PROCEEDINGS

OF THE

Biological Society of Washington

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PUBLICATION NOTE

By a change in the By-Laws of the Biological Society of Washington, effective March 27, 1926, the fiscal year now begins in May, and the officers will henceforth hold office from May to May. This, however, will make no change in the volumes of the Proceedings, which will continue to coincide with the calendar year. In order to furnish desired information, the title page of the current volume and the list of newly elected officers and committees will hereafter be published soon after the annual election in May.

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(FOR 1929-1930)

(ELECTED MAY 18, 1929)

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S. A. Rohwer, 1925
H. C. Oberholser, 1926–1927
E. A. Goldman, 1927–1929

*Deceased.

TABLE OF CONTENTS

The Committee on Publications declares that each paper of this volume was distributed on the date indicated on its initial page. The index and minutes of proceedings for 1929 (pp. vii–xi; 221–226) were issued on March 12, 1930. The title and lists of officers and committees for 1929–1930 (pp. i–iv) were issued on July 16, 1929.

ERRATA.

Page 54, line 29, for Vermivorus read Vermivora.
Page 67, line 13, for 17 read 13.
Page 165, line 18, for *atyani*, read *styani*.

PLATES.

Vol. 42, pp. vii–xi

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

PROCEEDINGS.

The Society meets from October to May, on alternate Saturdays, at 8 P. M. All the meetings during 1929 were held in the new lecture hall of the Cosmos Club, except the special meeting of May 11, which was held in the Auditorium of the National Museum.

January 12, 1929—728th Meeting.[1]

President Goldman in the chair; 70 persons present.

Informal communications: P. Bartsch, Note on a mockingbird; H. Ball, Observation on rare birds in winter.

Formal communications: P. S. Galtsoff, Private life of the American oyster; H. F. Prytherch, Forecasting the time of setting of oysters; G. C. Rouncefel, Alaska herring investigations.

January 26, 1929—729th Meeting.[2]

President Goldman in the chair; 55 persons present.

New member elected: M. G. Netting.

Informal communications: F. Thone, Notice of new scientific publications; Mrs. T. M. Knappen, Observation of a towhee in winter.

Formal communications: E. P. Walker, Some graphic methods of showing problems in wild life administration; O. J. Murie, The Alaska caribou.

[1]Abstract in Journ. Washington Acad. Sci., vol. 19, p. 312–313, August 19, 1929.
[2]Abstract in Journ. Washington Acad. Sci., vol. 19, p. 313–314, August 19, 1929.

February 9, 1929—730th Meeting.[1]

President Goldman in the chair; 63 persons present.

Informal communication: H. Ball, Recent observation of Holboell Grebe and Horned Grebe.

Formal communications: T. S. Palmer, Some early collectors and recent changes in wild life conditions in the District of Columbia; W. P. Taylor, Important wild life problems in Arizona.

February 23, 1929—731st Meeting.[2]

President Goldman in the chair; 113 persons present.

Formal communications: J. C. Merriam, Opportunities for inspirational education at the Grand Canyon; V. Bailey, Present conditions of animal life of the Grand Canyon.

March 9, 1929—732d Meeting.[3]

President Goldman in the chair; 46 persons present.

New member elected: C. E. Burt.

Informal communications: Mrs. T. M. Knappen, Observation of large flocks of White Ibis in Florida and Georgia; A. A. Doolittle, Observation of a Black-crowned Night Heron in January; A. Wetmore, Note on new buildings at the Zoological Park; H. Ball, Recent observations of birds; P. B. Johnson, Notes on the muskox.

Formal communications: F. C. Lincoln, Some causes of bird mortality; W. B. Bell, Present needs in biological research.

March 23, 1929—733d Meeting.[4]

President Goldman in the chair; 120 persons present.

Informal communications: V. Bailey, Note on the deer situation in Pennsylvania; E. P. Walker, Exhibition of a new binder for pamphlets.

Formal communications: P. B. Johnson, The pupil of the eye; E. W. Brandes, Sugar plant hunting by aeroplane in New Guinea.

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[1] Abstract in Journ. Washington Acad Sci., vol. 19, p. 314–315, August 19, 1929.

[2] Abstract in Journ. Washington Acad. Sci., vol. 19, p. 315, August 19, 1929.

[3] Abstract in Journ. Washington Acad. Sci., vol. 19, p. 316–318, August 19, 1929.

[4] Abstract in Journ. Washington Acad. Sci., vol. 19, p. 348–349, September 19, 1929.

April 6, 1929—734th Meeting.[1]

President Goldman in the chair; 75 persons present.

New member elected: C. F. W. Muesebeck.

Informal communication: R. M. Libby, Spring arrival of the Purple Martin.

Formal communications: C. W. Stiles, The zoo-parasitic diseases of non-human primates in reference to diseases of man; C. F. Swingle, Botanical exploration in Madagascar.

April 20, 1929—735th Meeting.[2]

President Goldman in the chair; 90 persons present.

New members elected: G. G. Becker, Ralph Ellis, Jr. (life member), E. H. Taylor.

Formal communication: J. M. Holzworth, The brown and grizzly bears of Alaska.

May 11, 1929—Special Meeting.[3]

President Goldman in the chair; 140 persons present.

Formal communication: R. G. Canti, Living tissue cells grown in vitro.

May 18, 1929—736th Meeting.[4]

50th Annual Meeting.

President Goldman in the chair; 23 persons present.

New members elected: F. W. Appel, J. I. Hambleton, J. M. Holzworth.

The annual reports of the Recording Secretary, Corresponding Secretary, Treasurer, and Publication Committee were presented.

The following officers and members of Council were elected: *President,* Alexander Wetmore; *Vice-Presidents,* C. E. Chambliss, H. H. T. Jackson, C. W. Stiles, T. E. Snyder; *Recording Secretary,* S. F. Blake; *Corresponding Secretary,* W. H. White; *Treasurer,* F. C. Lincoln; *Members of Council,* H. C. Fuller, W. R. Maxon, A. A. Doolittle, I. Hoffman, E. P. Walker.

[1] Abstract in Journ. Washington Acad. Sci., vol. 19, p. 349–350, September 19, 1929.
[2] Abstract in Journ. Washington Acad. Sci., vol. 19, p. 350, September 19, 1929.
[3] Abstract in Journ. Washington Acad. Sci., vol. 19, p. 350, September 19, 1929.
[4] Abstract in Journ. Washington Acad. Sci., vol. 19, p. 366, October 4, 1929.

Amendments to Art. III of the Constitution, and Art. I and III of the By-laws, were adopted.

The business meeting was followed by a special meeting, at which L. O. Howard, C. W. Stiles, and W. P. Hay presented recollections of the early days of the Society.

October 19, 1929—737th Meeting.[1]

President Wetmore in the chair; 55 persons present.

The president announced the membership of the standing committees of the Society, as follows: *Committee on Communications:* W. B. Bell, Chairman, V. Bailey, W. H. White, Lewis Radcliffe, W. R. Maxon, W. L. Schmitt; *Committee on Zoological Nomenclature:* G. S. Miller, Jr., Chairman, A. C. Baker, Paul Bartsch, E. A. Chapin, H. C. Oberholser; *Committee on Publications:* C. W. Richmond, Chairman, J. H. Riley, F. C. Lincoln, W. H. White.

Informal communication: A. Wetmore, Note on the bird collections of the Pinchot Expedition.

Formal communications: J. M. Aldrich, Notes on the life zones of northern Europe; H. Friedmann, Parasitism in birds.

November 2, 1929—738th Meeting.[2]

President Wetmore in the chair; 100 persons present.

Informal communications: S. F. Blake, Late occurrence of Solitary Vireo; I. Hoffman, Note on the successful raising of Elliot Pheasants near Washington, D. C.

Formal communications: A. H. Howell, Recent notes on birds and mammals of the Everglades; E. F. Coe, America's own Tropics.

November 16, 1929—739th Meeting.[3]

Vice-President Jackson in the chair; 35 persons present.

New members elected: C. Cottam, B. Miller.

Informal communication: S. F. Blake, Note on the English Sparrow.

Formal communications: L. V. Coleman, Museums in South

[1] Abstract in Journ. Washington Acad. Sci., vol. 20, p. 84–85, March 4, 1930.
[2] Abstract in Journ. Washington Acad. Sci., vol. 20, p. 85, March 4, 1930.
[3] Abstract in Journ. Washington Acad. Sci., vol. 20, p. 86, March 4, 1930.

America; C. W. Stiles, Proposals submitted as amendments to the International Rules of Zoological Nomenclature.

November 30, 1929—740th Meeting.[1]

President Wetmore in the chair; 44 persons present.

New member elected: J. W. Bulger.

Informal communications: F. Thone, Note on recent biological publications; A. Wetmore, Note on birds collected by the Pinchot South Sea Expedition; P. B. Johnson, Necrological note on Rev. Francis Tondorf; V. Bailey, Note on the scarcity of natural food for squirrels; P. B. Johnson, Note on a black squirrel; A. Wetmore, Note on the capture of Sharp-tailed Sparrows in Maryland.

Formal communications: E. R. Kalmbach, Notes on waterfowl sickness in 1929; R. Kellogg, The migration of whales.

December 14, 1929—741st Meeting.[2]

President Wetmore in the chair; 120 persons present.

New members elected: H. Friedmann, F. A. Warren.

Alexander Wetmore was nominated as a Vice-President of the Washington Academy of Sciences.

Informal communication: C. W. Stiles, Note on the nomenclature of the South American fox-tailed wolves.

Formal communication: O. J. Murie, Elk studies in the Jackson Hole region; M. C. Hall, Parasites of elk and other wild ruminants.

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[1]Abstract in Journ. Washington Acad. Sci., vol. 20, p. 86–87, March 4, 1930.

[2]Abstract in Journ. Washington Acad. Sci., vol. 20, p. 87–88, March 4, 1930.

Vol. 42, pp. 1–80 March 25, 1929

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

BIRDS OF THE WASHINGTON, D. C., REGION.

BY MAY THACHER COOKE.

Introduction.

The territory known as the "Washington Region" is that included within a radius of about twenty miles of the Capitol. Few areas of like size in the country have been more thoroughly studied ornithologically, and the records go back for more than a century. When Coues and Prentiss published the first comprehensive work on the birds of Washington in 1862, a list that was revised and enlarged in 1883, the area surveyed was almost entirely within the District of Columbia. But as the city has grown the birds have been pushed farther from the center, and trolley lines and later automobiles have given easy access to a larger territory so that for some years the present limits have been generally understood. In this region 301 species and subspecies of birds have been found, and 109 of these breed.

This region lies wholly within the Carolinian zone, and the edge of the Piedmont plateau crosses it several miles west of the city. It is neither possible nor desirable at this time to attempt a complete description of the topography of the country. Excellent accounts will be found in the "Avifauna Columbiana" by Coues and Prentiss, and in McAtee's "Natural History Sketch of the District of Columbia."[1] It does, however, seem desirable to describe some of the localities interesting from the ornithologist's standpoint and to point out some of the changes that have taken place.

Many of the localities mentioned by Coues and Prentiss, and by Mrs. Maynard in 1898, as especially good for birds

[1]Bull. I, Biol. Soc. Wash., 1918, 142 pp., with map.

are now solidly built up and native species have been excluded. When Mrs. Maynard wrote, what is now Florida Avenue was the city boundary to the north and Chevy Chase and Takoma Park were small settlements set down in the midst of woods. About that time a trolley ran from Chevy Chase Circle to Glen Echo. Service was discontinued about 1904, but the right of way was passable for about ten years after, and the route was a favorite bird-walk.

Many localities where much collecting has been done in the past have been largely abandoned because of changes or because others seemed better. Accessibility has often been a determining factor in the choice of locality and certain areas have been well worked to the exclusion of others, perhaps as good, but less well known.

Among the places that have been largely abandoned are Laurel and Marshall Hall, Md. The valley of the Patuxent in the vicinity of Laurel, near the eastern limits of our area, was a favorite collecting ground in the eighties and nineties and many important finds were made there. Marshall Hall, the former home of Chief Justice Marshall, near our limit down the river, has been easily accessible by boat for many years. Several of the earlier collectors did considerable work there and it was the locality treated in "Birds of a Maryland Farm" (Judd, Bull. 17, Biol. Surv., 1902).

The Eastern Branch, or Anacostia River, is the largest confluent of the Potomac and flows through a part of the city. While its valley is not so good for birds as formerly, the marshes and wooded hillsides along Eastern Branch are still the resort of many species. There are large areas of wild rice which attract Bobolinks and ducks in fall. These marshes above Anacostia Bridge and those on the Virginia side of the Potomac below Key Bridge are the only places within the District of Columbia where hunting is allowed. A section adjoining Eastern Branch, including what are known as Licking Banks and Mt. Hamilton, is to be reserved as a National Arboretum. This region, which is very good for winter and early spring birds, has yielded many specimens important to the Washington list.

Rock Creek, another branch of the Potomac, also flows through the city and its valley from the District Line nearly to the river is now a park, much of it left almost in its original

state. In spite of the great numbers of people who use the drives and bridle paths, the wooded and brushy areas of this park furnish shelter for many birds, including the Hooded and Kentucky Warblers. The National Zoological Park is a section of this valley, and, though the city has so encroached on its environs as to make it disappointing to persons who knew it in its more primitive state, its easy accessibility is a decided asset and it is still possible to find some of the rarer migrant warblers here in spring. In May, 1922, many persons visited this park to make the acquaintance of the Evening Grosbeak on its only recorded visit to Washington.

Takoma Park and the valley of Sligo Branch nearby were until recent years woodland, but a growing suburb has caused the destruction of much of the woods, though many birds still frequent the region. The same general statement may be applied to the vicinity of Forest Glen and Chevy Chase.

The Soldiers' Home grounds with their fields and open woods, though now almost within the city, give shelter to many birds. Bobolinks come here in spring and the Short-billed Marsh Wren was found here in 1927, the third definite record for Washington.

The Maryland shore of the Potomac, at least the upper part, has been less worked than the Virginia side, because it was less easy of access. For a few years a trolley ran to Great Falls on this side, but service was discontinued about 1920. This shore is neither so precipitous nor so picturesque as the other. The Chesapeake and Ohio Canal parallels the river and its towpath is a good place from which to observe birds for the trees and bushes between the canal and the river attract many species.

About ten miles above the District Line is Plummers Island, the home of the Washington Biologists' Field Club. On this high island of some dozen acres a cabin was built in 1901 and the island and about forty acres of the adjacent mainland between the river and canal are carefully preserved. This area and the adjacent Virginia shore have been under constant observation by some of the keenest field men in the country and many important records have been the result.

Two miles below Plummers Island is the famous Cabin John Bridge spanning the lower part of Cabin John Run.

This easily reached spot provides great diversity of country within a small radius, the trees and bushes of the ravine and adjacent canal bank and above open fields. But here again real estate development is encroaching.

The river bank and towpath from Cabin John to Chain Bridge have been and still are among the best places about Washington for the average bird student. Below Chain Bridge the river bank is low and practically within the city.

The Virginia shore of the Potomac is a favorite resort of nature lovers for its beauty as well as for its bird life. For the latter the several sections are attractive at different seasons. About 1905 a trolley line from Georgetown to Great Falls opened up this country several miles back from the river, but this line reaches the river only at its terminals. The immediate vicinity of Great Falls is more interesting scenically than ornithologically, and since it has been made an amusement park is good principally as a point of departure.

From a point several miles above Great Falls, nearly to the city, the Virginia shore of the Potomac is a series of wooded, sometimes precipitous, bluffs broken by deep ravines. This shore is a north slope and especially good for the latter part of spring migration. Between Difficult Run and Dead Run, a distance of about four miles, is some of the heaviest timber to be found near Washington. Nearly every stream here has a few pairs of Louisiana Water-thrushes, a Pileated Woodpecker is occasionally seen, and here the Worm-eating and Kentucky Warblers are at home. In this region are the only native hemlocks about Washington. But unfortunately settlement is encroaching even here, and the wilderness is in danger of being destroyed.

The shore, for about a mile above the Key Bridge (which replaces the old Aqueduct Bridge, so named because at one time the canal was carried across the river at that point), used to be a favorite birding ground, but in recent years quarrying operations and settlement have spoiled it. The shore below Key Bridge, once a favorite hunting ground, is at present occupied by the building of the new Memorial bridge to Arlington.

The section known as Alexander Island about the south end of Highway Bridge (which replaces the historic Long Bridge)

has always been a Mecca for bird students and especially in the last fifteen years since many other easily accessible places have been spoiled. Besides being the most readily reached from the city, the marsh here is one of the easiest in which to observe birds, for railroad tracks afford access to its very edge. But, alas, it is rapidly being filled in as a dump! This "island" has been the source of many exceptional records for the region, such as the nesting of the Bittern, Virginia Rail, and Florida Gallinule. This is the favorite resort of the southern herons and the bars off Gravelly Point at the lower end have yielded many shorebird records.

At the upper side of this land lies Columbia Island, a raised mud flat that has been formed by dredging operations, and has replaced in part the Analostan Marshes, favorite and popular shooting grounds of a generation ago. This has proved a great attraction to shore birds, and here the Knot was added to the Washington list in May, 1926.

About a mile and a half below the bridge lies the mouth of Four Mile Run, where extensive mud flats are exposed at low tide. The stream flows through low, wooded hills and the section has been a favorite with collectors and others. Many important specimens have been collected here, such as the Ruff, Western Sandpiper, and Newfoundland Crossbill. This spot, too, has been considerably spoiled by the destruction of much of the woods and the building of car barns and railroad yards near the stream's mouth.

Just below the city of Alexandria, Hunting Creek (sometimes called Big Hunting Creek) empties into the Potomac. At the mouth it is about a half mile wide and is a favorite resort for ducks.

The country from Hunting Creek to Mount Vernon, a distance of about eight miles, has been for many years a favorite resort for bird-lovers, for nearly all sections are easily accessible from the trolley. The country adjacent to the station of Dyke, about midway, has been especially thoroughly worked, because the protecting hills on the north and the open river to the south make a favorite retreat for winter birds, and many species are first found here in spring. The variety of country, wooded, swampy river bottom, wooded hillsides, and open fields makes it a good place for birds at any time. For

nearly twenty years the Audubon Society has been going here for one of its spring outings. Here the Prothonotary Warbler has been seen many times and in 1928 was found breeding.

The woodland between Little Hunting Creek and Mount Vernon is another favored spot, especially for warblers in early May. Here again is a combination of dry and swampy woodland and open fields, and there is the added charm that it is about the least spoiled woods within easy reach of the city.

About four miles below Mount Vernon on the next peninsula, is the Fort Humphreys reservation, where the mixed woods are favored by the birds. Here a Pileated Woodpecker is sometimes seen. The valley of Dogue Creek which separates the two points has been found good for birds both in winter and spring.

A few places back from the river should also be mentioned. Munson Hill, about five miles west of Long Bridge on the road to Falls Church, a favorite collecting ground of some of the older ornithologists, is no longer visited. Fort Runyon which appears on the labels of many old specimens was about where the Arlington Junction station now stands.

Arlington National Cemetery is a good place for birds at any season of the year. In the vicinity of the Mansion are many evergreens and huge oaks and some shrubbery. In other sections there are bushy woods, swampy tangles, and open fields. In May this is a fine place to find migrant warblers and thrushes. Adjoining the cemetery on the east the Government Experimental Farm affords large open fields such as are liked by Vesper and Savannah Sparrows and Horned Larks.

In the past century numerous organizations have at various times been engaged in gathering data on the bird life of the region. The first scientific organization of Washington was the Columbian Institute for the Promotion of Arts and Sciences,[1] established in 1816 and chartered by Congress in 1818 for a period of twenty years. While this organization established a small general museum, it paid little attention to birds.

The National Institution for the Promotion of Science (later changed to the National Institute) was organized in 1840 "to promote science and the useful arts, and to establish a national museum of natural history, etc." This organization which

[1]See Rathbun, R., Bull. 101, U. S. Nat. Mus., 1917.

had much to do with shaping the Smithsonian Plan,[1] and for a time had oversight of the government collections housed in the Patent Office, gathered together considerable collections among which were many birds. These collections together with those of the Columbian Institute, which had been acquired in 1841, were later deposited in the National Museum. In the "Bulletin of Proceedings" (published 1840–46) are to be found the first records of some of the rarest species on our list.

In 1856 the Potomac-side Naturalists' Club was organized. For many years this had a rather informal organization, but in 1875 headquarters were established at the Franklin School where subsequent meetings were held. Here a collection to illustrate the natural history of the District of Columbia was started, but apparently little was done. In July of that year the publication "Field and Forest" was started, which ran for three volumes to June, 1878. In this were published notes on birds of the vicinity and Jouy's "Catalogue of Birds."

The Potomac Valley Ornithologists' Club (1892–96) had a membership of the active ornithologists of Washington. They issued no official publication but some of the results of their activities were published by the individual members in "The Auk."

In 1897 the Audubon Society of the District of Columbia was organized and has since been an important agent in the study of the local avifauna. The following spring a study class was formed, for several years limited to teachers but later (1903) opened to the public and still continued. Four years after its organization, in 1901, the Audubon Society began holding field trips on the four Saturdays in May and subsequently two trips in April were added. Members of the Biological Survey have often served as leaders on these trips, which have proved a great stimulus to bird study about Washington. Through these trips and the efforts of individual members, close watch has been kept on the movements of the birds (especially in spring) for the past twenty years.

Since 1902 the Biological Survey has made a special study of the local birds. As a consequence its distribution files now

[1]Bull. 101, U. S. Nat. Mus., pp. 1–3. Goode, G. Brown. Report of the Nat. Mus. for 1891, p. 273.

contain several thousand records pertaining to this region and extending over a period of nearly a hundred years. These records have been the basis of three previous papers on the local avifauna published in the Proceedings of the Biological Society of Washington.

In the preparation of the present paper the writer has had access to some sources of information which were not available when the previous one was written, and many somewhat questionable records have been traced to their sources. This has changed the status of some species and has resulted in relegating six species to the hypothetical list. It has also seemed advisable to discard some of the older records since they were of birds purchased in market, and there is no definite evidence of local origin. The writer has followed William Brewster's excellent rule that the presence of a species in a locality outside its normal range and difficult to identify should depend on a well-authenticated specimen and not on personal opinion. Exception has been made in the case of three species not far from their normal range which have been seen on more than one occasion, and by *several competent* observers.

In 1921 the list was given as 299 species and subspecies, 2 hybrids, and 2 hypothetical forms. The present paper adds seven forms (besides the Northern Robin previously included tentatively) all of which have been published elsewhere, and one hybrid. Six species included in the previous list are here transferred to the hypothetical list and the Audubon Shearwater is restored, making a net increase of two species. Of the 301 species and subspecies and 3 hybrids that have definitely been found about Washington, three, the Heath Hen, Passenger Pigeon, and Carolina Paroquet, are now extinct or extirpated. Of the 109 species that breed more or less regularly in this region, 40 may be considered as permanent residents.

The Washington region is a meeting ground of northern and southern forms, the latter rather predominating.

Considerable change has been noted in the local avifauna in the past forty years, some real and some only apparent. The real changes include both decreases and increases; the former due principally to the growth of the city, driving many birds from their former haunts; the latter due, in part at least,

to Federal protection. Many species now seem much more abundant than formerly, but in many cases, especially among the breeding species, this seeming increase is largely due to a better knowledge of their habits and haunts resulting from the much greater number of observers constantly afield.

Of the purely accidental occurrences, such as sea birds blown in by storm, there have been very few in the last thirty years.

Gulls and terns have everywhere increased in abundance since they have been protected and the effect has been noticeable in the Washington region. The Herring Gull, called rare by Coues and Prentiss, is now a common winter visitant. The Laughing Gull has again become abundant on its coastal breeding grounds and a regular summer visitant to Washington instead of a rare straggler; practically the same is true of the Common Tern. In the case of the two latter species it must be remembered that not only have the birds actually increased in number, but there are now many more observers capable of identifying them in the field.

Some species of ducks have shown a gratifying increase since the abolition of spring shooting, but this alone can not account for the return to the Potomac of some species, notably the Canvasback, which in very recent years has changed from a rare species to one of the most abundant. Until the last three or four years observations have been mostly confined to the shore between Washington and Mount Vernon. A great many of the ducks raft well out in the river where they can not be seen from shore, or opposite sections where it is impossible to get to the shore. Since the fall of 1925 parties from the Biological Survey have been making trips by boat from time to time to study the ducks. They have found that about Occoquan Bay and Craney Island (a tiny islet about twenty miles below Washington) large numbers of ducks congregate, and that certain species, notably the Gadwall, previously rare, are there in some numbers. Also many ducks are found between there and Widewater, about twenty miles farther down, including some of the sea ducks rarely reported for our area. Therefore, it is quite likely that some of the species that winter in the lower Potomac wander within our limits more frequently than the definite records indicate.

The Wood Duck is the only species known to breed within

our territory. Crippled ducks sometimes remain in the river throughout the summer, and individuals found very much later or earlier than normal may safely be considered of this class.

The southern herons have noticeably increased in numbers, in late summer, frequenting principally the marshes about Gravelly Point and below Anacostia.

Until quite recently there have been few easily accessible localities attractive to shorebirds and consequently comparatively little attention has been paid to them. In the last dozen years dredging operations have caused the formation of mud flats which (especially that known as Columbia Island) have proved attractive to shorebirds and have shown that our knowledge of them in this vicinity is very imperfect. Many observers pay little attention to the latter part of spring migration and stop bird-hunting as soon as the warblers have all been recorded. Until quite recently the river shore has been visited principally for early migrants and deserted after the first week in May. In the last half-dozen years Alexander Island and adjacent regions have been visited off and on throughout May and early June with the result that there has been a great increase in the number of records of species previously considered extremely rare or accidental.

Some species, such as the Stilt and White-rumped Sandpipers, thought to be only casual, are apparently tolerably regular migrants over this region, for they drop in whenever conditions are right. Several times in recent years heavy rains in late summer or fall have left pools which have remained for some days. Whenever this happens mixed flocks of shorebirds are soon seen around them. In October, 1924, pools near the tourist camp in East Potomac Park attracted some eight or ten species, including the Stilt, White-rumped, and Red-backed Sandpipers. Following the great storm of August 11 and 12, 1928, pools stood for several weeks on the golf course of East Potomac Park, in the Monument grounds, and in the large excavation on Fourteenth Street for the Department of Commerce building, all of which were soon found by the waders. It was a strange sensation to observe rare shorebirds only a block from Pennsylvania Avenue, one of the busiest streets of the city. The various observers found in

"Hoover Lake" (as this excavation came to be known) fifteen species of shorebirds, including such rarities as the Knot, Sanderling, Black-bellied Plover, and Ruddy Turnstone. At the golf course in Potomac Park nineteen species were noted, all the common species, those above mentioned, and the Dowitcher, previously known from only two records. Also a pair of Blue-winged Teal and a flock of five Pintails frequented the pool.

All of the *Raptores* are decidedly less common than formerly, due in part to cutting down of woods but also, especially in recent years, to the misguided efforts of certain persons who think the extermination of hawks a desirable achievement.

Many late migrants seem much rarer than they really are because of the difficulty of seeing them. Frequently by the second week in May when the bulk of the warblers and thrushes are going through, the trees are in full leaf and the identification of warblers in their tops is almost impossible. Seasons when late frosts have retarded the vegetation have often proved wonderful warbler years. Such was the case in 1907 and in 1917 when many records, especially for departure, were broken.

The height of the migration for passerine birds is about the 10th to the 12th of May. The great bulk of the warblers come with the Bay-breast around May 10th. In several recent unusually cold springs birds have been scarce because they banked up in the South and then went through so quickly that only the persons fortunate enough to be afield on a particular day saw any great number.

Unfortunately, in our local observations, too much emphasis has been placed on the *first one seen* and too little attention paid to bulk arrival and the waves of migration. In the case of species which winter in small numbers, such as the Myrtle Warbler and Hermit Thrush, the first ones seen in spring are usually birds which have wintered, and few records have been kept of the arrival of the migrants. Also, in the case of species that have been classed as permanent residents, because a few are present at all times, such as the Field Sparrow and Bluebird, little attention has been paid to the passage of migrants.

Records of fall migration are comparatively scarce. Many persons do not realize that fall migration begins in July and

that many of our local breeding birds are gone by the middle of August. Moreover, the taking of observations during the late summer and fall is not easy. Besides the heat and chiggers, in many places, easily visited in spring, the vegetation (including catbriar) at that season is so dense as to be almost impenetrable.

The workers in the older organizations were primarily collectors, recording few observations beyond the specimens taken. Toward the close of the last century the opera glass began to take the place of the gun as a means of observation, to be later superseded by the higher powered prism binocular which makes possible the identification in life of birds that previously could not be seen. The advantages of this change for the study of habits, etc., are too obvious to need explanation. Also it has led to a great increase in the number of persons making observations, and the volume of notes for the past twenty years far exceeds that for the fifty years previous. It also puts upon the compiler the onerous burden of judging the reliability of some of these records, never a pleasant, and often a very difficult task.

The bird-student of Washington has an unusual opportunity of getting trained assistance in the pursuit of his hobby. The classes of the Audubon Society offer a chance to study specimens of local birds and the outings to observe the birds in life under capable instructors. At the National Museum, besides the general collections, is a special exhibit showing nearly all the species that occur in the region. This exhibit, under the direction of Dr. Paul Bartsch, is constantly being improved and made of greater interest to the student. Here and at the Public Library and its branches tables are posted each spring showing the progress of the local migration. These show the regular and extreme dates of arrival and departure, and the date of arrival for the current year as each species is recorded The Audubon Society, in cooperation with the Public Library, has published a handbook of the literature on birds that may be consulted at that library. In the Library of Congress and the libraries of the Department of Agriculture and the National Museum is a wealth of ornithological literature. The student who wishes to go more deeply into the subject may also con-

sult the study collections of the National Museum and the distribution files of the Biological Survey.

In the following annotated list of species the order and nomenclature of the third edition of the A. O. U. Check-List and supplements has been followed. In this list and in the table of migration the arithmetical average date of arrival and departure is not to be taken too seriously. At best it can be only a general guide as to when the species may be expected. If a species arrives within two or three days, either way, of the "average" date it can certainly be said to have arrived "on time." In the case of species usually arriving between April 25 and May 5, in a majority of years they will arrive within this normal, but the earlier migrants are quite irregular. The dates of last seen are subject to great variations because such records are difficult to obtain and because weather conditions greatly affect the departure of migrants. A couple of hot days may send practically all the migrants north early, while protracted cold may cause them to remain far beyond their accustomed time. Good examples of the latter condition were seen in the springs of 1907 and 1917. In the former year the early spring was rather ahead of the average, but a hard frost on May 10 was followed by cool weather throughout the remainder of the month. In 1917 there was no pronounced cold wave but the weather remained unusually cold throughout May and in both years many records for departure were broken. Fall records are subject to even greater irregularity than those for spring, due in part to the greater influence of the human equation.

Our knowledge of the breeding of our local birds is very incomplete, but personal experience of the difficulty of finding such information has convinced the writer that it would be worth while to give even the few available data. These have been drawn from the files of the Biological Survey and the egg collection of the National Museum.

It is hoped that the bird students of Washington will report their records to the Biological Survey, including data on breeding habits, in order that our knowledge of the local avifauna may be kept as nearly up to date as possible.

To the many bird students about Washington who have from time to time reported their finds to the Biological Survey,

I make grateful acknowledgment of their assistance. Many of their names appear scattered through the text as authority for special records. There are some to whom I am especially indebted for their help in the preparation of this manuscript. Dr. Charles W. Richmond kindly turned over to me all his manuscript notes on our local birds, prepared in the early 90s, which have proved very useful, and he has also helped in the finding of old records. Dr. Alexander Wetmore, besides allowing me the free use of his personal notebooks, has given much kindly advice and has read and corrected the manuscript. Mr. Frederick C. Lincoln has been ready at all times to answer questions and to give encouragement and advice, as has also Mr. Edward A. Preble, who has besides critically read the entire manuscript.

ANNOTATED LIST OF THE BIRDS OF THE WASHINGTON REGION.

Holboell's Grebe, *Colymbus holboelli* (Reinhardt).

Occasional visitant for which there are few definite records.

November 4, about 1850, about 1859 (Spec. in Nat. Mus.); September 30, 1877 (W. F. Roberts); March 26 and December 2, 1916 (L. D. Miner); 2, March 8, 1921 (P. Bartsch).

Horned Grebe, *Colymbus auritus* Linnaeus.

Winter visitant, not uncommon.

September 26, 1925 (Katharine H. Stuart), to May 23, 1927 (W. H. Ball); average, October 28 to April 28.

Pied-billed Grebe, *Podilymbus podiceps* (Linnaeus).

Tolerably common migrant, and possibly occasionally winter visitant, though there is no definite record between December 22 (1927) and February 22 (1922). Birds seen in June in several years are probably non-breeding individuals. One seen, apparently a migrant, July 15, 1899 (E. A. Preble).

Spring: February 22, 1922 (J. Kittredge, Jr.), to May 15, 1920 (Mrs. C. A. Aspinwall); average, March 28 to May 3.

Fall: August 21, 1894 (E. J. Brown), to December 3, 1921 (J. Kittredge, Jr.); average, September 11 to November 2.

Common Loon, *Gavia immer* (Brünnich).

Rare winter visitant.

October 25, 1887 (E. J. Brown), to June 2, 1907 (A. K. Fisher); average, November 4 to May 12.

RED-THROATED LOON, *Gavia stellata* (Pontoppidan).

Casual winter visitant for which there are few definite records.

One caught in a gill net at Marshall Hall in the spring of 1882; October 20, 1889, one captured near Ft. Washington; November 15, 1892, a specimen taken at Glymont, Md. (Wm. Palmer); October 30, 1904, one at Plummers Island (A. K. Fisher); April 17, 1928, two on the Tidal Basin, one captured alive next day (W. H. Ball).

BRÜNNICH'S MURRE, *Uria lomvia lomvia* (Linnaeus).

An accidental visitant which has occurred only once, seven specimens having been secured.

Five specimens were purchased in market between December 14, 1896, and January 1, 1897, which careful questioning revealed had been shot between Washington and Alexandria. One was shot by a gunner at Occoquan Creek December 20, 1896, and another caught about the same time near Kensington.

GLAUCOUS GULL, *Larus hyperboreus* Gunnerus.

Accidental visitant, two records within the city limits. Although specimens were not taken, the circumstances of both records, birds seen well by men familiar with the species in the north seem to justify its inclusion in our list.

One seen over the Tidal Basin April 5–9, 1914, and identified by E. A. Preble, J. T. Nichols, J. M. Johnson, and C. H. Rogers.

One seen at Gravelly Point February 20, 1920, identified by F. Harper, watched for some time through x8 glasses; seen also by Preble, Wetmore, and Bailey. It was seen again the next day by Miss Marion J. Pellew.

On February 18, 1926, one was seen near Quantico, Va., by Preble and Oberholser.

The Glaucous Gull is said to have become a regular winter visitor to the New York City region in recent years, so it may be expected to wander occasionally to our area.

HERRING GULL, *Larus argentatus* Pontoppidan.

A common winter visitant, more abundant than formerly, as are all the gulls.

October 16, 1919 (J. Kittredge, Jr.), to May 20, 1917 (A. Wetmore); average, November 5 to May 6.

A specimen in the National Museum was taken August 19, 1865.

RING-BILLED GULL, *Larus delawarensis* Ord.

A common spring and fall migrant, a few sometimes remaining throughout the winter.

Spring: Latest, June 1, 1928 (W. H. Ball); average, February 25 to May 11.

Fall: Earliest, August 20, 1927 (A. Wetmore); average, October 8 to November.

LAUGHING GULL, *Larus atricilla* Linnaeus.

Regular summer visitant, more frequently seen in late summer. It was formerly considered a rare straggler in the vicinity of the city, though probably a fairly regular visitor as far up the river as Marshall Hall. In the last ten years its occurrences have so increased in frequency that it has ceased to be rare. It breeds commonly on the coast and like all the gulls has greatly increased under protection. Large flocks are sometimes seen.

In spring it has been observed from April 26, 1923 (Miss M. J. Pellew), to May 22, 1923 (M. J. Pellew), and in fall from July 18, 1927 (W. H. Ball), to October 30, 1927 (A. Wetmore). Birds, probably non-breeders, have been seen in June.

BONAPARTE'S GULL, *Larus philadelphia* (Ord).

Common migrant, occasionally winters in small numbers.

Spring: Latest, June 2, 1927 (W. W. Rubey); average, April 6 to May 12.

Fall: Earliest, August 23, 1928 (W. J. Whiting); average, October 18 to December 2.

COUES' CASPIAN TERN, *Sterna caspia imperator* (Coues).

Casual in migration, more frequent in spring than in fall.

Two October 4, 1896, brought in flesh to the National Museum; eight May 11, 1917 (F. Harper); one May 5, 1918, near Plummers Island (A. Wetmore); one April 26 and two April 27, 1923 (Marion J. Pellew); seven May 21, 1927 (W. W. Rubey); one June 24 and four June 28, 1927 (H. G. Deignan); two June 29, 1927 (Mrs. T. M. Knappen); one April 26 and four May 20, 1928 (W. H. Ball); five May 12, 1928 (H. H. T. Jackson); one August 14, 1928 (Ball); one October 13, 1928 (Jackson).

FORSTER'S TERN, *Sterna forsteri* Nuttall.

The first record of this species was of a specimen taken near Georgetown in the summer of 1875 by P. L. Jouy. There was also a specimen in the National Museum collected in August, 1859, supposed to have been from this vicinity. Nothing further was heard of this tern until the fall of 1928 when it was fairly common off Hains Point. It was first noted September 13 by W. J. Whiting and last on October 26 by Ball and Whiting. The largest number seen together was thirty-seven, on October 9. On October 11, sixteen were seen and three collected by F. C. Lincoln.[1]

COMMON TERN, *Sterna hirundo* Linnaeus.

