (4), Florida.

94.0-98.0	69.0-71.0	20.3-21.4	10.0-11.5	24.5-26.1	16.5-18.8
(95.5)	(70.2)	(20.8)	(10.7)	(25.0)	(17.7)

23 adult females from coast of Louisiana.

90.0-96.0 ¹	68.0-73.0 ¹	19.4-23.0	10.1-11.1	25.0-26.9	17.1-19.0
(92.6)	(70.5)	(21.0)	(10.6)	(25.7)	(18.1)

¹ Eight birds not measured for wing and tail because of excessive wear.

U. S. Biol. Survey, Washington, D. C.
and Pasadena, Calif.

PRELIMINARY DESCRIPTIONS OF FOUR NEW NORTH AMERICAN GROUND SQUIRRELS

BY ARTHUR H. HOWELL

Critical studies of the North American ground squirrels have brought to light several undescribed forms additional to those previously published by the writer.¹ These are here briefly described in advance of a more formal paper.

Citellus beecheyi parvulus subsp. nov.

Type.—Female subadult, skin and skull No. 28068/40167, U. S. National Museum (Biological Survey collection); collected in Shepherd Canyon, Argus Mountains, California, April 30, 1891, by A. K. Fisher; original number, 569.

Subspecific characters.—Similar in color and cranial characters to *Citellus b. fisheri*, but smaller; smaller and paler than *beecheyi*.

Measurements.—Type (subadult ♀): Total length, 410; tail vertebrae, 169; hind foot, 50; ear from notch, 17. Average of 8 adult males (Argus Mountains, Panamint Mountains, Owens Lake): 406.6; 161.6; 54.6; 19.6. Average of 12 adult females from same localities: 410; 163; 52.9; 19.

Skull: Average of 7 adult males: Greatest length, 56.3; palatal length, 26.8; zygomatic breadth, 35.3; cranial breadth, 23.3; least interorbital breadth, 12.8; least postorbital breadth, 14.9; length of nasals, 20.9; maxillary tooth row, 11.1. Adult female (type): 54.1; 26; 33.3; 23.3; 14; 16.4; 19.4; 11.1.

Range.—Desert ranges of southern California and northern Lower California, from Owens Valley and the Panamint Mountains south to the San Pedro Martir Mountains.

Remarks.—This small, pale race intergrades with *fisheri* at the southern end of the San Joaquin Valley and with *beecheyi* in the San Bernardino, San Jacinto, and other ranges in southwestern California.

¹ Proc. Biol. Soc. Washington, vol. 41, pp. 211-214, 1928.

Callospermophilus chrysodeirus connectens subsp. nov.

Type.—Male adult, skin and skull, No. 212461, U. S. National Museum (Biological Survey collection); collected at Homestead, Oregon, June 1, 1916, by H. H. Sheldon; original number, 535.

Subspecific characters.—Similar in summer pelage to *C. chrysodeirus chrysodeirus*, but head and mantle darker; shoulders and fore back more vinaceous (less ochraceous); under side of tail paler. Similar in color to *C. chrysodeirus castanurus* but under side of tail paler, and sides of face and neck paler (more ochraceous).

Description of type (summer pelage).—Head, ears, shoulders, and sides of neck russet, shading on sides of face and neck to cinnamon-buff; nape and fore back between the shoulders cacao brown; median dorsal area fawn color, shading to army brown on rump and thighs; sides of body and feet pinkish buff; light dorsal stripes creamy white, tinged with pinkish buff, bordered on each side with shorter black stripes of the same width; tail beneath, cinnamon; tail above, mixed with fuscous-black; underparts grayish white, washed with pale pinkish buff.

Measurements.—*Type* (♂ adult): Total length, 275; tail vertebrae, 95; hind foot, 42; ear from notch (dry), 14. Average of 16 adults (7 males, 9 females): 266; 91.9; 41.2; 14.3. *Skull*: (Type): Greatest length, 44.1; palatal length, 20; zygomatic breadth, 27.1; cranial breadth, 19.1; least interorbital breadth, 9.6; least postorbital breadth, 12.3; length of nasals, 14.8; maxillary toothrow, 8.8.