Tolerably common in migration, formerly considered very rare or accidental. Like the other gulls and terns this species has increased under protection. Also there are now more observers capable of identifying it in the field. In 1861 Coues and Prentiss called it "occasional visitor

[1]One seen December 28, 1928, (W. H. Ball).

during the late summer and early fall months." Since 1917 it has been reported almost every year, more frequently in spring than in fall. In the fall of 1928 with other water birds it was unusually common.

In spring it has been noted in 9 years from April 24, 1918 (R. W. Moore), to June 3, 1928 (W. H. Ball); in fall in 5 years from August 20, 1927 (A. Wetmore), to October 31, 1920 (J. Kittredge, Jr.). One record in winter, two seen December 23, 1918 (McAtee, Preble, and Wetmore).

LEAST TERN, *Sterna antillarum* (Lesson).

Accidental visitant, of which two specimens have been taken.

One shot at the carp ponds which were formerly west of the Monument, August 17, 1878, by Mr. Hamilton, and in the National Museum. Another specimen in the museum was taken about 1879.

There are breeding colonies on the lower Potomac.

BLACK TERN, *Chlidonias nigra surinamensis* (Gmelin).

Tolerably common fall migrant, and apparently becoming of more frequent occurrence in spring. The first spring record was May 3, 1917 (Dyke, M. T. Cooke), and since then it has occurred in spring in four different years.

Records in spring are from May 3 (1917), to May 26 (1928). It was also seen June 29, 1927 (Knappen).

Fall: July 12, 1926 (Miss M. J. Pellew), to September 22, 1894 (Hasbrouck and Wm. Palmer); average, August 17 to September 14.

AUDUBON'S SHEARWATER, *Puffinus lherminieri* Lesson.

Following the great storm of August, 1842, a shearwater was captured in the District of Columbia. Coues and Prentiss in both their lists record it as doubtfully referred to *Puffinus obscurus*, the name then used for the present species. In his monograph of the family, however, Dr. Coues says: "The species of *Puffinus* spoken of in a paper published by Dr. D. W. Prentiss and myself in the Annual Smithsonian Report for 1861, p. 418, as having occurred at Washington, D. C., and doubtfully referred to as the *obscurus*, has since been definitely ascertained to be this species." (Proc. Acad. Sci. Phila., 1864, p. 138.)

The specimen can not now be found, but in view of Dr. Coues' statement it seems that it should be included in the list, and not considered hypothetical as was done in the list of 1921 when the author did not know of the above statement

On November 27, 1884, on the Potomac off Ft. Foote, Dr. H. M. Smith saw a bird so closely as definitely to identify it as a shearwater, but the species was not determined.

LEACH'S PETREL, *Oceanodroma leucorhoa* (Vieillot).

An accidental visitant that has occurred four times.

One (not 4 as given in former list) in August, 1842, following a severe northeast storm.

Two, ♂ and ♀, taken about 1859 (spec. in Nat. Mus.).

One, probably this species, seen at close range in January, 1878, by William Palmer.

One shot near Navy Yard Bridge June 7, 1891 (spec. in Nat. Mus.).

HAWAIIAN PETREL, *Oceanodroma castro* (Harcourt).

Accidental visitant. One was shot from a flock of 3 or 4, August 28, 1893, following a severe storm along the south Atlantic coast. Another was captured in a house on Capitol Hill where it had taken refuge. Both specimens were in the collection of William Palmer and constitute the first record for North America.

WILSON'S PETREL, *Oceanites oceanicus* (Kuhl).

Accidental visitant which has occurred three times: one taken after the hurricane in August, 1842; one about 1859 (spec. in Nat. Mus. received from "Master" Bender); one taken near Marshall Hall, June 27, 1914 (in Nat. Mus.).

DOUBLE-CRESTED CORMORANT, *Phalacrocorax auritus auritus* (Lesson).

Casual visitant, mostly in spring and early summer.

Fall 1842 (National Institute); 1859 (C. Drexler); July 19, 1884 (Wm. Palmer); November, 1884 (spec. B. Steinmetz); April 19, 1896 (Bendire and Fisher); several May 11–20, 1917 (various observers); June 12, 1921 (W. L. McAtee); May 31, 1922 (Miss M. J. Pellew); April 7, 1925 (H. C. Oberholser); May 13, 1926 (A. Wetmore); June 1 and 2, 1927 (W. W. Rubey); June 27, 1927 (Mrs. T. M. Knappen); June 1, 1928 (W. H. Ball).

AMERICAN WHITE PELICAN, *Pelecanus erythrorhynchos* Gmelin.

Accidental visitant, four specimens; one in the District in 1863, and one near Alexandria in April, 1864, both immatures shot by C. Drexler, and in the National Museum; one shot opposite Washington in the autumn of 1864, and one near Alexandria in October, 1878, specimens known to Smith and Palmer.

AMERICAN MERGANSER, *Mergus americanus* Cassin.

Winter visitant, fairly common on the Potomac, most numerous below Indian Head. It is sometimes seen in the Washington harbor.

October 13, 1889 (B. Greenwood), to May 26, 1905 (H. C. Oberholser); average, October 29 to April 27.

One seen near Four Mile Run on July 27, 1927, was probably a crippled bird.

RED-BREASTED MERGANSER, *Mergus serrator* Linnaeus.

Tolerably common winter visitant. All migration records are for recent years. It is frequently seen in the Tidal Basin.

October 31, 1920 (J. Kittredge, Jr.), to May 30, 1927 (W. H. Ball); average, October 29 to April 30.

HOODED MERGANSER, *Lophodytes cucullatus* (Linnaeus).

Winter visitant, tolerably common, found most frequently in the creeks tributary to the Potomac.

October 1, 1889 (B. Greenwood), to May 11, 1917 (F. Harper); average, October 21 to April 14.

MALLARD, *Anas platyrhynchos* Linnaeus.

Common winter visitant. Seen more commonly on the Potomac below Fort Washington, and most numerous from Occoquan Bay to Cherry Hill.

August 20, 1927 (Preble and Wetmore), to May 14, 1922 (J. Kittredge, Jr.); average, September 24 to April 24.

RED-LEGGED BLACK DUCK, *Anas rubripes rubripes* Brewster.

This northern race is abundant in winter but most observers do not distinguish it from the other form.

March 25, 1917 (specimens, F. Harper); April 21, 1918 (Harper).

BLACK DUCK, *Anas rubripes tristis* Brewster.

Abundant winter visitant, and perhaps a very rare summer resident, since it is found only a short distance outside our limits. On January 5, 1925, one was shot on Eastern Branch that had been banded September 29, 1922, at Lake Scugog, Ontario. Several others banded at the same station have been taken within our area.

August 1, 1887 (A. K. Fisher), to June 1, 1928 (W. H. Ball); average, September 17 to May 3.

GADWALL, *Chaulelasmus streperus* (Linnaeus).

Winter visitant. This species probably shows the most radical change in distribution of any in our area. Formerly of very rare occurrence it has within the last five years increased until now it is common in migration and tolerably common throughout the winter, at least just below our area, on the Potomac.

One was taken from a flock, August 24, 1884 (Thos. Marron). The latest record in spring is May 8, 1924 (A. Wetmore). They begin to arrive in numbers after the middle of September, and increase to the middle of November; then the numbers greatly decrease until late February or early March. The bulk leave in March.

EUROPEAN WIDGEON, *Mareca penelope* (Linnaeus).

Accidental visitant for which there are three records.

Specimen taken near Alexandria and bought in market by Drexler, spring, 1863; another taken on the Potomac River near Washington, October 16, 1892, was also purchased in market.

A specimen was collected near Aquia Creek, about forty-five miles below Washington, December 24, 1927, by U. T. Brooks, and now in the National Museum.

BALDPATE, AMERICAN WIDGEON, *Mareca americana* (Gmelin).

Tolerably common winter visitant, more numerous in migration. Most commonly seen between Fort Washington and Quantico.

Arrive in October; earliest, September 4, 1905 (B. Greenwood); and leave by early April; latest, April 21, 1928 (L. D. Miner); average, April 5.

EUROPEAN TEAL, *Nettion crecca* (Linnaeus).

Accidental, one record, a specimen in the National Museum, was taken on the Potomac River near Washington in April, 1885.

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

Formerly a common fall migrant, but now rather rare; casual in winter; very rare or accidental in spring, only two records. Since 1905 it has been recorded in only five years.

Spring: March 11, 1852 (spec. in Nat. Mus.); March 31, 1918 (L. Griscom).

Fall: September 18, 1903 (B. Greenwood), to November 15, 1902 (Greenwood); average, October 4 to November 7.

Eight seen December 23, 1926 (A. Wetmore).

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

Common migrant, less commonly seen on the open river. This has been called a wintering species, but the records do not bear this out; there are no records of its occurrence from the middle of December to the middle of March.

Spring: March 12, 1922 (J. Kittredge, Jr.), to May 11, 1917 (H. C. Oberholser); average, March 21 to April 20.

Fall: August 7, 1928 (W. H. Ball), to December 10, 1927 (H. H. T. Jackson); average, August 30 to November 1.

One seen June 2, 1892 (Wm. Palmer), was very likely a cripple.

SHOVELER, *Spatula clypeata* (Linnaeus).

Rare winter visitant, more frequently recorded in fall migration.

Spring: Has been recorded in three years, March 24, 1918 (L. Griscom); April 2–9, 1922 (J. Kittredge, Jr.); March 30, 1926 (H. C. Oberholser), to April 17, 1926 (W. H. Ball).

Fall: In eight years has been reported from September 17, 1911 (W. L. McAtee), to December 16, 1920 (F. C. Lincoln).

One winter record, January 20, 1923 (A. Wetmore).

AMERICAN PINTAIL, *Dafila acuta tzitzihoa* (Vieillot).

Common winter visitant, both in the Potomac and in the smaller streams and marshes. It is rarely seen in large flocks.

August 27, 1928 (A. H. Howell, 4 in a rain pool on the golf course, Potomac Park), to May 14, 1922 (J. Kittredge, Jr.); average, October 3 to April 15.

June 17–23, 1927, a pair, apparently not crippled, was seen in the Alexander Island Marsh (H. C. Oberholser).

Wood Duck, *Aix sponsa* (Linnaeus).

Tolerably common in migration; a few breed. This has been listed as a permanent resident, but it is very doubtful if it occurs in winter at the present time. Fifty years ago it was seen principally in winter but, even in the days of its general abundance, was never a common species in this region. In recent years there have been no certain records in winter.

Nesting begins early in April, for young about two weeks old were seen May 30 (1897).

Spring: Arrive about the middle of March; earliest, February 22, 1860 (spec. in Nat. Mus.).

Fall: Leave about the first of November; latest, December 10, 1927 (H. H. T. Jackson).

Redhead, *Marila americana* (Eyton).

Common winter visitant, but very irregular in abundance. Found commonly between Fort Washington and Aquia Creek and large flocks farther down the river.

October 5, 1901 (B. Greenwood), to April 21, 1912 (W. D. Appel); average, October 13 to March 25.

Canvasback, *Marila valisineria* (Wilson).

Very abundant winter resident. This is one of the species that has recently greatly increased in numbers. Early accounts of the District of Columbia refer to this duck as enormously abundant in the river as far up as Georgetown. In the time that Coues and Prentiss were writing, they had ceased to be very abundant and by 1900 were rather rare and remained so until less than ten years ago when they began to come back.

September 10, 1922 (J. Kittredge, Jr.), to April 21, 1928 (W. H. Ball); average, October 17 to April 1.

Birds seen during the summer are either cripples or non-breeding individuals that failed to migrate.

Greater Scaup Duck, *Marila marila* (Linnaeus).

Both Scaups winter in abundance, but it is seldom possible to distinguish between them. The Greater is much less common. In 1881 a female, undoubtedly crippled, bred near Mt. Vernon (Richmond, Auk, V, 1888, p. 18).

September 26, 1920 (J. Kittredge, Jr.), to May 27, 1906 (H. C. Oberholser); average, October 22 to May 12.

Lesser Scaup Duck, *Marila affinis* (Eyton).

Very abundant winter resident. This is much the more abundant of the two Scaups and is found on the Potomac in large rafts. Non-breeding individuals often remain quite late in spring, and birds, probably cripples, have been seen throughout the summer.

September 25, 1903 (B. Greenwood), to June 3, 1928 (W. H. Ball); average, October 13 to May 19.

Ring-necked Duck, *Marila collaris* (Donovan).

Rather rare migrant, and occasionally occurs in winter. Seen on the river chiefly between Indian Head and Occoquan.

Spring: Latest, April 13, 1926 (E. A. Preble); average departure March 30.

Fall: Earliest, October 6, 1901 (B. Greenwood); average arrival, October 21.

One was seen May 12, 1928 (H. H. T. Jackson).

American Goldeneye, *Glaucionetta clangula americana* (Bonaparte).

Common winter visitant, confined to the river and its larger tributaries. Often seen in the river near the city.

October 8, 1901 (B. Greenwood), to April 27, 1918 (F. Harper); average, October 26 to April 2.

One, probably a cripple, May 12, 1922 (A. Wetmore).

Bufflehead, *Charitonetta albeola* (Linnaeus).

Tolerably common winter visitant. It has apparently somewhat increased in abundance in the last dozen years. Coues and Prentiss called it common, but there are very few definite records previous to 1916.

Records range from November 26, 1922 (J. Kittredge, Jr.), to May 1, 1928 (W. J. Whiting). The majority of the records are in March and April.

Old-squaw, *Clangula hyemalis* (Linnaeus).

Rare winter visitant. A sea duck, wintering commonly on Chesapeake Bay, it is possible that it wanders to the edge of our region nearly every winter, but seldom gets farther up the river.

November, 1842 (reported to the National Institute); April 15, 1881 (S. F. Baird); November 20, 1884 (H. W. Henshaw); April 3, 1889 (J. D. Figgins); October 20, 1889 (Wm. Palmer); April 20, 1896, on Rock Creek near Kensington (J. D. Figgins); November 6, 1915 (F. M. Weston); April 21, 1917 (F. Harper); March 4, 1921 (J. Kittredge, Jr.); January 20, 1923 (A. Wetmore); six March 9, 1925 (H. C. Oberholser); December 7, 1926, March 16 and 30, 1927 (Moody Creighton); March 13, 1928 (H. H. T. Jackson).

On June 16, 1897, George Marshall found one in worn plumage on a lake near Laurel; it had not been there a few days previous.

American Eider, *Somateria dresseri* Sharpe.

Accidental visitant, only one record. A specimen taken at Pomonkey Neck below Marshall Hall was in the collection of the Maryland Academy of Sciences.

American Scoter, *Oidemia americana* Swainson.

All three Scoters occur regularly in winter in Chesapeake Bay, but seldom ascend the Potomac River as far as Washington. There is only

one record for the American Scoter, a specimen in the National Museum taken in December, 1842.

WHITE-WINGED SCOTER, *Oidemia deglandi deglandi* Bonaparte.

This is the least rare of the three species of Scoters. They winter abundantly in Chesapeake Bay and possibly wander up to the Potomac nearly to our limits every winter.

December, 1842 (spec. in Nat. Mus.); November, 1880 (ditto); October 14, 1882 (specimen identified by E. Coues); April 18, 1892 (spec. in Nat. Mus); November 8, 1920 (L. Griscom); January, 1925 (M. Creighton); 3, December 10, 1927 and 2 January 24, 1928 (H. H. T. Jackson).

One, believed to be a cripple, August 20, 1927 (A. Wetmore).

SURF SCOTER, *Oidemia perspicillata* (Linnaeus).

Like the other Scoters this is common on Chesapeake Bay in winter, but like other sea ducks seldom wanders up the river as far as Washington. One was reported to the National Institute as having been taken in February, 1842; and there are five specimens in the National Museum taken within our area: December 11, 1858; February 19 and April 10, 1859; one about 1859; 1868.

RUDDY DUCK, *Erismatura jamaicensis* (Gmelin).

Winter visitant, rare in mid-winter, tolerably common in migration, less abundant now than formerly.

August 20, 1889 (B. Greenwood), to May 22, 1928 (W. H. Ball); average, September 28 to April 30.

Two records in June, possibly crippled birds; June 21, 1877 (Wm. Palmer), and June 28, 1927 (W. H. Ball).

CANADA GOOSE, *Branta canadensis canadensis* (Linnaeus).

Uncommon winter visitant, common migrant in October and February.

October 5, 1888 (B. Greenwood), to April 22, 1890 (H. B. Stabler); average, October 18 to March 30.

BRANT, *Branta bernicla glaucogastra* (Brehm).

Accidental visitant, one specimen, December 16, 1858, in National Museum.

The specimen of January, 1844, previously recorded was taken on the eastern shore of Maryland.

WHISTLING SWAN, *Olor columbianus* (Ord).

Regular migrant in fall but rare in spring. In recent years a flock has wintered nearly every year at Widewater, Va., about 40 miles below Washington. The earliest date of arrival is October 15, 1901 (B. Greenwood); average, November 6.

January 14, 1881, one that had been stunned from flying against a wire was caught in the grounds of the Louise Home at 15th Street and Massa-

chusetts Avenue. March 22, 1907, a flock of 15–20 was reported below Alexandria, and on April 5 flying over Falls Church (J. H. Riley). A flock of 14 near Alexandria March 17, 1916 (H. H. Bailey), to March 20, 1916 (W. W. Cooke and T. S. Palmer); some in Occoquan Bay, March 28, 1920 (A. Wetmore); large flock over the Tidal Basin, March 27, 1921 (W. W. Rubey); six or seven over Potomac Park, March 29, 1927 (S. F. Blake).

GLOSSY IBIS, *Plegadis falcinellus* (Linnaeus).

There are two records for this species nearly a hundred years apart. The first, about 1817, by Ord is rather doubtful. In September, 1900, one was shot near the city by a hunter who brought it to a local taxidermist's shop where it was identified by J. W. Daniel, Jr. Although published by Ord in 1817 and again by Baird, Brewer, and Ridgway in 1884, this species was not included in the Washington list until 1898.

WOOD IBIS, *Mycteria americana* Linnaeus.

An accidental visitant from the south which has occurred twice. Two, ad. ♀ and im. ♀, were taken on the flats near the Monument July 2 1892 by Frederick Zeller. In July, 1896, several were reported, and 3 specimens taken, two on July 20 at Silver Hill, Md., brought to Schmid's Bird Store, and one taken near Laurel, Md., July 27, brought to George Marshall. A daily paper reported two "white cranes" over the White House on July 15 and another about that time was reported at Four Mile Run.

AMERICAN BITTERN, *Botaurus lentiginosus* (Montagu).

Rare summer resident, more common in migration. In "Birds of the Northwest" (p. 527) Coues says "I have procured it in January at Washington." Otherwise there is no record of its occurrence between early November and late March, so any wintering must be accidental.[1] This species seems to have increased in abundance; between 1894 and 1911 there are apparently but two records, since the latter date they have been recorded nearly every year.

Hard set eggs and also young ready to fly found June 3 (1917).

March 22, 1894 (W. Robinson), to November 7, 1860 (E. Coues); average, April 10 to September.

LEAST BITTERN, *Ixobrychus exilis* (Gmelin).

Summer resident, locally common. They breed rather commonly in the marshes below Alexandria, expecially near Dyke where young have been found in July.

April 27, 1922 (M. T. Cooke), and April 27, 1927 (W. W. Rubey), to September 19, 1881 (H. M. Smith); average, May 4 to September 5.

[1]Since this manuscript was completed a Bittern was seen at Arlington Farm, December 3, 1928, by W. J. Whiting.

GREAT BLUE HERON, *Ardea herodias herodias* Linnaeus.

This species is common in migration and almost a permanent resident for it is found in every month of the year, but has never been known to breed here, and it is rare in winter.

Spring: Average, March 30 to May 26.

Fall: Average, August 2 to November 1.

AMERICAN EGRET, *Casmerodius egretta* (Gmelin).

A wanderer from the south in the late summer and early autumn. In the early days these herons were tolerably common in summer, but by the time Coues and Prentiss were writing, they had become rare. There is no record of their occurrence between 1894 and 1912 since which date they have been present nearly every year, sometimes quite a number. They are never so abundant as the Little Blue Heron.

They arrive usually from the middle of July to the middle of August; they have arrived as early as June 21, 1927 (W. H. Ball); June 23, 1926 (H. G. Deignan), and June 27, 1925 (L. D. Miner). They remain until about the middle of September, the latest date being October 2, 1923 (S. F. Blake). Two records in May: May 30, 1891 (Wm. Palmer), and May 27, 1926 (Mrs. T. M. Knappen).

SNOWY HERON, *Egretta candidissima candidissima* (Gmelin).

An accidental visitant from the south, of which a single specimen is known, taken about 1841 and now in the museum of Oberlin College.

It is possible that when this species was more abundant it occasionally wandered to our area, but the majority of the records refer to the Little Blue Heron in the white phase.

LOUISIANA HERON, *Hydranassa tricolor ruficollis* (Gosse).

An accidental visitant from the south. One was found in the Alexander Island marsh August 25, 1922, by Miss Marion J. Pellew, and between then and the 29th was seen by a number of persons. August 30–31, 1926, two others were seen in the same marsh by several persons, and on September 21, 1926, perhaps the same two birds were seen at Four Mile Run (W. H. Ball). One was again reported July 17, 19, and 30, 1927, in the same marsh (W. H. Ball).

LITTLE BLUE HERON, *Florida caerulea* (Linnaeus).

A late summer visitant from the south, sometimes in large numbers. Nearly all birds seen are in the white phase.

Birds have been seen from June 27, 1925 (L. D. Miner), to October 3, 1925 (H. H. Hazen), and October 13, 1928 (W. H. Ball); average July 29 (19 years) to September 18 (9 years).

There is a single spring record of one seen near Miller, Va., May 12, 1917 (Wm. Palmer).

GREEN HERON, *Butorides virescens virescens* (Linnaeus).

Tolerably common summer resident. Eggs May 3 (1894); young about a third grown June 3 (1888).

April 3, 1927 (W. W. Rubey), to October 16, 1923 (C. H. M. Barrett); average, April 19 to September 21.

BLACK-CROWNED NIGHT HERON, *Nycticorax nycticorax naevius* (Boddaert).

Permanent resident, rare in winter. There seems to be no occupied heronry near Washington at the present time. In the late eighties there was one near Ballston, Va., and one on Hunting Creek. For many years there was one at the east side of the Dalecarlia reservoir at District line; the birds later moved to trees nearer the river, and these were abandoned about 1920. Night Herons sometimes winter in the Zoological Park near the flying cage which contains several individuals of this species, and have been known to nest on the outside of the cage.

Nest building begins about the end of March.

YELLOW-CROWNED NIGHT HERON, *Nyctanassa violacea* (Linnaeus).

Accidental visitant from the south. One taken in the Smithsonian Grounds in August, 1901 (Wm. Palmer). All subsequent observations have been in the marsh at the lower end of Alexander Island. One May 30, 1926, and during July and August by a number of observers; one July 4, 19, and 30, 1927 (W. H. Ball).

SANDHILL CRANE, *Grus mexicana* (Müller).

Coues and Prentiss are authority for the statement that this species has occurred once in the region. They record a specimen previous to 1861.

KING RAIL, *Rallus elegans* Audubon.

Rare summer resident, occasional in winter, for there are several records for December and one for January 19 (1901). They begin breeding the latter part of May, ten eggs May 30 (1910) to June 18 (1887); downy young, June 23 (1893).

Records are too insufficient to determine the migration.

CLAPPER RAIL, *Rallus crepitans crepitans* Gmelin.

An accidental visitor from the coast, one record, a specimen taken in the marsh above Long Bridge, September 8, 1882, by Frank Ford.

VIRGINIA RAIL, *Rallus virginianus* Linnaeus.

Fairly common in migration and breeds locally in small numbers. It occurs at all seasons of the year but probably not the same individuals.

Eggs have been taken from May 26 (1922) to June 3 (1917).

It migrates principally in April and September. Specimens, December 28, 1912 (E. R. Adams), and January 17, 1924 (C. H. M. Barrett).

SORA, *Porzana carolina* (Linnaeus).

A regular migrant, seldom reported in spring but common in fall, when they are hunted. An old report says that in September, 1888, over 1,300 were killed in the marshes below Alexandria.

Spring: April 1, 1928 (W. H. Ball), to May 21, 1926 (W. H. Ball); average, April 18 to May 13.

Fall: July 8, 1918 (R. W. Moore), to November 9, 1878 (S. F. Baird); average, August 12 to October 19.

YELLOW RAIL, *Coturnicops noveboracensis* (Gmelin).

Casual in migration, more frequent in fall than in spring. All records are of specimens.

Autumn, 1843 (National Institute); October 4, 1879, November 3, 1880, March 28, 1884, April 14, 1893, October 18, 1895, 1896, October 13, 1900, March 12, 1909 (spec. Nat. Mus.); November 17, 1893 (Wm. Palmer); May 20, 1917 (N. Hollister).

BLACK RAIL, *Creciscus jamaicensis* (Gmelin).

Rare in migration, occurs regularly in the marshes near Mt. Calvert, Md. One, September, 1861 (Coues and Prentiss); specimen from Glymont, Md., October, 1868, September 25, 1877, and specimen, June 6, 1879 (Nat. Mus.); one taken May 29, 1891 (R. L. Jones); October 19, 1906; September 22, 1907, and October 12, 1908 (W. F. Roberts); one taken September 1, 1908, on Eastern Branch by H. M. Darling (spec. Nat. Mus.); one seen on Eastern Branch, September 15, 1918 (R. W. Moore); one picked up in Woodridge, May 14, 1923 (E. R. Kalmbach).

FLORIDA GALLINULE, *Gallinula chloropus cachinnans* Bangs.

Tolerably common migrant; rare and local breeder; all definite breeding records being from the marsh near the south end of Highway Bridge. Seven eggs, incubated about 5 days, were taken there June 3, 1917 (E. J. Court); 8 eggs, similarly incubated, were found May 30, 1919 (Court); 10 eggs, May 11, 1922 (R. W. Williams). In September, 1926, young were seen at Four Mile Run (Ball), and downy young in the Alexander Island marsh in July, 1927, and August, 1928 (Ball and Donoho).

The earliest date of arrival is March 29, 1928 (W. H. Ball), and the latest date in fall, October 26, 1876 (Spec. Nat. Mus.).

AMERICAN COOT, *Fulica americana* Gmelin.

Abundant migrant, a few sometimes remaining throughout the winter. In recent years, in late fall and early spring, coots have bedded in great numbers in Occoquan Bay and from there to Quantico, Va.

Spring: Latest, June 13, 1926 (W. H. Ball); average, March 25 to May 10.

Fall: Earliest, September 1, 1890 (B. Greenwood); average, September 29 to November 10.

Red Phalarope, *Phalaropus fulicarius* (Linnaeus).

Accidental visitant, one record; a specimen in the National Museum, an immature taken on Eastern Branch, October 17, 1885, by F. S. Webster.

Another specimen was shot October 4, 1897, at White's Ferry on the Potomac about 40 miles above Washington.

Northern Phalarope, *Lobipes lobatus* (Linnaeus).

Accidental visitant, two records; a specimen in the National Museum taken August 31, 1891, on Navy Yard Creek, and one seen August 29, 1916, on Eastern Branch by R. W. Moore and C. R. Shoemaker.

American Woodcock, *Rubicola minor* (Gmelin).

Summer resident, now rare; fairly common locally in late summer; possibly sometimes wintering for there are records to the end of December but none in January. Coues and Prentiss mention a number of localities as good for woodcock, where none would be found at present. In recent years it has been known to breed in Rock Creek Park, near Dyke, and Four Mile Run. It begins to breed about the middle of March; young about a week old have been found April 18 (1897). Eggs have been found late in February when there was snow on the ground.

Earliest, February 6, 1916 (E. A. Preble); average, March 8 to November 20.

Wilson's Snipe, *Gallinago delicata* (Ord).

A common migrant. It is probable that birds occasionally winter, though there is only one record for January. This may be due to lack of observers rather than of birds.

Spring: Latest, May 14, 1910 (W. W. Cooke); average, March 13 to May 3.

Fall: Earliest, August 26, 1928 (H. G. Deignan); average, September 9 to November 23.

Dowitcher, *Limnodromus griseus griseus* (Gmelin).

Accidental visitant. One taken on Analostan Island, September 2, 1878, by W. F. Roberts; two seen July 31, 1928 (H. G. Deignan). Following the hurricane in August, 1928, two appeared in the pool on the golf course in East Potomac Park where they were observed from August 14 (Howell and Wetmore) to August 29 (Ball).

Long-billed Dowitcher, *Limnodromus griseus scolopaceus* (Say).

Accidental visitant. Smith and Palmer record seven specimens secured in April, 1884, on the Eastern Branch.

Stilt Sandpiper, *Micropalama himantopus* (Bonaparte).

An irregular fall migrant which may be less rare than the records indicate.

Records are: Two, September 8, 1885, near Laurel (H. W. Henshaw); one, October 26, 1916, on Eastern Branch (F. Harper); one September 6,

1918, on Little River (A. H. Hardisty); one September 20, 1923, in west court of National Museum building (P. Bartsch); one October 8, 1924, in a rain pool in East Potomac Park (A. Wetmore); one August 14, 1928, in East Potomac Park (Howell and Wetmore). One spring record, June 3, 1926, at Columbia Island (Ball and Ruppert).

KNOT, *Calidris canutus* (Linnaeus).

Accidental in migration. It was first recorded for the region in May, 1926, and appeared both spring and fall in 1928.

One was present at Columbia Island May 26 to June 3, 1926, where it was discovered by Edmund Platt and W. H. Ball, and was subsequently seen by a number of observers, and an unsuccessful attempt made to collect it. A flock of 15 was seen off Hains Point May 26, 1928 (Knappen and Ball). One was seen in East Potomac Park August 29 and September 3, 1928 (Ball), and two in the excavation at 14th and B Streets, September 4 and 10 (Lincoln and Wetmore) to September 12, 1928 (H. G. Deignan).

PECTORAL SANDPIPER, *Pisobia maculata* (Vieillot).

Tolerably common migrant, more abundant in fall. Recent observations indicate that our knowledge of its movements in spring are very imperfect, and that the main migration is later than was previously supposed.

Spring: March 26, 1916 (A. Wetmore), and April 22, 1887 (Wm. Palmer), to June 11, 1926 (W. H. Ball); average, April 23 to late May.

Fall: August 10, 1914 (W. W. Cooke), to November 1, 1916 (H. C. Oberholser); average, August 23 to October 15.

WHITE-RUMPED SANDPIPER, *Pisobia fuscicollis* (Vieillot).

A very rare migrant which has recently been added to the list. Records are not yet sufficient to determine its status, but it has occurred in four of the last five years, one to four birds being observed each time.

October 8 and 24, 1916 (F. Harper); May 11, 1917 (Wm. Palmer); September 20, 1918 (A. H. Hardisty); October 3–12, 1924 (A. Wetmore); May 15 to 26, 1926 (various observers); May 12, 1927 (W. H. Ball); August 24 to September 3, 1928 (Ball and Whiting).

BAIRD'S SANDPIPER, *Pisobia bairdi* (Coues).

An accidental visitant, two specimens, at Four Mile Run, one collected September 3, 1894, by R. S. Matthews (Nat. Mus.); and one taken September 25, 1894, by Wm. Palmer.

LEAST SANDPIPER, *Pisobia minutilla* (Vieillot).

Tolerably common in migration, apparently somewhat less abundant than the Semipalmated Sandpiper, with which it is often associated.

Spring: April 17, 1926 (W. H. Ball), to June 14, 1926 (Ball); average, April 28 to May 20.

Fall: July 17, 1927 (Ball), to November 22, 1917 (C. H. M. Barrett); average, August 14 to October 15.

Red-backed Sandpiper, *Pelidna alpina sakhalina* (Vieillot).

This is a rare migrant which has been increasingly reported in recent years, and is one of the species that may be looked for whenever there are pools to attract shorebirds. Previous to 1916 there were less than a half-dozen records; since then a number have been observed. Spring records are mostly in late May (11–27) with one for April 22, 1887 (Wm. Palmer). Fall records range from August 14, 1928 (Howell and Wetmore), to November 1, 1916 (H. C. Oberholser). The earliest specimen was taken October 20, 1842, by S. F. Baird.

Semipalmated Sandpiper, *Ereunetes pusillus* (Linnaeus).

Tolerably common in migration. In the autumn of 1928 it was very common in the Department of Commerce Building excavation as well as on the golf course.

Spring: May 4, 1927 (W. H. Ball), to June 14, 1926 (Ball); average, May 11 to 27.

Fall: July 22, 1927 (Ball), to October 28, 1916 (L. D. Miner); average, August 13 to October 10.

Western Sandpiper, *Ereunetes mauri* Cabanis.

Accidental in fall migration, has been taken in three seasons. The first specimen was taken September 8, 1894 (Wm. Palmer), at Four Mile Run. In the following month over a hundred specimens of small sandpipers were taken but only three proved to be this species; September 11 (R. S. Matthews), September 14 (E. J. Brown), September 22 (E. M. Hasbrouck). Subsequently one was taken August 20, 1897 (Bartsch and Palmer); two September 3, 1897 (Osgood and Palmer), two on Eastern Branch September 25, 1919 (Nat. Mus.); one, September 17, 1926 (P. Bartsch).

It sometimes becomes rather common at St. George Island, Md., and on the coast of Virginia.

Sanderling, *Crocethia alba* (Pallas).

Rare in migration.

September, 1874, one taken near the Monument (seen by Wm. Palmer); one October 24, 1885 (C. W. Richmond); three seen, one taken at Four Mile Run September 22, 1894 (Wm. Palmer); two at the same place between September 26 and 30, 1898; one at Columbia Island May 31, 1926 (Ball and Ruppert). In the fall of 1928 there were a number of observations of this species: one July 29 (H. G. Deignan); one at Hains Point August 14 (Ball); one to five August 28 to September 15 at the excavation 14th and B Streets, N. W.; a flock in East Potomac Park September 21 (A. H. Howell); one on the Virginia shore September 27 (F. C. Lincoln).

GREATER YELLOWLEGS, *Totanus melanoleucus* (Gmelin).

Tolerably common migrant. Both Yellowlegs frequent grass-bordered pools in preference to mud-flats, but often occur on the flats at Four Mile Run.

Spring: April 1, 1928 (M. T. Donoho), to June 3, 1928 (W. H. Ball); average, April 19 to May 17.

Fall: July 17, 1927 (W. H. Ball), to November 2, 1919 (J. Kittredge, Jr.); average, August 3 to October 13.

LESSER YELLOWLEGS, *Totanus flavipes* (Gmelin).

Common migrant, much more numerous than the Greater Yellowlegs. In the autumn of 1928 a small flock was frequently seen in a pool in the Monument grounds close to Fourteenth Street.

Spring: April 5, 1925 (E. Platt), to May 22, 1926 (M. T. Cooke); average, April 18 to May 13.

Fall: July 17, 1927 (W. H. Ball), to November 1, 1916 (H. C. Oberholser); average, August 20 to October 12.

One that had been caught alive by a cat, March 12, 1906, was brought to the Biological Survey for identification.

SOLITARY SANDPIPER, *Tringa solitaria solitaria* Wilson.

Common migrant. This species is well-named, and is a bird of small pools and the stream banks rather than of the open mud flats.

Spring: March 30, 1883 (H. W. Henshaw), to May 21, 1921 (M. T. Cooke); average, April 28 to May 17.

Fall: July 15, 1899 (E. A. Preble), to October 28, 1916 (L. D. Miner); average, August 6 to October 4.

E. J. Brown took a specimen early in November, 1893.

WILLET, *Catoptrophorus semipalmatus semipalmatus* (Gmelin).

Rare migrant. A flock of about 50 was reported near Eastern Branch August 10–11, 1893. One shot was secured by Wm. Palmer; a flock of over 30 seen near the same place August 27, 1893 ("Bart" in "Forest and Stream"); one May 16, 1917 (Mrs. F. M. Bailey); one June 9–11, 1926, at Columbia Island (Ball *et al.*); other records without dates.

RUFF, *Philomachus pugnax* (Linnaeus).

One of the nineteen specimens of this European species taken in North America was secured by Wm. Palmer at Four Mile Run, September 3, 1894. It was an immature female.

UPLAND PLOVER, BARTRAMIAN SANDPIPER, *Bartramia longicauda* (Bechstein).

Uncommon migrant, more frequently noted in fall than in spring. This is a species that has become much depleted everywhere, but seems to be increasing slightly under protection. Coues and Prentiss called this a rare summer resident here. It certainly does not breed within our terri-

tory at present; the latest record is of a pair that bred near Sandy Spring, Md., about 1900 (*fide* A. K. Fisher). In July, 1927, Dr. Wetmore saw several at Dickerson, Md., and thought that they had bred there that season.

Spring: March 21, 1896 (P. W. Shufeldt), to May 11, 1917 (L. D. Miner); average, April 5 to 26.

Fall: June 29, 1902 (W. W. Cooke), to September 26, 1919 (A. Wetmore); average, July 15 to August 30.

SPOTTED SANDPIPER, *Actitis macularia* (Linnaeus).

A common summer resident, more abundant in migration. It breeds in May, but no data are available.

April 2, 1905 (W. L. McAtee), to October 28, 1906 (A. K. Fisher); average, April 18 to September 28.

LONG-BILLED CURLEW, *Numenius americanus* Bechstein.

Accidental visitant from the west. A specimen taken on the Potomac April 11, 1842, is in the National Museum.

HUDSONIAN CURLEW, *Numenius hudsonicus* Latham.

This species is abundant in migration along the Virginia coast but has only once wandered up the river to Washington. A flock of eighteen was seen off Hains Point May 26, 1928, by Mrs. T. M. Knappen and W. H. Ball, and a single bird in the same place next day by W. H. Ball and H. C. Oberholser.

AMERICAN BLACK-BELLIED PLOVER, *Squatarola squatarola cynosurae* Thayer and Bangs.

Rare in migration. Three, September 26, 1914 (Nat. Mus.); one October 24, 1916 (H. C. Oberholser); one October 26, 1919 (A. Wetmore); one October 3, and two October 4, 1924 (Wetmore and Swales); one May 24, eleven May 26, 1928 (Ball and Mrs. Knappen); one seen on many occasions between August 21 and September 13, 1928, sometimes at the Commerce building excavation and sometimes at East Potomac Park (Lincoln and Ball); six on the Potomac marshes September 27, 1928 (Lincoln).

GOLDEN PLOVER, *Pluvialis dominica dominica* (Müller).

Accidental in migration. A specimen said to have been taken many years ago by D. W. Prentiss. Following the great hurricane, two were seen in East Potomac Park, September 20, 1928. On October 14, four were seen on the mud bar off Hains Point, three October 16, one October 18, collected, two October 26 (all by W. H. Ball).

A specimen in the National Museum was collected by John B. Peyton, March 28, 1911, at Nanjemoy Creek, Maryland, on the Potomac about fifty miles below Washington.

KILLDEER, *Oxyechus vociferus* (Linnaeus).

Common summer resident and a few usually winter. Twenty-five years ago this was a very rare species here, but has gradually increased. Nesting

begins early in April, if not before, for eggs have been found April 3 (1895) and young just hatched, April 24 (1897).

Average dates, March 11 to November 7.

SEMIPALMATED PLOVER, *Charadrius semipalmatus* Bonaparte.

Irregular migrant, more often reported in spring than in fall. Since the marshes have been more carefully watched in late May, there has been a decided increase in the number reported. All early records are of only 1 or 2 birds at a time but since 1923 flocks have several times been reported, usually in late May.

In spring they have been noted from April 30, 1926 (W. H. Ball), and May 3, 1884 (Spec. Nat. Mus.), to June 19, 1926, large flocks on Columbia Island from May 25 to June 19 (Ball). Fall records range from August 14, 1928 (Ball), to October 7, 1924 (Wetmore and Swales).

PIPING PLOVER, *Charadrius melodus* Ord.

Accidental visitant from the coast where it breeds, and for which there is but one record for our territory. A specimen taken May 3, 1884, near the Virginia end of Long Bridge by A. Skinner is in the National Museum.

Another specimen was taken March 25, 1881, by William Hamlin on the Potomac near Aquia Creek, Virginia, about 15 miles beyond our limits.

RUDDY TURNSTONE, *Arenaria interpres morinella* (Linnaeus).

Rare and irregular in migration, principally in late May and September.

Spring: May, 1881 (O. N. Bryan); June, 1882 (J. A. Moore); eight June 3, 1926 (Ball and Ruppert); two May 20–24, 75, May 26, 1928 (Knappen and Ball).

Fall: One September 2, 1912 (E. R. Adams); September 7, 12, and 13, 1928 (Ball), September 27, 1928 (F. C. Lincoln).

Other records without definite dates.

BOB-WHITE, *Colinus virginianus virginianus* (Linnaeus).

Resident, common. For some years it has been the custom of the D. C. Audubon Society to provide grain for feeding the quail whenever snow endangers them. Through the kindness of the local authorities, this is distributed by the police in the outlying sections, and several times censuses of the quail have thus been taken.

Nesting begins early in May, and while only one brood is raised, a female has been found incubating September 16 (1891).

RUFFED GROUSE, *Bonasa umbellus umbellus* (Linnaeus).

Formerly a somewhat local permanent resident but now nearly extirpated within our area. According to Mr. L. C. Gunnell it is still found in very small numbers near Bush Hill and Accotink, Fairfax County, Va. Late records from other localities are: two near Falls Church, November 23, 1913 (A. Wetmore); one below Great Falls, Md., February 22, 1916 (W. W. Cooke); one between Contee and Bowie, Md., January 28, 1917 (W. L. McAtee).

Adult and young were seen near Dyke in May, 1894 (E. A. Preble).

HEATH HEN, *Tympanuchus cupido* (Linnaeus).

A specimen taken near Washington, April 10, 1846, by Dr. Alex. McWilliams was formerly in the National Museum (Swales, Proc. Biol. Soc. Wash. XXXII, 1919, p. 198).

WILD TURKEY, *Meleagris gallopavo silvestris* Vieillot.

Formerly a common resident, now very rare within our limits. There is a small flock near Bush Hill, Fairfax County, Va., and they occur in the Bull Run valley slightly beyond our area. Apparently they remained fairly common in the wilder sections until about 1890. The latest definite date of breeding within our area was of eggs found near Falls Church May 3, 1903 (J. H. Riley).

A flock of eleven was seen near Neabsco, Va., December 2, 1928 (B. M. Morgan).

PASSENGER PIGEON, *Ectopistes migratorius* (Linnaeus).

Formerly abundant migrant, now extinct; the last large flock was previous to 1860. Subsequent records are: September 18, 1877 (Spec. Nat. Mus.); April 3, 1887 (H. W. Henshaw); September 11, 1889 (W. Palmer); October 19, 1889 (J. D. Figgins); a flock of about a dozen, one taken, near Jefferson, Md., fall of 1889 (J. D. Figgins); a small flock, two or three taken, near Laurel, fall of 1889 (Geo. Marshall); one, May 2, 1891 (R. W. Shufeldt).

MOURNING DOVE, *Zenaidura macroura carolinensis* (Linnaeus).

Common summer resident and irregular winter resident. A flock of 5 or 6 wintered one year near the bird house at the Zoological Park. Three broods are often raised, eggs have been found from April 6 (1919) to August 11 (1889), and young from fully fledged in nest April 24 (1921) to young just hatched in early September.

Average dates, March 17 to November 3.

GROUND DOVE, *Chaemepelia passerina passerina* (Linnaeus).

An accidental visitant from the south. Two specimens, both females, are in the National Museum, the first taken September 1, 1844, and the other taken at Broad Creek, Md., October 14, 1888.

Other dates given in the 1921 list were errors.

TURKEY VULTURE, BUZZARD, *Cathartes aura septentrionalis* Wied.

Common permanent resident. Nesting begins usually the latter part of April; but fresh eggs have been found by April 11 (1897) to May 9 (1914); young June 2 (1892). On May 4, 1924, a nest containing *three* slightly incubated eggs was found (R. W. Williams).

BLACK VULTURE, *Coragyps urubu urubu* (Vieillot).

Casual visitant from southern Maryland. Four March 30, 1895, at Kensington (J. D. Figgins); one July, 1896, at Brookland (A. W. Ridgway);

one December 17, 1899, at Congress Heights (P. Bartsch); one February 21 to March 10, 1917, at the Zoological Park around the flying cage (N. Hollister); five, January 2, 1920, near Plummers Island (H. S. Barber); two March 25, 1922, at Laurel (G. Marshall); one October 22, 1924 (W. L. McAtee); one May 14, 1927, at Miller (Audubon Society); one November 6, 1927, at Mt. Vernon, two May 10, 1928, near Dyke (W. H. Ball).

The species is established as a breeding bird near La Plata, Maryland, about twenty-five miles south of Washington.

SWALLOW-TAILED KITE, *Elanoides forficatus* (Linnaeus).

Accidental visitant from the south for which there is one local record and two from nearby points.

One observed near the Virginia end of Aqueduct Bridge, April 11, 1897, by Paul Bartsch.

One taken in Montgomery County, Maryland (probably within our limits), August 3, 1895, and brought to Schmid's store.

One taken August 7, 1879, near Ellicott City, Md., was sent to the National Museum in the flesh.

MARSH HAWK, *Circus hudsonius* (Linnaeus).

Tolerably common migrant and winter visitant (much less common than formerly), and a few pairs probably breed, since there are records of birds seen in June and early July, but no record of eggs or young. They arrive in late September and leave in late April.

SHARP-SHINNED HAWK, *Accipiter velox* (Wilson).

Common in migration; a few breed, and a few remain in winter.

Eggs, May 5 (1894) to 31 (1891); young first week in June (1891).

COOPER'S HAWK, *Accipiter cooperi* (Bonaparte).

Rare resident; fairly common in migration. A pair that nested near Terra Cotta had fresh eggs from April 21 (1918) to May 5 (1922); just hatching May 27 (1919). Young with pinfeathers of wing just showing were found June 15 (1888).

AMERICAN GOSHAWK, *Astur atricapillus atricapillus* (Wilson).

Rare winter visitant, probably occurring more frequently than the few definite records would indicate.

Coues and Prentiss (1883) say that it occurs, but give no dates.

One taken at Sandy Spring, Md., December 27, 1887, brought to A. K. Fisher; one caught at Takoma Park, January 1, 1896, brought alive to the National Museum; specimens shot September 1 and 2, 1916, and December 20, 1917, at Beltsville, Md., by T. A. Davis; one seen near Craney Island, February 3, 1927 (H. C. Oberholser).

RED-TAILED HAWK, *Buteo borealis borealis* (Gmelin).

Tolerably common winter visitant, formerly rare summer resident, but it is doubtful whether any breed within our area at present. Formerly bred near Sandy Spring, Maryland.

RED-SHOULDERED HAWK, *Buteo lineatus lineatus* (Gmelin).

Permanent resident, formerly rather common, but now, like all the hawks, rather rare. For many years a pair nested near Dyke, but they have not been there since about 1924. They have also nested in Glover Park west of Georgetown in recent years.

Eggs about to hatch taken April 26 (1891); large young May 9 (1891).

BROAD-WINGED HAWK, *Buteo platypterus* (Vieillot).

Summer resident, tolerably common. This has been considered a permanent resident, but since its principal winter home is in South America, all winter records, being sight records, are open to question. In April and September large flocks are sometimes seen in migration. Because of the supposition that the species is resident, little attention has been paid to migration dates except the first one seen in spring.

Eggs have been taken from April 23 (1893) to May 15 (1897); eggs about to hatch May 20 (1901) and young in nest June 3 (1896).

March 31, 1919 (M. T. Cooke); average, April 22 to about the first of October.

AMERICAN ROUGH-LEGGED HAWK, *Archibuteo lagopus sancti-johannis* (Gmelin).

Rare winter visitant, probably occurring more frequently than the few definite records would indicate.

One about 1859 (spec. Nat. Mus.); one December 29, 1879 (H. W. Henshaw); one winter of 1880 (spec. Nat. Mus.); one, December 23, 1882 (spec. Nat. Mus.); March 17, 1888 (A. K. Fisher); March 25, 1888 (Wm. Palmer); January 1, 1895 (E. A. Preble); December 23 and 31, 1916 (Gabrielson and Kalmbach); January 1, 1918 (A. H. Howell); December 27, 1925 (A. Wetmore).

GOLDEN EAGLE, *Aquila chrysaetos* (Linnaeus).

An accidental visitant from the north. Two specimens in the National Museum taken December 26, 1857, and March 7, 1859. A pair, one of which was taken, occurred near Gaithersburg, Md., December 8, 1887.

Several specimens have been taken in Maryland and Virginia a little beyond our limits, some during recent years.

BALD EAGLE, *Haliaeetus leucocephalus leucocephalus* (Linnaeus).

Permanent resident, more commonly observed in summer. They breed near Mt. Vernon and have bred in recent years near Great Falls where slightly incubated eggs were found February 20 (1897).

DUCK HAWK, *Falco peregrinus anatum* Bonaparte.

Regular but rather rare winter visitant. One or two frequently winter in the tower of the Post Office Department building. Records of observations of this species about the city range from October 17, 1928 (M. T. Cooke), to May 22, 1918 (L. Griscom).

Duck hawks have also been seen several times in the neighborhood of Plummers Island.

PIGEON HAWK, *Falco columbarius columbarius* Linnaeus.

Rare, probably regular, in migration, but seldom identified with certainty.

Spring: March 21, 1920 (J. Kittredge, Jr.), to May 11, 1917 (H. C. Oberholser); average, April 11 to 30.

Fall: September 4, 1890 (W. B. Barrows), to November 10, 1891 (Wm. Palmer); average September 12 to October 25.

AMERICAN SPARROW HAWK, *Cerchneis sparveria sparveria* (Linnaeus).

Fairly common permanent resident. Eggs from March 31 (1894) to August 4 (1889).

FISH HAWK, AMERICAN OSPREY, *Pandion haliaetus carolinensis* (Gmelin).

Fairly common summer resident, a few pairs nest along the Potomac River, especially in the vicinity of Ft. Washington and Mt. Vernon. Nesting begins in April.

March 19, 1905 (C. R. Ellis), to November 30, 1907 (A. K. Fisher); average, April 9 to October 20.

One was seen over the frozen river February 1, 1918, near Plummers Island (A. Wetmore).

BARN OWL, *Tyto alba pratincola* (Bonaparte).

Uncommon permanent resident. It has nested in the towers of the District jail and in various towers of the Smithsonian Institution, and uses the latter as a winter roosting place. Apparently deceived as to season by the heat from the building, young have been hatched here in late fall and winter. Young just from the nest were seen in the grounds, December 8, 1893, and February 27, 1895 (C. E. Bendire). The latter must have been hatched in late December or early January. Young not over two weeks from the nest were seen January 7, 1896 (A. K. Fisher). On May 11, 1914, a female was found in the northwest tower incubating five eggs (A. Wetmore). They probably breed sometimes in Arlington Cemetery and near Plummers Island, and formerly on Analostan Island.

AMERICAN LONG-EARED OWL, *Asio wilsonianus* (Lesson).

Now a very rare permanent resident, formerly fairly common. Like most of the Raptores, it is an early breeder and young about two weeks old have been found April 20 (1890). A recent record is of one taken near Laurel, January 23, 1926.

SHORT-EARED OWL, *Asio flammeus* (Pontoppidan).

Rare winter visitant, November to May. In Fisher's "Hawks and Owls" eleven specimens from this region are listed, taken between November 22, 1886, and November 20, 1891. Besides these there are about a dozen records, only one since then, March 2, 1913 (A. Wetmore).

BARRED OWL, *Strix varia varia* Barton.

Fairly common permanent resident. Usually begins nesting in March, but eggs have been found as early as February 28 (1897); young on the wing April 28 (1917).

Saw-whet Owl, *Cryptoglaux acadica acadica* (Gmelin).

Occasional winter visitant for which there are about twenty records, mostly from November to February. One October 3, 1886 (F. S. Webster), and one March 12, 1889 (J. D. Figgins). Recent records are: January, 1914 (R. W. Shufeldt); February 6, 1916 (I. N. Gabrielson); November 30, 1916 (A. K. Fisher); December 1, 1917 (E. A. Sikken); January 2, 1928 (D. C. Audubon Society).

Screech Owl, *Otus asio asio* (Linnaeus).

Fairly common permanent resident, often observed in the city. For several years one or more roosted every winter in trees in the Agricultural grounds.

Incubated eggs April 6 (1899); four young just hatched and one egg April 26 (1891).

Great Horned Owl, *Bubo virginianus virginianus* (Gmelin).

Rather rare permanent resident confined to the more heavily wooded sections. Most of the recent records have come from the vicinity of Plummers Island and Fort Humphreys. Young were found February, 1890, near Rockville.

Snowy Owl, *Nyctea nyctea* (Linnaeus).

Accidental winter visitant from the far north. A specimen taken December 4, 1858, now in the National Museum was made the type of the race *arctica* by Mr. Ridgway. About 15 specimens were taken during the winter of 1876–77; November 11, 1885, from Arlington County, Va.; one received in the flesh from Spring Hill, Md., December 30, 1890. A female was killed near Lanham, Md., November 29, 1926, that had been in the neighborhood about a month.

Carolina Paroquet, *Conuropsis carolinensis* (Linnaeus).

This species is now extinct. There is one record for the region, a flock in September, 1865, from which several were shot.

Yellow-billed Cuckoo, *Coccyzus americanus americanus* (Linnaeus).

Common summer resident, frequently observed in the shade trees of the city during the summer. Eggs May 30 (1894) to September. Young recently from nest August 3 (1919).

April 30, 1927 (F. C. Lincoln), to October 13, 1925 (Katharine H. Stuart); average, May 5 to October 5.

Black-billed Cuckoo, *Coccyzus erythrophthalmus* (Wilson).

Fairly common migrant and rare summer resident. Nesting begins about the first of June.

April 30, 1928 (W. H. Ball), to October 28, 1925 (L. D. Miner); average, May 7 to September 30.

BELTED KINGFISHER, *Ceryle alcyon alcyon* (Linnaeus).

Common summer resident, a few sometimes remain through the winter. Young about ten days old, June 16 and half-fledged young June 24 (1889). Average, March 21 to November 7.

HAIRY WOODPECKER, *Dryobates villosus villosus* (Linnaeus).

Fairly common permanent resident, rather local; frequently observed near Plummers Island, Takoma Park and elsewhere. Nesting begins early; birds have been seen apparently beginning to mate February 14 (1915); young just hatched April 9 (1900) and young still in nest June 6 (1926).

DOWNY WOODPECKER, *Dryobates pubescens medianus* (Swainson).

Common permanent resident. Fully-fledged young May 31 (1914).

YELLOW-BELLIED SAPSUCKER, *Sphyrapicus varius varius* (Linnaeus).

Common in migration, tolerably common in winter.

September 10, 1905 (W. W. Cooke), to May 20, 1927 (F. C. Lincoln); average, October 2 to April 23.

PILEATED WOODPECKER, *Phloeotomus pileatus pileatus* (Linnaeus).

Very rare permanent resident confined to the heavy timber; probably only two or three pairs left in the region. Recent observations are from the region between Plummers Island and Great Falls and from Fort Humphreys. About 1920 it was known to nest on an island above Great Falls. At one time it was common in heavy timber near Falls Church, and near Mt. Vernon.

RED-HEADED WOODPECKER, *Melanerpes erythrocephalus* (Linnaeus).

Tolerably common summer resident, irregular in winter, some years common, and others almost totally absent. Its presence in winter depends more on the oak mast than on temperature. Birds can nearly always be found in Arlington cemetery and they breed in the Agricultural grounds.

This species is less common than formerly, due to the cutting down of patches of oak woods in the course of real estate developments, and probably to the killing of birds by electric power companies.

Eggs June 4 (1887) to 23 (1885); young out of nest June 23 (1901).

RED-BELLIED WOODPECKER, *Centurus carolinus* (Linnaeus).

Local resident, not common. Several pairs may be found between Oaks and Mt. Vernon, along both sides of the river between Great Falls and Cabin John Bridge, and in the high woods back of Chevy Chase Lake. Apparently somewhat more common than formerly.

Young recently from the nest, August 3 (1919).

NORTHERN FLICKER, *Colaptes auratus luteus* Bangs.

Common permanent resident, less abundant in winter; abundant in migration. Breeds principally in May and June, fresh eggs from April 29 (1894) to June 13 (1887); small young May 22 (1888).

HYBRID FLICKER, *Colaptes auratus luteus* x *cafer collaris*.

An adult male of this hybrid between the yellow-shafted and red-shafted flickers was taken at Laurel about 1880 by Henry Marshall.

WHIPPOORWILL, *Antrostomus vociferus vociferus* (Wilson).

Common summer resident. Begins nesting early in May; eggs May 6 (1906) to June 6 (1895).

April 1, 1913 (E. J. Brown), and April 1, 1917 (V. Mindeleff), to October 13, 1889 (H. W. Henshaw); average, April 18 to September 20.

NIGHTHAWK, *Chordeiles virginianus virginianus* (Gmelin).

Formerly abundant migrant and rare summer resident, now fairly common in summer. This species has greatly increased as a breeding bird in the last ten years especially in the city where it evidently breeds on the roofs of the buildings.

No data are available regarding the time of breeding in this area.

Spring: Earliest, April 18, 1919 (H. H. T. Jackson); average, May 3 to 25.

Fall: Latest, October 13, 1926 (M. T. Cooke); average, August 16 to September 29.

CHIMNEY SWIFT, *Chaetura pelagica* (Linnaeus).

Common summer resident and abundant migrant. In fall large numbers use various chimneys about the city as nightly roosting places. Migrants apparently begin to arrive about the middle of August. Nesting does not begin until June and the earliest date for eggs seems to be June 10 (1888).

April 5, 1914 (M. W. Curry), to October 25, 1906 (W. W. Cooke), and October 25, 1925 (V. Bailey); average, April 16 to October 12. One was seen over Alexandria, November 19, 1925 (Katharine H. Stuart).

RUBY-THROATED HUMMINGBIRD, *Archilochus colubris* (Linnaeus).

Common summer resident. At a meeting of the Potomac Valley Ornithological Club, Prof. Beal reported that about the middle of May, 1895, he saw upwards of a hundred ruby-throated hummingbirds around a horse-chestnut tree in the Agricultural grounds.

Two broods are probably raised; eggs May 20 (1896) and young in the nest August 12 (1893). A nest containing *three* eggs was found at Congress Heights, May 28, 1899 (P. Bartsch).

April 16, 1912 (W. R. Maxon), to October 20, 1913 (A. K. Fisher); average, May 2 to September 20.

KINGBIRD, *Tyrannus tyrannus* (Linnaeus).

Locally common summer resident. Begins nesting about the first of June.

April 18, 1914 (E. R. Kalmbach), to September 23, 1905 (F. E. L. Beal); average, April 26 to August 31.

ARKANSAS KINGBIRD, *Tyrannus verticalis* Say.

A western species for which we have one record, a specimen taken in Maryland just beyond the District line, September 30, 1874, and found in the market by P. L. Jouy.

CRESTED FLYCATCHER, *Myiarchus crinitus* (Linnaeus).

Common summer resident. Eggs May 13 (1887) to June 16 (1914).

April 19, 1914 (W. W. Cooke), to September 29, 1907 (R. W. Williams); average, April 28 to September 11.

PHOEBE, *Sayornis phoebe* (Latham).

Common summer resident, a few may occasionally winter, for there are several records for late December and January. Two broods are raised and possibly sometimes a third. Eggs from April 16 (1925) to June 19 (1889); young on the wing May 10 (1921).

Average, March 13 to October 19.

OLIVE-SIDED FLYCATCHER, *Nuttallornis borealis* (Swainson).

Very rare in migration, seen more often in spring than in fall.

Several in September, 1881, at Falls Church (R. Ridgway); May 9, 1912 (A. K. Fisher); May 22, 1915, at Great Falls, Va. (W. W. Cooke); May 27, 1917, on Eastern Branch (A. Wetmore); two, August 13, 1917, on Eastern Branch and one, September 9 and 14, 1918, at Kensington (R. W. Moore); one May 10, 1919, at Franklin Park, Va. (Miner and Moore); one May 16, 1920, in Cleveland Park (E. A. Preble); one May 22, 1920, near Prospect Hill, Va. (M. T. Cooke); one May 25, 1924, at Takoma Park (A. Wetmore).

WOOD PEWEE, *Myiochanes virens* (Linnaeus).

Common summer resident. Nesting begins about the first of June, and a second brood is probably raised. Eggs have been found June 1 (1887) and young still in the nest August 26 (1895).

April 29, 1914 (W. W. Cooke), to October 12, 1906 (A. K. Fisher); average, May 5 to September 20.

YELLOW-BELLIED FLYCATCHER, *Empidonax flaviventris* (W. M. and S. F. BAIRD).

Tolerably common, but local in migration. This is one of the last species to arrive in spring and frequently slips through without being detected.

Spring: May 9, 1902 (A. K. Fisher), to June 1, 1917 (F. Harper); average, May 14 to 22.

Fall: July 28, 1859 (E. Coues), to October 6, 1881 (H. M. Smith); average, August 15 to September 18.

ACADIAN FLYCATCHER, *Empidonax virescens* (Vieillot).

Common summer resident. The earliest record for a complete set of three eggs is May 30 (1896). Fresh eggs are found throughout the month of June.

April 25, 1926 (A. Wetmore), to September 15, 1912 (W. W. Cooke), and September 15, 1922 (J. Kittredge, Jr.); average, May 6 to September 7.

ALDER FLYCATCHER, *Empidonax trailli alnorum* Brewster.

A migrant, apparently rare, though possibly tolerably common; but since it is very difficult to distinguish the Acadian and Alder in life except by their songs, few of the latter are recorded.

Spring: May 7, 1922 (H. C. Oberholser), to June 1, 1917 (F. Harper); average, May 13 to 22.

Fall: August 16, 1886 (A. K. Fisher), to September 17, 1890 (C. W. Richmond); average, August 23 to September 14.

LEAST FLYCATCHER, *Empidonax minimus* (W. M. and S. F. Baird).

Tolerably common in migration.

Spring: April 20, 1881 (Wm. Palmer), to May 27, 1917 (A. Wetmore); average, May 2 to 17.

Fall: August 13, 1887 (A. K. Fisher), to October 1, 1916 (D. C. Mabbott); average, August 25 to September 13.

HORNED LARK, *Otocoris alpestris alpestris* (Linnaeus).

Rare winter visitant. Flocks of Horned Larks are present nearly every winter, but in the majority of cases the race is not determined; *alpestris* is probably less common than *praticola*. Undetermined or mixed flocks have been reported from October 26, 1890 (H. B. Stabler), to April 7, 1889 (H. W. Henshaw), but the majority of records are in December and February.

Flocks certainly of this race were observed between December 15, 1917, and February 24, 1918 (F. Harper).

PRAIRIE HORNED LARK, *Otocoris alpestris praticola* Henshaw.

Irregular winter visitant, probably more common than *alpestris*. Very rare summer resident. Young of the year were taken near Laurel, June 23, 1922 (E. B. Marshall), and one seen August 11, 1889 (C. W. Richmond).

Other definite records are: February 8, 1881, January 23 to February 16, 1888 (Wm. Palmer); March 1 and 8, 1914 (A. Wetmore); February 10 to 24, 1918 (F. Harper); February 22, 1921 (J. Kittredge, Jr.).

BLUE JAY, *Cyanocitta cristata cristata* (Linnaeus).

Common permanent resident, abundant migrant from late April to mid-May and October. This species has varied greatly in abundance. Coues and Prentiss in both of their lists called it abundant, especially in migration and winter. In the 90's it was considered rare except in mi-

gration. In the last twenty-five years it has greatly increased and is now a common breeding species, sometimes nesting in the shade trees of the city. Two broods are raised, and eggs have been taken as early as April 27 (1913).

CROW, *Corvus brachyrhynchos brachyrhynchos* Brehm.

A winter visitant, frequenting the roosts with the Southern and Fish Crows. They have usually left by the middle of March.

SOUTHERN CROW, *Corvus brachyrhynchos paulus* Howell.

Common permanent resident. At the present time there are no large winter crow roosts in this vicinity, those previously used having broken up about six to eight years ago. The last large roost was near Woodridge and was used by several thousand crows for many years. The building up of this suburban region was probably largely responsible for the roost's abandonment. Coues and Prentiss mention a large roost on the Virginia shore some distance above Chain Bridge. Later the birds shifted to Arlington Cemetery where at one time they occupied twelve to fifteen acres. This roost was abandoned soon after 1900.

Crows are early breeders, begin pairing soon after the first of March and well incubated eggs have been found as early as March 23 (1894) though the majority of records are for early April.

FISH CROW, *Corvus ossifragus* Wilson.

Permanent resident, fairly common in summer, rare in winter. This is the common crow about the city and frequently nests in the Mall and other parks and sometimes in trees along streets. April 20, 1926, they were observed carrying nesting material in the Smithsonian grounds and young were seen in the Agricultural grounds July 4, 1914. Fresh eggs found from April 5 (1890) to May 24 (1910), young out of the nest, May 31 (1914).

EUROPEAN STARLING, *Sturnus vulgaris vulgaris* Linnaeus.

Common permanent resident, very abundant in winter, especially in the city where they roost by thousands. Starlings first appeared in Washington, following a storm, January 21, 1912, when two were collected near Anacostia. Each winter following they occurred in increasingly large flocks but the first evidence of breeding was young of the year seen at Woodridge June 26, 1916 (F. Harper). The following spring found the species spreading into the adjoining country. In the earlier years starlings roosted in late summer and winter in trees in the Mall. Following a heavy snowstorm in late January, 1922, thousands were found roosting on various buildings in the business section of the city. These roosts have increased until now many of the buildings, especially along Pennsylvania Avenue between Ninth and Fourteenth Streets, are lined with starlings every night. They begin coming to these roosts in numbers in October and break up in late March. In January, 1928, nearly 4,000 were banded in the steeple of the First Presbyterian Church at John Marshall Place.

Bobolink, *Dolichonyx oryzivorus* (Linnaeus).

Migrant, more common in fall than in spring; less abundant than formerly.

Spring: April 26, 1896 (H. Oldys), to June 6, 1909 (H. W. Henshaw); average, May 2 to 22.

Fall: July 23, 1904 (S. D. Judd), to October 21, 1894 (Wm. Palmer); average, August 18 to September 29.

Birds seen in November are almost certainly cripples.

Cowbird, *Molothrus ater ater* (Boddaert).

Tolerably common local summer resident, sometimes winters. Egg taken May 12 (1895).

Average, March 19 to November 3.

Yellow-headed Blackbird, *Xanthocephalus xanthocephalus* (Bonaparte).

A western species which has once been taken, a female collected near the city on August 29, 1892, by E. M. Hasbrouck.

There are three records for the vicinity of Baltimore, Maryland.

Red-winged Blackbird, *Agelaius phoeniceus phoeniceus* (Linnaeus).

Abundant migrant and common summer resident in the marshes; a few usually winter. Nesting begins about the middle of May; slightly incubated eggs found May 19 (1889).

Average, March 1 to November 19.

Meadowlark, *Sturnella magna magna* (Linnaeus).

Common permanent resident, less abundant in winter.

Nesting begins in late April; young just hatched, May 18 (1891).

Orchard Oriole, *Icterus spurius* (Linnaeus).

Tolerably common summer resident. Nesting begins soon after the middle of May and young birds have been found June 20 (1888).

April 25, 1908 (A. H. Howell), to September 14, 1919 (F. Harper); average, May 3 to August 27.

Baltimore Oriole, *Icterus galbula* (Linnaeus).

Common migrant and rare summer resident. Eggs May 27 (1887) and chattering young in nest June 16 (1914).

April 24, 1912 (H. H. T. Jackson), to October 15, 1922 (J. Kittredge, Jr.); average, May 2 to September 1.

A specimen that had recently died was picked up in Anacostia, January 5, 1925 (C. H. M. Barrett).

Rusty Blackbird, *Euphagus carolinus* (Müller).

Common migrant, occasional in winter.

September 16, 1885 (H. W. Henshaw), to May 14, 1926 (W. H. Ball); average, October 22 to April 18.

PURPLE GRACKLE, *Quiscalus quiscula quiscula* (Linnaeus).

Abundant summer resident, a few usually winter. They nest commonly in the parks and larger yards of the city. Nesting begins early in April; eggs have been found April 17 (1887) and young out of the nest May 4 (1913). The breeding season is rather prolonged, but it is doubtful if, under normal conditions, more than a single brood is raised.

Average, February 23 to November 16.

BRONZED GRACKLE, *Quiscalus quiscula aeneus* Ridgway.

Migrant, probably occurring every year, but seldom distinguished. All definite dates are in winter or spring and range from January 21, 1916 (Mrs. F. M. Bailey), to April 17, 1886 (spec. Nat. Mus.). The majority of the records are during February and March.

EVENING GROSBEAK, *Hesperiphona vespertina vespertina* (W. Cooper).

An accidental visitant from the northwest. This bird was added to the Washington list in 1922 when a flock of 5 to 6 was seen April 3–6, at Laurel, Md., by George Marshall. On April 21 of the same year a flock of about a dozen birds was found in the Zoological Park and on April 25 a specimen was taken by A. K. Fisher which is now in the National Museum. Birds were seen until May 12, and individuals were reported from Takoma Park and Cabin John Bridge, Md.

ENGLISH SPARROW, HOUSE SPARROW, *Passer domesticus domesticus* (Linnaeus).

Abundant permanent resident. This European species was introduced in Washington in 1871. Cages for them were hung in some of the parks of the city, notably in Franklin Square. They became very abundant about 1900. Since the automobile has largely replaced horses, English sparrows have considerably decreased in numbers, but they are still abundant. Four or five broods are sometimes raised in one season. A female has been seen carrying straws as early as February 14 (1894), but the nesting season begins usually early in March.

PURPLE FINCH, *Carpodacus purpureus purpureus* (Gmelin).

Fairly common winter visitant, abundant spring migrant; less common in fall. Sometimes very abundant in the city trees in early May.

August 23, 1923 (J. Kittredge, Jr.), to May 29, 1860 (spec. Nat. Mus.); average, October 22 to April 18.

AMERICAN CROSSBILL, *Loxia curvirostra minor* (Brehm).

Irregular winter visitant, sometimes common. It has been noted from October 10 (1886, H. W. Henshaw) to June 5 (1895). A female taken May 23, 1884 (R. Ridgway), showed unmistakable evidence of having recently incubated. A young bird barely able to fly was taken with an adult, May 17, 1885 (H. M. Smith). These seem to be the only evidences of the breeding of this species in the vicinity.

Newfoundland Crossbill, *Loxia curvirostra percna* Bent.

Accidental visitant, a specimen taken at Four Mile Run, Va., November 30, 1919, by A. Wetmore.

White-winged Crossbill, *Loxia leucoptera* Gmelin.

Irregular winter visitant. One, about 1864 (C. Drexler, in Nat. Mus.); specimens about 1874 (Henry Marshall); one, November, 1906 (J. H. Fleming); one taken at Oxon Hill, Md., August 11, 1907 (brought to Biological Survey); flock, October 23, 1913, at Takoma Park (R. W. Williams); tolerably common from December 10, 1916 (W. L. McAtee), to January 16, 1917 (D. C. Mabbott); flock of 15 in Woodridge, D. C., February 25, 1923 (E. R. Kalmbach).

Redpoll, *Acanthis linaria linaria* (Linnaeus).

Accidental winter visitant from the north.

A flock seen and one taken, February 19, 1875, at Ft. Runyon (T. H. Bean, spec. in Nat. Mus.); seven, February 12, 1899, just before the great blizzard (Wm. Palmer); small flock in Rock Creek Park, March 9 (R. W. Moore) to March 12, 1914 (M. T. Cooke); six or eight February 22, 1925 (T. H. Kearney).

American Goldfinch, *Astragalinus tristis tristis* (Linnaeus).

Common permanent resident, abundant in spring migration. This is one of the latest species to nest and does not begin until July. The earliest available date for eggs is July 12 (1885) and young have been found still in the nest September 10 (1890).

Pine Siskin, *Spinus pinus* (Wilson).

An irregular winter visitant, sometimes common, some winters almost totally absent.

October 15, 1916 (F. Harper), to May 22, 1926 (R. V. Truitt); average, October 24 to May 14.

Snow Bunting, *Plectrophenax nivalis nivalis* (Linnaeus).

Accidental winter visitant from the north. Recorded February or March, 1842 (National Institute); one near Soldiers' Home, November, 1906 (Wm. Palmer); a large flock near Congress Heights, February 18, 1905 (2 specimens brought to Biological Survey); a flock near Cabin John Bridge February 22, 1905 (Cary and Piper); one December 19, 1917, on Eastern Branch (C. H. M. Barrett); one below Alexandria February 12, 1927 (W. H. Ball); two seen, one collected at Hains Point November 29, 1928 (Ball).

Lapland Longspur, *Calcarius lapponicus lapponicus* (Linnaeus).

Accidental visitant, has been once recorded; six or more were seen and one collected at Bailey's Cross Roads, Va., December 11, 1886, by H. W. Henshaw.

VESPER SPARROW, *Pooecetes gramineus gramineus* (Gmelin).

Common migrant and rare and local summer resident. The spring migration is of rather short duration. Eggs have been found from June 3 (1889) to July 6 (1888).

Spring: Earliest, February 18, 1890 (Wm. Palmer); average, March 23 to April 15.

Fall: Latest, November 21, 1886 (A. K. Fisher); average, October 9 to November 6.

There are two records of occurrence in winter; January 8, 1887 (H. W. Henshaw), and December 30, 1894 (Wm. Palmer).

SAVANNAH SPARROW, *Passerculus sandwichensis savanna* (Wilson).

Fairly common but local migrant. It may occasionally remain through the winter for there are three records in late December.

Spring: February 14, 1891 (spec. Nat. Mus.), to May 14, 1925 (F. C. Lincoln), and May 14, 1926 (A. Wetmore); average, March 26 to May 3.

Fall: September 21, 1903 (W. W. Cooke), to November 22, 1886 (H. W. Henshaw); average October 9 to 29. Several, December 26, 1884 (Henshaw); December 24, 1885 (A. K. Fisher); three, December 30, 1916 (McAtee, Preble, and Wetmore).

GRASSHOPPER SPARROW, *Ammodramus savannarum australis* Maynard.

A common summer resident in old fields where it is often heard but difficult to see.

Two broods are probably raised; young almost ready to fly found June 13 (1889) and young just out of the nest July 29 (1894).

March 30, 1895 (J. D. Figgins), to November 20, 1899 (E. A. Preble); average, April 21 to October 21.

One was taken at Marshall Hall February 18, 1900 (S. D. Judd), when the snow was knee deep.

HENSLOW'S SPARROW, *Passerherbulus henslowi henslowi* (Audubon).

A local summer resident, but not rare where found. It prefers old fields grown up to broom-sedge. There are several such fields between Big and Little Hunting Creeks where it can usually be found.

Probably raises two broods (P. L. Jouy); eggs May 23 (1896); full-fledged young June 6 (1880) to July 12 (1879).

April 1, 1917 (M. T. Cooke), to October 21, 1892 (E. A. Preble); average, April 19 to October 11.