Range.—The Blue Mountains region of northeastern Oregon and southeastern Washington.

Callospermophilus chrysodeirus mitratus subsp. nov.

Type.—Male adult, skin and skull, No. 138125, U. S. National Museum (Biological Survey collection); collected on South Yolla Bolly Mountain, California, July 30, 1905, by J. F. Ferry; original number, 13.

Subspecific characters.—Similar to *Callospermophilus c. chrysodeirus*, but upperparts paler and more grayish (less brownish), especially on the rump; mantle darker; tail averaging longer and darker beneath; hind feet longer; skull larger. Compared with *trinitatis*: Upperparts much paler; mantle darker and more extensive; skull broader across zygomata; external measurements smaller.

Description of type (summer pelage).—Head and mantle russet (this color extending to the shoulders and fore back), shaded on sides with ochraceous-tawny; throat and sides of lips warm buff; median dorsal area and rump smoke gray; light dorsal stripes creamy white, bordered on each side with black stripes of about the same width; sides of body pale pinkish buff; feet cinnamon-buff; tail above, fuscous-black, mixed with warm buff; tail beneath, deep tawny, bordered with fuscous-black, and edged with warm buff; underparts pinkish buff.

Measurements.—*Type* (♂ adult): Total length, 282; tail vertebrae, 110; hind foot, 42; ear from notch (dry), 14.5. Average of 10 adults (5 males, 5 females) from type region: 269; 94.1; 41.4; 14.5. *Skull* (of type): Greatest length, 43.6; palatal length, 20.5; zygomatic breadth, 28; cranial breadth, 20.8; least interorbital breadth, 9.9; least postorbital breadth, 12.7; length of nasals, 15.9; maxillary toothrow, 7.9.

Range.—Mountain ranges of northern California, from Glenn County north to southern Siskiyou County.

Remarks.—This race is most strongly developed in the region around South Yolla Bolly Mountain. A large series (in the Museum of Vertebrate Zoology) from northern Trinity and southern Siskiyou counties agree in size with typical *mitratus*, but are slightly darker; their skulls average a little longer, and narrower across the zygomata, thus showing approach to *trinitatis*.

***Ammospermophilus leucurus pennipes* subsp. nov.**

Type.—Female adult, skin and skull, No. 75683, U. S. National Museum (Biological Survey collection); collected at Grand Junction, Colorado, November 11, 1895, by A. H. Howell; original number, 494.

Subspecific characters.—Similar to *Ammospermophilus l. cinnamomeus*, but upperparts in winter pelage more grayish (less vinaceous) and in summer pelage darker and more brownish; skull slightly larger. Compared with *A. leucurus leucurus*: Coloration in summer pelage decidedly more vinaceous (less grayish); in winter pelage rather similar, but averaging more vinaceous; skull decidedly larger.

Description of type (winter pelage): Upperparts light vinaceous-cinnamon, the hairs on the median dorsal area tipped with white; flanks and hind legs vinaceous-cinnamon, shading to pale pinkish buff on the hind feet; front feet similar; lateral stripes creamy white; tail above, mixed black and white, the hairs showing a broad, subterminal band of black; tail beneath, creamy white; underparts white, the bases of the hairs plumbeous.

Measurements.—Type (♀ adult): Total length, 229; tail vertebrae, 76; hind foot, 41; ear from notch (dry), 9. Average of 10 adults (4 males, 6 females) from type locality: 226.6; 68.8; 39; 8.7. *Skull* (of type): Greatest length, 40.8; palatal length, 18.5; zygomatic breadth, 23.4; cranial breadth, 19.2; least interorbital breadth, 10.1; least postorbital breadth, 14.5; length of nasals, 12.7; maxillary tooththrow, 6.9.

Range.—The Colorado Valley and its tributaries (except the San Juan) in western Colorado and eastern Utah; specimens examined from Grand Junction, Hotchkiss, Fruita, and White River, 20 miles east of Rangely, Colorado; Vernal, Thurber, and Henry Mountains, Utah.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTIONS OF TWO NEW HARVEST MICE
FROM HONDURAS.