NELSON'S SPARROW, *Passerherbulus nelsoni nelsoni* (Allen).

Rare migrant. Definite records are: September, 1862, specimen taken by C. Drexler; September 18, 1893, specimen taken by Wm. Palmer at Four Mile Run; September 26, 1898, one seen on Potomac flats by Wm. Palmer; May 30, 1906, two seen and photographed on Eastern Branch by P. Bartsch.

LARK SPARROW, *Chondestes grammacus grammacus* (Say).

A western species for which there are three records in this region. An adult female was collected at Fort Runyon, near the south end of Long Bridge, August 25, 1877, by W. F. Roberts. Two days later, August 27, 1877, two were seen in the Smithsonian grounds by Mr. Ridgway. An adult male was taken August 8, 1886, by H. W. Henshaw.

WHITE-CROWNED SPARROW, *Zonotrichia leucophrys leucophrys* (J. R. Forster).

A rare migrant. One seen at Brookland January 20, 1901 (R. Ridgway), and one at a feeding shelf on Park Road February 4 and 5, 1922 (C. W. Richmond), are the only definite winter records.

Spring: March 26, 1922 (Katharine H. Stuart), to May 22, 1928 (W. H. Ball); average, April 26 to May 15.

Fall: October 1, 1910 (W. L. McAtee), to November 28, 1886 (H. W. Henshaw); average, October 13 to November 20.

WHITE-THROATED SPARROW, *Zonotrichia albicollis* (Gmelin).

Common winter resident and abundant migrant. Migrants arrive from the south about the middle of April and until the second week in May are very abundant.

August 9, 1907, one in molt was found in the Mall by N. R. Wood which remained until the next day and was seen by several persons.

September 14, 1918 (Miner and Moore), to June 14, 1899 (A. H. Howell); average, October 8 to May 22.

TREE SPARROW, *Spizella monticola monticola* (Gmelin).

Winter visitant of varying abundance, in some years common, and in others rather rare.

October 3, 1859 (spec. Nat. Mus.), to April 24, 1861 (spec. Nat. Mus.); average, November 10 to March 27.

CHIPPING SPARROW, *Spizella passerina passerina* (Bechstein).

Very common summer resident. At least two broods are raised, fresh eggs being found from May 12 (1887) to July 12 (1885).

February 9, 1902 (H. W. Maynard), to December 17, 1899 (P. Bartsch); average March 22 to November 10.

FIELD SPARROW, *Spizella pusilla pusilla* (Wilson).

Common summer resident, and a few winter in sheltered localities. Migrants arrive from the south early in April. Nesting begins by the first of May. Probably a third brood is sometimes raised for on July 27, 1913, the young of the second brood left the nest and another nest contained eggs apparently fresh.

SLATE-COLORED JUNCO, *Junco hyemalis hyemalis* (Linnaeus).

Abundant migrant and common winter visitant.

September 14, 1918 (Miner and Moore), to May 17, 1908 (A. M. Stimson); average, October 7 to April 30.

MONTANA JUNCO, *Junco hyemalis montanus* Ridgway.

A western subspecies, a specimen of which was taken at Laurel, Md., April 28, 1890, by Mr. Robert Ridgway.

BACHMAN'S SPARROW, *Peucaea aestivalis bachmani* (Audubon).

A southern species which has occurred a number of times in summer but has never been detected as breeding. Two April 29, 1896, at Kensington (J. D. Figgins); one all summer, 1912, near Lanham, Md., arrived in April (W. R. Maxon); one May 12, 1913, near Lanham (Maxon and Kearney); one June 1, 1913, near Peacock Station, Va.; April 26, 1914, Four Mile Run, and May 9, 1915, Cabin John, Md. (A. Wetmore); one May 2, 1918, at Kensington (R. W. Moore); one May 22, 1920, near Black Pond, Va. (L. D. Miner); one April 19, 1925, near Piney Branch (Frank Lees). A regular visitor for many years previous to 1912 to a field near Congress Heights (P. Bartsch).

SONG SPARROW, *Melospiza melodia melodia* (Wilson).

Abundant permanent resident, but probably the same individuals are not present both summer and winter. Migrants arrive about the middle of March and the middle of October.

Two or more broods are raised for fresh eggs have been found from April 23 (1910) to June 26 (1887); young on the wing, May 18 (1890).

LINCOLN'S SPARROW, *Melospiza lincolni lincolni* (Audubon).

Occurs in migration, but is probably less rare than the number of records would indicate for its secretive habits make it a difficult bird to observe.

Spring: April 21, 1918 (L. Griscom), to May 30, 1917 (A. Wetmore); average, May 6 to 20.

Fall: September 30, 1894 (Wm. Palmer), to October 21, 1888 (Palmer); average, October 6 to 18.

SWAMP SPARROW, *Melospiza georgiana* (Latham).

Common in migration and occasionally a few winter.

Spring: Latest, May 27, 1917 (A. Wetmore); average, March 31 to May 11.

Fall: Has occurred twice in August; August 21, 1913 (W. D. Appel) and August 29, 1922 (C. H. M. Barrett), September 28, 1890 (C. W. Richmond); average, October 9 to November 7.

FOX SPARROW, *Passerella iliaca iliaca* (Merrem).

Common migrant, sometimes winters in small numbers.

Spring: Latest, May 11, 1882 (Wm. Palmer), and May 11, 1917 (Miss M. J. Pellew); average, March 3 to April 6.

Fall: Earliest, October 3, 1906 (A. K. Fisher); average, October 28 to November 21.

Towhee, Chewink, *Pipilo erythrophthalmus erythrophthalmus* (Linnaeus).

This might be classed as a permanent resident for a few individuals nearly always winter. It is a common summer resident and abundant migrant. Two broods are probably raised for young have been found May 30 (1888) and eggs July 15 (1888 and 1894).

Average date of arrival, March 30; date of departure, October 24.

Cardinal, *Cardinalis cardinalis cardinalis* (Linnaeus).

Abundant permanent resident and found quite commonly in the suburbs and in the city.

Two, and possibly three, broods are raised; eggs have been found from April 15 (1888) to July 16 (1916); young leaving the nest May 5 (1921) and young recently from the nest August 24 (1919).

Rose-breasted Grosbeak, *Hedymeles ludovicianus* (Linnaeus).

Tolerably common in migration, but its stay is rather brief and it frequently escapes detection.

Spring: April 17, 1902 (H. W. Maynard), to June 3, 1917 (I. N. Gabrielson); average, May 3 to 17.

Fall: August 29, 1926 (Wetmore and Lincoln), to October 16, 1920 (J. Kittredge, Jr.); average, September 4 to October 1.

Blue Grosbeak, *Guiraca caerulea caerulea* (Linnaeus).

Rare summer resident. Eggs May 26 (1894); young barely able to fly near Falls Church September 13, 1879 (R. Ridgway). A set of eggs in the National Museum was taken May 28, 1863, in the Smithsonian grounds.

May 1, 1878 (Wm. Palmer), to September 20, 1884 (spec. Nat. Mus.); average, May 5 to September 12.

Indigo Bunting, *Passerina cyanea* (Linnaeus).

An abundant summer resident. Begins nesting about the end of May; young out of the nest June 23 (1889); fresh eggs June 28 (1885).

April 18, 1918 (E. A. Chapin), to October 16, 1907 (W. W. Cooke); average, May 1 to October 6.

A specimen apparently in perfect condition was taken December 13, 1887 (M. M. Green).

Dickcissel, *Spiza americana* (Gmelin).

In 1860 this was an abundant migrant and common summer resident, arriving about May 1. From 1860 to about 1875 it was still a regular visitant; about 1872, Mr. Robert Ridgway found it not uncommon on Columbia Heights, and he saw one near Aqueduct Bridge in 1874. About 1875 the species disappeared from the entire eastern portion of its range, and since then has been seen in this region in only two years; one near Soldiers' Home, May 31, 1887 (H. W. Henshaw); one in Brookland, late May or early June, 1894 (R. Ridgway); one at the Washington Barracks (War College) in late June or early July, 1894 (W. Robinson).

In July, 1928, several pairs of Dickcissels were found breeding near Dickerson, Maryland, by F. C. Lincoln and A. Wetmore.

SCARLET TANAGER, *Piranga erythromelas* Vieillot.

Common summer resident, sometimes abundant in migration. Eggs the last week in May.

April 17, 1896 (P. W. Shufeldt), to November 13, 1896 (R. Ridgway); average, April 29 to October 4.

SUMMER TANAGER, *Piranga rubra rubra* (Linnaeus).

Very rare summer resident. Nearly fresh eggs have been found from June 2 (1905) to July 4 (1885); young just from the nest June 30 (1914).

April 18, 1896 (P. W. Shufeldt), to September 19, 1906 (H. Oldys); average, May 1 to September 14.

PURPLE MARTIN, *Progne subis subis* (Linnaeus).

Summer resident, tolerably common, but local. For many years a box at the engine house on Delaware Avenue, near the Capitol, has been occupied by a colony. In spring one or two individuals sometimes come as scouts, and none are seen for a week or two thereafter when flocks begin to arrive.

For the last dozen years large roosts have been formed in the city; for a couple of years in trees opposite the Red Cross building, and since then in the vicinity of New Jersey Avenue and P Street. The local birds begin gathering soon after the young are on the wing, early in July, and are soon joined by migrants from the north, which continue to use the roost until September. At the height of the migration as many as 30,000 birds have been estimated to occupy the roost in a single night.

Although the first of the swallows to arrive they apparently do not begin nesting until late in May.

March 13, 1910 (I. R. Hitt), to October 1, 1928 (M. T. Donoho); average, April 2 to September 12.

CLIFF SWALLOW, *Petrochelidon lunifrons lunifrons* (Say).

This is the rarest of the swallows about Washington. It occurs only in migration and is now seldom noted farther up the river than Alexandria.

Spring: April 10, 1887 (A. K. Fisher), and 1916 (L. D. Miner) to June 7, 1877 (Wm. Palmer); average, April 24 to May 21.

Fall: July 6, 1889 (spec. Nat. Mus.), to September 7, 1928 (W. H. Ball); average July 8 to August 25.

BARN SWALLOW, *Hirundo erythrogastra* Boddaert.

An abundant migrant and locally common summer resident. Seen carrying straws April 16 (1894); fresh eggs to June 26 (1886).

March 30, 1890 (C. W. Richmond), to September 23, 1921 (F. C. Lincoln); average, April 11 to September 7.

TREE SWALLOW, *Iridoprocne bicolor* (Vieillot).

Migrant, tolerably common in spring, abundant in fall about the marshes.

Spring: March 24, 1919 (R. W. Moore), to May 26, 1889 (C. W. Richmond); average, April 11 to May 14.

Fall: July 3, 1912 (A. H. Howell), to October 17, 1911 (A. K. Fisher); average, July 31 to September 22.

BANK SWALLOW, *Riparia riparia* (Linnaeus).

A local summer resident, less common than formerly, partly because some of its former nesting banks have been destroyed.

Full sets of eggs May 26, 1889, while other birds were seen apparently in migration (C. W. Richmond); fully fledged young June 24 (1889).

April 4, 1918 (I. N. Gabrielson), to September 21, 1920 (F. C. Lincoln); average, April 20 to September 4.

ROUGH-WINGED SWALLOW, *Stelgidopteryx serripennis* (Audubon).

Common summer resident and the most widely distributed of the swallows. It has been known to breed in the drain pipes of a stone wall on upper 16th Street. They have been seen nest-building by April 24 (1887); dates of eggs range from May 16 (1886) to June 20 (1887).

March 24, 1928 (M. T. Donoho), to September 11, 1920 (H. C. Oberholser); average, April 9 to September 4.

CEDAR WAXWING, *Bombycilla cedrorum* Vieillot.

Tolerably common permanent resident, but sometimes in spring very abundant in the shade trees of the city; not common in summer. This is one of the species that does not breed until late in June.

NORTHERN SHRIKE, *Lanius borealis* Vieillot.

Very rare, or accidental winter visitant. In over 80 years it has been recorded in only about a dozen winters.

February 10, 1846 (spec. Nat. Mus.); winter 1859–60 (coll. of R. Ridgway); early 1865, November 7, 1884, and November 17, 1888 (spec. Nat. Mus.); November 11 and 13, 1887 (H. W. Henshaw); December 26, 1887 (C. W. Richmond); January 10, 1891 (W. G. W. Leizear); February 10, 1896 (J. D. Figgins); December 28, 1917 (Oberholser and Swales); January 26, 1920 (G. W. Field); a few other specimens without dates.

MIGRANT SHRIKE, *Lanius ludovicianus migrans* W. Palmer.

Uncommon permanent resident. The earlier collectors knew this bird only as a rather rare winter visitant. Coues and Prentiss did not include it in their first list. Very few were known to breed within our area until after the first decade of the present century. Since then it has increased until now it may be classed as uncommon and local as a breeding species, more common in winter.

Nest with female on it found April 22 (1914) and young left nest at Bell Station, Md., May 20, 1910.

RED-EYED VIREO, *Vireosylva olivacea* (Linnaeus).

Abundant summer resident. Nesting begins about the last week in May. Evidently more than one brood is raised for fresh eggs have been taken from May 26 (1887) to July 23 (1885) and young only a few days old found August 17 (1917).

April 21, 1895 (H. Oldys), to November 11, 1888 (J. D. Figgins); average, April 28 to October 11.

PHILADELPHIA VIREO, *Vireosylva philadelphica* Cassin.

Rare migrant which frequently slips through without detection.

Spring: May 4, 1928 (W. J. Whiting), to May 30, 1917 (A. Wetmore); average, May 8 to 26.

Fall: September 4, 1921 (A. K. Fisher), to October 5, 1919 (A. Wetmore); average, September 9 to 23.

WARBLING VIREO, *Vireosylva gilva gilva* (Vieillot).

Very rare summer resident and apparently decreasing. This species is as much at home in the shade trees of the city as in the woods.

April 21, 1895 (H. Oldys), to September 12, 1903 (W. W. Cooke); average, May 1 to August 30.

YELLOW-THROATED VIREO, *Lanivireo flavifrons* (Vieillot).

Common summer resident. This species vies with its cousin the red-eye in loquaciousness, but is not so abundant as the latter.

Begins nesting soon after the middle of May; young in the nest June 1 (1894). Fresh eggs June 16 (1887).

April 11, 1922 (J. Kittredge, Jr.), to September 29, 1907 (R. W. Williams); average, April 24 to September 16.

SOLITARY VIREO, *Lanivireo solitarius solitarius* (Wilson).

A regular migrant but varies considerably in abundance from year to year.

Spring: April 6, 1905 (T. H. Levering), to June 2, 1924 (A. Wetmore); average, April 19 to May 15.

Fall: September 6, 1903 (W. L. McAtee), to November 3, 1906 (S. W. Mellott); average, October 1 to 20.

WHITE-EYED VIREO, *Vireo griseus griseus* (Boddaert).

A common summer resident in the underbrush along the river and streams. The first of the breeding vireos to arrive, it is the first to start nesting, eggs having been found May 15 (1889).

April 10, 1912 (W. D. Appel), to October 28, 1910 (Miss M. D. Suter); average, April 22 to October 7.

BLACK AND WHITE WARBLER, *Mniotilta varia* (Linnaeus).

Common summer resident. Begin nesting about the middle of May;

fully fledged young have been taken as early as May 24 (1896), and eggs in June.

March 30, 1908 (H. Oldys), to October 18, 1890 (C. W. Richmond); average, April 17 to September 23.

PROTHONOTARY WARBLER, *Protonotaria citrea* (Boddaert).

This is the most recent addition to the list of breeding species, the first nest having been taken at Dyke, Va., June 9, 1928, by F. C. Lincoln. This is a notable case of a species which has increased in recent years. Previous to 1911, it had been recorded only four times; since then it has occurred nearly every year. It is confined almost entirely to the region between Dyke and Mt. Vernon, only two records being from other localities; Falls Church, Va. (Gabrielson), and Chevy Chase, Md. (Stimson). The increase is not merely apparent, for the area where it occurs has been under close observation in spring since about 1905. For several years only single birds were observed, but in 1928 at least 5 were present near Dyke. In 1915 a single bird was noted several times during June (R. W. Moore) and 2 on July 15, 1922. The first definite evidence of nesting was a bird seen gathering nesting material on May 30, 1928. The nest, eggs, and female were collected on June 9 and are now in the National Museum. The earliest date of arrival is April 22, 1922 (Katharine H. Stuart).

WORM-EATING WARBLER, *Helmitheros vermivorus* (Gmelin).

Rather uncommon summer resident, confined to the wooded areas, usually hillsides with lofty deciduous trees.

Young in the nest were found June 5 (1887) and three broods in first plumage June 16 (1914); eggs as late as July 4 (1885).

April 25, 1908 (A. K. Fisher), April 25, 1920 (A. Wetmore); April 25, 1925 (W. H. Ball), to September 13, 1879 (R. Ridgway); average, May 2 to August 31.

BLUE-WINGED WARBLER, *Vermivorus pinus* (Linnaeus).

Rather rare migrant. There are records of its having nested in the region. Nest with four eggs about to hatch found early in June, 1880 (H. H. Birney). Noted near Laurel early in June, 1891, and June 10, 1895, and a nest found some years before (George Marshall).

Spring: April 23, 1925 (Mrs. T. M. Knappen), to May 30, 1891 (G. Marshall); average, May 3 to 22.

Fall: August 13, 1889, to September 14, 1927 (H. G. Deignan); average, August 22 to September 4.

BREWSTER'S WARBLER, *Vermivora leucobronchialis* (Brewster).

This bird, really a hybrid between the Blue-winged and Golden-winged Warblers, has been taken twice in spring. Both specimens are adult males.

May 15, 1885, near Fort Myer (Wm. Palmer).

May 1, 1895, Beltsville, Md. (A. H. Thayer).

LAWRENCE'S WARBLER, *Vermivora lawrencei* (Herrick).

Another hybrid between the Blue-winged and Golden-winged Warblers which has been taken once, near Plummers Island, Md., May 12, 1907 (W. H. Osgood).

GOLDEN-WINGED WARBLER, *Vermivora chrysoptera* (Linnaeus).

A migrant, somewhat commoner than the Blue-wing, but can hardly be classed as common.

Spring: April 24, 1924 (M. T. Cooke), to May 20, 1882 (H. W. Henshaw); average, May 2 to 15.

Fall: August 8, 1889 (C. W. Richmond), to September 14, 1924 (A. Wetmore); average, August 16 to 31.

NASHVILLE WARBLER, *Vermivora ruficapilla ruficapilla* (Wilson).

Tolerably common migrant, found in low second growth, but it also frequents tall, deciduous trees.

Spring: April 20, 1925 (W. H. Ball), to May 20, 1917 (D. C. Mabbott); average, May 3 to 16.

Fall: September 5, 1882 (H. M. Smith), to October 13, 1918 (C. H. Rogers); average, September 13 to October 4.

ORANGE-CROWNED WARBLER, *Vermivora celata celata* (Say).

An accidental visitant which has been taken twice in October.

October 13, 1889, at Munson Hill (A. K. Fisher); October 14, 1894, at Kensington (Wm. Palmer).

A specimen was picked up, recently frozen, in Chevy Chase, D. C., January 4, 1928, and brought to the Biological Survey by Dr. E. T. Wherry.

TENNESSEE WARBLER, *Vermivora peregrina* (Wilson).

Migrant, formerly tolerably common in fall and almost unknown in spring. About 1912 they began to be recorded in spring; in the spring of 1916 they were almost common and have been recorded every spring since, varying in numbers from rare to tolerably common.

Spring: May 2, 1923 (J. Kittredge, Jr.), to June 3, 1917 (I. N. Gabrielson); average, May 7 to 29.

Fall: August 31, 1890 (W. L. Richmond), and 1922 (Kittredge) to October 22, 1922 (Kittredge); average, September 4 to October 7.

At Jefferson, Md., on November 30, 1889, a number were seen and all seemed chilled and unable to fly (J. D. Figgins).

PARULA WARBLER, *Compsothlypis americana americana* (Linnaeus).

Common summer resident. Apparently increasing, for in 1888, Dr. Richmond considered this species rare. Eggs just hatching found May 29 (1897).

April 6, 1928 (A. H. Howell), to October 17, 1919 (Miss M. J. Pellew); average, April 23 to October 4.

Northern Parula Warbler, *Compsothlypis americana pusilla* (Wilson).

A common migrant but seldom distinguished from the breeding form. Very typical individuals may sometimes be distinguished in the field by the very distinct band across the throat.

May 15, 1903 ,and May 6, 1904 (coll. W. W. Cooke); May 26 and 30, 1905 (H. C. Oberholser); May 9, 1912 (W. L. McAtee); May 12, 1913 (H. C. Oberholser); April 23, 1914 (spec. A. Wetmore); October 5, 1917 (M. T. Cooke).

Cape May Warbler, *Dendroica tigrina* (Gmelin).

Migrant; formerly extremely rare in spring, and somewhat less so in fall. Since 1910 it has been recorded every spring, and sometimes is tolerably common. In fall it often frequents the shade trees in the city.

Spring: April 19, 1914 (J. H. Riley), to May 30, 1917 (A. Wetmore); average, May 4 to 17.

Fall: August 4, 1892 (E. J. Brown), to November 26, 1915 (P. Bartsch); average, September 5 to October 9.

It has twice been taken on December 16, in 1888 (J. D. Figgins) and in 1916 (C. W. Richmond).

Yellow Warbler, *Dendroica aestiva aestiva* (Gmelin).

A common summer resident, more frequently noted in the shade trees of the city and suburbs than in the country.

Two broods are probably raised for eggs have been found from May 7 (1921) to June 15 (1890); fully fledged young found June 16 (1914).

April 2, 1916 (W. L. McAtee), to October 12, 1910 (E. J. Brown); average, April 21 to September 9.

Black-throated Blue Warbler, *Dendroica caerulescens caerulescens* (Gmelin).

Common in migration, frequenting principally the higher deciduous woods.

Spring: April 19, 1896 (J. D. Figgins), to May 30, 1888 (C. W. Richmond), and 1917 (A. Wetmore); average, May 1 to 21.

Fall: August 21, 1887 (A. K. Fisher), to October 29, 1913 (L. D. Miner); average September 8 to October 8.

Myrtle Warbler, *Dendroica coronata* (Linnaeus).

Abundant in migration, and a few in winter. In late April it becomes exceedingly common, and many of the birds are still in molt.

Spring: Latest, May 30, 1917 (A. Wetmore); average, April 2 to May 17.

Fall: Earliest, September 9, 1913 (R. W. Moore); average, October 5 to November 14.

Specimen taken August 7, 1859 (E. Coues).

MAGNOLIA WARBLER, *Dendroica magnolia* (Wilson).

Tolerably common migrant, found mostly in mixed woodland and undergrowth.

Spring: April 22, 1891 (C. W. Richmond), to June 3, 1917 (I. N. Gabrielson); average, May 4 to 25.

Fall: August 15, 1886 (A. K. Fisher), to October 28, 1916 (L. D. Miner); average, August 31 to October 1.

CERULEAN WARBLER, *Dendroica cerulea* (Wilson).

Very rare, or accidental in migration. May, 1877 (P. L. Jouy); May 5, 1888, and May 11, 1890 (E. M. Hasbrouck); May 12, 1899 (P. Bartsch); May 22 and 29, 1902 (W. R. Maxon); May 9 and 15, 1904, May 3 and 11, 1907 (W. W. Cooke); May 13, 1909 (R. W. Shufeldt); May 20, 1922 (M. T. Cooke); May 4, 1926 (Ruppert and Ball).

CHESTNUT-SIDED WARBLER, *Dendroica pensylvanica* (Linnaeus).

Usually a common migrant, some years rather scarce. This is a bird of the second growth deciduous woods and is often found in the trees along streams outside the woods.

Spring: April 19, 1902 (H. W. Maynard), to June 2, 1917 (L. D. Miner); average, May 1 to 21.

Fall: August 10, 1894 (J. D. Figgins), to October 14, 1906 (A. K. Fisher); average, August 24 to September 28.

BAY-BREASTED WARBLER, *Dendroica castanea* (Wilson).

Tolerably common in migration. One of the last warblers to arrive in spring. Arlington Cemetery is an especially good place to look for this species.

Spring: May 2, 1896 (H. Oldys), to June 5, 1917 (I. N. Gabrielson); average, May 10 to 25.

Fall: August 17, 1921 (B. H. Swales), to November 6, 1887 (H. W. Henshaw); average, September 7 to October 8.

BLACKPOLL WARBLER, *Dendroica striata* (J. R. Forster).

An abundant migrant. It is one of the late arrivals in spring and through the latter half of May its staccato song can be heard commonly about the city.

Spring: April 21, 1916 (R. W. Moore), to June 16 in three different years; 1907 (R. W. Williams); 1915 (A. H. Howell), and 1926 (S. F. Blake); average, May 5 to June 1.

Fall: August 17, 1912 (H. C. Oberholser), to October 26, 1908 (R. W. Williams); average, September 12 to October 12.

An accidental specimen was taken July 30, 1893 (E. J. Brown).

BLACKBURNIAN WARBLER, *Dendroica fusca* (Müller).

Tolerably common in migration, found principally in the low second growth.

Spring: April 23, 1920 (A. Wetmore), to June 3, 1907 (W. W. Cooke); average, May 3 to 21.

Fall: August 2, 1872 (E. Coues), to October 10, 1919 (Miss M. J. Pellew); average, August 27 to September 26.

YELLOW-THROATED WARBLER, *Dendroica dominica dominica* (Linnaeus).

Local summer resident. It is a tolerably common bird in the moist woodlands bordering the river from Dyke southward, but there are very few records of its occurrence farther up the river. It has been recorded in spring in Arlington Cemetery, the National Zoological Park, and on the Eastern Branch above Bennings.

Coues and Prentiss called this species accidental and in 1883 knew of only two specimens.

Eggs May 2 (1896) near Mt. Vernon and young on the wing July 12 (1896).

March 30, 1927 (Katharine H. Stuart), to September 11, 1927 (H. G. Deignan); average, April 15 to September 4.

BLACK-THROATED GREEN WARBLER, *Dendroica virens* (Gmelin).

Common in migration, when it is found in mixed woodland and usually well up in the trees, but its characteristic song betrays its presence.

Spring: April 18, 1920 (B. H. Swales), to June 10, 1917 (D. C. Mabbott); average, April 29 to May 20.

Fall: August 22, 1921 (J. Kittredge, Jr.), to October 21, 1888 (spec. Nat. Mus.); average, September 6 to October 7.

KIRTLAND'S WARBLER, *Dendroica kirtlandi* (Baird).

Accidental visitant, one occurrence, a specimen taken near Fort Myer, September 25, 1887, by Wm. Palmer, who saw another a week later.

PINE WARBLER, *Dendroica vigorsi* (Audubon).

Tolerably common local summer resident, found wherever there are pine woods. In migration it is often seen in mixed woods. Fully fledged young, June 17 (1888).

March 5, 1922 (C. S. Baer), to October 24, 1916 (H. C. Oberholser); average, March 29 to October 6.

PALM WARBLER, *Dendroica palmarum palmarum* (Gmelin).

Probably occurs every year in migration, but not often distinguished from the commoner Yellow Palm.

It has been noted in spring from April 18, 1904 (W. W. Cooke), to May 20, 1917 (W. L. McAtee), and in fall from September 18, 1887 (W. Palmer), to October 11, 1861 (P. L. Jouy).

YELLOW PALM WARBLER, *Dendroica palmarum hypochrysea* Ridgway.

Common in migration, usually found outside the woods. Along the canal is a good place to find this bird.

Spring: March 28, 1926 (F. C. Lincoln), to May 13, 1923 (Lincoln); average, April 9 to 29.

Fall: September 4, 1887 (H. W. Henshaw), to November 18, 1914 (J. H. Riley); average, September 19 to October 19.

PRAIRIE WARBLER, *Dendroica discolor* (Vieillot).

Common summer resident in the scrub pines, where it would seldom be observed were its presence not betrayed by its characteristic song.

Eggs found May 14 (1891) to July 1 (1890); young in the nest, June 14 (1896).

April 12, 1883 (H. W. Henshaw), to October 3, 1910 (E. J. Brown); average, April 23 to September 16.

OVENBIRD, *Seiurus aurocapillus* (Linnaeus).

Common summer resident. Eggs found May 12 (1896) to June 3 (1906); young in nest, May 24 (1896).

April 10, 1904 (J. H. Riley), to November 13, 1887 (H. W. Henshaw); average, April 23 to October 3.

NORTHERN WATER-THRUSH, *Seiurus noveboracensis noveboracensis* (Gmelin).

Common in migration, found in low wet ground, often seen along the bank of the river.

Spring: April 16, 1921 (Miss M. J. Pellew), to June 2, 1907 (A. K. Fisher); average, April 27 to May 23.

Fall: July 28, 1889 (J. D. Figgins), to October 16, 1919 (M. J. Pellew); average, August 9 to September 25.

GRINNELL'S WATER-THRUSH, *Seiurus noveboracensis notabilis* Ridgway.

A western race of the Northern Water-thrush which has been taken three times; May 11, 1879 (Wm. Palmer); May 5, 1885 (Palmer); August 5, 1886 (A. K. Fisher).

LOUISIANA WATER-THRUSH, *Seiurus motacilla* (Vieillot).

Common summer resident. It breeds along most of the wooded streams, where its wild, ringing song may often be heard though the bird can not be found.

Seen nest building April 10 (1908), eggs May 8 (1921) to May 28 (1888); young on the wing May 24 (1896).

March 27, 1921 (Miss M. J. Pellew), to October 4, 1920 (Pellew); average, April 4 to September 19.

KENTUCKY WARBLER, *Oporornis formosus* (Wilson).

Tolerably common summer resident. Its increase in recent years may be more apparent than real, and due to the greater accessibility of its haunts and the larger number of observers.

Eggs have been found from May 22 (1915) to June 15 (1879); small young about the middle of June (1894) and young strong on the wing July 20 (1913).

April 25, 1920 (W. N. Koelz), to September 5, 1920 (A. K. Fisher); average, May 2 to August 27.

CONNECTICUT WARBLER, *Oporornis agilis* (Wilson).

This is one of the species whose spring and fall migration routes are different. Consequently it is only accidental in spring while in fall it is a tolerably common migrant.

Spring: Four specimens in 1882; May 22 (D. W. Prentiss), May 24 (H. W. Henshaw), May 28 (Wm. Palmer), May 30 (E. W. Nelson); May 24, 1891 (Wm. Palmer); May 17, 1909 (W. H. Osgood), April 30, 1911 (H. H. T. Jackson).

Fall: August 28, 1886 (A. K. Fisher), to October 24, 1889 (Wm. Palmer); average, September 21 to October 14.

MOURNING WARBLER, *Oporornis philadelphia* (Wilson).

Rare migrant. It is seldom found outside of the denser woods and in spring does not appear until so late that it is usually missed.

Spring: May 4, 1928 (W. J. Whiting), to June 7, 1917 (F. Harper); average, May 15 to 28.

Fall: August 17, 1894 (George Marshall), to October 1, 1894 (Wm. Palmer); average, August 19 to September 30.

MARYLAND YELLOW-THROAT, *Geothlypis trichas trichas* (Linnaeus).

Abundant summer resident near water and in swampy places.

Two broods are raised; fresh eggs have been found from May 1 (1887) to June 22 (1884). On June 14, 1914, at Four Mile Run, one nest was found from which the young had flown, another with eggs just hatching, and another with one egg.

April 13, 1891 (Wm. Palmer), to November 2, 1919 (F. Harper); average, April 22 to October 6. Two accidental records in December; one near Arlington, December 29, 1913 (Preble and McAtee); one in Meridian Hill Park, December 12, 1927 (M. T. Cooke).

NORTHERN YELLOW-THROAT, *Geothlypis trichas brachidactyla* (Swainson).

Common in migration but the records are not separable from those of the Maryland Yellow-throat.

Specimens have been taken: September 23, 1902 (struck Washington Monument); May 27 and September 16, 1903, and May 11, 1904 (W. W. Cooke).

YELLOW-BREASTED CHAT, *Icteria virens virens* (Linnaeus).

Common summer resident, frequenting brushy places.

Begins nesting about the middle of May. Eggs have been found from May 18 (1887) to July 2 (1885). Young left nest June 12 (1922).

April 14, 1927 (Miss H. P. Childs), to October 4, 1925 (A. Wetmore); average, April 30 to September 19.

HOODED WARBLER, *Wilsonia citrina* (Boddaert).

Common summer resident. This species seems to have increased in recent years but this may be partly due to its haunts having become better known and visited by more observers. Coues and Prentiss called it only a straggler.

Young just out of the nest have been found June 8 (1902).

April 13, 1919 (A. Wetmore), to October 1, 1899 (J. H. Riley); average, April 29 to September 14.

WILSON'S WARBLER, *Wilsonia pusilla pusilla* (Wilson).

Uncommon in migration, and usually found in low, brushy growth near water.

Spring: May 1, 1876 (H. W. Henshaw); May 1, 1908 (A. M. Stimson), and May 1, 1914 (A. Wetmore), to May 31, 1891 (F. C. Kirkwood); average, May 8 to 24.

Fall: August 22, 1910 (W. W. Cooke), to October 13, 1919 (Miss M. J. Pellew); average, August 26 to September 19.

CANADIAN WARBLER, *Wilsonia canadensis* (Linnaeus).

Common in migration, frequenting the bushes and lower branches.

Spring: May 2, 1923 (J. Kittredge, Jr.), to June 2, 1917 (F. Harper); average, May 8 to 25.

Fall: July 31, 1887 (A. K. Fisher), to October 23, 1921 (A. Wetmore); average, August 19 to September 16.

AMERICAN REDSTART, *Setophaga ruticilla* (Linnaeus).

Abundant migrant and common summer resident. Nesting begins about the first of May (April 27, 1926, a female was seen to bring the first straws to the nest site), and eggs have been found as late as June 25 (1910). Young just hatched were found June 12 (1895).

April 15, 1877 (Wm. Palmer), to October 13, 1927 (W. H. Ball); average, April 22 to September 20.

AMERICAN PIPIT, *Anthus rubescens* (Tunstall).

A rather rare and irregular migrant. It has been said to winter, but there is no record of its occurrence in January.

Spring: February 16, 1908 (W. W. Cooke), to May 14, 1910 (E. A. Preble); average, March 11 to April 24.

Fall: October 1, 1916 (F. Harper), to December 23, 1916 (J. P. Young); average, October 11 to November 27.

MOCKINGBIRD, *Mimus polyglottos polyglottos* (Linnaeus).

Permanent resident, now common and well distributed. Coues and Prentiss, in both lists, called this a rare summer resident. In the last decade of the last century it was almost unknown; active collectors might not find one in the course of several years. By 1902 or 1903 a few pairs (probably not over a half dozen) were known, but outside their particular

localities the species was never seen. About 1905 it began gradually to increase until it is now common.

Dr. Wetmore reports that on August 22, 1925, he saw fifteen mockingbirds along a hedge in the space of a hundred yards near Cabin John, Md. The law prohibiting the taking of these birds for cage birds has undoubtedly been partly responsible for their increase. It is now common not only in the country but is also quite at home and frequently nests in the suburbs and even in the city.

They begin nesting in late April and it is probable that more than one brood is raised, for young only recently from the nest have been found early in August.

CATBIRD, *Dumetella carolinensis* (Linnaeus).

Abundant summer resident. This is one of the species that comes into the suburbs and city parks. It occasionally remains into the winter. One was noted December 25–31, 1883 (H. W. Henshaw), and one recently killed January 13, 1889 (C. W. Richmond). One was noted near the Harvard Street entrance to the Zoological Park from December 13, 1924, to January 6, 1925 (W. H. Ball), and one appeared at a feeding table about a block from there about February 2, 1925 (Mrs. David White).

Fresh eggs have been found from May 17 (1885) to July 12 (1885); young out of nest, June 14 (1914).

March 14, 1918 (C. M. Shaw), to December 6, 1917 (B. H. Swales); average, April 22 to October 25.

One about February 1, 1898 (J. H. Gaut), and February 21, 1915 (S. W. Mellott).

BROWN THRASHER, *Toxostoma rufum* (Linnaeus).

Common summer resident.

Eggs have been taken from early in May to the end of June; young on the wing May 30 (1888).

March 4, 1867 (Spec. Nat. Mus.), to November 13, 1887 (C. W. Richmond); average, April 3 to September 26.

In two years stray birds have appeared on February 22, in 1916 (Miner and Moore), and in 1925 (F. Bond).

CAROLINA WREN, *Thryothorus ludovicianus ludovicianus* (Latham).

A permanent resident, usually near water, varying in abundance from year to year; at present fairly common. During a severe storm in February, 1918, this species was nearly exterminated in this region and it was several years before it recovered. This is one of the most sedentary species, and year after year may be found near the same place.

They have been found building as early as April 11 (1886), and fully fledged young were taken May 2 (1890). Eggs of the second brood were found in a Bank Swallow's nest June 16, 1889 (C. W. Richmond).

BEWICK'S WREN, *Thryomanes bewicki bewicki* (Audubon).

A southern species which straggles to our area, but though it has been found in summer, it has never been known to breed.

Since 1882 it has been noted in spring in 14 years from March 26, 1897 (J. H. Gaut), to April 29, 1905 (A. H. Howell). One was seen at close range near Falls Church February 8, 1918 (J. H. Riley), and one recorded in "late May," 1906 (Howell). On July 19, 1925, one appeared in the west court of the National Museum (H. H. T. Jackson). It has been recorded three times in fall; September 9, 1928 (Jackson); November 24, 1889 (J. D. Figgins); and December 22, 1890, on the Mall (C. W. Richmond).

House Wren, *Troglodytes aedon aedon* Vieillot.

Common summer resident. Two broods are usually raised and eggs have been taken from May 1 (1887) to July 7 (1885).

March 26, 1910 (E. B. Gregg), to November 26, 1914 (F. M. Weston); average, April 18 to October 16.

Winter Wren, *Nannus hiemalis hiemalis* (Vieillot).

A fairly common winter visitant whose elusiveness makes it seemingly a rarity.

September 25, 1925 (H. G. Deignan), to May 1, 1882 (spec. Nat. Mus.); average, October 5 to April 21.

Short-billed Marsh Wren *Cistothorus stellaris* (Naumann).

Apparently very rare in migration, but possibly not so rare as the few dates would indicate.

Specimen May 9, 1890, near Rock Creek (E. M. Hasbrouck); specimen May 3, 1893, near the Tidal Basin (Hasbrouck); 2 seen May 10, 1927, in a meadow at Soldiers' Home (W. H. Ball); one was collected (F. C. Lincoln) the next day and the other disappeared the day following.

Long-billed Marsh Wren, *Telmatodytes palustris palustris* (Wilson).

Abundant summer resident in the marshes along the Potomac River and Eastern Branch. There are two records in winter; one seen near Dyke, December 27, 1914–January 3, 1915 (W. W. Cooke), and one that wintered on Eastern Branch near Woodridge, 1919–1920 (F. Harper).

Nesting begins the last of May for eggs advanced in incubation have been found June 1 (1885), and fresh eggs as late as June 26 (1887).

April 17, 1920 (F. C. Lincoln), to November 16, 1926 (W. H. Ball); average, May 2 to October 9.

Brown Creeper, *Certhia familiaris americana* Bonaparte.

Fairly common winter visitant.

One seen at Dranesville, Va., just outside our area, on June 2, 1912 (A. G. Whitney), was a delayed migrant.

September 22, 1858 (E. Coues), to May 9, 1925 (M. T. Donoho); average, October 6 to April 24.

White-breasted Nuthatch, *Sitta carolinensis carolinensis* Latham.

A tolerably common permanent resident. The nuthatch breeds almost entirely on the Piedmont Plateau and may be partially resident there.

It is very rarely found on the Coastal Plain in summer but is tolerably common there in winter.

They begin to nest about the middle of April; young have been found early in May.

RED-BREASTED NUTHATCH, *Sitta canadensis* Linnaeus.

A winter visitant, varying in abundance from common to rare in different seasons. It is likewise quite erratic as to its times of arrival and departure.

August 22, 1903 (W. L. McAtee), to May 20, 1917 (I. N. Gabrielson); average, September 24 to May 5.

TUFTED TITMOUSE, *Baeolophus bicolor* (Linnaeus).

Abundant permanent resident everywhere except in the city. The breeding season begins early; young have been found as early as May 7 (1914). More than one brood is raised since young just out of the nest were found as late as August 3 (1919).

BLACK-CAPPED CHICKADEE, *Penthestes atricapillus atricapillus* (Linnaeus).

Very rare winter visitant. It has been frequently reported, but there are few records that can be considered authentic. Sight records are not reliable in the majority of cases.

January 12, 1859 (spec. Nat. Mus.); December 10, 1859 (spec. taken by D. W. Prentiss now in Nat. Mus.); December 24, 1876, December 25, 1878, January 2, 1879 (specimens taken by Wm. Palmer); common March and April, 1885, 19 specimens taken March 15–April 19 (Wm. Palmer); October 19, 1896 (specimen by W. Palmer).

CAROLINA CHICKADEE, *Penthestes carolinensis carolinensis* (Audubon).

Common permanent resident. They begin nesting in April (♀ with egg nearly ready to be laid taken April 11, 1888), eggs have been taken from April 27 (1879). Young out of nest May 19 (1926).

GOLDEN-CROWNED KINGLET, *Regulus satrapa satrapa* Lichtenstein.

A winter visitant, in some years abundant, in others rather scarce.

September 20, 1910 (E. J. Brown), to April 27, 1888 (E. M. Hasbrouck); average, October 7 to April 15.

RUBY-CROWNED KINGLET, *Regulus calendula calendula* (Linnaeus).

Common in migration, occasionally seen in winter.

September 14, 1913 (W. W. Cooke), to May 17, 1917 (I. N. Gabrielson); average, April 7 to May 4 and October 2 to November 7.

BLUE-GRAY GNATCATCHER, *Polioptila caerulea caerulea* (Linnaeus).

Common summer resident, mostly on the Coastal Plain. They begin nest-building about the third week in April, and young on the wing have been found May 24 (1896).

March 6, 1916 (L. D. Miner), to September 13, 1919 (F. Harper); average, April 8 to August 28.

A bird seen October 24, 1896 (W. Palmer), was a cripple, as was probably the one taken November 23, 1890 (C. W. Richmond). There are two records of its occurrence on New Year's Day, both of the birds apparently in good condition: January 1, 1917, at the Arlington Experiment Farm (M. T. Cooke) and January 1, 1924, near the Tidal Basin (S. F. Blake).

WOOD THRUSH, *Hylocichla mustelina* (Gmelin).

Common summer resident, more abundant than formerly. They now nest freely about lawns in the suburbs as well as in the woods.

Eggs have been taken from May 1 (1895) to June 8 (1895); young on the wing about June 15.

April 13, 1888 (E. M. Hasbrouck), to October 30, 1913 (A. H. Howell); average April 24 to October 1.

WILSON'S THRUSH, VEERY, *Hylocichla fuscescens fuscescens* (Stephens).

Common in migration. The migrant thrushes slip through so quickly and silently that they seem much rarer than they really are.

Spring: April 9, 1922 (F. C. Lincoln), to June 2, 1907 (A. K. Fisher); average May 1 to 19.

Fall: August 18, 1889 (J. D. Figgins), to October 1, 1916 (L. D. Miner); average August 23 to September 13.

WILLOW THRUSH, *Hylocichla fuscescens salicicola* Ridgway.

A specimen of this western race of the Veery was taken in the Zoological Park September 2, 1920, by Ned Hollister. Another was reported seen near the same place May 7, 1922, by H. C. Oberholser.

GRAY-CHEEKED THRUSH, *Hylocichla aliciae aliciae* (Baird).

Fairly common in migration.

Spring: May 6, 1928 (F. C. Lincoln), to June 3, 1917 (I. N. Gabrielson); average, May 10 to 26.

Fall: September 1, 1860 (spec. Nat. Mus.), to October 20, 1903 (A. K. Fisher); average, September 21 to October 7.

BICKNELL'S THRUSH, *Hylocichla aliciae bicknelli* Ridgway.

This race is tolerably common in migration, but since it can not be distinguished in the field from the Gray-cheeked Thrush, there are few definite records.

Specimen records are as follows: 2 May 14, and 1 May 18, 1888 (R. Ridgway); May 17, 1892, and May 24, 1893 (E. A. Preble); May 27, 1903 (W. W. Cooke); October 3, 1885 (C. W. Richmond).

OLIVE-BACKED THRUSH, *Hylocichla ustulata swainsoni* (Tschudi).

Common in migration.

Spring: April 18, 1925 (M. T. Cooke), to June 2, 1917 (F. Harper); average, May 3 to 24.

Fall: September 1, 1926 (A. Wetmore), to November 1, 1886 (A. K. Fisher); average, September 15 to October 9.

HERMIT THRUSH, *Hylocichla guttata pallasi* (Cabanis).

Common migrant and rare winter visitant.

Spring: Latest, May 17, 1902 (W. W. Cooke); average, March 24 to May 1.

Fall: Earliest, September 18, 1900 (R. W. Shufeldt); average, October 16 to November 20.

NORTHERN ROBIN, *Planesticus migratorius migratorius* (Linnaeus).

Abundant in migration, a few in winter, the majority of the robins found in winter belonging to this race. Those found in the woods in early spring are nearly all migrant *migratorius* while those in the city are the breeding form, *achrusterus*. Their migration seems to be principally in March and October when robins are abundant in the woods.

Specimens in the National Museum collection determined by J. H. Riley and A. Wetmore range in date from October 17, 1889, to April 4, 1884. There was a specimen in the collection of W. W. Cooke taken April 10, 1903.

SOUTHERN ROBIN, *Planesticus migratorius achrusterus* (Batchelder).

Abundant summer resident, but no specimens of this race have yet been recorded in winter. The earlier writers all refer to the robin as an uncommon breeder, though common in migration. Since the killing of robins for market has been stopped, the species has greatly increased in abundance throughout the eastern United States. This is now one of the most abundant species about Washington from late February to early November, nesting freely about the city. Fresh eggs have been found from April 11 (1905) to July 3 (1887); young on the wing May 21 (1907).

Specimens in the National Museum determined by J. H. Riley and A. Wetmore range in date from April 5, 1891, to October 29, 1859.

BLUEBIRD, *Sialia sialis sialis* (Linnaeus).

Permanent resident, local in winter, and only fairly common in summer. It is common during migration in March and October. The breeding season is a long one, for two and sometimes three broods are raised. Young in the nest have been found from April 28 (1921) to August 10 (1919). Bluebirds are much less common than formerly; several times, notably in the winters of 1895 and 1912, many have been killed by storms, and, at least in the latter case, they recovered their numbers very slowly. It is a question whether they have ever been as abundant since.

HYPOTHETICAL LIST.

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

Has been reported as "occasional in autumn" but no specimen has been found. One was reported seen off Hains Point, May 20, 1928 (W. H. Ball), and while there seems little reason to doubt the identification it seems best to consider this species as hypothetical until a specimen is obtained.

BLACK SKIMMER, *Rynchops nigra* Linnaeus.

Coues and Prentiss report having *seen* an individual of this species "on the Potomac, some distance below Washington," September 8, 1858. Another individual was reported seen briefly over the Anacostia River, April 14, 1928, by C. H. M. Barrett. In view of the uncertainty of these records it seems advisable to place the species on the hypothetical list until a specimen is obtained.

WHITE-FRONTED GOOSE, *Anser albifrons gambeli* Hartlaub.

The authority for including this species is a specimen in the National Museum bought in the Washington market in March, 1856, but there is no evidence that it was shot in the immediate vicinity.

PRAIRIE CHICKEN, *Tympanuchus americanus americanus* (Reichenbach).

A specimen taken March 17, 1885, was undoubtedly an introduced bird, for about that time birds taken in the west were liberated in Kent County, Maryland.

CHUCK-WILL'S-WIDOW, *Antrostomus carolinensis* (Gmelin).

The presence of this species in the list proves to be based on the record of a bird *heard* by Mr. Ridgway in 1895 and on descriptions of strange birds seen by other persons who were not acquainted with the species. Dr. Richmond had all the data available when he prepared his lists of 1898 and 1902 but thought best not to include it, and it seems best to transfer it to the hypothetical list until a specimen is obtained.

SCISSOR-TAILED FLYCATCHER, *Muscivora forficata* (Gmelin).

This is a south-western species of which there are two reports of birds *seen* by persons not familiar with the species. The nearest specimen record is from Aylett, Virginia, some distance beyond our territory.

PINE GROSBEAK, *Pinicola enucleator leucura* (Müller).

A card in the Biological Survey files credits H. W. Henshaw with having taken a specimen of this northern species in January, 1888. Dr. Fisher, who collected with Mr. Henshaw at that time, says he has no knowledge of such a find, and since careful search of Mr. Henshaw's original notes from which the cards were copied fails to show it, there was evidently some error in the copying. Since the only other record is of three reported *seen* November 26, 1903 (T. H. Levering), it seems best to consider this hypothetical until a specimen is secured.

BIBLIOGRAPHY.

The present bibliography is intended to give only the more important lists of birds of the area and to show chronologically the growth of the list of the birds of the Washington region.

1816. Warden, David Baillie. [Birds seen in the District of Columbia.] A Chorographical and Statistical Description of the District of Columbia. Paris. 1816, pp. 210–211.

Lists 32 species. (This list was reprinted in the "Osprey," V, 1901, pp. 57–58.)

1862. Coues, Elliott, and Prentiss, Daniel Webster. List of birds ascertained to inhabit the District of Columbia, with the times of arrival and departure of such as are non-residents, and brief notices of habits, etc. 16th Annual Report Smithsonian Institution, 1861 (1862), pp. 399–421.

Enumerates 226 species, two as doubtful, making the list 224 certain and 2 hypothetical forms.

1876. Shufeldt, Robert Wilson. Birds of the District of Columbia. Field and Forest, I, 1876, pp. 79–80.

Names 38 permanent residents (and one duplicated), 29 winter residents and mentions 6 other species. The list still stands as 224 species and 2 hypothetical.

1876. Jouy, Pierre Louis. Notes on Forster's Tern. Field and Forest, II, 1876, pp. 29–31.

Adds this species, making the list 225 species and 2 hypothetical forms.

1877. Jouy, Pierre Louis. Catalogue of the Birds of the District of Columbia. Field and Forest, II, 1877, pp. 154–156, 178–181.

A nominal list of 240 species which adds 14: Wilson Petrel, European Widgeon, Shoveler, Brant, Florida Gallinule, Semipalmated Plover, Barn Owl, Arkansas Kingbird, Bronzed Grackle, English Sparrow, American Crossbill, White-winged Crossbill, White-eyed Vireo, Mourning Warbler, and drops the Chickadee. Makes the list 238 certain and 2 hypothetical forms.

1877. Coues, E., and Prentiss, D. W. Remarks on Birds of the District of Columbia. Field and Forest, II, 1877, pp. 191–193.

Comparison between their list and Jouy's, restores the Chickadee and eliminates the Crested Grebe, making the list 238 certain and 2 hypothetical forms.

1877. Jouy, P. L. Field Notes on some of the Birds of the District of Columbia. Field and Forest, III, 1877, pp. 51–52.

Adds Lark Sparrow and Cerulean Warbler, making the list 240 certain and 2 hypothetical forms.

1877. Catalogue of the Birds of the District of Columbia, Prepared by Pierre Louis Jouy, with Remarks on the Birds of the District, by Drs. Coues and Prentiss.

A reprint of the two articles from Field and Forest, repaged.

1878. Roberts, William Florian. Additions to the List of District Birds. Field and Forest, III, 1878, p. 172.

Adds the Dowitcher, making the list 241 certain and 2 hypothetical forms.

1882. Ridgway, Robert. Birds New to or Rare in the District of Columbia. Bull. Nutt. Ornith. Club, VII, 1882, p. 253.

Adds Sharp-tailed Sparrow (later ascertained to be the Nelson's Sparrow), Loggerhead (Migrant) Shrike, and Bewick's Wren, making the list 244 certain and 2 hypothetical forms.

1883. Coues, Elliott, and Prentiss, Daniel Webster. Avifauna Columbiana: being a List of Birds ascertained to inhabit the District of Columbia. Bulletin 26, U. S. National Museum, 1883, 133 pp., 4 maps.

An annotated list of 248 species (really 249 forms, since both forms of the Palm Warbler are included under one number), and still includes the two hypothetical forms. Does not include the Cerulean Warbler, but adds Clapper Rail, Rough-legged Hawk, Duck Hawk, and Palm Warbler, making the list now really 248 certain and 2 hypothetical forms.

1885. Palmer, William. Occurrence of Helminthophila leucobronchialis in Virginia. Auk, II, 1885, p. 304.

Adds this hybrid to the list, making it 248 certain and 2 hypothetical forms and 1 hybrid.

1886. Smith, Hugh McCormick. Birds New to the District of Columbia. Auk, III, 1886, pp. 139–140.

Adds the European Teal, Northern (really Red) Phalarope, Stilt Sandpiper, and Red-backed Sandpiper, making the list 252 certain and 2 hypothetical forms and 1 hybrid.

1887. Webster, Frederick Smith. The Saw-whet Owl in the District of Columbia. Auk, IV, 1887, p. 167.

Adds this species, making 253 certain and 2 hypothetical forms and 1 hybrid.

1887. Henshaw, Henry Wetherbee, The Lapland Longspur about Washington, D. C. Auk, IV, 1887, p. 347.

Adds this to the list, making it 254 certain and 2 hypothetical forms and 1 hybrid.

1888. Richmond, Charles Wallace. An Annotated List of Birds Breeding in the District of Columbia. Auk, V, 1888, pp. 18–25.

Notes on 100 species, but adds nothing to the list.

1888. Smith, Hugh M. and Palmer, Wm. Additions to the Avifauna of Washington and Vicinity. Auk, V, 1888, pp. 147–148.

Records 12 forms new to the list: Red-throated Loon, White Pelican, Yellow Rail, Long-billed Dowitcher, Piping Plover, Ruddy Turnstone, Carolina Paroquet, Olive-sided Flycatcher, Prairie Horned Lark, Lincoln's Sparrow, Kirtland's Warbler and Grinnell's Water-thrush. List now 266 certain and 2 hypothetical forms and 1 hybrid.

1888. Hasbrouck, Edwin Marble. Dendroica caerulea in the District of Columbia. Auk, V, 1888, pp. 323–324.

First specimen for the region, though Jouy had recorded a sight identification. Lists 266 certain and 2 hypothetical forms and 1 hybrid.

1889. Palmer, Wm. First Occurrence of the Philadelphia Vireo near Washington, D. C. Auk, VI, 1889, p. 74.

Makes list 267 certain and 2 hypothetical forms and 1 hybrid.

1890. Fisher, Albert Kenrick. Capture of a Specimen of the Orange-crowned Warbler (*Helminthophila celata*) in the Vicinity of Washington, D. C. Auk, VII, 1890, p. 96.

The addition of this species makes the list 268 certain and 2 hypothetical forms and 1 hybrid.

1890. Ridgway, Robert. *Junco hyemalis shufeldti* in Maryland. Auk, VII, 1890, p. 289.

This specimen, later reidentified as the Montana Junco, makes the list 269 certain and 2 hypothetical forms and 1 hybrid.

1890. Hasbrouck, Edwin Marble. Cistothorus stellaris at Washington, D. C. Auk, VII, 1890, p. 291.

This makes the list 270 certain and 2 hypothetical forms and 1 hybrid.

1891. Richmond, Charles Wallace. Barrow's Golden-eye (*Glaucionetta islandica*) near Washington, D. C. Auk, VIII, 1891, p. 112.

This makes the list 271 certain and 2 hypothetical forms and 1 hybrid.

1893. Hasbrouck, Edwin Marble. Rare Birds near Washington, D. C. Auk, X, 1893, pp. 91–92.

Adds the Wood Ibis and Yellow-headed Blackbird, making the list 273 certain and 2 hypothetical forms and 1 hybrid.

1894. Matthews, Renick Seymour. Baird's Sandpiper near Washington, D. C. Auk, XI, 1894, p. 325.

This addition makes the list 274 certain and 2 hypothetical forms and 1 hybrid.

1894. Palmer, William. The Ruff and Western Sandpiper near Washington, D. C. Auk, XI, 1894, p. 325.

This addition brings the list to 276 certain and 2 hypothetical forms and 1 hybrid.

1895. Kirkwood, Frank Coates. A List of the Birds of Maryland. Trans. Maryland Academy of Sciences, 1895, pp. 241–281.

Records specimens of American Eider, Sanderling, and Bicknell's Thrush, making the list 279 certain and 2 hypothetical forms and 1 hybrid.

1896. Palmer, William. The Scissor-tailed Flycatcher in Virginia and Maryland. Auk, XIII, 1896, p. 83.

Considers this as belonging to the Washington list, making it 280 certain and 2 hypothetical forms and 1 hybrid.

1896. Richmond, Charles Wallace. List of Birds of the District of Columbia. July, 1896, pp. 1–12.

An annotated list of birds of the region, of which only 40 species were published. Specimens of Hawaiian Petrel are recorded under Leach's Petrel, making the list 281 certain and 2 hypothetical forms and 1 hybrid.

1897. Figgins, Jesse Dade. Bachman's Sparrow in Maryland. Auk, XIV, 1897, p. 219.

This addition brings the list to 282 certain and 2 hypothetical forms and 1 hybrid.

1897. Bartsch, Paul. Uria lomvia, An Addition to the Avifauna Columbiana. Auk, XIV, 1897, pp. 312–313.

This makes the list 283 certain and 2 hypothetical forms and 1 hybrid.

1897. Bartsch, Paul. A Few Notes on the Avifauna Columbiana. Auk, XIV, 1897, p. 326.

Adds the Swallow-tailed Kite, making the list 284 certain and 2 hypothetical forms and 1 hybrid.

1898. Maynard, Lucy Warner. Birds of Washington and Vicinity, including adjacent parts of Maryland and Virginia. Washington, 1898, 204 pp. Revised edition, 1902, 210 pp., illus.

A handbook of the birds of the region. Contains a list of all birds of the region by Dr. Richmond.

1898. Richmond, Charles Wallace. List of All Birds Found in the District of Columbia. In Maynard, Birds of Washington and Vicinity, 1898, pp. 178–186.

A classified list of 291 forms, in which the doubtful *Milvulus* of Coues and Prentiss is dropped and four forms are added: Glossy Ibis, Northern Phalarope, Black Vulture, and Northern Parula Warbler, making the list 288 certain and 1 hypothetical form and 1 hybrid.

1901. Daniel, John Warwick, Jr. Occurrence of the Glossy Ibis at Washington, D. C. Auk, XVIII, 1901, p. 271.

First positive record, though it had been admitted by Dr. Richmond on the strength of an old record by Ord. List remains 288 certain and 1 hypothetical form and 1 hybrid.

1902. Richmond, C. W. List of All Birds Found in the District of Columbia. In Maynard, Birds of Washington and Vicinity, revised edition, 1902, pp. 178–186.

A reprint of his 1898 list to which is added the Yellow-crowned Night Heron, making the list 289 certain and 1 hypothetical form and 1 hybrid.

1907. Osgood, Wilfred Hudson. Helminthophila lawrencei near the District of Columbia. Auk, XXIV, 1907, pp. 342–343.

Records a specimen of this hybrid, making the list 289 certain and 1 hypothetical form and 2 hybrids.

1908. Cooke, Wells Woodbridge. Bird Migration in the District of Columbia. Proc. Biol. Soc. Wash., XXI, 1908, pp. 107–118.

A table of migration dates, list of permanent residents, and dates of occurrence of casual visitants. Lists 294 forms in which he adds the Chuck-will's-widow and Northern Yellow-throat, but inadvertently omits the Carolina Paroquet; also throws doubt upon the record of the Barrow's Goldeneye. The list is therefore 291 certain and 2 hypothetical forms and 2 hybrids.

1912. Gronberger, Sven Magnus. Starlings. Forest and Stream, LXXVIII, January-June, 1912, p. 178.

Records first specimens taken in Washington, making the list 292 certain and 2 hypothetical forms and 2 hybrids.

1913. Cooke, Wells Woodbridge. Bird Migration in the District of Columbia. Proc. Biol. Soc. Wash., XXVI, 1913, pp. 21–26.

Revised table for spring migration, nothing added.

1917. Oberholser, Harry Church. Autumn Water-bird Records at Washington, D. C. Proc. Biol. Soc. Wash., XXX, 1917, p. 122.

Adds the White-rumped Sandpiper and Black-bellied Plover, making the list 293 certain and 2 hypothetical forms and 2 hybrids.

1919. Swales, Bradshaw Hall. A Former Record of the Heath Hen (Tympanuchus cupido) at Washington, D. C. Proc. Biol. Soc. Wash., XXXII, 1919, p. 198.

Though an old record this is an addition and makes the list 294 certain and 2 hypothetical forms and 2 hybrids.

1920. Wetmore, Alexander. The Newfoundland Crossbill in the Washington Region. Auk, XXXVII, 1920, p. 456.

The addition of this race of the American Crossbill brings the list to 295 certain and 2 hypothetical forms and 2 hybrids.

1921. Cooke, May Thacher. Birds of the Washington Region. Proc. Biol. Soc. Wash., XXXIV, 1921, pp. 1–21.

A revision of Cooke's list of 1908, recording 299 certain and 2 hypothetical forms and 2 hybrids. In this list the hypothetical Barrow's Goldeneye is dropped on the basis of a reexamination of the specimen; the Newfoundland Crossbill is inadvertently omitted, and the following are added: Glaucous Gull, Red-legged Black Duck, White-fronted Goose, Northern Robin (in a footnote), and the Prairie Chicken to the hypothetical list. The list, therefore, is 300 species and subspecies, 2 hybrids and 2 hypothetical forms.

1921. Court, Edward Joseph. Some Records of Breeding Birds for the Vicinity of Washington, D. C. Auk, XXXVIII, 1921, pp. 281–282.

Adds the American Bittern, Virginia Rail, and Florida Gallinule to the breeding birds of the region.

1921. Hollister, Ned. The Willow Thrush in the District of Columbia. Auk, XXXVIII, 1921, p. 463.

Adds this race, making the list 301 certain and 2 hypothetical forms and 2 hybrids.

1922. Oberholser, Harry C. The Season: Washington Region. Bird-lore, XXIV, 1922, pp. 350–351.

Records the occurrence of the Louisiana Heron, making the list 302 certain and 2 hypothetical forms and 2 hybrids.

1923. Wetmore, Alexander. The Evening Grosbeak near Washington, D. C. Auk, XL, 1923, p. 130.

This addition makes the list 303 certain and 2 hypothetical forms and 2 hybrids.

1926. Wetmore, Alexander. The Migrations of Birds. Cambridge, 1926, 217 pp., illus.

On page 86, Dr. Wetmore calls attention to the fact that two races of Crows are found around Washington. This makes the list 304 certain and 2 hypothetical forms and 2 hybrids.

1927. Ball, William Howard. Notes from Washington, D. C. Auk, XLIV, 1927, pp. 257–258.

Adds the Knot to the local list, making it 305 certain and 2 hypothetical forms and 2 hybrids.

1928. Ball, William Howard. The Hudsonian Curlew (Numenius hudsonicus) at Washington, D. C. Auk, XLV, 1928, p. 371.

This latest addition brings the list to 306 certain and 2 hypothetical forms and 2 hybrids.

[The present (1929) list contains 301 certain and 7 hypothetical forms and 3 hybrids.]

SUMMARY OF MIGRATION RECORDS.

Species.	No. of dates.	Earliest date of spring arrival.	Average date of spring arrival	No. of dates.	Average date of spring departure.	Latest date of spring departure.	No. of dates.	Earliest date of fall arrival.	Average date of fall arrival.	No. of dates.	Average date of fall departure.	Latest date of fall departure.
Horned Grebe	....	Winters	.....	11	April 28	May 23, 1927	8	Sept. 26, 1925	Oct. 28	....	.....	.....
Pied-billed Grebe	16	Feb. 22, 1922	Mar. 28	17	May 3	May 15, 1920	16	Aug. 21, 1894	Sept. 11	10	Nov. 4	Dec. 3, 1921
Common Loon	....	Winters	.....	11	May 14	June 2, 1907	6	Oct. 25, 1887	Nov. 6	....	.....	.....
Herring Gull	....	Winters	.....	15	May 6	May 20, 1917	11	Oct. 16, 1919	Nov. 10	....	.....	.....
Ring-billed Gull	14	Rare, winter	Feb. 25	11	May 11	June 1, 1928	8	Aug. 20, 1927	Oct. 8	....	Nov.	.....
Bonaparte's Gull	19	Rare, winter	April 6	20	May 12	June 2, 1927	5	Aug. 23, 1928	Oct. 18	4	Dec. 2	.....
Black Tern	....	.....	.....	....	.....	.....	12	July 12, 1926	Aug. 15	10	Sept. 14	Sept. 22, 1894
American Merganser	....	Winters	.....	11	April 27	May 26, 1905	3	Oct. 13, 1889	Oct. 29	....	.....	.....
Red-breasted Merganser	....	Winters	.....	8	April 30	May 30, 1927	2	Oct. 31, 1920	Oct. 29	....	.....	.....
Hooded Merganser	....	Winters	.....	8	April 13	May 11, 1917	11	Oct. 1, 1889	Oct. 29	....	.....	.....
Mallard	....	Winters	.....	8	April 24	May 14, 1922	16	Aug. 20, 1927	Sept. 24	....	.....	.....
Black Duck	....	Winters	.....	11	May 3	June 1, 1928	18	Aug. 1, 1887	Sept. 17	....	.....	.....
American Widgeon	....	Winters	.....	7	April 5	April 21, 1928	5	Sept. 4, 1905	Oct. 1	....	.....	.....
Green-winged Teal	....	.....	.....	....	.....	.....	12	Sept. 18, 1903	Oct. 4	7	Nov. 7	Nov. 15, 1902
Blue-winged Teal	5	Mar. 12, 1922	Mar. 21	10	April 20	May 11, 1917	21	July 25, 1926	Aug. 30	6	Nov. 1	Dec. 10, 1927
American Pintail	....	Winters	.....	10	April 15	May 14, 1922	12	Aug. 27, 1928	Oct. 3	....	.....	.....
Redhead	....	Winters	.....	7	Mar. 25	April 21, 1912	12	Oct. 5, 1901	Oct. 13	....	.....	.....
Canvasback	....	Winters	.....	9	April 1	April 21, 1928	23	Sept. 10, 1922	Oct. 17	....	.....	.....
Greater Scaup	....	Winters	.....	4	May 12	May 27, 1906	8	Sept. 26, 1920	Oct. 22	....	.....	.....
Lesser Scaup	....	Winters	.....	10	May 19	June 3, 1928	15	Sept. 25, 1903	Oct. 13	....	.....	.....

Ring-necked Duck	....	.....	.....	8	Mar. 30	April 13, 1926	6	Oct. 6, 1901	Oct. 21	....	.....	.....
American Goldeneye	....	Winters	.....	10	April 3	April 27, 1918	14	Oct. 8, 1901	Oct. 26	....	.....	.....
Ruddy Duck	....	Winters	.....	6	April 30	May 22, 1928	21	Aug. 20, 1889	Sept. 27	....	.....	.....
Canada Goose	....	Winters	.....	11	April 3	April 22, 1890	23	Oct. 5, 1888	Oct. 18	....	.....	.....
American Bittern	17	Mar. 22, 1894	April 10	....	.....	Breeds	....	.....	.....	....	.....	Nov. 7, 1860
Least Bittern	7	April 27, 1922	May 2	....	.....	Breeds	....	.....	.....	....	.....	.....
Great Blue Heron	18	Rare, winter	Mar. 30	9	May 26	Rare, summer	17	.....	Aug. 2	9	Nov. 1	.....
Green Heron	28	April 3, 1927	April 19	....	.....	Breeds	....	.....	.....	15	Sept. 21	Oct. 16, 1923
Sora	3	April 1, 1928	April 18	3	May 13	May 21, 1926	16	July 8, 1918	Aug. 12	9	Oct. 19	Nov. 11, 1878
American Coot	13	Rare, winter	Mar. 25	10	May 10	June 13, 1926	21	Sept. 1, 1890	Sept. 29	15	Nov. 10	.....
American Woodcock	26	Feb. 6, 1916	Mar. 8	....	.....	Breeds	....	.....	.....	12	Nov. 20	.....
Wilson's Snipe	34	Occ. winter	Mar. 13	14	May 3	May 14, 1910	8	Aug. 26, 1928	Sept. 9	3	Nov. 11	.....
Pectoral Sandpiper	5	Mar. 26, 1916	April 23	....	.....	June 11, 1926	5	Aug. 10, 1914	Aug. 23	4	Oct. 15	Nov. 1, 1916
Least Sandpiper	5	April 17, 1926	April 28	7	May 20	June 14, 1926	6	July 17, 1927	Aug. 14	5	Oct. 15	Nov. 22, 1917
Semipalmated Sandpiper	7	May 4, 1927	May 11	4	May 27	June 14, 1926	10	July 22, 1927	Aug. 13	7	Oct. 10	Oct. 28, 1916
Greater Yellowlegs	11	April 1, 1928	April 19	9	May 17	June 3, 1928	5	July 17, 1927	Aug. 3	6	Oct. 13	Nov. 2, 1919
Lesser Yellowlegs	10	April 5, 1925	April 18	14	May 13	May 22, 1926	10	July 17, 1927	Aug. 20	6	Oct. 12	Nov. 1, 1916
Solitary Sandpiper	31	Mar. 30, 1883	April 28	26	May 17	May 21, 1921	10	July 15, 1899	Aug. 8	9	Oct. 4	Oct. 28, 1916
Bartramian Sandpiper	5	Mar. 21, 1896	April 5	5	April 26	May 11, 1917	10	June 29, 1902	July 15	9	Aug. 30	Sept. 26, 1919
Spotted Sandpiper	41	April 2, 1905	April 18	....	.....	Breeds	....	.....	.....	8	Sept. 28	Oct. 28, 1906
Killdeer	29	Rare, winter	Mar. 11	....	.....	Breeds	....	.....	.....	11	Nov. 7	.....
Mourning Dove	31	Rare, winter	Mar. 17	....	.....	Breeds	....	.....	.....	9	Nov. 3	.....
Broad-winged Hawk	14	Mar. 31, 1919	April 22	....	.....	Breeds	....	.....	.....	....	Sept.	.....
Pigeon Hawk	4	Mar. 21, 1920	April 11	3	April 30	May 11, 1917	3	Sept. 4, 1890	Sept. 11	5	Oct. 25	Nov. 10, 1891
Fish Hawk	33	Mar. 19, 1905	April 9	....	.....	Breeds	....	.....	.....	9	Oct. 20	Nov. 30, 1907
Yellow-billed Cuckoo	20	April 30, 1927	May 5	....	.....	Breeds	....	.....	.....	15	Oct. 5	Oct. 13, 1889
Black-billed Cuckoo	26	April 30, 1928	May 7	....	.....	Breeds	....	.....	.....	12	Sept. 30	Oct. 28, 1925
Belted Kingfisher	30	Rare, winter	Mar. 21	....	.....	Breeds	....	.....	.....	8	Nov. 7	.....
Yellow-bellied Sapsucker	....	Winters	.....	31	April 23	May 20, 1927	32	Sept. 10, 1905	Oct. 2	....	.....	.....