BY ARTHUR H. HOWELL.

In a small collection of mammals recently acquired by the United States National Museum from Honduras there are three specimens of *Reithrodontomys*, representing two apparently undescribed forms. These have been submitted to me for identification and are herewith described.

Reithrodontomys mexicanus lucifrons, subsp. nov.

Type.—Female adult, skin and skull, No. 257086, United States National Museum; collected at Cerro Cantoral, Honduras, February 7, 1932, by C. F. Underwood; original number, 709.

Subspecific characters.—Similar in size and cranial characters to *mexicanus*; hind foot smaller; coloration distinctly paler, especially on the forehead and sides of face. Compared with *goldmani*: coloration of body similar, but face paler; skull shorter with more globular braincase.

Description of type.—Forehead and sides of face cinnamon-buff; eye-ring black; dorsal area, from crown to rump, sayal brown, varied with fuscous; sides pale sayal brown; ears fuscous; feet dull white, with a median stripe of hair-brown; underparts pale pinkish cinnamon; tail fuscous, unicolor.

Measurements.—Type: Head and body, 68 mm.; tail vertebrae, 112; hind foot, 19; ear from notch (dry), 13.2. Topotype (female): 70; 114; 18; 13. Skull (type): Greatest length, 23.7; breadth of braincase, 11.7; length of nasals, 8.5; width of outer wall of antorbital foramen, 1.7.

Remarks.—The two specimens on which this race is based agree closely in color, except that the topotype has the underparts whitish instead of buffy. The new form is clearly related to *R. mexicanus mexicanus*, which is known to range from Vera Cruz, Mexico, south to Guatemala. No members of this genus have previously been described from Honduras.

Reithrodontomys mexicanus minusculus, subsp. nov.

Type.—Male adult, skin and skull, No. 257087, United States National Museum; collected at Comayabuela (just south of Tegucigalpa), Honduras, February 27, 1932, by C. F. Underwood; original number, 797.

Subspecific characters.—Similar in color and cranial characters to *R. mexicanus lucifrons* (described above), but decidedly smaller; upper parts slightly paler, except on the head, which is similar to the back.

Description of type.—Head and upper parts sayal brown, varied with fuscous; sides pale sayal brown; ears fuscous; eye-ring black; feet dull white, with a median stripe of hair-brown; tail fuscous, unicolor; underparts white, faintly washed with pale pinkish cinnamon.

Measurements.—Type: Head and body, 69 mm.; tail vertebrae, 102; hind foot (dry), 18.5; ear from notch (dry), 11. Skull: Greatest length, 21.4; breadth of braincase, 11.1; length of nasals, 7.5; width of outer wall of antorbital foramen, 1.5.

Remarks.—The single specimen of this form at hand is clearly referable to the *mexicanus* group, and doubtless will prove to be a subspecies, nearest related to *lucifrons*. Although resembling the latter closely in color, its distinctly smaller size indicates that it represents a separate race.

PROCEEDINGS
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BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTIONS OF TWO NEW HARVEST MICE
FROM HONDURAS.

BY ARTHUR H. HOWELL.

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Subspecific characters.—Similar in size and cranial characters to *mexicanus*; hind foot smaller; coloration distinctly paler, especially on the forehead and sides of face. Compared with *goldmani*: coloration of body similar, but face paler; skull shorter with more globular braincase.

Description of type.—Forehead and sides of face cinnamon-buff; eye-ring black; dorsal area, from crown to rump, sayal brown, varied with fuscous; sides pale sayal brown; ears fuscous; feet dull white, with a median stripe of hair-brown; underparts pale pinkish cinnamon; tail fuscous, unicolor.

Measurements.—Type: Head and body, 68 mm.; tail vertebrae, 112; hind foot, 19; ear from notch (dry), 13.2. Topotype (female): 70; 114; 18; 13. Skull (type): Greatest length, 23.7; breadth of braincase, 11.7; length of nasals, 8.5; width of outer wall of antorbital foramen, 1.7.