Species.	No. of dates.	Earliest date of spring arrival.	Average date of spring arrival	No. of dates.	Average date of spring departure.	Latest date of spring departure.	No. of dates.	Earliest date of fall arrival.	Average date of fall arrival.	No. of dates.	Average date of fall departure.	Latest date of fall departure.
Whippoorwill	42	April 1, 1913	April 18	....	.....	Breeds	....	.....	.....	11	Sept. 20	Oct. 13, 1889
Nighthawk	33	April 18, 1919	May 3	10	May 26	Breeds	12	.....	Aug. 16	17	Sept. 29	Oct. 13, 1926
Chimney Swift	43	April 5, 1914	April 16	....	.....	Breeds	....	.....	.....	22	Oct. 12	Oct. 25, 1906
Ruby-throated Hummingbird	36	April 16, 1912	May 2	....	.....	Breeds	....	.....	.....	19	Sept. 20	Oct. 20, 1913
Kingbird	45	April 18, 1914	April 26	....	.....	Breeds	....	.....	.....	15	Aug. 31	Sept. 23, 1905
Crested Flycatcher	44	April 19, 1914	April 28	....	.....	Breeds	....	.....	.....	18	Sept. 12	Sept. 29, 1907
Phoebe	50	Rare, winter	Mar. 13	....	.....	Breeds	....	.....	.....	20	Oct. 19	.....
Wood Pewee	45	April 29, 1900	May 5	....	.....	Breeds	....	.....	.....	27	Sept. 21	Oct. 12, 1906
Yellow-bellied Flycatcher	20	May 9, 1886	May 14	8	May 27	June 1, 1917	9	July 28, 1859	Aug. 15	7	Sept. 18	Oct. 16, 1881
Acadian Flycatcher	39	April 25, 1926	May 6	....	.....	Breeds	....	.....	.....	18	Sept. 7	Sept. 15, 1907
Alder Flycatcher	19	May 7, 1922	May 12	14	May 22	June 1, 1917	3	Aug. 16, 1886	Aug. 23	3	Sept. 14	Sept. 17, 1890
Least Flycatcher	35	April 20, 1881	May 2	23	May 17	May 27, 1917	8	Aug. 13, 1887	Aug. 25	11	Sept. 13	Oct. 1, 1916
Bobolink	33	April 26, 1896	May 3	21	May 22	June 6, 1909	23	July 23, 1904	Aug. 17	14	Sept. 29	Oct. 21, 1894
Cowbird	20	Rare, winter	Mar. 19	....	.....	Breeds	....	.....	.....	9	Nov. 3	.....
Red-winged Blackbird	29	Rare, winter	Mar. 1	....	.....	Breeds	....	.....	.....	6	Nov. 19	.....
Orchard Oriole	40	April 25, 1908	May 3	....	.....	Breeds	....	.....	.....	5	Aug. 27	Sept. 14, 1919
Baltimore Oriole	43	April 24, 1912	May 2	....	.....	Breeds	....	.....	.....	11	Sept. 1	Oct. 15, 1922
Rusty Blackbird	....	Winters	.....	27	April 18	May 14, 1926	18	Sept. 16, 1885	Oct. 22	....	.....	.....
Purple Grackle	38	Rare, winter	Feb. 23	....	.....	Breeds	....	.....	.....	8	Nov. 16	.....
Purple Finch	....	Winter	.....	33	May 9	May 29, 1860	18	Aug. 26, 1923	Oct. 3	....	.....	.....
Pine Siskin	....	Winter	.....	11	May 14	May 22, 1926	10	Oct. 15, 1916	Oct. 27	....	.....	.....
Vesper Sparrow	37	Feb. 18, 1890	Mar. 23	24	April 15	Breeds	8	.....	Oct. 10	7	Nov. 6	Nov. 21, 1886

Savannah Sparrow	37	Feb. 14, 1891	Mar. 26	24	May 3	May 14, 1925	10	Sept. 21, 1903	Oct. 9	7	Oct. 30	Nov. 22, 1886
Grasshopper Sparrow	34	Mar. 30, 1895	April 21	....	.....	Breeds	....	.....	.....	9	Oct. 21	Nov. 20, 1899
Henslow's Sparrow	31	April 1, 1917	April 18.	....	.....	Breeds	....	.....	.....	6	Oct. 11	Oct. 21, 1892
White-crowned Sparrow	14	Mar. 26, 1922	April 26	16	May 15	May 22, 1928	7	Oct. 1, 1910	Oct. 13	3	Nov. 26	Nov. 28, 1886
White-throated Sparrow	....	Winters	.....	32	May 22	June 14, 1899	36	Sept. 14, 1918	Oct. 8	....	.....	.....
Tree Sparrow	....	Winters	.....	29	Mar. 27	April 24, 1861	16	Oct. 3, 1859	Nov. 10	....	.....	.....
Chipping Sparrow	39	Feb. 9, 1902	Mar. 22	....	.....	Breeds	....	.....	.....	18	Nov. 10	Dec. 17, 1899
Slate-colored Junco	....	Winters	.....	36	April 30	May 17, 1908	31	Sept. 14, 1918	Oct. 7	....	.....	.....
Lincoln's Sparrow	10	April 21, 1918	May 5	10	May 20	May 30, 1917	3	Sept. 30, 1894	Oct. 6	3	Oct. 18	Oct. 21, 1888
Swamp Sparrow	29	Occ. winter	Mar. 31	42	May 11	May 27, 1917	20	Sept. 28, 1890	Oct. 8	14	Nov. 7	.....
Fox Sparrow	33	Rare, winter	Mar. 3	27	April 6	May 11, 1882	23	Oct. 3, 1906	Oct. 28	15	Nov. 21	.....
Chewink	42	Rare, winter	Mar. 30	....	.....	Breeds	....	.....	.....	20	Oct. 24	.....
Rose-breasted Grosbeak	37	April 17, 1902	May 4	20	May 17	June 3, 1917	4	Aug. 29, 1926	Sept. 4	14	Oct. 1	Oct. 16, 1920
Blue Grosbeak	13	May 1, 1878	May 5	....	.....	Breeds	....	.....	.....	8	Sept. 12	Sept. 20, 1884
Indigo Bunting	43	April 18, 1918	May 1	....	.....	Breeds	....	.....	.....	19	Oct. 6	Oct. 16, 1907
Scarlet Tanager	42	April 17, 1896	April 29	....	.....	Breeds	....	.....	.....	21	Oct. 4	Nov. 13, 1896
Summer Tanager	23	April 18, 1896	May 1	....	.....	Breeds	....	.....	.....	7	Sept. 14	Sept. 19, 1906
Purple Martin	37	Mar. 13, 1908	April 2	....	.....	Breeds	....	.....	.....	14	Sept. 12	Oct. 1, 1928
Cliff Swallow	16	April 10, 1887	April 23	10	May 21	June 7, 1877	2	July 6, 1889	July 8	4	Aug. 14	Aug. 22, 1926
Barn Swallow	38	Mar. 30, 1890	April 11	....	.....	Breeds	....	.....	.....	14	Sept. 7	Sept. 23, 1921
Tree Swallow	37	Mar. 24, 1919	April 11	26	May 14	May 26, 1889	12	July 3, 1912	July 31	8	Sept. 23	Oct. 17, 1911
Bank Swallow	29	April 4, 1918	April 20	....	.....	Breeds	....	.....	.....	12	Sept. 4	Sept. 21, 1920
Rough-winged Swallow	42	Mar. 24, 1928	April 9	....	.....	Breeds	....	.....	.....	5	Sept. 3	Sept. 11, 1920
Red-eyed Vireo	45	April 21, 1895	April 28	....	.....	Breeds	....	.....	.....	18	Oct. 11	Nov. 11, 1888
Philadelphia Vireo	5	May 4, 1928	May 8	3	May 26	May 30, 1917	5	Sept. 4, 1921	Sept. 9	9	Sept. 23	Oct. 5, 1919
Warbling Vireo	30	April 21, 1895	May 1	....	.....	Breeds	....	.....	.....	5	Aug. 30	Sept. 12 1903
Yellow-throated Vireo	42	April 11, 1922	April 24	....	.....	Breeds	....	.....	.....	14	Sept. 16	Sept. 29, 1907
Solitary Vireo	35	April 6, 1905	April 19	17	May 15	June 2, 1924	11	Sept. 6, 1903	Oct. 1	17	Oct. 20	Nov. 3, 1906
White-eyed Vireo	49	April 10, 1912	April 22	....	.....	Breeds	....	.....	.....	12	Oct. 7	Oct. 28, 1910

Species.	No. of dates.	Earliest date of spring arrival.	Average date of spring arrival	No. of dates.	Average date of spring departure.	Latest date of spring departure.	No. of dates.	Earliest date of fall arrival.	Average date of fall arrival.	No. of dates.	Average date of fall departure.	Latest date of fall departure.
Black and White Warbler	56	Mar. 30, 1908	April 17	....	.....	Breeds	....	.....	.....	25	Sept. 23	Oct. 18, 1890
Worm-eating Warbler	38	April 25, 1908	May 2	....	.....	Breeds	....	.....	.....	11	Aug. 31	Sept. 13, 1879
Blue-winged Warbler	30	April 23, 1925	May 3	12	May 20	May 30, 1891	4	Aug. 13, 1889	Aug. 22	6	Sept. 4	Sept. 14, 1927
Golden-winged Warbler	31	April 24, 1924	May 2	15	May 15	May 20, 1882	3	Aug. 8, 1889	Aug. 16	6	Aug. 31	Sept. 14, 1924
Nashville Warbler	29	April 20, 1925	May 1	15	May 16	May 20, 1917	4	Sept. 5, 1882	Sept. 13	5	Oct. 4	Oct. 13, 1918
Tennessee Warbler	16	May 2, 1923	May 7	9	May 27	June 3, 1910	5	Aug. 31, 1890	Sept. 4	13	Oct. 7	Oct. 22, 1922
Parula Warbler	45	April 6, 1928	April 23	....	.....	Breeds	....	.....	.....	23	Oct. 4	Oct. 17, 1919
Cape May Warbler	26	April 19, 1914	May 4	20	May 16	May 30, 1917	14	Aug. 4, 1892	Sept. 5	21	Oct. 9	Dec. 16, 1916
Yellow Warbler	55	April 2, 1916	April 21	....	.....	Breeds	....	.....	.....	5	Sept. 9	Oct. 12, 1910
Black-throated Blue Warbler	50	April 19, 1896	May 1	31	May 21	May 30, 1888	15	Aug. 21, 1887	Sept. 8	20	Oct. 10	Oct. 29, 1913
Myrtle Warbler	33	Rare, winter	April 2	27	May 17	May 30, 1917	32	Sept. 9, 1913	Oct. 5	11	Nov. 14	.....
Magnolia Warbler	45	April 22, 1891	May 4	25	May 25	June 4, 1917	21	Aug. 15, 1886	Aug. 29	22	Oct. 1	Oct. 28, 1916
Chestnut-sided Warbler	45	April 19, 1896	May 2	26	May 21	June 2, 1917	18	Aug. 10, 1889	Aug. 25	15	Sept. 28	Oct. 14, 1906
Bay-breasted Warbler	36	May 2, 1896	May 10	15	May 25	June 5, 1917	11	Aug. 17, 1921	Sept. 7	18	Oct. 6	Nov. 6, 1887
Blackpoll Warbler	44	April 21, 1916	May 5	41	June 1	June 16, 1907	24	Aug. 17, 1912	Sept. 12	26	Oct. 12	Oct. 26, 1908
Blackburnian Warbler	36	April 23, 1920	May 3	27	May 21	June 3, 1907	15	Aug. 2, 1872	Aug. 27	13	Sept. 27	Oct. 10, 1919
Yellow-throated Warbler	26	Mar. 30, 1927	April 15	....	.....	Breeds	....	.....	.....	5	Sept. 4	Sept. 11, 1927
Black-throated Green Warbler	40	April 18, 1920	April 28	23	May 20	June 10, 1917	18	Aug. 22, 1921	Sept. 6	29	Oct. 7	Oct. 21, 1888
Pine Warbler	38	Mar. 5, 1922	Mar. 29	....	.....	Breeds	....	.....	.....	12	Oct. 6	Oct. 24, 1916
Yellow Palm Warbler	36	Mar. 28, 1926	April 9	35	April 29	May 13, 1923	6	Sept. 4, 1887	Sept. 19	19	Oct. 19	Nov. 18, 1914
Prairie Warbler	46	April 12, 1883	April 23	....	.....	Breeds	....	.....	.....	10	Sept. 16	Oct. 3, 1910
Ovenbird	44	April 10, 1904	April 23	....	.....	Breeds	....	.....	.....	23	Oct. 3	Nov. 13, 1887

Northern Water-thrush	36	April 16, 1921	April 27	23	May 23	June 2, 1907	13	July 28, 1889	Aug. 12	15	Sept. 25	Oct. 16, 1919
Louisiana Water-thrush	31	Mar. 27, 1921	April 9	....	.....	Breeds	....	.....	.....	8	Sept. 19	Oct. 4, 1920
Kentucky Warbler	30	April 25, 1920	May 2	....	.....	Breeds	....	.....	.....	6	Aug. 27	Sept. 5, 1920
Connecticut Warbler	....	.....	.....	....	.....	.....	21	Aug. 28, 1886	Sept. 21	13	Oct. 12	Oct. 24, 1889
Mourning Warbler	16	May 4, 1928	May 15	7	May 27	June 7, 1917	3	Aug. 17, 1894	Aug. 19	2	Sept. 30	Oct. 1, 1894
Maryland Yellow-throat	57	April 13, 1891	April 22	....	.....	Breeds	....	.....	.....	20	Oct. 6	Nov. 2, 1919
Yellow-breasted Chat	52	April 14, 1917	April 30	....	.....	Breeds	....	.....	.....	8	Sept. 19	Oct. 4, 1925
Hooded Warbler	35	April 13, 1919	April 29	....	.....	Breeds	....	.....	.....	10	Sept. 14	Oct. 1, 1899
Wilson's Warbler	38	May 1, 1876	May 8	22	May 24	May 31, 1891	6	Aug. 22, 1910	Aug. 26	8	Sept. 19	Oct. 13, 1919
Canadian Warbler	38	May 2, 1923	May 8	30	May 25	June 2, 1917	15	July 31, 1887	Aug. 19	16	Sept. 18	Oct. 23, 1921
American Redstart	53	April 15, 1877	April 22	....	.....	Breeds	....	.....	.....	33	Sept. 20	Oct. 13, 1927
American Pipit	16	Feb. 16, 1908	Mar. 11	8	April 24	May 14, 1910	8	Oct. 1, 1916	Oct. 11	10	Nov. 27	Dec. 23, 1916
Catbird	48	Mar. 14, 1918	April 22	....	.....	Breeds	....	.....	.....	19	Oct. 21	Dec. 6, 1917
Brown Thrasher	42	Mar. 4, 1867	April 3	....	.....	Breeds	....	.....	.....	19	Sept. 26	Nov. 13, 1887
House Wren	48	Mar. 26, 1910	April 18	....	.....	Breeds	....	.....	.....	16	Oct. 16	Nov. 26, 1914
Winter Wren	....	Winters	.....	22	April 21	May 1, 1882	25	Sept. 25, 1925	Oct. 5	....	.....	.....
Long-billed Marsh Wren	33	April 17, 1920	May 2	....	.....	Breeds	....	.....	.....	11	Oct. 9	Nov. 16, 1926
Brown Creeper	....	Winters	.....	25	April 24	May 9, 1925	23	Sept. 22, 1858	Oct. 6	....	.....	.....
Red-breasted Nuthatch	....	Winters	.....	19	May 5	May 20, 1917	23	Aug. 22, 1903	Sept. 24	....	.....	.....
Golden-crowned Kinglet	....	Winters	.....	27	April 15	April 27, 1888	22	Sept. 20, 1910	Oct. 7	....	.....	.....
Ruby-crowned Kinglet	38	Rare, winter	April 7	42	May 4	May 17, 1917	28	Sept. 14, 1913	Oct. 2	15	Nov. 7	.....
Blue-gray Gnatcatcher	44	Mar. 6, 1916	April 8	....	.....	Breeds	....	.....	.....	5	Sept. 7	Oct. 24, 1896
Wood Thrush	52	April 13, 1888	April 24	....	.....	Breeds	....	.....	.....	20	Oct. 1	Oct. 30, 1913
Wilson's Thrush	39	April 9, 1922	May 1	22	May 19	June 2, 1907	4	Aug. 18, 1889	Aug. 23	11	Sept. 13	Oct. 1, 1916
Gray-cheeked Thrush	29	May 6, 1928	May 10	22	May 27	June 3, 1917	11	Sept. 1, 1860	Sept. 21	13	Oct. 7	Oct. 20, 1903
Olive-backed Thrush	44	April 18, 1925	May 3	22	May 24	June 2, 1917	21	Sept. 1, 1926	Sept. 13	17	Oct. 9	Nov. 1, 1886
Hermit Thrush	25	Winters	Mar. 24	30	May 1	May 17, 1902	25	Sept. 18, 1900	Oct. 16	10	Nov. 13	.....

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NEW BIRDS FROM PERÚ, BRAZIL, AND COSTA RICA.

BY JOHN T. ZIMMER.[1]

Recent study of the collection of birds secured by the Captain Marshall Field Peruvian Expedition of Field Museum of Natural History in 1922–23, has revealed the existence of a number of new subspecies which seem to be worthy of recognition. Most of the new forms here described were obtained by the expedition mentioned; the others appeared in material used for comparative study. Descriptions of other new forms from the same source have been published in Field Museum of Natural History Publication, Zoological series, vol. 12, no. 4, 1924; tom. cit. No. 8, 1925; and the present publication, vol. 40, 1927.

The type specimens of the forms described below are in the collection of Field Museum of Natural History, as are all other specimens not otherwise accredited. Acknowledgments are due to Dr. Frank M. Chapman, American Museum of Natural History, New York; to Mr. W. E. C. Todd, Carnegie Museum, Pittsburgh; to Mr. O. Bangs, Museum of Comparative Zoology, Cambridge; and to Drs. C. W. Richmond and A. Wetmore, U. S. National Museum, Washington. Comparative material generously loaned from these sources has been of great assistance in establishing the relationships of the various species and subspecies. I am indebted further to Dr. C. E. Hellmayr for notes on certain specimens in European museums and for freedom of access to manuscript notes of the late Count Berlepsch, which have aided in the study.

Names of colors when capitalized indicate direct comparison with Ridgway's "Color Standards and Color Nomenclature."

[1]Published by permission of the Director, Field Museum of Natural History, Chicago.

Xenops rutilus septentrionalis, subsp. nov.

Type from Guayabo, Costa Rica. No. 35744, Field Museum of Natural History. Adult male collected January 29, 1908, by J. F. Ferry; original number 243.

Diagnosis.—Similar to *X. r. purusianus* from Hyutanahán, Rio Purús, Brazil, but differs by having the pale streaks on the top of the head more rufescent and less buffy; back less strongly marked, with deeper ochraceous streaks; breast, flanks, and belly more narrowly streaked with pale shaft-lines; under tail-coverts averaging more rufescent in tone and less sharply streaked; tail with less black, having none on the outer webs of any of the rectrices except a minute shade at the extreme base, the black being confined almost entirely to the inner webs of the third and fourth and the basal half of the second outer feathers. From *X. r. heterurus* of Bogotá, Colombia, it is separable by the much lesser amount of black on the tail and by the narrower streaking below, together with somewhat smaller size. Wing (four males) 65–68 mm., average 67; tail 44–50, average 46.25; culmen from base 14–14.5, average 14.25; exposed culmen 10.5–13, average 12.5; tarsus 13–15, average 14.

Habitat.—Central America, in Costa Rica (Juan Viñas and Guayabo) and Panamá (Boquete).

Description of type.—Top of head Mummy Brown with narrow shaft-streaks of deep Cinnamon-Buff, broadest on forehead; mantle Brussels Brown with pale ochraceous shaft-lines becoming obsolete on the lower border; mantle separated from the more dusky nape by an ill-defined and narrow collar which is slightly more rufescent than either the head or mantle; rump and upper tail-coverts light Sanford's Brown grading insensibly into the color of the mantle. Lores white with a dusky area immediately in front of the eye; a broad superciliary stripe of slightly buffy white from the lores to the nape; a postocular stripe of Mummy Brown; auriculars dull white with dark brown edges; a broad, conspicuous subauricular stripe of silky white; sides of the neck like the back but the edges of the feathers grayer brown and the central stripes broader and whiter. Chin and throat dull white; sides of the lower throat, breast, sides, belly, and flanks Hair Brown x Olive Brown with narrow shaft-streaks of faintly buffy white, broadest on anterior portions; under tail-coverts Buffy Brown with whitish shaft-streaks less sharply defined than those on the remainder of the under parts. Under wing-coverts tawny Ochraceous Buff. Upper wing-coverts Snuff Brown with an ill-defined blackish or dusky area on the inner webs; primaries and secondaries largely black, narrowly margined externally with Sanford's Brown x Amber Brown, and with a broad band of Ochraceous-Tawny across both webs of the median portion of the quills from the fourth outer primary to the penultimate inner secondary; the ochraceous color deeper and more tawny on the outer webs of the secondaries where it forms a bright patch visible on the closed wing; outer three primaries black except for the pale outer margin; inner secondary with a paler and more orange-tinted subbasal area continuous with the band on the other quills but not so sharply

defined; blackish distal patch on this quill reduced to an ill-defined dusky area; beginning with the sixth outer primary, the tips of the primaries and secondaries are Amber Brown x Sanford's Brown, forming a narrow terminal margin on the primaries and a wider band on the secondaries; tertials entirely Amber Brown x Sanford's Brown. Rectrices light Auburn; outermost rectrix entirely of this color; second with the basal third of the inner web, adjacent to the shaft, dusky; third with a broad black stripe on the inner web from the base to near the tip, not reaching the inner margin; fourth similar to the third but black region a little broader and longer, leaving a narrower rufous inner margin and tip; fifth and innermost rectrices entirely light Auburn. There is no black on the outer webs of any rectrix except for a dusky shading at the very base. Wing 66 mm.; tail 45; culmen from base 14.5; exposed culmen 11; tarsus 15.

A specimen from Juan Viñas, Costa Rica, has a small dusky spot on the inner web of the fifth rectrix near the tip. One specimen from Boquete, Panamá, has the blackish area on the third rectrix more or less broken about a third of the way from the tip. All four examples examined agree in the absence of black on the outer webs of the remiges.

Peruvian specimens of *purusianus* are very close to this Central American form and agree with it in the disposition of the black markings on the tail, thereby differing from the average of topotypical *purusianus*. However, one male from Hyutanahán has very little more black on the tail than have the Peruvian specimens, and as the latter agree with *purusianus* in other respects, according to the series at hand, it seems best to consider them as *purusianus*, at least for the present.

On the other hand, the Central American birds, while showing affinity to *purusianus* through the Peruvian examples, are cut off from the range of that form by *heterurus*, which appears to occupy all three chains of the Andes in Colombia. Although *purusianus* was originally described as having a tail-pattern like that of *heterurus*, the material at hand tends to show that the black areas are rather more extensive in *heterurus*, occupying the larger part of the outer webs of the fifth as well as the fourth rectrices; in some specimens of *purusianus* there may be a certain amount of black on the basal portion of those webs but it does not extend so far toward the tip, and in other examples it is but little more extensive than in *septentrionalis*.

Specimens examined:

X. r. rutilus—Brazil: "Bahia" 1 ? ; Rio de las Velhas 1 ♂ 2 ♀; Victoria, São Paulo 1 ♂; Barra do Corda, Maranhão 1 ♂ 1 ♀. Argentina: Puerto Segundo, Misiones 1 ♂.

X. r. connectens—Argentina: Ledesma, Jujuy 1 ♀.

X. r. purusianus—Brazil: Hyutanahán 2 ♂ 1 ♀[1]; Arimã, Rio Purús 1 ♂ 1 ♀[1]. Perú: Chinchao 1 ♂; Huachipa 2 ♂ 1 ♀.

X. r. guayae—Ecuador: Puente de Chimbo 1 ♀.

X. r. heterurus—Colombia: "Bogotá" 6 ? ; Santa Elena, Antioquia 1 ? .

[1]Specimens in Carnegie Museum, Pittsburgh.

X. r. septentrionalis—Costa Rica: Guayabo 1 ♂ (type); Juan Viñas 1 ♂. Panamá: Boquete 2 ♂[1].

Pipra coronata circumpicta, subsp. nov.

Type from Munichis, Yurimaguas, Perú. No. 50897, Field Museum of Natural History. Adult male collected September 1, 1912, by M. P. Anderson; original number 29.

Diagnosis.—Closely allied to *P. c. exquisita* from central-eastern Perú but male slightly more obscure on the upper back, duller green on the breast, and duller yellow in a more restricted area on the belly; top of the head slightly darker blue, completely encircled by a border of much deeper blue which includes the forehead, upper part of the lores, supercilium, postocular region above the auriculars, and hind neck, which are clear green in *exquisita;* wing-quills browner, less blackish, with paler inner margins.

Habitat.—Northern Perú south of the Marañon River; Yurimaguas and Chyavetas.

Description of type.—Back bright Grass Green, brighter on the rump, somewhat darker anteriorly; hind neck Cossack Green; auriculars and lower part of the lores Dull Blackish Green. Top of the head Pale Cerulean Blue (the feathers sooty black at their bases), completely encircled by a border of light Methyl Blue which involves the forehead, upper part of the lores, supercilium, postocular region above the auriculars, and the hind neck. Chin and throat Danube Green, passing into Bice Green on the breast and sides, Light Bice Green on the flanks, and Barium Yellow on the mid-belly and under tail-coverts. Wings and tail fuscous with the outer webs of the quills and upper coverts like the rump; inner margins of the wing-quills Pale Smoke Gray; under wing-coverts Marguerite Yellow. Maxilla blackish; mandible soiled white; feet dull brown. Wing 57 mm.; tail 25; culmen from base 10; exposed culmen 7.5; tarsus 13.5.

Although I have only a single specimen of this well-marked form, I do not hesitate to describe it since its characteristics have already been noted in other material from northern Perú. A specimen from Chyavetas was recorded as *Pipra cyaneocapilla* by Sclater and Salvin (Proc. Zool. Soc. London, 1867, p. 751) and by Taczanowski (Orn. Pérou, **2**, p. 344, 1884). This same example and another from the Río Huallaga were recorded as young males of *cyaneocapilla* by Sclater (Cat. Birds Brit. Mus., **14**, p. 300, 1888). Hellmayr (Ibis, 1906, p. 36) found that these two specimens were fully adult though differing somewhat from typical *exquisita,* to which they were most closely related, and possibly belonging to a separable form. The reappearance of the same peculiarities in the Moyobamba specimen indicates the apparent stability of the characters in birds from that region.

I place this new race in the species *coronata* at the suggestion of Dr. Hellmayr, who has worked out the relationship of *coronata* and *exquisita* in his forthcoming treatment of the family Pipridae.

[1]Specimens in Museum of Comparative Zoology, Cambridge.

Specimens examined:

P. c. exquisita—Perú: Puerto Bermúdez 3 ♂ 1 ♀.

P. c. circumpicta—Perú: Munichis, Yurimaguas 1 ♂ (type).

Pipra pipra microlopha, subsp. nov.

Type from Puerto Bermúdez, Rio Pichis, Perú; altitude 1100 feet. No. 65801, Field Museum of Natural History. Adult male collected March 18, 1923, by J. T. Zimmer; original number 3521.

Diagnosis.—Somewhat intermediate between *P. p. comata* and *P. p. coracina* in the degree of gloss on the black plumage, but differing from both the others by having a shorter, more rounded crest; the bases of the feathers of the forehead, and sometimes of the whole crown, white, quite different from *coracina* though sometimes equaled by *comata* in this respect.

Habitat.—Northeastern Perú and western Brazil south of the Amazon River; from the Ucayali eastward to São Paulo de Olivença and probably as far as the Juruá; tropical zone.

Description of type.—General color bluish black, slightly more silky than in *coracina* but not as glossy as in *pipra* and *comata.* Whole top of the head, including nuchal crest, white, but the crest is rather short, tapering posteriorly to form an oval point in the middle of the hind neck instead of being produced into a flattened, broadly rounded collar lying over the upper part of the mantle as in the other races. The feathers of the forehead and crown, back to the posterior border of the eyes, are entirely white; those of the rest of the cap are narrowly pale gray at the base. Wings and tail sooty black with the exposed outer edges and tips bluish black like the back. Wing 65 mm.; tail 28; culmen from base 11; exposed culmen 9; tarsus 14; length of cap 27.

Young males are, above, dark Kronberg's Green, much darker than the dark Yellowish Oil Green of *comata,* with the whole top of the head dark gray, more or less washed with green. Below, Mineral Gray, somewhat washed with Kronberg's Green on the breast and flanks and slightly tinged with green on the throat. Feathers of the crown with a trace of black on each side of the shaft at the base; some new white feathers which have appeared on the head of one of the specimens are white to the base as in the adult. One immature male, possibly younger than the others, has rather more green on the breast and a wash of the same color on the top of the head, while the mandible is pale yellow except at the extreme tip, not blackish as in the other immature examples and the adults.

A female is similar to the young males but has the back a little lighter in color, about Kronberg's Green; top of the head lighter gray, washed with green; throat whitish, washed with pale Lime Green; breast dark Tea Green; middle of belly white, tinged with Sea-foam Yellow in the anal region, less strongly on the under tail-coverts; flanks Deep Grape Green. Wing 63 mm.; tail 26.5; culmen from base 12; exposed culmen 9; tarsus 14.

Among the adult males of this form there seems to be little or no variation in the degree of gloss on the black feathers. The white cap is always short and oval at the tip, although the exact length is slightly variable.

The feathers of the forehead are white to the base in all the specimens; those of the crown are also white in the type specimen. In one male from São Paulo de Olivença, Brazil, the feathers of the crown at base are narrowly very pale gray, and those of the occiput are somewhat darker. One specimen from Orosa, Perú (nearly opposite the mouth of the Napo River) is a little darker in this respect, and two others from the same locality are even more marked, but none of the series is as heavily marked as typical *coracina*, which has the basal portion of the cap, sometimes including most of the forehead, much deeper and more broadly black. The type of *microlopha* apparently resembles the type of *comata* (as the latter was originally described) in having the crown feathers white to the base, but whereas *comata* was described on account of its unusually long crest, *microlopha* is notable for its very short crest.

The extent of the dusky bases on the head is not constant, even in *comata;* two males from Uchco have the glossy plumage and long crest of *comata*, but the feathers of the crown are distinctly blackish at the base, possibly in an approach toward *coracina* which occurs not far distant, at Pomará. On the other hand, a Yurimaguas male has the crown and occiput pale gray at base. This specimen seems to be abnormal. It is exceptionally small (wing 60 mm.; tail 25) and exhibits traces of albinism in various parts of its plumage, but its crest is proportionately long and broad at the tip, and its plumage is as glossy as in typical *comata*.

A male from the mouth of the Curaray River, eastern Ecuador, seems to be intermediate between *pipra* and *microlopha*, having a moderately short crest with considerable white at the base of the crown feathers combined with a heavily glossed plumage which is somewhat lighter in tone than that of most examples of *pipra*.

Ihering (Rev. Mus. Paulista, **6**, p. 435, 1904=May, 1905) records *leucocilla* (=*pipra*) from the Juruá region. This record certainly refers to the present new form since there is no allied form south of the Amazon except far to the eastward, on the Tocantins, where *bahiae* occurs.

The measurements of five adult males of *microlopha* are as follows: wing 65–69 mm., average 67.2; tail 27–29, average 28.4; culmen from base 11–12, average 11.5; exposed culmen 8.5–9.5, average 9; tarsus 14; length of white cap 25–27.5, average 26.3.

The use of the specific name *pipra* instead of *leucocilla* is, I believe, necessary. In 1758, Linnaeus described "*Parus Pipra*," which he based on Seba's account of the "Cacotototl" (Thes., **2**, p. 102, pl. 96, fig. 5). Seba's description and figure unmistakably represent a white-crowned manakin with a glossy black body, and as Seba is the only earlier authority quoted by Linnaeus in this connection, his species is entitled to the name *pipra*. Unfortunately, Linnaeus, after citing Seba and quoting an abbreviated diagnosis from his work, appended a more complete description of a totally different species (a flycatcher), which disagrees not only with Seba's account but also with a short diagnosis of his own which he quoted from his then unpublished "Museum Adolphi Friderici." In the latter work, published six years later, he erected the genus *Pipra*, applied a new name, *leucocilla*, to his own earlier diagnosis of *P. pipra* (which he elaborated but did not otherwise alter), and repeated his more lengthy description

of the flycatcher under the name *leucocephala* (=*Arundinicola leucocephala*); but he again confused matters by referring Seba's account to *leucocephala* in spite of the obvious disagreement. No mention was made of the name *pipra* in either connection. Two years later, in the twelfth edition of the Systema Naturae, the names *leucocilla* and *leucocephala* were again used for the two distinct species, and here the original *Parus Pipra* was definitely identified as *leucocilla*, although it was erroneously placed in synonymy in spite of its six years of priority. By this association, Linnaeus, as first reviser, succeeded in separating the integral parts of the composite *Parus Pipra* and in allocating the original name to one of the parts. Berlepsch and Hartert (Novit. Zool., **9**, p. 53, footn., 1902) were unjustified in rejecting the name *pipra*, and Ridgway (Bull. U. S. Nat. Mus., **50**, pt. 4, p. 744, 1907) used the name correctly.

Linnaeus's original reference gives the type locality of *pipra* as "in Indiis," which is not sufficiently definite for modern zoology. It is antedated by Seba's "montagnes de Tetzcocanara" which that author, in another connection, places "au Bresil"; but there is considerable doubt attached to this name. In the first place, both Tetzcocanara and Cacototl suggest Mexican, rather than Brazilian, origin. Seba's reference to Hernandez in connection with another species also said to be from Tetzcocanara gives a clue to the probable explanation. Hernandez (Rev. Med. Nov. Hisp. Thes., Hist. Animal., lib. unic., p. 52, cap. CXCVII) gives the description of a bird which he calls "Cacatototl" from the "planis Tetzcoquensibus" in Mexico. There is not much doubt that Seba took name and locality from this account, although his own description (which does not agree at all with that of Hernandez) was drawn up from specimens which he received from a Jacques Guillot of Amsterdam who, in turn, probably secured them from Surinam. In any case Seba's species does not occur in Mexico and Tetzcocanara or Tezcuco can not well be the type locality of the bird which he described and figured. Linnaeus's citation of Brazil and Surinam, in the twelfth edition of the Systema Naturae, in connection with *leucocilla*, is probably correct, and Surinam, as the most definite locality given, should be designated as type locality for *Parus Pipra*. The Cacatototl of Hernandez has yet to be identified.

Specimens examined:

P. p. pipra—Surinam: Rijsdijkweg 1 ♂. British Guiana: Saint Laurent du Maroni 2 ♂; Hyde Park 2 ♂; Demerara 1 ♂; Caramang River 3 ♂. Brazil: Conceicão, Rio Branco 2 ♂ 1 ♀; Itacoatiará 1 ♀; Manacapurú, Rio Solimões 3 ♂[1].

P. p. anthracina—Panamá 1 ♂.

P. p. coracina—Colombia: "Bogotá" 1 ♂. Ecuador: Guayaba, Loja 1 ♂[2]. Perú: Pomará 1 ♂[2].

P. p. comata—Perú: Vista Alegre 1 ♂ ad., 1 ♂ imm.; Huachipa 1 ♂ 1 ♀; Chinchao 1 ♂ 1 ♀; Uchco 2 ♂[2]; Munichis, Yurimaguas 1 ♂.

P. p. microlopha—Perú: Puerto Bermúdez 1 ♂ ad. (type), 4 ♂ imm., 1 ♀; Orosa 3 ♂[2]. Brazil: São Paulo de Olivença 1 ♂[1].

P. p. ?—Ecuador: mouth of Río Curaray 1 ♂[2].

[1]Specimens in Carnegie Museum, Pittsburgh.

[2]Specimens in American Museum of Natural History, New York.

Phrygilus unicolor inca, subsp. nov.

Type from the mountains near Huánuco, Perú; altitude 12200 feet. No. 60073, Field Museum of Natural History. Adult male collected June 19, 1922, by J. T. Zimmer; original number 2404.

Diagnosis.—Similar to *P. u. unicolor* of northern Chile, but smaller and decidedly darker above and below; more sooty, less ashy.

Habitat.—Highlands of Perú.

Description of type.—Above, Slate Gray. Below, Dark Gull Gray, slightly paler and duller near the crissum. Wings and tail black; upper wing-coverts bordered with the color of the back; alula with the outer border a little paler, about the color of the breast; second to fifth outer primaries with their outer margins distinctly white except toward the tips of the quills; outermost primary with the outer margin slightly grayer than the rest of the outer web, faintly tinged with brown; inner primaries, secondaries and tertials with outer margins the color of the back, becoming paler and more whitish near the tips. Rectrices with outer margins the color of the breast, inclining toward whitish. Under wing-coverts gray like the breast. Iris brown; bill brownish black; feet dull brown. Wing 85 mm.; tail 57.5; culmen from base 13.5; exposed culmen 11; tarsus 23.

Females are like the males and sometimes almost indistinguishable, but are usually paler below, between Gull Gray and Deep Gull Gray, with indistinct dusky shaft-lines; belly and crissum approaching Pale Gull Gray. Above, the feathers of the head and back have broad dusky shaft-lines, rather ill-defined, and sometimes have a brownish tinge on the margins, but the color is still definitely gray and quite distinct from the brown of the young birds.

Both sexes in juvenal plumage are closely streaked throughout. Above, the blackish brown shaft-stripes are margined with buffy brown on the crown, with Hair Brown on the upper back, and with Sepia on the middle back. Below, the feathers are dark Clove Brown in their centers, edged with whitish Pale Olive Buff. A characteristic feature is an area of Dark Olive Buff on the sides of the face, including the lores, auriculars, malar region and eyelids. The upper wing-coverts are brownish black margined with buffy brown. Wings and tail are margined externally with grayish buffy brown. In this plumage, *inca* is easily separated from *unicolor* by the much broader and darker streaks on the upper and under parts, by the darker edges of the dorsal feathers, and by the olivaceous sides of the face.

Males in first annual plumage are similar to the juvenals in being streaked above and below, but the streaks are much less pronounced (especially below), the whole tone of coloration is much grayer and less buffy, and the sides of the face have lost the curious olive color.

It is not my intention to enter here into a detailed discussion of the various plumages of this and related species as I hope to do in a later paper. Suffice it to say that there is evidence at hand which indicates that both sexes are very much alike in *unicolor*, *tucumanus*, and *inca*, but noticeably different in some of the more northern races.

The present form probably is more closely approached by *tucumanus* than by typical *unicolor*, to which I have compared it in the diagnosis, since *tucumanus* also is smaller and darker than *unicolor* though it does not go so far in this direction as typical *inca*. Specimens from Tucumán are farther removed from both *unicolor* and *inca* than are Bolivian examples, which show an approach to *unicolor* in size and to *inca* in color but remain closest to *tucumanus*.

Three adult males of *inca* measure as follows: wing 81–89.5 mm., average 85; tail 56–60, average 57.8. Six adults of *tucumanus* (marked as males) from Tucumán measure: wing 85.5–89 mm., average 87.8; tail 61–65, average 62.5. Six males of *tucumanus* from Bolivia measure: wing 91–96 mm., average 92.6; tail 61.5–69, average 63.75. Nine males of *unicolor* from Chile measure: wing 91-98 mm., average 93.4; tail 62–68, average 64.5. Females of all three forms are a little smaller than the males in average measurements.

North of the range of *inca* occurs the Ecuadorean form, *grandis*, which is again larger than paler than *inca*, being more like topotypical *tucumanus* in color and Bolivian *tucumanus* in size, although it has a longer bill than either. The Peruvian form described herewith exists as a small, dark race replaced by larger, paler forms both to the north and south.

The general failure to recognize this Peruvian race heretofore may be attributed to a protracted misidentification of *unicolor*. The species, *unicolor*, was described by d'Orbigny and Lafresnaye from the Cordillera of Tacora, Perú, and the Pampa de Oruro, Bolivia, and Tacora usually has been considered, as it may be more formally designated, as the type locality. Tacora belonged to Perú at the time the species was described, and most authors, misled by this fact, have referred all Peruvian specimens of this group to the Tacora form without having examined topotypes. Tacora now belongs to Chile, being situated not far from Choquelimpie, and specimens from Choquelimpie agree with others from other parts of Chile but differ from Peruvian examples. Thus, while Peruvian specimens of this group have long been known and Chilean examples have been comparatively rare, the latter appear to be entitled to the name *unicolor*, leaving the Peruvian race in need of formal description.

In 1844, Tschudi (Arch. Naturg., **10**, (1), p. 290, no. 162, May, 1844) described *Phrygilus rusticus* from Perú. This name has been placed in the synonymy of *unicolor* by various authors and, if it referred to the present species, it would be valid for the race I have described here as *inca*. Dr. Hellmayr has kindly examined Tschudi's type in the Berlin Museum and pronounces it a molting, immature specimen of the bird long known as *Spodiornis jardinii* Sclater, over which latter name *rusticus* thus has priority. Tschudi's description reads as though the author had had several specimens before him of different sexes and ages. Ten years after Tschudi's description appeared there was but a single specimen of the species in the Berlin Museum (cf. Lichtenstein, Nom. Av. Mus. Berol., p. 43, 1854) and it is evident that Tschudi composed his description of the various plumages of his species from this single molting example.

In any case, *Phrygilus rusticus* Tschudi does not affect the nomenclature of *P. u. inca.*

Specimens examined:

P. u. unicolor—Chile: Choquelimpie, Tacna 1 ♂ 1 ♀; San Pedro, Antofogasta 9 ♂ 2 ♀; Baños del Toro, Coquimbo 1 ♂ 2 ♀; Cajon del Rio Blanco, Vega Redonda 2 ♂; Valle de Los Piuquenes, Vega Redonda 1 ♀; Guardia Vieja, Aconcagua 1 ♂.

P. u. tucumanus—Argentina: Las Pavas, Tucumán 9 ♂ 11 ♀ (as sexed by the collector). Bolivia:[1] Calugo, Cochabamba 1 ♀; near Cochabamba 1 ♂; Coloni 5 ♂; Incachaca 1 ? ; Cerro San Benito 3 ♀; Mollemolle 1 ♂.

P. u. inca—Perú: Huánuco, mountains at 12200 feet 3 ♂ (including type) 4 ♀; La Quinua 1 ♂; mountains near Balsas 1 ♂ 1 ? .

P. u. grandis—Ecuador: Pichincha, 14000 feet 1 ♂ 2 ♀.

Chlorophanes spiza axillaris, subsp. nov.

Type from Bahia, Brazil. No. 9701, Field Museum of Natural History. Adult male; no date; ex collection C. B. Cory, ex collection Lawrence.

Diagnosis.—Similar to *C. s. spiza* from British Guiana, Trinidad, and Venezuela, but general color of males more greenish, less bluish, especially on the belly; hind neck without the yellowish tone which is usually pronounced in *spiza;* under wing-coverts and thighs decidedly paler, light gray instead of sooty black.

Habitat.—Southeastern border of Brazil from Pernambuco to Santa Catharina.

Description of type.—Whole top and sides of the head occupied by a black hood which extends from the base of the mandible along the lower border of the malar region to the auricular orifice, thence upward and a little forward to the postocular region where the line curves backward around the rear of the occiput. Held away from the light (toward the light all greenish colors are bluer) the hind neck appears Chrysoprase Green; back light Viridian Green; point of the chin black; remainder of under parts Cobalt Green x Vivid Green. Wings and tail black with the upper wing-coverts and outer margins of the remiges and rectrices similar to the back but a little duller; tertials and middle rectrices largely of the same color. Under wing-coverts, axillaries, and thighs Light Mouse Gray with moderately pronounced pale greenish tips, heaviest on the outer margin of the wing. Maxilla black with an angular yellow area at the base of the commissure below the nostril; in lateral view this reaches forward about to the middle of the commissure; in dorsal aspect it appears to end about at the anterior end of the nostril. Mandible entirely yellow; feet olivaceous. Wing 68.5 mm.; tail 46; culmen from base 18.5; exposed culmen 15; tarsus 18.5; length of black cap in the middle 22.

One female from Bahia appears to be deeper and less yellowish green than four females of *spiza* from various localities, but I am not assured of

[1]Specimens from Bolivia in Carnegie Museum, Pittsburgh.

the stability of this character. Wing 64.5 mm.; tail 45; culmen from base 18.5; exposed culmen 14.75; tarsus 16.

In addition to the material listed below, I have notes which Dr. Hellmayr has kindly made on an adult male from Blumenau, Santa Catharina, and two adult males from Braço do Sul, Victoria, in the Munich Museum, in comparison with sixteen males of typical *spiza* from Caparo, Trinidad. These notes confirm the characters which I have given for the southeast Brazilian race. They also indicate the existence of a longer black cap in *axillaris* than in *spiza*, but two males of *spiza* from Trinidad, in the collection of Field Museum of Natural History, have the cap longer than in the type of *axillaris*, showing the variability of this feature. The type of *Turdus micans* Hahn, in the Munich Museum, proves to be typical *spiza*, and two males from Pará show no trace of approach toward *axillaris*, being also typical *spiza*.

The western limits of the range of this new form are uncertain. Ihering (Cat. Faun. Braz., **1**, p. 344, 1907) records the species from Matto Grosso, but I suspect that the variety occurring there will be found to be *caerulescens* and not *axillaris;* I have no material to determine the point.

Specimens examined:

C. s. spiza—British Guiana: no locality 1 ♂; Caramang River 2 ♀. Trinidad: Valencia 2 ♂ 1 ♀. Venezuela: Guanacos, Orinoco delta 1 ♂. Brazil: Pará 1 ♀; Santarem 1 ♀[1]. Colombia: "Bogotá" 2 ♂ 1 ♀, 1 ♀[2].

C. s. axillaris—Brazil: Bahia 1 ♂ (type) 1 ♀, 3 ♂[1]; Rio de Janeiro 1 ♂[1]; Pernambuco 4 ♂[1].

C. s. caerulescens—Perú: Moyobamba 1 ♀; Huachipa 1 ♂; Vista Alegre 3 ♂; Río Colorado, Chanchamayo 1 ♀, Puerto Bermúdez 1 ♂ imm., 1 ♀. Colombia: Honda 1 ♀[2].

C. s. exsul—Ecuador: Puente de Chimbo 3 ♂ 4 ♀; Paramba, Esmeraldas 2 ♂ 1 ♀.

C. s. subtropicalis—Colombia: Miraflores, Cauca 1 ♂, 1 ♂[3]; Cauca Seca 1 ♂; Chocó, Noanamá 1 ♂ 1 ♀; La Cumbre 1 ♀[3]; Bitaco Valley 2 ♂[3]; Jerico 1 ♀[2].

Tangara chilensis chlorocorys, subsp. nov.

Type from Vista Alegre, junction of the Chinchao and Huallaga rivers, Perú; altitude 4100 feet. No. 60142, Field Museum of Natural History. Adult male collected August 31, 1922, by J. T. Zimmer; original number 2778.

Diagnosis.—Similar to *T. ch. caelicolor* from northeastern Colombia but larger; green cap longer, reaching farther posteriorly, and brighter, more yellowish green.

Habitat.—Tropical valleys of the upper Huallaga River, Perú, from the Huayabamba River and its tributaries south to the Chinchao River.

[1]Specimens in Museum of Comparative Zoology, Cambridge.
[2]Specimens in American Museum of Natural History, New York.
[3]Specimens in Carnegie Museum, Pittsburgh.

Description of type.—A brilliant hood of Bright Green-Yellow, tinged with Viridine Yellow, occupies the top and sides of the head, reaching the occiput in its mid line, then extending farther backward on either side to an angle on the sides of the neck, turning forward over the ear-openings to a point at their anterior border, and passing forward thence to include the malar region, lores and forehead except for a narrow line of black feathers which completely surrounds the base of the bill and a similar narrow line of black around the eye. The feathers of this hood are small and squamiform, black at their bases and Venice Green on their concave under surfaces. Hind neck, sides of the neck behind the hood, and mantle, including the scapulars, rich velvety black. Middle of the back below the mantle occupied by a patch of brilliant Scarlet-Red x Scarlet, with the concealed portions of the feathers subterminally yellow, subbasally white, and basally gray; lower back and rump Lemon-Chrome x Light Cadmium, with the concealed portions subterminally dull buff, subbasally white and basally gray; upper tail-coverts like mantle; the extreme sides of the lower back Chrysoprase Green with black subterminal areas and gray bases. Point of the chin black, included in the black ring surrounding the base of the bill; remainder of the chin and throat Dull Blue-Violet (1); on the lower throat the feathers are subterminally bright Cendre Blue (greener if held away from the light); on the upper breast the violet tips have almost disappeared and the general color is bright Cendre Blue which extends over the breast and sides and down each flank in a broad lateral stripe; middle of the belly black with a tinge of violet blue where it meets the Cendre Blue of the flanks; thighs black with broad tips the color of the breast on each feather; under tail-coverts black. Wings and tail black; primaries, except the outermost, with outer margins the color of the throat; secondaries and tertials with short, narrow borders of greenish blue at the bases of the outer webs, concealed by the greater upper wing-coverts which are black, with a tiny blue spot at the tips of the outer webs; primary-coverts and alula black, edged externally like the primaries and with a small greenish spot near the tip of each feather; smallest lesser upper wing-coverts Yellow-Green in a very restricted patch which is concealed by the scapulars; remainder of the lesser coverts like the breast; median coverts like the throat; under wing-coverts mostly like the breast, those along the outer margin of the wing like the throat. Iris brown; bill black; feet bluish black. Wing 78 mm.; tail 55; culmen from base 13; exposed culmen 9; tarsus 18; length of hood in middle 19.5.

Females are similar to the males.

A young female from Huachipa, taken October 7, 1922, in general is like the adults but the cap is duller green with its feathers normal, not squamiform; the chin and upper throat are like the breast with violet feathers beginning to appear on the sides and lower border; the back is dull black; the middle of the back is yellow like the rump but is more tinged with orange. The entire plumage lacks the brilliance of coloring of the adults, even where the color is the same.

In addition to measurements secured from ten adults in the collection

of Field Museum, I have those of sixteen adults from Huambo and Huayabamba as recorded in manuscript notes of the late Count Berlepsch. These combined data show the wing to vary between 76 and 82 mm., average 79.3; tail 53–61.5, average 56.8; exposed culmen 9–10.75, average 9.7; length of hood in the middle 18–22, average 19.5.

Two adults of *T. ch. caelicolor* in Field Museum and twenty-one Bogotá skins measured by Berlepsch show the measurements of that form to be as follows: wing 72.5–80 mm., average 75.6; tail 52–59.5, average 54.9; exposed culmen 8.5–10.75, average 10.1; length of hood in the middle 15–17, average 15.8.

Berlepsch's notes confirm my observations on the difference between *caelicolor* and the form I have described as *chlorocorys*, in the color of the green hood. They also mention a reduction in the width of the black ring about the base of the bill in *chlorocorys*, but this character is not shown by the series in Field Museum and appears to be unreliable as a racial character.

The differences between *caelicolor* and *chlorocorys* are given more weight by the complete separation of the ranges of the two forms with the occurrence of a related subspecies, *chilensis*, in the intervening territory. Sclater described *caelicolor* from two specimens said to have come from Anolaima, Colombia, and these two skins represent the only records from that locality. There are many skins extant from "Bogotá," though, of course, these must have been taken in more or less distant tropical valleys and not in the vicinity of the city of that name. The known general range of the race lies to the eastward. It may be questioned, therefore, whether Sclater's specimens actually came from Anolaima or from the country on the eastern side of the range where the form is common.

Chapman (Bull. Am. Mus. Nat. Hist., **36**, p. 593, 1917) records *chilensis* from Andalucia and Florencia, Colombia, and from these points the race ranges southward across eastern Ecuador and Perú to Bolivia. In Perú it has been recorded from Pebas, Iquitos, Rioja, Moyobamba, Chyavetas, Xeveros, Río Ucayali, Monterico, La Merced, Chanchamayo, Huaynapata, Marcapata, Río Cosireni and Río Comberciata, and possibly other localities. The new form, *chlorocorys*, is known from Huambo, Huayabamba, Nuevo Loreto, Huachipa and Vista Alegre. The closest approach of the two distributional areas occurs at Moyobamba and Huayabamba; both of these places are in the Huallaga drainage, although one lies in the valley of the Río Mayo and the other in that of the Río Huambo, with a range of mountains forming a barrier open only by way of the rivers at the junction of the Río Huayabamba and the Río Huallaga. One specimen in Field Museum from Moyobamba clearly demonstrates the relationship of *chlorocorys* and *chilensis*. This bird, an adult female, has the lower back and rump pure Orange-Chrome, exactly intermediate between the red of *chilensis* and the yellow of *chlorocorys* and *caelicolor*. The entire series from Moyobamba exhibits a tone of green on the hood about intermediate between that of *chlorocorys* and that of *caelicolor*, so that *chilensis* in this particular is a connecting link between the other forms though differing from both in the color of the lower back.

Sclater (Cat. Birds Brit. Mus., **11**, p. 97, 1886) noted that *caelicolor* "crossed" the range of *yeni* (=*chilensis*) into "N. E. Peru" (=north-central Perú), but he did not appreciate the fact that the range of his *caelicolor* was interrupted by that of the other form. Berlepsch (Ber. V Int. Orn.-Kongr. Berlin, p. 1027, 1912) recorded the fact of divided range and in his manuscript notes, as shown above, he described the differences between Colombian and Peruvian examples. The basic facts of the case, therefore, are not entirely new although the western Peruvian form has not received a name to date.

Specimens examined:

T. ch. chilensis—Ecuador: Sarayacu 1. Perú: no loc. 1; Rioja 1 ♂; Yahuas, near Pebas 1 ♀; Moyobamba 5 ♂ 3 ♀; Río Colorado, Chanchamayo 3 ♂ 1 ♀ imm.

T. ch. caelicolor—Colombia: "Bogotá" 1. British Guiana: Roraima 1 ♂.

T. ch. chlorocorys—Perú: Vista Alegre 1 ♂ (type) 4 ♀; Huachipa 2 ♀ ad. 1 ♀ imm.; Nuevo Loreto near Tayabamba 3 ad.

Thraupis episcopus caeruleus, subsp. nov.

Type from Vista Alegre, junction of the Chinchao and Huallaga rivers, Perú; altitude 4100 feet. No. 60288, Field Museum of Natural History. Adult male collected October 14, 1922, by J. T. Zimmer; original number 3052.

Diagnosis.—Allied to *T. e. coelestis* and *T. e. major* but purer blue than either; size about the same, covering the range of variation in *coelestis* and almost reaching the maximum of *major*. Males: wing 89–97 mm.; tail 64.5–71.

Habitat.—Tropical valleys of central and north-central Perú, from the Chinchao River north along the Huallaga to Moyobamba and Yurimaguas.

Description of type.—Held away from the light, the upper surface and sides of the head are between Glaucous Blue and Porcelain Blue; back a trifle duller and greener, approaching light Terra Verte, with the tips of the feathers indistinctly paler; rump whitish Pale Glaucous Blue; upper tail-coverts like the back, tipped with the color of the rump. Chin and throat Pale Glaucous Blue; lower throat, sides, and flanks Glaucous Blue; center of the breast strongly bluish, almost Alice Blue; under tail-coverts Pale Glaucous Blue. Remiges blackish; primaries with most of their outer webs between China Blue and Mathews Blue, becoming greener and duller, approaching Gobelin Blue, on the exposed webs of the tertials, which have also a whitish subterminal spot on their outer webs; greater upper wing-coverts and primary-coverts dusky at base, with the exposed webs dull China Blue; outer edges of primary-coverts narrowly margined with paler blue; greater series broadly margined and tipped with white, forming a conspicuous wing-bar. Tail blackish above, with the outer webs of all the retrices and the inner webs of the middle pair bright China Blue; under surface of the tail between Gobelin Blue and China Blue. Under wing-coverts Pale Glaucous Blue.

Held toward the light, all blue-green colors are much bluer. The top

of the head is a trifle duller than Yale Blue, about Neropalin Blue; the back is Orient Blue and the rump is pale Sky Gray; the center of the breast is Forget-me-not Blue and the flanks are Light Neropalin Blue; the blue edgings of wing and tail become Olympic Blue. Wing 94 mm.; tail 71; culmen from base 18; exposed culmen 13; tarsus 21.

Females are not constantly separable from males although I have seen none as intensely colored as the brightest males. The dullest female which is definitely adult is no duller than the dullest male, although the rump may be less whitish and more bluish than in the males. A certain amount of variation appears in both sexes in the amount of white on the upper wing-coverts. Examples with the least amount of white are at the greener end of the series and appear to be not quite fully adult; the most immature specimens have no trace of a wing-bar. One of the nearly adult males from Chinchao, Perú, is matched in the color of wing, tail, shoulder-patch and wing-bar (though not in the tone of body plumage) by a male of *T. e. episcopus* (also slightly immature) from Utinga, Pará, Brazil; the latter is different, in turn, from another *episcopus* taken at Manáos, Brazil, and both are different from a typical example taken in French Guiana. Adult Manáos birds show an approach toward *T. e. coelestis* but are closer to *episcopus*. Eleven males and six females of *episcopus* from various localities show considerable variation which I am unable to associate with geographical distribution.

Specimens examined:

T. e. episcopus—British Guiana: Potaro 2 ♂; Georgetown 1 ♂ 2 ♀; no loc. 1 ?. French Guiana: Saint Laurent du Maroni 1 ♂. Dutch Guiana: Paramaribo 1 ♂. Brazil: Bôa Vista 1 ♂; Manáos 1 ♀; Itacoatiará 1 ♀; Utinga, Pará 1 ♂; São Luis, Maranhão 2 ♂ 1 ♀; Barra do Corda 1 ♀; São Bento 1 ♂; Codó, Cocos 1 ♂.

T. e. coelestis—Brazil: Porto Velho, Rio Madeira 1 ♂ 1 ♀ imm.; Caviana, Rio Solimões 1 ♂; São Paulo de Olivença 1 ♂; Tonantins 2 ♂ 1 ♀[1]; Manacapurú 2 ♂ 2 ♀[1].

T. e. caeruleus—Perú: Vista Alegre 2 ♂ (including type) 1 ♀?; Chinchao 2 ♂ ad., 1 ♂ imm., 1 ♀; Moyobamba 5 ♂ 7 ♀; Yurimaguas 2 ♀; Hacienda Limón 2 ♀ imm.

T. e. major—Perú: San Ramón, Chanchamayo 2 ♂ ad., 1 ♂ imm.

Ramphocelus melanogaster transitus, subsp. nov.

Type from Chinchao, Perú; altitude 5700 feet. No. 60244, Field Museum of Natural History. Adult male collected October 25, 1922, by J. T. Zimmer; original number 3124.

Diagnosis.—Similar to *R. m. melanogaster* from northern Perú, but males with throat and breast paler, having only the upper breast colored like the throat or a trifle darker; this passes insensibly into the brighter red of the lower breast and flanks whereas in *melanogaster* the deep red of the throat is carried well across the chest and is separated there from the brighter red of the extreme lower breast and flanks by an abrupt line;

[1]Specimens in Carnegie Museum, Pittsburgh.

interscapular region more strongly suffused with red than in *melanogaster*, approaching *R. d. dimidiatus* of Colombia and northwestern Venezuela in this respect though never so strongly red above.

Habitat.—Tropical and subtropical valleys of the upper Huallaga and Chinchao rivers, central (but not far northern) Perú.

Description of type.—Head and interscapular region between Ox-blood Red and Garnet Brown; interscapular region with concealed subterminal areas of black; lower back, rump, and upper tail-coverts between Carmine and Nopal Red. Wings and tail black; upper wing-coverts black with broad external margins the color of the back. Lores, indistinct superciliary stripes, and sides of the face a little brighter than the crown; chin and throat a little brighter, between Ox-blood Red and Carmine, becoming a little darker (though still brighter than the sides of the head) on the upper breast where the color grades insensibly into the rich Carmine of the lower breast, sides, flanks, and under tail-coverts. The middle of the belly is traversed by a black longitudinal stripe which is more or less mixed with red and appears as a row of black spots on the anterior portion, down to the lower belly where it is purer black. Under wing-coverts black. Wing 80 mm.; tail 75; culmen from base 18; exposed culmen 14; tarsus 21.

Females have the forehead Pompeiian Red, passing into Blackish Brown on the crown and nape; fore part of the crown with narrow whitish shaft-lines which do not reach the tips of the feathers and which are lost in the dull gray basal areas of the occipital feathers. Back between Madder Brown and Diamine Brown; lower back and rump Pompeiian Red which becomes brighter on the upper tail-coverts, approaching Brazil Red. Lores, superciliaries, and sides of face Pompeiian Red; hinder ear-coverts like the occiput. Chin Dragon's-blood Red with whitish shaft-lines; throat blackish brown with a faint wash of brighter red; breast between Madder Brown and Pompeiian Red, passing into clear Pompeiian Red on the remaining under parts. Wings and tail brownish black; upper wing-coverts edged with the color of the back; under wing-coverts dark vinaceous.

A male from Vista Alegre, Perú, is darker than the type and has the black subterminal areas of the upper tail-coverts reaching nearer the tips of the longer feathers (as it does sometimes in *melanogaster*), while the black of the belly is broader and extends a little farther anteriorly. Apparently this specimen is simply a dark example of the new race which is comparable to certain dark examples of *melanogaster* but which is still brighter than the brightest examples of the typical form.

Two females from Vista Alegre hardly differ from two females of *melanogaster* from Moyobamba. There is a little greater suffusion of Pompeiian Red in the Madder Brown of the chest which is quite noticeable in one of the Vista Alegre birds. Two other specimens of *melanogaster* are quite noticeably different from the first two and from the Vista Alegre birds, since they lack the whitish chin and pale reddish forehead.

Two young males of *transitus* from Vista Alegre are much like the females but are duller above, with the crown paler and with the shaft-lines broader

and extending to the nape. One of these specimens has the throat Dusky Brown, the upper breast Mineral Red, and the lower breast and sides between Mineral Red and Corinthian Red; the other lacks the heavy dusky suffusion of the upper breast and has this region dull Madder Brown, not strongly differentiated from the throat or from the lower breast and flanks. In four young males of *melanogaster* the throat and breast are as dark as in the females.

In describing this new race it becomes necessary to examine the status of Swainson's species, *Rhamphopis melanogaster*. This species was described from "Peru," being based on a specimen in W. Hooker's collection; the exact locality is unknown and the type is lost. Swainson's description is not exact enough to be of much assistance in the separation of the two Peruvian races. It says that the bird is "above brownish black" (unlike *transitus*), with the "head, throat and breast reddish chestnut—of the same dark color as in *R. atrococcineus*" (hardly like *transitus*), "but the rump and sides of the body are bright crimson; which color blends into the darker hue of the throat upon the breast" (which applies to *transitus* but in a general way describes specimens from northern Perú as well). Beyond this, the probability is much greater that Hooker's specimen came from northern Perú than that it was taken in the almost unknown interior to the southward, and, furthermore, it is the more northern form which has been recognized in more recent years and described by various authors under the names of *luciani* and *melanogaster*. Accordingly I have restricted the older name, *melanogaster*, to the northern birds and would suggest, as type locality, Moyobamba, whence specimens are recorded by both Taczanowski and Berlepsch.

A comparison of the type specimen of "*Rhamphocelus luciani*" of Lafresnaye (No. 77011, Museum of Comparative Zoology; Lafresnaye collection No. 3019) with five adult males of *melanogaster* from northern Perú, reveals unquestionable identity. The type of *luciani* is somewhat darker, less reddish, on the top of the head; the interscapulars are about as in a Moyobamba bird, though a trifle duller black; the rump and upper tail-coverts are faintly deeper red; the under parts are about as in north-Peruvian specimens, with the under tail-coverts slightly inclined to brownish—one longer covert is uniform dusky black; the deep red of the throat is prolonged over the breast and is then rather sharply defined against the paler hue of the posterior under parts, with the blackish median areas of the feathers producing a noticeably streaked appearance on the upper flanks, exactly as in one Moyobamba male. Wings and tail black, slightly brownish in tone. Wing 81.5 mm.; tail 77; tarsus 21.5.

The darker and duller appearance of some parts of the type of *luciani* may be due to age and post mortem change; the general aspect is much duller than is indicated in Prêtre's plate which accompanies Lafresnaye's article in the Magazin de Zoologie (1839, pl. 2). In length of tail the specimen comes exactly within the range of variability of *melanogaster* but exceeds the dimensions of seventeen males of *R. dimidiatus* which, like *luciani*, was described from Carthagena. Moreover, in comparison with *dimidiatus*, the type of *luciani* has the black of the mantle longer,

reaching farther posteriorly, as it does in *melanogaster*. It is evident, therefore, that *luciani* can not be the same as *dimidiatus*, as might be supposed from the identity of type localities as given by the describer, and it is equally certain that Carthagena is not the actual type locality of *luciani* which certainly came from northern Perú. N. Perú should, therefore, be substituted for Carthagena as type locality of *luciani*.

My males of *transitus* are decidedly similar in many ways to the males of *dimidiatus* from Colombia and Venezuela, though they are somewhat darker above and paler below. In *dimidiatus* the breast is deeper red but similarly graduated into the color of the lower breast and flanks. Thus *transitus* seems to be somewhere intermediate between *melanogaster* and *dimidiatus*, although the two latter forms are separated from each other by a region in which no representative of either species occurs. The females show no such intermediacy. Those of *melanogaster* and *transitus* are very similar while *dimidiatus* females are separable from both the others by their clear dusky black throat, upper breast, and forehead, and by their brighter, redder rump. The relationship is very close, however, and I would not be surprised in the future to find sufficient evidence to justify placing *melanogaster* and *transitus* in the *dimidiatus* group.

Among the specimens examined in this connection are two from the W. S. Church collection in the U. S. National Museum, labeled as coming from the "Upper Huallaga" and the "Headwaters of the Huallaga R." respectively. Dr. Wetmore advises me that a number of the birds in Church's collection were obtained in Lima where they had been sent by the Prefect of the Department of Amazonas who had secured them from the Indians in his part of the country; they were without given localities but were said to have come from the upper waters of the Huallaga. Evidently the two specimens in question are from this source. The probability is that they came from the head of navigation on the Huallaga since the actual source of the river is high in the temperate zone where this genus is not found. This head of navigation is between Chasuta and Yurimaguas, within the range of typical *melanogaster*, to which form the specimens unquestionably belong.

Specimens examined:

R. m. melanogaster—Perú: Moyobamba 3 ♂ ad., 4 ♂ imm., 4 ♀; "Upper Huallaga" and "Headwaters of Huallaga R." (=lower Huallaga); 2 ♂[1]; "Cartagena" (=n. Perú) 1 ♂[2] (type of *R. luciani* Lafr.).

R. m. transitus—Perú: Vista Alegre 1 ♂ ad. (type), 2 ♂ imm., 2 ♀; Chinchao 1 ♂.

R. d. dimidiatus—Venezuela: Colón, Táchira 1 ♂ 1 ♀; Encontrados, Zulia 4 ♂ 4 ♀; Catumbo 5 ♂ 4 ♀; Orope, Zulia 2 ♀. Colombia: Chicoral, Tolima 1 ♂; "Bogotá" 1 ♂ 2 ♀; Río Caquetá 1 ♂; Atrata 1 ♂ 1 ♀; Cuenta 3 ♂; Cauca Valley 1 ♀; San Augustin, Huila 1 ♀.

R. d. isthmicus—Panamá: Colón 4 ♂ ad., 1 ♂ imm., 1 ♀; Agua Dulce 1 ♂.

[1]Specimens in U. S. National Museum, Washington, D. C.

[2]Specimen in Museum of Comparative Zoology, Cambridge.

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PROCEEDINGS
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A NEW ANADIA FROM COLOMBIA WITH REMARKS ON OTHER MEMBERS OF THE GENUS.

BY A. LOVERIDGE.

Since the publication, in 1885, of Volume III of the Catalogue of Lizards in the British Museum no fewer than five species of Anadia (Family Teiidae) have been described. Unfortunately members of this genus are rarely obtained in series and most of the species were based on one or two individuals, nevertheless it appears likely that the majority are valid and the necessity of describing a tenth member of the genus makes it seem advisable to list the recognizable species with their known range of variation in the matter of scale counts. The new species may be known as

Anadia nicefori sp. nov.

Type, a male, no. 27,340, Museum of Comparative Zoölogy, from Rio Garagoa at Macanal, Eastern Andes, Colombia. Collected by Brother Niceforo Maria (collector's number 64) in 1928.

Diagnosis.—Closely related to *A. bitaeniata* Boulenger (of Venezuela) from which it differs in having a

(1) frontonasal much broader (not narrower) than long.
(2) a divided (instead of single) nasal.
(3) three (instead of four) posterior pairs of chin-shields, all three (instead of two) forming a median suture.
(4) seven, or nine, according to method of counting (instead of 12–16) scales between posterior chin-shields and edge of collar.
(5) six (not four) anterior and four (not six) posterior praeanals.
(6) three (not eight to ten) femoral pores.
(7) thirty-one (not 34–36) scales round mid-body.
(8) thirty-two (not 34–40) longitudinal scale-rows.
(9) coloration.
(10) smaller size ? See note on sex.

Description.—Habit lacertiform. Snout obtusely pointed, frontonasal much broader than long: praefrontals forming a median suture; four supraoculars, first smallest; frontals much longer than the frontoparietals, about the same size as the interparietal; a divided nasal; loreal single; a series of small infraorbitals; 7 upper and 6 lower labials, one single anterior and three pairs of chin-shields of which the last pair are the largest and all three pairs form a suture, 7 (or 9) transverse series of scales from the chin-shields to the edge of the collar; 8 collar shields; dorsal scales quadrangular but elongate, narrow; ventrals squarish, therefore broader than the dorsals; 31 scales round the middle of the body and 32 between the occiput and base of tail; 6 anterior and 4 posterior praeanals, a single scale being interposed between these two rows; caudal scales like those on the body. No praeanal and only 3 femoral pores distinguishable.

Color (in alcohol).—Head brownish with black smudges on each scale, the supraoculars almost entirely black; rest of upper surface black. Below white, a few black blotches on the labials and outermost scales of neck and belly and on all the posterior subcaudal scales.

Measurements:	Length from snout to vent	32 mm.
	Length of tail	64 mm.
	Length of hind limb	10 mm.
	Length of head	7.5 mm.
	Width of head	5 mm.

Sex.—The testes being 3 x 2 mm. would rather argue that the lizard is mature though only a trifle over half the length of the type of *A. bitaeniatus.*

Food.—Remains of a spider and two beetle larvae were found in the stomach: these were examined by Mr. Nathan Banks who considers the former a *Theraphosid* and the latter probably carabid larvae or of a related family.

When attempting to discover the affinities of this lizard, it was found that the characters on which Boulenger based his key (Catalogue of Lizards, 1885, III, p. 398) are now misleading, though at that time embodying the known data. For example *rhombifera* is included under the section "four supraoculars" though the text states the solotype had only three, the first being absent. *A. bogotensis* is rightly in the section "two supraoculars" but an examination of 24 topotypic Bogotá lizards in the collection of the Museum of Comparative Zoölogy shows that 25% of them have three, while a seventh has two on one side and semi-divided third on the other. In another series of 15 from Choachi, Colombia, only one has three supraoculars. These Choachi specimens are within the range of variation of the Bogotá lizards in having from 25 to 30 midbody scale rows and from 38 to 52 longitudinal ones (counting from the occipital scale to the second post anal ring of scales).

The character of the nostril being in a single nasal may not be very reliable as many Bogotá lizards exhibit a suture or semidivided state. As the Museum of Comparative Zoölogy only possesses a topotypic *A.*

pulchella and an *A. metallica* in addition to *A. bogotensis*, it seems inadvisable to attempt anything like a generic revision, particularly as the descriptions of most of the species were based on single examples. An attempt to form anything like a satisfactory key seems futile in face of our ignorance of the possible range of variation in these species, a tabular list may, however, serve some useful purpose.

Species	*Supraoculars*	*Mid-body Scale-rows.*	*Longitudinal Scale-rows.*
1. *metallica*	4	23–28	43–56
2. *ocellata*	4	30	58
3. *vittata*	4	30	58
4. *angusticeps*	4	32	60
5. *nicefori*	4	31	32
6. *bitaeniata*	4	34–36	34–40
7. *steyeri*	4	40–44	62–64
8. *pulchella*	3	41	43
9. *rhombifera*	3	48	33
10. *bogotensis*	2 (rarely 3)	38–52	25–30

1. *Anadia metallica* (Cope).
   Chalcidolepis metallicus Cope, 1876, Jour. Acad. Nat. Sci. Phila., p. 116, pl. xxiv, fig. 5.
   Aguacate Mountains, Costa Rica.

2. *Anadia ocellata* Gray.
   Gray, 1845, "Cat. Lizards in Brit. Mus." p. 58; 1851, Proc. Zool. Soc. Lond., pl. vi, fig. 1.
   Habitat unknown.

3. *Anadia vittata* Boulenger.
   Boulenger, 1913, Proc. Zool. Soc. Lond., p. 1033, pl. cvii, fig. 2.
   Peña Lisa, Condoto, Choco, Western Colombia. (Alt. 300 feet.)

4. *Anadia angusticeps* Parker.
   Parker, 1926, Ann. & Mag. Nat. Hist., (9) XVII, p. 550–1, text figs.
   Gorgona Id., Western Colombia.

5. *Anadia nicefori* sp. n.
   Rio Garagoa at Macanal, Eastern Andes, Colombia.

6. *Anadia bitaeniata* Boulenger.
   Boulenger, 1903, Ann. & Mag. Nat. Hist. (7) XII, p. 420.
   Escorial and Culatá, Venezuela. (Alt. 10,000 feet.)

7. *Anadia steyeri* Nieden.
   Nieden, 1914, Sitz. Ges. Naturf. Freunde, p. 365.
   Puerto Cabello, Venezuela (? sea level).

8. *Anadia pulchella* Ruthven.
   Ruthven, 1926, Occ. Papers Mus. Zool. Mich., 177, p. 1.
   La Cumbre, Hacienda Vista Nieve, Santa Marta Mountains, Colombia. (Alt. 7,000 feet.)

9. *Anadia rhombifera* (Günther).
   Cercosaurus rhombifer Günther, 1859, Proc. Zool. Soc. Lond., p. 405, pl. xx, fig. A.
   Western Ecuador.

10. *Anadia bogotensis* (Peters).
   Ecpleopus (*Xestosaurus*) *bogotensis* Peters, 1862, Abh. Berl. Acad., p. 217, pl. iii, fig. 3.
   Sta. Fé de Bogotá, Colombia.

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SIX NEW POCKET MICE FROM LOWER CALIFORNIA AND NOTES ON THE STATUS OF SEVERAL DESCRIBED SPECIES.

BY E. W. NELSON AND E. A. GOLDMAN.

Study of recent collections made in Lower California by the Museum of Vertebrate Zoology of the University of California, the California Academy of sciences, the San Diego Society of Natural History, and the Los Angeles Museum has added materially to knowledge of the mammals of the peninsula and adjacent islands. These collections supplement in a substantial way those made by the writers in an overland journey through the peninsula more than 20 years ago, and combined with them, and with specimens already available from other sources, afford a more satisfactory basis for a general report, now in course of preparation, on the mammals of the region. The following treatment of some of the pocket mice is published in advance in order that information may be made promptly available to other workers. For the use of critical material, including in several instances the types upon which new subspecies are based, we are indebted to Dr. Joseph Grinnell, Museum of Vertebrate Zoology, University of California, Dr. Barton W. Evermann, California Academy of Sciences, Mr. Laurence M. Huey, San Diego Society of Natural History, and Dr. Wilfred H. Osgood, Field Museum of Natural History.

Status of **Perognathus bombycinus** Osgood.

Perognathus bombycinus Osgood, from Yuma, Arizona, has been regarded as a species distinct from *Perognathus longimembris*, which in its various forms occupies extensive territory in California, Lower California, Nevada, and Utah. In the original description (Proc. Biol. Soc. Washington, vol. 20, February 23, 1907, p. 19) the relatively large, fully expanded

mastoids and very narrow interparietal were regarded as specific characters. Study of additional material now available shows considerable variation in members of the *P. longimembris* group, in the development of the mastoids, in the extent to which they project posteriorly beyond the plane of the occiput, and in their relation to the interparietal and supraoccipital. In typical *longimembris*, for example, the mastoids are comparatively small with slight posterior projection beyond the occiput, and the interparietal and supraoccipital are moderately wide; in *P. l. bangsi* the mastoids are more swollen and somewhat variable in extent of posterior projection, the interparietal and supraoccipital, while variable within certain limits, remain essentially as in *longimembris;* from *P. l. bangsi* it is only a short step to the form described as *P. bombycinus*, with still more swollen, more posteriorly projecting mastoids, crowding inward at the expense of the interparietal and supraoccipital. *P. l. panamintinus* and *P. l. aestivus* are geographic races presenting varying combinations of the same cranial features. The systematic position of *bombycinus* as one of the several subspecies of *longimembris* (*Perognathus longimembris bombycinus*) is clearly indicated.

Status of **Perognathus formosus** Merriam.

Perognathus formosus Merriam (North Amer. Fauna No. 1, October 25, 1889, p. 17) originally described from St. George, Utah, was accorded a range by Osgood (North Amer. Fauna, No. 18, September 20, 1900, p. 41), in his revision of the genus, extending from southwestern Utah, across southern Nevada into adjacent parts of California. Subsequent collections from southeastern California and from Lower California have, however, added materially to the known ranges of forms assignable to the species. As in many other instances the Colorado River appears to form a barrier to the distribution of this species which has been taken near its northern and western bank, but never on the other side. Elliott (Field Columb. Mus., publ. 87, Zool. ser., vol. 3, December, 1903, p. 251) in describing *Perognathus mesembrinus* from Palm Springs, Riverside County, California recognized relationship to *Perognathus formosus*, but the animal was given specific rank. Study of numerous specimens now available, including large series from various localities, shows intergradation between typical *formosus* and *mesembrinus* which is, however, usually distinguished by smaller size, paler coloration and cranial details, especially the attenuation of the rostrum. The subspecies *mesembrinus* occupies the Colorado Desert region extending south from the San Bernardino Mountains and east to the Colorado River, California, as shown by specimens from Palm Springs (type locality), Riverside County, Vallecito and La Puerta, San Diego County, and Pot Holes and Pilot Knob near the Colorado River, Imperial County. Specimens from along the Colorado River on the California side nearly opposite Ehrenberg, Arizona, and localities north as far as Chemehuevis Valley are variable, some being as pale as typical *mesembrinus*, while others are rather dark and in cranial characters approach *formosus*. In the sum of characters presented, with due allowance

for individual variation, they seem more properly referable to *mesembrinus* which evidently merges with *formosus* in the Mohave Desert region.

The recent Museum of Vertebrate Zoology collection from Lower California extends the known range of *Perognathus formosus* to the western shore of the Gulf of California where it is represented by a new geographic race described below.