Remarks.—The two specimens on which this race is based agree closely in color, except that the topotype has the underparts whitish instead of buffy. The new form is clearly related to *R. mexicanus mexicanus*, which is known to range from Vera Cruz, Mexico, south to Guatemala. No members of this genus have previously been described from Honduras.

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Subspecific characters.—Similar in color and cranial characters to *R. mexicanus lucifrons* (described above), but decidedly smaller; upper parts slightly paler, except on the head, which is similar to the back.

Description of type.—Head and upper parts sayal brown, varied with fuscous; sides pale sayal brown; ears fuscous; eye-ring black; feet dull white, with a median stripe of hair-brown; tail fuscous, unicolor; underparts white, faintly washed with pale pinkish cinnamon.

Measurements.—Type: Head and body, 69 mm.; tail vertebrae, 102; hind foot (dry), 18.5; ear from notch (dry), 11. Skull: Greatest length, 21.4; breadth of braincase, 11.1; length of nasals, 7.5; width of outer wall of antorbital foramen, 1.5.

Remarks.—The single specimen of this form at hand is clearly referable to the *mexicanus* group, and doubtless will prove to be a subspecies, nearest related to *lucifrons*. Although resembling the latter closely in color, its distinctly smaller size indicates that it represents a separate race.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW RED SQUIRREL FROM NORTH DAKOTA.¹

BY ARTHUR H. HOWELL.

The examination of a large series of North American chickarees has revealed the existence of the following undescribed subspecies:

Tamiasciurus hudsonicus pallescens, new subspecies.

NORTH DAKOTA CHICKAREE.

Type.—Collected 8 miles east of Upham, McHenry County, North Dakota, January 8, 1936, by C. J. Henry; adult female, skin and skull, No. 261625, U. S. National Museum (Biological Survey's collection); original number 135 (27532X.)

Range.—North-central North Dakota, specifically the Souris River Valley in McHenry County, North Dakota, and the Turtle Mountains.

External characters.—Similar to *T. h. dakotensis*, but smaller; dorsal area and tail a darker shade of red; sides of head and body paler and more grayish (less buffy), especially in winter pelage; nose and face more grayish, lacking the rich buffy wash of *dakotensis*; fore and hind feet in winter pelage grayish rather than cinnamon buff; hind feet in summer darker buff; under parts in winter sometimes slightly vermiculated with fuscous. Compared with *preblei*: Similar in winter pelage, but upper parts and sides averaging paler and less reddish, the red of the back never forming a distinct band; sides of head paler gray; fore and hind feet paler and more buffy (less grayish); under parts mainly without vermiculation. In summer pelage upper parts averaging more tawny (less olivaceous), the fore and hind feet darker buff and the tail darker red above. Compared with *loquax*: Size larger; upper parts and tail in winter much paler, lacking the deep reddish dorsal band of that race; in summer pelage upper parts paler and more ochraceous.

Cranial characters.—Skull similar to that of *preblei*, but averaging smaller and relatively narrower across zygomata; much smaller than that of *dakotensis*; larger than that of *loquax*.

¹ This description of a hitherto unrecognized subspecies of red squirrel was found by me in arranging the papers of the late Arthur H. Howell. It was prepared by him in connection with his revision of the red squirrels of North America which was left uncompleted by his untimely death.—Viola S. Schantz.

Color.—*Winter pelage:* Median dorsal area hazel or mikado brown, not sharply defined, shading into color of the sides, which are warm buff, lightly shaded with fuscous; sides of face pale neutral gray; ears fuscous, shaded with hazel; sides of nose pinkish buff; feet pinkish buff, shaded with fuscous; tail above, tawny or mikado brown, bordered with black and edged with warm buff; tail beneath, warm buff, mixed with neutral gray; under parts white. *Summer pelage:* Upper parts warm buff, mixed with fuscous, the head darker; sides of nose warm buff; ears ochraceous tawny, shaded with fuscous; front feet ochraceous tawny; hind feet similar; the toes buckthorn brown; tail above, russet, bordered with black and edged with warm buff; tail beneath, mixed russet and neutral gray; under parts white, faintly washed with pale pinkish buff.

Measurements.—Average of 10 adults from Mouse River, North Dakota: Total length, 333.4 (324–360); tail vertebrae, 132.9 (120–143); hind foot, 48.1 (46–49). *Skull:* Average of 10 adult males from same locality: Greatest length, 47.6 (46.9–49); zygomatic breadth, 26.6 (25–27.7); cranial breadth, 20.5 (20–21.3); interorbital breadth, 13.5 (13–14.3); least post-orbital breadth, 14.2 (13–15.1); length of nasals, 14.4 (12.9–15.7); maxillary tooth row, 7.9 (7.6–8.2). Seven females average: Total length, 46.5; zygomatic breadth, 26.6; cranial breadth, 20.1; the other measurements are much as in the males.

Remarks.—This race occupies a limited area in the Souris River Valley, North Dakota, extending northward into the Turtle Mountains. It is the palest of all the races of *hudsonicus*, the red on the back much reduced in extent and intensity. In color it most resembles *dakotensis*, but is less suffused with ochraceous.

Specimens examined.—Total number, 31, from localities as follows: North Dakota: Bottineau, 2; Max Lake, Turtle Mountains, 2;² Mouse River, 10 miles east of Upham, and S. E. of Stillings Dam, 14; Towner, 7; Turtle Mountains, 6.³

United States Department of the Interior, Fish and Wildlife Service, Washington, D. C.

² Coll. Nat. Mus. Canada.

³ Two in American Mus. Nat. Hist.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW RED SQUIRREL FROM MINNESOTA.

BY ARTHUR H. HOWELL.

This description of a previously unrecognized subspecies of red squirrel was found among the papers of the late Arthur H. Howell. It was prepared by him in connection with his revision of the red squirrels of North America, which was left uncompleted by his untimely death.—Viola S. Schantz.

Tamiasciurus hudsonicus murii, new subspecies

RED RIVER CHICKAREE.

Type.—Collected at Moorhead, Minnesota, February 11, 1918, by O. J. Murie; adult male, skin and skull, No. 234039, U. S. National Museum (Biological Survey collection); original number 1174 (21595X).

Range.—The Red River Valley, Minnesota and North Dakota, north in southern Manitoba to Aweme.

External characters.—Hind foot larger than in *loquax*; upper parts in winter pelage paler, the red of a paler shade, and sides paler and more grayish (less buffy); ear tufts more brownish (less red); under parts with more vermiculation. In summer pelage very similar to *loquax*, but red of tail averaging paler. Compared with *pallascens*: Upper parts in winter much brighter red—the red color concentrated in the middle line. Compared with *hudsonicus*: Upper parts in winter paler, the red concentrated in the middle line; under parts with less vermiculation; tail darker red and with darker buffy edgings. In summer pelage, upper parts more ochraceous (less olivaceous); front legs a deeper shade of ochraceous buff; tail darker and more reddish above.

Cranial characters.—Skull slightly smaller than that of *hudsonicus*, and relatively narrower across zygomata; slightly larger than that of *loquax*; similar in size to that of *pallascens*.

Color.—*Winter pelage* (type): Median portion of upper parts, from crown to rump, between ochraceous tawny and tawny, shaded on each side of middle line with light ochraceous buff; sides of head and body smoke gray; feet gray, slightly darker than sides; front of face ochraceous buff, mixed with dusky; eye ring dull white; tail above, light tawny,

bordered with black and tipped with warm buff; tail beneath, ochraceous buff mixed with gray; under parts white. *Summer pelage*: Upper parts clay color or ochraceous tawny; lightly mixed with black; front legs and feet ochraceous tawny; hind feet ochraceous buff; tail above, tawny, bordered with black and tipped with ochraceous buff; under parts white.

Measurements.—Average of 9 adults (7 males, 2 females) from type locality: Total length, 325 (314–344); tail vertebrae, 130.8 (119–141); hind foot, 50.2 (48–52). *Skull*: Average of 8 adults (7 males, 1 female) from same locality: Greatest length, 47.1 (46–48.3); zygomatic breadth, 26.6 (25.5–27.5); cranial breadth, 20.3 (19.9–21.1); interorbital breadth, 14.1 (13.3–14.7); least postorbital breadth, 14.4 (13.7–15.7); length of nasals, 14 (13–15.6); maxillary tooth row, 8 (7.5–.4).

Remarks.—In color, this race most resembles *loquax*, but it is distinctly paler and also larger. It is an intermediate form, connecting *loquax* with *pallescens* of the Souris River region.

Specimens examined.—Total number, 61, from localities as follows: Manitoba: Aweme, 17 ^{1,2}; Carberry, 3; Red River, 2.

Minnesota: Moorhead, 12 ³.

North Dakota: Grafton, 12; Grand Forks, 3; Larimore, 1; Lisbon, 1; Manvel, 1; Portland, 3; Wahpeton, 3; Walhalla, 3.

United States Department of the Interior, Fish and Wildlife Service, Washington, D. C.

¹ Stuart Criddle collection.

² Royal Ontario Mus. Zool.

³ Nine in collection Carnegie Mus.

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

TWO NEW COTTON RATS FROM FLORIDA

BY ARTHUR H. HOWELL.

These new cotton rat descriptions were found with the late Arthur H. Howell's partly completed manuscript on Florida mammals.—Viola S. Schantz.

Sigmodon hispidus floridanus, new subspecies.

FLORIDA COTTON RAT.

Type.—Collected at Canal Point, Palm Beach County, Florida, March 1, 1936, by A. H. Howell; female adult, skin and skull, No. 261624, U. S. National Museum (Biological Surveys collection); original number 2813.

Range.—Greater part of central Florida (except coastal beaches), from Orange Lake south to the southern side of Okeechobee Lake.

External characters.—Coloration of upper parts darker (more blackish) than in *littoralis*; sides less heavily washed with buff; under parts more whitish (less buffy). Compared with *S. h. hispidus* of northern Florida and the Carolinas it is much darker and more blackish (less buffy).

Cranial characters.—Skull similar to that of *littoralis*; longer and relatively narrower across zygomatica than that of *hispidus*.

Color.—Upper parts mixed black, grayish white, and pale buff; sides mixed grayish white and buff, the buff rather inconspicuous; hind feet neutral gray; tail dull blackish above, slightly paler beneath; under parts grayish white.

Measurements.—*Type* (adult female): Total length, 302; tail vertebrae, 112; hind foot, 32. *Skull*: Occipitonasal length, 38.1; zygomatic breadth, 21; cranial breadth, 15.9; length of nasals, 15; maxillary tooth row, 6.8.

Remarks.—Cotton rats are probably the most abundant of Florida mammals. They inhabit a variety of terrain but are most numerous in neglected fields grown up to briars and broomsedge, or in palmetto scrub. Although not as aquatic in habit as the rice rats (*Orzomys*) they often invade the marshes or mangrove swamps and are frequently found in moist woodland. On the coast they are said to feed on mangrove shoots.

When pineapples were grown extensively in Florida these rats proved to be a serious pest. They flocked into the plantations and cut the plants off near the surface in order to reach the roots, which they consumed. They also destroyed the fruit by biting a hole in one side and

tunnelling inwards, leaving only an empty shell. At present they cause serious damage to sugarcane in the big plantations around Okeechobee Lake, where they often become very numerous and where hundreds are killed by the use of strychnine bait.

These rats are partly diurnal, being frequently seen running about in daytime in grassy situations or even crossing the highways.

Specimens examined.—Total number, 155, from the following localities in Florida: Canal Point, 4; Canaveral, 2; Chester Shoal, 1; Citrus Center, 1; Eden (St. Lucie County), 1; Kissimmee, 44; Kissimmee River (Osceola County), 4; Labelle, 2; Lake Harney, 33; Lake Kissimmee, 2; Lake Mobley (Hillsborough County), 1; Mullett Lake (Orange County, 2; Ocala National Forest, 5; Okeechobee, 2; Ponce Park, 1; Port Mayaca, 5; Port Richey, 6; Ritta, 9; Sebastian, 9; Sebring, 1; Silver Springs, 2; Sunbeam (near Titusville), 1; Titusville, 15; and Wilson, 2.

***Sigmodon hispidus insulicola*, new subspecies.**

INSULAR COTTON RAT.

Type.—Collected on Captiva Island, Florida, February 25, 1939, by W. H. Osgood; male adult, skin and skull, No. 48679, Field Museum of Natural History; original number 7057.

Range.—Captiva Island, Sanibel Island, Chadwick Beach (near Englewood).

External characters.—Upper parts paler and more grayish (less blackish) than in *floridanus* from the central portion of Florida; under parts more whitish; tail averaging paler both above and below; hind feet averaging paler; size smaller. Compared with *spadicipygus* from Cape Sable it is about the same size, but colors much paler and more grayish (less brownish). Compared with *littoralis* from the east coast beaches, opposite Micco, it is smaller, more grayish on the upper parts and more whitish (less buffy) beneath. Compared with *exsputus* from the Lower Florida Keys *insulicola* is decidedly more grayish, lacking the strong buffy suffusion on the upper parts shown by *exsputus*. The underfur is of a darker shade of neutral gray.

Cranial characters.—Skull much smaller and relatively shorter than that of *littoralis* or *floridanus*; similar in size to that of *spadicipygus*.

Color.—*Type*: Hairs of upper parts tipped with buffy white over dark neutral gray underfur, producing a grayish effect; rump shows a stronger suffusion of pale buff; sides pale pinkish buff; feet grayish white; tail hair brown above, whitish beneath; under parts creamy white.

Some specimens from Sanibel Island are slightly more suffused with buff on the back and sides, but all are paler than in *floridanus*.

Measurements.—*Type* (male adult): Total length, 274; tail vertebrae, 117; hind foot, 31. Average of 6 adult males, from Sanibel Island (5), and Captiva Island (1): 278; 114; 31.7. *Skull*: Average of 4 adult males from same localities: Occipitonasal length, 35.9 (35.2–36.9); zygomatic breadth, 20.3 (20–21); cranial breadth, 15.6 (15.1–15.6); length of nasals, 14.3 (14–14.9); maxillary tooth row, 6.7 (6.7–7).

Remarks.—The range of this pale, gray race of the cotton rat is not

known in detail; it seems to be confined mainly to islands or beaches on the southwest coast of Florida. Specimens from the mainland at Englewood are somewhat intermediate in color between *insulicola* and *floridanus*, but are best referred to the former.

The writer is indebted to Dr. Wilfred H. Osgood for calling attention to this form and for permission to describe it.

Specimens examined.—Total number, 21, from localities as follows: Florida: Captiva Island, 2¹; Sanibel Island, 10¹; Chadwick Beach (Near Englewood), 3; Englewood, 5; Pine Island (Lee County) 1.²

United States Department of the Interior, Fish and Wildlife Service,
Washington, D. C.

¹ Field Mus. Nat. Hist.

² Amer. Mus. Nat. Hist.

known in detail; it seems to be confined mainly to islands or beaches on the southwest coast of Florida. Specimens from the mainland at Englewood are somewhat intermediate in color between *insulicola* and *floridanus*, but are best referred to the former.

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Some specimens from Sanibel Island are slightly more suffused with buff on the back and sides, but all are paler than in *floridanus*.

Measurements.—*Type* (adult female): Total length, 302; tail vertebrae, 112; hind foot, 32. *Skull*: Occipitonasal length, 38.1; zygomatic breadth, 21; cranial breadth, 15.9; length of nasals, 15; maxillary tooth row, 6.8.

Remarks.—The range of this pale, gray race of the cotton rat is not known in detail; it seems to be confined mainly to islands or beaches on the southwest coast of Florida. Specimens from the mainland at Englewood are somewhat intermediate in color between *insulicola* and *floridanus*, but are best referred to the former.

The writer is indebted to Dr. Wilfred H. Osgood for calling attention to this form and for permission to describe it.

Specimens examined.—Total number 21, from localities as follows: Florida: Captiva Island, 2¹; Sanibel Island, 10¹; Chadwick Beach (near Englewood), 3; Englewood, 5; Pine Island (Lee County), 1.²

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¹ Field Mus. Nat. Hist.

² Amer. Mus. Nat. Hist.