Perognathus formosus cinerascens, subsp. nov.

ASHY POCKET MOUSE.

Type.—From San Felipe, northeastern Lower California, Mexico. No. 37685, ♀ (in adult pelage but molars unworn), Museum of Vertebrate Zoology, University of California, collected by Chester C. Lamb, April 10, 1926. Original number 5772.

General characters.—A small, extremely pallid subspecies closely allied to *Perognathus formosus mesembrinus*, but distinguished by ashy gray coloration of upperparts, with scarcely a trace of the dully buffy brownish suffusion present in *mesembrinus*. Similar in general to *P. f. formosus*, but decidedly smaller and differing otherwise as from *mesembrinus*.

Color.—Type: Upper parts in general light ashy gray, finely and rather inconspicuously mixed with black owing to overlying black-tipped hairs which are most numerous along median line on head and over back; under parts, including lips, lower part of cheeks, entire fore limbs and hind feet white; tail light brownish above, becoming darker toward tip; white below. *Young* (in first pelage): Upper parts nearly uniform plain ashy gray of a lighter tone than in *P. f. formosus* or *P. f. mesembrinus* of corresponding age.

Skull.—Very similar to that of *P. f. mesembrinus*, but still smaller, the rostrum and nasals very slender and the interorbital region apparently narrower. Compared with that of *P. f. formosus* the skull differs strikingly in size, especially the reduction in width of rostrum.

Measurements.—Type: Greatest length, 155 mm.; tail vertebrae, 75; hind foot, 22.8. A female topotype with molars somewhat worn, and with 7 embryos, but pelage indicating immaturity, 175; 82; 22.7. *Skull* (female of which external measurements are given): Greatest length, 24.3; greatest mastoid breadth, 13.6; interorbital breadth, 6.1; length of nasals, 9.3; width of nasals (in front of incisors), 2.2; interparietal, 5x3.5; maxillary toothrow, 3.4.

Remarks.—Various species of rodents inhabiting the region including San Felipe along the northwestern desert shore of the Gulf of California, representing such differing families as the Heteromyidae and the Cricetidae are distinguished by extremely pallid coloration. In fact most of the mammals of the region are very light in color, and the subspecies here described accords with the general rule. It is a region of extreme aridity and continued intense sunshine. As the soil is of light color, even where the land surface is not covered with whitish drifting sand, the pale color of the mammals is undoubtedly due to environmental influences. *Perognathus f. cinerascens*, presents extreme development in the direction of pallor

in the species. It probably intergrades with *P. f. mesembrinus* in the imperfectly known desert section extending north, between the mountains on the west and the Gulf and Colorado River on the east, into California. This subspecies is based upon five specimens all from the type locality.

The forms of *Perognathus formosus*, with type localities, will stand subspecifically as follows:

Perognathus formosus formosus Merriam.....St. George, Utah.
Perognathus formosus mesembrinus Elliot.....Palm Springs, California.
Perognathus formosus cinerascens Nelson and Goldman.....
San Felipe, Lower California.

Perognathus baileyi hueyi,[1] subsp. nov.

HUEY POCKET MOUSE.

Type.—From San Felipe, northeastern Lower California, Mexico. No. 5220, ♀ young adult (permanent premolars in place but very slightly worn), San Diego Society of Natural History, collected by Laurence M. Huey, April 17, 1926.

General characters.—Similar to *Perognathus baileyi baileyi* and *P. b. rudinoris*, but general color of upper parts decidedly paler, more ashy, the dusky element less developed than in either; cranial details slightly different.

Color.—Type: General tone of upper parts ashy gray with a light buffy suffusion, the head and dorsal area finely and rather inconspicuously lined with black; a faint buffy lateral line present; under parts, fore limbs and hind feet white; ears scantily clothed with fine whitish hairs, the epidermis light in color; tail light brownish above, white below.

Skull.—Closely resembling that of *P. b. rudinoris* but mastoid and audital bullae larger, as in *P. b. baileyi*. Differing from that of *P. b. baileyi* in narrower rostrum, greater posterior extension of premaxillae beyond nasals, and in slenderness of ascending branches of supraoccipital.

Measurements.—Type: Total length, 196; tail vertebrae, 106; hind foot, 24. *Skull* (type): Greatest length, 27.5; greatest mastoid breadth, 14.3; zygomatic breadth, 14.5; interorbital breadth, 6.4; length of nasals, 10.5; width of nasals (in front of incisors), 2.5; interparietal, 5.7 x 4.4; maxillary toothrow, 3.7.

Remarks.—The discovery of this subspecies in the desert region of northeastern Lower California tends to fill the wide gap that formerly existed between the known ranges of *Perognathus baileyi baileyi* and *P. b. rudinoris*. Additional field work may reveal its presence in southeastern California. Like various other forms of the type region this subspecies is distinguished by extremely pale coloration. Although the type is scarcely mature, as indicated by lack of wear on the molars, the condition of the mammae shows that young had been suckled.

Specimens examined.—Total number, 9, all from Lower California, as

[1]Named for the collector, Mr. Laurence M. Huey, whose work in the field and in the museum is resulting in important extensions of our knowledge of the mammals of southern California and northern Lower California.

follows: El Mayor, 2; El Mayor (13 miles north), 1; San Felipe (type locality), 6.

Relation of **Perognathus penicillatus** Woodhouse to **Perognathus arenarius** Merriam.

Until recently *Perognathus penicillatus*, originally described from San Francisco Mountain, Arizona, was assumed to include in its wide range as a species practically the entire length of the peninsula of Lower California and several adjacent islands, as shown by the assignment to it of *Perognathus penicillatus ammophilus* from Margarita Island and *Perognathus penicillatus siccus* from Ceralbo Island by Osgood (Proc. Biol. Soc. Washington, vol. 20, February 23, 1907, p. 20) and of *Perognathus penicillatus albulus* by Nelson and Goldman (Proc. Biol. Soc. Washington, vol. 36, May 1, 1923, p. 159). While *Perognathus arenarius* was not formally reduced to subspecific rank Osgood and Nelson and Goldman (l. c.) regarded it as one of the intergrading forms of *P. penicillatus*, owing to remarkable general resemblances including size and color which in some forms mark true differential characters, and to the fact that none of the races of *penicillatus* and *arenarius* had ever been collected at the same locality. Field work by Laurence M. Huey and his published results (Proc. Biol. Soc. Washington, vol. 39, July 30, 1926, pp. 67–70), however, directed attention to the specific distinction of the two, representatives of both of which (*Perognathus penicillatus angustirostris* and *Perognathus arenarius albescens*) were taken by him at San Felipe, Lower California. At San Felipe *penicillatus* and *arenarius* as species are easily separated by marked differences in size and color which alone, as observed elsewhere, are not reliable specific characters, but correlated with certain cranial details reveal the true status of the two. Specific characters distinguishing *arenarius* from *penicillatus* are the following: Skull less flattened, the braincase more inflated and and higher arched; upper part of foramen magnum normally forming a distinct embayment, constricted by projecting lateral angles of the margin (foramen magnum more evenly rounded in *penicillatus*); coronoid process more slender and curving strongly backward, not rising so steeply or so high above level of condyle as usual in *penicillatus*. Huey (l. c.) properly allocated *ammophilus*, *albulus*, and *helleri* as subspecies of *arenarius*. To the same species should be transferred the animal originally described as *Perognathus penicillatus siccus*. The subspecies of *P. arenarius*, with two new geographic races which are characterized beyond, with their type localities should stand as follows:

Perognathus arenarius arenarius Merriam.....
San Jorge, near Comondu, Lower California, Mexico.
Perognathus arenarius albescens Huey.....
San Felipe, Lower California, Mexico.
Perognathus arenarius helleri Elliot.....
San Quintin, Lower California, Mexico.
Perognathus arenarius ammophilus Osgood.....
Margarita Island, Lower California, Mexico.

Perognathus arenarius siccus Osgood.....
Ceralbo Island, Lower California, Mexico.
Perognathus arenarius albulus Nelson and Goldman.....
Magdalena Island, Lower California, Mexico.
Perognathus arenarius sublucidus subsp. nov.....
La Paz, Lower California, Mexico.
Perognathus arenarius ambiguus subsp. nov.....
Yubay, Lower California, Mexico.

Perognathus arenarius ambiguus, subsp. nov.

YUBAY POCKET MOUSE.

Type.—From Yubay, 30 miles southeast of Calamahue, Lower California, Mexico (altitude 2,000 feet). No. 140011, ♂ young adult (molars slightly worn), U. S. National Museum (Biological Survey collection), collected by E. W. Nelson and E. A. Goldman, September 18, 1905. Original number 18141.

General characters.—Similar to *Perognathus arenarius arenarius*, but smaller and paler colored. Slightly larger than *P. a. helleri* with decidedly paler coloration. Rather closely resembling *P. a. albescens*, but color usually distinctly darker. Buffy lateral line absent or faint. Skull presenting slight average differences when compared with those of the neighboring forms mentioned.

Color.—Type: Upper parts light buff (Ridgway, 1912), obscured by overlying black-tipped hairs; buffy lateral line absent; under parts, forelimbs and hind feet white; tail brownish above, white below.

Skull.—Similar in general to that of *P. a. arenarius* and *P. a. albescens* but usually smaller, with relatively smaller mastoid and audital bullae, these differences most noticeable in comparison with *arenarius*. Differing from that of *P. a. helleri* mainly in larger average size.

Measurements.—Type: Total length, 150 mm.; tail vertebrae, 88; hind foot, 22. Average and extremes of 5 adults from San Andres: 163 (157–167); 92 (88–96); 22 (22–23.5). *Skull* (type): Greatest length, 22.6; greatest breadth, 12; interorbital breadth, 6.2; length of nasals, 8.3; width of nasals (in front of incisors), 2.3; interparietal, 5.8 x 2.8; maxillary toothrow, 3.2.

Remarks.—The forms of *Perognathus arenarius* present a wide range of local variation in color of upper parts evidently associated with the prevailing color tone of the habitat. Pallid individuals inhabit areas of whitish sand or very light-colored soil, and darker ones are found in blackish lava or other soils that are dark in general hue. This subspecies occupies the central section from San Fernando south to the Vizcaino Desert, the region of perhaps most extreme aridity in Lower California. It embraces material somewhat variable in color and cranial details from numerous localities and not satisfactorily assignable to forms heretofore described. Specimens from San Fernando approach *P. a. helleri*, the dark form of the northwest coast of the Peninsula, in rather dark upper parts and tendency, to exhibit a buffy lateral line present in that form. Some of those from San Francisquito and from certain localities as far south as the Vizcaino

Desert, 20 miles west of San Ignacio, are rather pale and in this character not widely different from *P. a. albescens* from San Felipe, Gulf of California, but cranial details, especially the smaller mastoids, are usually distinctive. Most of the specimens from the extensive area assigned to *P. a. ambiguus* possess a medium depth of color combined with slight average cranial details which are fairly distinctive.

Specimens examined.—Total number, 58, all from localities in Lower California as follows: Calamahue, 3; Calamahue Canyon (mouth), 7; La Lomita Maria, 4; Pozo Altamirano, 2; Pozo San Augustin (20 miles east of San Fernando), 11; Punta Prieta, 1; Rancho Mesquital (33 miles west of Calmalli), 2; San Andres, 7; San Fernando, 5; San Ignacio (20 miles west), 4; Santo Domingo, 3; San Francisquito, 6; Santa Clara Mountains, 1; Santa Rosalia Bay, 3; Scammon's Lagoon (south side), 4; Turtle (or San Bartolome) Bay, 1; Yubay (type locality), 1.

Perognathus arenarius sublucidus, subsp. nov.

LA PAZ POCKET MOUSE.

Type.—From La Paz, Lower California, Mexico. No. 146896, ♂ adult, U. S. National Museum (Biological Survey collection), collected by E. W. Nelson and E. A. Goldman, February 16, 1906. Original number 19146.

General characters.—Closely allied to *Perognathus arenarius albulus* but darker in color, the general tone of upper parts tending toward ochraceous-tawny instead of light ochraceous-buff (Ridgway 1912), reaching well down over face along sides and over hips (in *albulus* the pure white of under parts tends to spread upward over face to include orbits, along lower part of sides, and over hips). Similar in general to *Perognathus arenarius arenarius*, but averaging smaller and decidedly paler, the upper parts much less heavily overlaid with black; skull differing in detail.

Color.—Type: Upper parts near light ochraceous-tawny, finely and inconspicuously overlaid with brownish black; buffy lateral line absent; under parts, entire forearms and hind feet white; tail scantily haired, light brownish above, whitish below.

Skull.—About as in *P. a. albulus*, of Magdalena Island. Compared with that of *P. a. arenarius*, the skull averages smaller, and relatively narrower with relatively smaller, less inflated mastoid and audital bullae.

Measurements.—Type: Total length, 167 mm.; tail vertebrae, 95; hind foot, 22. Averages and extremes of 10 adult topotypes: 157 (151–166); 87.7 (83–95); 21.6 (21–22). *Skull* (type): Greatest length, 24.8; greatest breadth, 12.6; interorbital breadth, 6.3; length of nasals, 9.4; width of nasals (in front of incisors), 2.3; interparietal, 6.4 x 3.7; maxillary toothrow, 3.2.

Remarks.—This subspecies has an unusually limited but well defined range, covering the very arid desert of the small sloping basin a few miles in extent, lying about the southern and southwestern part of La Paz Bay. To the north and south its range is limited by mountainous areas and to the west by the divide between the drainage to the Gulf and to the Pacific.

Specimens examined.—Seventeen, all from the type locality.

Perognathus fallax inopinus, subsp. nov.

TURTLE BAY POCKET MOUSE.

Type.—From Turtle (also known as San Bartolome) Bay, Lower California, Mexico. No. 81059, ♂ adult, U. S. National Museum (Biological Survey collection), collected by A. W. Anthony, August 1, 1896. Original number, 82.

General characters.—Closely allied to *Perognathus fallax fallax* and *P. f. pallidus*, but smaller and upper parts more rufescent than usual in either; skull differing in smaller size and structural details. Similar in general to *P. anthonyi*, of Cedros Island, but more ruddy in color and cranial characters quite distinctive. Rump spines present as usual in the species.

Color.—Type: Lighter element in upper parts near ochraceous-buff, of Ridgway, but slightly more tawny, this color purest along lateral line, but much obscured on head and back by overlying black-tipped hairs, the combination producing a brownish tawny effect; under parts and feet white; outer sides of forearms faintly tinged with buff; tail blackish above, white below.

Skull.—Similar to those of *P. f. fallax* and *P. f. pallidus*, but smaller, less massive; rostrum relatively more slender; dentition lighter; incisors narrower; molariform toothrows relatively shorter; audital bullae relatively rather large. Compared with that of *P. anthonyi* the skull is broader posteriorly, with zygomata narrower, more convergent anteriorly, the sides, therefore, less nearly parallel; interorbital space broader; interparietal larger; audital bullae larger, more inflated.

Measurements.—Type: Total length, 180 mm.; tail vertebrae, 104; hind foot (dry skin), 23. *Skull* (type): Greatest length, 25.5; greatest mastoid breadth, 13.2; interorbital breadth, 6.2; length of nasals (median line), 9.3; width of nasals (in front of incisors), 2.5; interparietal, 6.6 x 4.3; maxillary toothrow, 3.5.

Remarks.—The known range of *Perognathus fallax* as a species lies south from the region of the type locality near San Bernardino, California, along the Pacific slope to Turtle or San Bartolome Bay, Lower California. Rather irregular geographic and individual variation in size and color is notable, but a pale geographic race *P. f. pallidus*, with a range apparently paralleling that of the typical form along the eastern side is recognizable. Specimens from turtle Bay were assigned by Osgood (North Amer. Fauna, no. 18, p. 56, September 20, 1900) to *fallax*, the only form then recognized, and he compared them in color with *P. anthonyi* of Cedros Island then represented by the type only. Study of material now available, including topotypes of *P. anthonyi* and collections from various localities within the general range of *P. fallax* indicate the desirability of recognizing the southern subspecies here described. It is represented by two specimens, both from the type locality.

Perognathus evermanni,[1] sp. nov.

EVERMANN POCKET MOUSE.

Type.—From Mejia Island (near north end of Angel de la Guardia Island), Lower California, Mexico. No. 3937, ♂ adult, California Academy of Sciences, collected by V. W. Owen, June 28, 1921. Original number, 24.

General characters.—A small species of the *Perognathus spinatus* group, resembling typical *spinatus* externally but underlying plumbeous area of pelage darker and more sharply defined; delicate structure of cranium, especially attenuation of nasals and narrowness of frontal and parietal regions, quite distinctive. Rump bristles present, and tail with an elongated terminal tuft as in *spinatus*.

Color.—Type (in worn pelage): Upper parts light ochraceous buff, darkened by overlying black tipped hairs with sharply defined plumbeous under color showing through, the result being a dull, grizzled, grayish brown general tone; under parts, forelimbs, and hind feet white; tail brownish above, white below.

Skull.—Similar in general to that of *P. s. spinatus*, but smaller, relatively narrower, and lighter in structure; braincase narrower and proportionately more arched above, nasals much narrower, more tapering, their width near posterior ends exceeded by that of ascending branches of premaxillae (nasals broader than premaxillae posteriorly in *P. s. spinatus*), the ends with a deep emargination between them; interorbital space narrower; mastoid and audital bullae smaller, dentition about as in *spinatus*.

Measurements.—Type (dry skin): Total length, 156 mm.; tail vertebrae, 80; hind foot, 20.7. An adult female topotype (dry skin), 158; 88; 20.7. *Skull* (type): Greatest length, 24.2; greatest mastoid breadth, 11.7; interorbital breadth, 5.6; length of nasals, 9.6; width of nasals (in front of incisors), 2.5; interparietal, 6.5 x 3; maxillary toothrow, 3.4.

Remarks.—While clearly a member of the *Perognathus spinatus* group this island pocket mouse differs so strongly from the widely ranging main, land animal that specific recognition appears warranted. Its small island habitat has been described by Mr. Joseph R. Slevin as rough and volcanic, and cut by steep, rocky canyons.

Specimens examined.—Two, both from the type locality.

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[1]Named for Dr. Barton W. Evermann in recognition of his active services as Director of the California Academy of Sciences, and as a systematic worker in furthering knowledge of the natural history of the peninsula of Lower California, and adjacent islands and waters.

Vol. 42, pp. 113–116 March 25, 1929

PROCEEDINGS
OF THE
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PRELIMINARY LIST OF THE BUTTERFLIES OF THE DISTRICT OF COLUMBIA.[1]

BY AUSTIN H. CLARK.

For some years the author has been gathering information regarding the butterflies of the District of Columbia and vicinity with a view to publishing a detailed account of the local species, with special emphasis on their seasons, the forms in which they occur in this region, their local distribution, and their habits.

It has seemed advisable to publish a preliminary list of the forms known to occur in this area in order to stimulate interest in the assembling of much needed information, particularly in regard to the earliest appearance of the various species, and the time of appearance of summer and autumn broods, concerning which we have at present no definite information.

The following list is based upon the collection of the late Mr. Henry F. Schönborn (H. F. S.), now in the National Museum, the collection of Mr. Ernest Shoemaker, of Brooklyn, N. Y. (E. S.), and the collection of the author and his two sons, Austin B. J. Clark and Hugh U. Clark (C.).

The local occurrence of the species is approximately indicated by the numbers immediately following the names. These numbers refer to the following habitats.

1. Generally distributed in open country.
2. Generally distributed in woods.
3. Open woods and fields near woods.
4. Moist grassy regions.
5. Low ground along the river.
6. Open woods and bushy fields.
7. Borders of fields and adjacent open woods.
8. Farm yards, roadsides and waste land.
9. Boggy areas along the Eastern Branch and in the vicinity of Beltsville.

[1]Published with the permission of the Secretary of the Smithsonian Institution.

10. Scrub and adjacent fields and gardens.
11. Proximity of hackberry (*Celtis occidentalis*) trees.
12. About cedar (*Juniperus virginianus*) trees.
13. Lowlands along the river and the Eastern Branch wherever the turtlehead (*Chelone glabra*) occurs.
14. Pine woods.
15. Above Little Falls.
16. Moist fields near willows, and hillsides with small poplars.
17. Along streams lined with alder or beech.

The nomenclature herein used is that of the list recently published by William Barnes and Foster H. Benjamin, except that the American forms of *Lycæna phlæas* and of *Lycænopsis argiolus* are given as subspecies, and the black and white swallowtail is given as *Papilio protesilaus* instead of *Papilio marcellus*.

Linné's description of *Papilio protesilaus* reads: "Protesilaus. 29. P. E. alis caudatis subconcoloribus albidis: fasciis fuscis: unica subtus sanguinea, angulo ani rubro. *Habitat in* America *septentrionali.*" Linné added "*Simillimus* Podalirio *Europæ australis & Africæ; an satis diversus?*" The description can refer only to our zebra swallowtail, since there is no other form in North America to which it is applicable. Certainly it was never intended to cover the silky white species from Surinam to which it is usually applied, as Linné would never have called that form very similar to *podalirius*, nor would he have had any doubt about its distinctness from that species.

The form of *Junonia cœna* designated as "wet" is the large dark form with the under side of the hind wings entirely deep pink. The "wet" form of *Cynthia atalanta* is the large blackish form with the orange band on the forewings narrow, often interrupted, and very deep in color. The "wet" form of *Cynthia cardui* is the large brightly colored form familiar to all entomologists in the District.

PAPILIONOIDEA.

NYMPHALIDÆ.

SATYRINÆ: *Megisto cymela* (Cramer), 2, H. F. S., E. S., C.; *Satyrodes eurydice* (Johanss.), 9, H. F. S., E. S., C.; *Cercyonis alope alope* (Fabr.), 7, H. F. S., E. S., C.; *Cercyonis alope maritima* (Edw.), 5, C.

NYMPHALINÆ: *Celtiphaga celtis celtis* (B. and Le C.), 11, H. F. S., E. S., C.; *Celtiphaga clyton clyton* (B. and Le C.), 11, C.; *Basilarchia arthemis astyanax* (Fabr.), 2, H. F. S., E. S., C.; *Basilarchia archippus archippus* (Cramer), 16, H. F. S., E. S., C.; *Junonia cœna cœna* Hübner, 1, H. F. S., E. S., C. (wet form very local, in boggy fields; dry form only survives the winter); *Cynthia atalanta* (L.), 3, H. F. S., E. S., C. (wet form very local, in boggy fields; dry form only survives the winter); *Cynthia virginiensis* (Drury), 1, H. F. S., C.; *Cynthia cardui* (L.), 1, H. F. S., E. S., C. (wet form only, except in early spring; does not survive the winter); *Hamadryas antiopa antiopa* (L.), 2, H. F. S., C.; *Polygonia interrogationis* (Fabr.) 3, H. F. S., C.; *Polygonia comma* (Harris), 3, H. F. S., E. S., C.; *Polygonia*

progne (Cramer), probably 9, H. F. S.; *Phyciodes tharos* (Drury), 1, H. F. S., E. S., C.; *Phyciodes batesii* (Reakirt), 1, C.; *Euphydryas phaëton phaëton* (Drury), 13, H. F. S., E. S., C.; *Euptoieta claudia* (Cramer), 4, H. F. S., E. S., C.; *Brenthis myrina* (Cramer), 9, C.; *Dryas idalia* (Drury), 4, H. F. S., E. S., C.; *Dryas cybele cybele* (Fabr.), 3, H. F. S., E. S., C.; *Dryas aphrodite aphrodite* (Fabr.), 3, C.

Danainæ: *Danaus menippe* (Hübner), in spring 5, in summer 1, H. F. S., C. (does not survive the winter).

Libytheinæ: *Libythea bachmanii* (Kirtl.), 11, H. F. S., E. S.

LYCÆNIDÆ.

Lycæninæ: *Lycæna phlæas hypophlæas* (Boisd.), 8, H. F. S., E. S., C.; *Feniseca tarquinius* (Fabr.), 17, H. F. S., E. S., C.

Plebejinæ: *Everes comyntas comyntas* (Godart), 1, H. F. S., E. S., C.; *Lycænopsis argiolus pseudargiolus* (B. and Le C.), 6, H. F. S., E. S., C. (occurring in forms *lucia, marginata, violacea, pseudargiolus* and *neglecta*).

Theclinæ: *Strymon m-album* (B. and Le C.), 1, H. F. S., E. S., C.; *Strymon melinus melinus* Hübner, 1, H. F. S., C.; *Strymon ontario* (Edw.), E. S. (June 26, 1920, two specimens); *Strymon titus mopsus* (Hübner), 5, E. S., C.; *Strymon calanus* (Hübner), 10, H. F. S., E. S., C.; *Mitoura gryneus gryneus* (Hübner), 12, H. F. S., E. S.; *Incisalia augustinus* (Westw.), Yale Univ. Mus.; *Incisalia irus* (Godart), 10, H. F. S., E. S.; *Incisalia niphon* (Hübner), 14, H. F. S., E. S., C.

PAPILIONIDÆ.

Asciinæ (Pierinæ): *Eurema nicippe* (Cramer), 5, H. F. S., E. S., C.; *Eurema lisa* (B. and Le C.), 1, H. F. S., E. S., C.; *Eurymus eurytheme* (Boisd.), 1, H. F. S., E. S., C. (frequent, 1926; abundant, 1927, 1928; occurs in forms *ariadne, keewaydin* and *amphidusa*); *Eurymus philodice* (Godart), 1, H. F. S., E. S., C.; *?Zerene cæsonia* (Stoll); *Catopsilia sennæ* (L.), 5, H. F. S., E. S. (males only); *Anthocharis midea* (Hübner), 2, H. F. S., E. S., C.; *Ascia protodice* (B. and Le C.), 1, H. F. S., C.; *Ascia rapæ* (L.), 1, H. F. S., E. S., C. (first appearance, 1872).

Papilioninæ: *Papilio philenor* L., 1, H. F. S., E. S., C.; *Papilio cresphontes* Cramer, 15, H. F. S.; *Papilio glaucus* L., 3, H. F. S., E. S., C.; *Papilio troilus* L., 3, H. F. S., E. S., C.; *Papilio ajax ajax* L. 1, H. F. S., E. S., C.; *Papilio protesilaus* L., 3, H. F. S., E. S., C.

HESPERIOIDEA.

HESPERIIDÆ.

Urbaninæ: *Epargyreus tityrus* (Fabr.), 3, H. F. S., C.; *Achalarus lyciades* (Geyer), 1, H. F. S., E. S., C.; *Cecropterus cellus* (B. and Le C.), 5, E. S.; *Thorybes pylades* (Scudder), 3, H. F. S., E. S., C.; *Thorybes daunus* (Cramer), 3, H. F. S., E. S., C.; *Urbanus centaureæ* (Rambur), 2, H. F. S., E. S., C.; *Urbanus tessellata tessellata* (Scudder), 3, H. F. S., E. S., C.; *Pholisora catullus* (Fabr.), 8, H. F. S., E. S., C.; *Erynnis icelus* (Scudder and Burgess), 3, H. F. S., E. S., C.; *Erynnis brizo brizo* (B. and Le C.), 3, H. F. S., E. S.; *Erynnis persius* (Scudder), 3, H. F. S., E. S., C.; *Erynnis martialis* (Scud-

der), 3, H. F. S., E. S., C.; *Erynnis juvenalis* (Fabr.), 3, E. S., C.; *Erynnis horatius* (Scudder and Burgess), 3, E. S., C.

HESPERIINÆ: *Ancyloxypha numitor* (Fabr.), 4, H. F. S., E. S., C.; *Hesperia leonardus* Harris, 4, E. S., C.; *Hesperia sassacus sassacus* Harris, 4, C.; *Hylephila phylæus* (Drury), 1, H. F. S., C.; *Polites cernes* (Boisd.), 1, H. F. S., E. S., C.; *Polites coras* (Cramer), 1, H. F. S., E. S., C.; *Polites verna* (Edw.), 1, H. F. S., E. S., C.; *Polites manataaqua manataaqua* (Scudder), 1, H. F. S., E. S., C.; *Atalopedes campestris* (Boisd.), 1, H. F. S., E. S., C.; *Catia otho egeremet* (Scudder), 1, H. F. S., E. S., C.; *Atrytone logan logan* (Edw.), 1, C.; *Atrytone vestris* (Boisd.), 1, H. F. S., E. S., C.; *Atrytone pontiac* (Edw.), 9, C.; *Poanes massasoit* (Scudder), 9, C.; *Poanes hobomok* (Harris), 1, H. F. S., E. S., C.; *Poanes zabulon* (B. and Le C.), 1, H. F. S., E. S., C.; *Amblyscirtes vialis* (Edw.), 5, H. F. S., E. S., C.; *Megistias fusca* (G. and R.), 1, H. F. S., E. S., C.; *Lerema accius* (A. and S.), E. S.; *Prenes ocola* (Edw.), H. F. S.

Vol. 42, pp. 117–120 March 25, 1929

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

NEW RACES OF BIRDS FROM HAITI.

BY ALEXANDER WETMORE.[1]

The races characterized in the following paragraphs have been identified in the collections of the United States National Museum during studies of the extensive collections from Haiti and the Dominican Republic in that institution. Types of both species were collected by Dr. W. L. Abbott.

In connection with this paper I am indebted to Dr. Witmer Stone of the Academy of Natural Sciences in Philadelphia for the privilege of examining a honey-creeper from Tortue Island collected by Mr. James Bond.

Dulus dominicus oviedo, subsp. nov.

Characters.—Similar to *Dulus dominicus dominicus* (Linnaeus)[2] but grayer brown, less olive above; rump and upper tail-coverts less extensively washed with greenish; averaging somewhat larger, with heavier bill.

Description.—Type, U. S. Nat. Mus. Cat. No. 278751, male, in somewhat worn plumage, collected at Pikmi, Gonave Island, Haiti, July 5, 1920, by Dr. W. L. Abbott. Back and scapulars between olive brown and buffy brown; hind-neck grayish olive, with obscure shaft streaks similar in color to the back; crown dull clove brown, the feathers margined faintly with grayish olive; auricular region dull blackish; rump and upper tail-coverts citrine drab; rectrices blackish brown, margined basally with grape green; primaries and secondaries blackish brown, margined externally, especially on the secondaries, with grape green; wing-coverts fuscous, margined very faintly with whitish; under surface of body dull white, with a very faint cast of yellowish buff on abdomen and flanks, streaked broadly and sharply with clove brown, the streaks being broadest on breast and sides, and becoming obsolete on abdomen; under wing-coverts ivory yellow lined with clove brown; edge of wing whitish streaked with clove

[1] Published by permission of the Secretary of the Smithsonian Institution.

[2] *Tanagra dominicus* Linnaeus, Syst. Nat., ed. 12, 1766, p. 316. ("Dominica"= Hispaniola.)

brown; under surface of flight feathers on inner margins edged with dull white. Upper mandible buffy brown, lower deep olive-buff; tarsus slate color; toes blackish slate (from dried skin).

Measurements (in millimeters).—Four males, wing 90.4–92.2 (91.1), tail 72.3–80.7 (75.5), culmen from base 15.6–16.8 (16.2), tarsus 21.0–23.1 (22.3).

Three females, wing 88.3–94.1 (90.9), tail 72.0–74.8 (73.0), culmen from base, 16.2–17.3 (16.9), tarsus 22.1–24.1 (22.9).

Type, male, wing 91.2, tail 75.3, culmen from base 16.1, tarsus 22.6.

Range.—Gonave Island, western Haiti.

Remarks.—This form is described from seven skins secured July 5, 1920, at Pikmi, a village on the southeastern shore of Gonave Island. The series is quite uniform in difference from an extensive set of specimens from various parts of the main island.

For comparison the following measurement of birds from Hispaniola proper (Haiti and the Dominican Republic) are offered:

Males, 17 specimens, wing 82.3–89.8 (86.3), tail 65.6–77.0 (69.8), culmen from base 13.5–16.5 (15.1), tarsus 20.3–24.4 (22.3).

Females, 15 specimens, wing 83.4–90.0 (86.8), tail 63.5–77.4 (68.3), culmen from base 13.7–16.0 (15.0), tarsus 20.2–23.5 (22.2).

It will be observed that the bird of Gonave Island averages appreciably larger in all measurements except the tarsus. Though occasional individuals from the main island may be as large as Gonave specimens this is not usual.

This race is named in honor of Capitán Gonzalo Fernandez de Oviedo y Valdés, first among the early historians of the New World, who in his Historia General y Natural de las Indias, begun in 1535, gave to the world many observations on natural history, particularly from Hispaniola, where he resided for years. His account of the *Paxaro comunero* as he termed the palm-chat is highly entertaining.

Coereba bananivora nectarea, subsp. nov.

Characters.—Similar to *Coereba bananivora bananivora* (Gmelin)[1] but throat and foreneck decidedly darker gray.

Description.—Type, U. S. Nat. Mus. Cat. No. 250608, male in fresh plumage, collected on Tortue Island, Haiti, February 1, 1917, by Dr. W. L. Abbott. Above sooty black with a very faint tinge of olive; superciliary line white, extended back to sides of nape; rump lemon yellow; a white spot on outer webs of sixth to eighth primaries, and a narrow white edging on outer webs of sixth to ninth primaries; throat and foreneck dark mouse gray; breast and upper abdomen lemon chrome; lower abdomen and under tail coverts dull white; sides and flanks vetiver green; edge of wing lemon yellow; under wing coverts white. Bill black; tarsus and toes blackish slate (from dried skin).

[1] *Motacilla bananivora* Gmelin, Syst. Nat., vol. 1, pt. 2, 1789, p. 951. ("Insulae S. Dominici"=Hispaniola.)

Measurements (in millimeters).—Two males, wing 58.0[1]–58.5 (58.3); tail 33.9[1]–35.3 (34.6); culmen from base 12.5–13.0[1] (12.8); tarsus 17.09 17.2[1] (17.1).

Range.—Tortue Island, Haiti.

Remarks.—In addition to two skins in the National Museum I have examined a third in the Academy of Natural Sciences in Philadelphia collected March 23, 1928, by James Bond. All three differ appreciably in darker throat from a considerable series seen from Haiti and the Dominican Republic.

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[1]Type.

Vol. 42, pp. 121–124 March 25, 1929

PROCEEDINGS

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THE IDENTITY OF CORVUS MEXICANUS GMELIN.

BY JAMES L. PETERS.

On page 375 of the 13th edition of the Systema Naturae, Gmelin described *Corvus mexicanus* in the following words: "C. totus ex caeruleo ater. Habitat in nova Hispania, ad oppida, perpetim sonorus, monedulae magnitudine. Rostrum pedes et ungues nigri." The references on which the bird was based are *Pica mexicana major* Briss. av. 2, p. 43, no. 4.; Hoitzanatl Raj., av. p. 162; Cirard, Pernetty, It. Mal. **1**, p. 185; Hocisana, Buff. Hist. Nat. Ois. **3**, p. 103; Mexican Crow, Lath. Syn. **1**, pt. 1, p. 396, no. 34.

These references are given in the order used by Gmelin, but for convenience I shall take them up chronologically beginning with Ray (Joannis Raii, Syn. Meth. Av. & Pisc. London, 1713). This author cites (p. 162) Hoitzanatl of Fernandez which is a lapsus for Hocitzanatl since the description agrees practically verbatim with Fernandez "Hocitzanatl." Brisson in 1760 gives as the basis for his Grande Pie de Mexique the Hocitzanatl of both Fernandez and Ray; Buffon, 1774, cites as "synonyms" of his "L. Hocisana" the Hocitzanatl of Fernandez and Ray together with the Grande Pie de Mexique of Brisson, while Latham in 1781 in characterizing his "Mexican Crow" bases it on Ray, Brisson and Buffon, adding the "Criard" from Pernetty Voy. au Malouines.

It is perfectly obvious therefore that the Hocitzanatl of Fernandez is the one and only original of *Corvus mexicanus* since all the references by Gmelin go back to this bird and his diagnosis alone is quite insufficient to identify the species.

I give the original description of the Hocitzanatl taken from the Latin edition of the Nova Plantarum Animalium et Mineralium Mexicanorum Historia, published at Rome in 1651.

"Circa urbes versatur Hocitzanatl, essetque monedulis nostratibus prorsus similis, nisi eas vinceret corporis magnitudine & prolixitate caudae (qua vel Picis ipsis est par) & e nigro colore in caeruleum splendentum paulisper inclinaret. Garrula est, altaeque vocis, sonorae, crura sunt nigra & mediocriter loga ac pedes in quaternos fissi digitis, armatos unguibus prolixis, ac nigris; alimoniam iucundam praebet, atramque, pertinentem ad succum melancholicum, sunt qui Cacaxtototl vocent."

To my mind this description of a bird the size of a jackdaw with a tail as long as a magpie, having a high-pitched sonorous note can not apply to a crow even if the color is black inclining to iridescent blue. Apparently Latham's calling the bird "Mexican Crow" was responsible for Gmelin naming the bird *Corvus mexicanus*, and once the bird was in the genus *Corvus*, ornithologists found it much more convenient to apply the name to a crow from Mexico than to take the trouble to go back to the original sources and find out what it was really all about.

There is just one Mexican bird to which the description of the Hocitzanatl can apply and that is the Great-tailed Grackle, at present known as *Megaquiscalus major macrourus*, and having so identified *Corvus mexicanus* a far reaching trail of consequences arises.

In 1831 Lesson, in his Traité d'Ornithologie, page 433, diagnosed the Genus Cassidix for the first time, giving as the only species the "Cassique a mantelet" for which *Corvus mexicanus* Gmel. and *Cassicus niger* Vieill. Gal. des ois. pl. 89 ? were cited as synonyms. His generic diagnosis is without much question referable to a Rice Grackle but his synonymy is not, —*Corvus mexicanus* being a Great-tailed Grackle and *Cassicus niger* is certainly some sort of *Holoquiscalus*. In 1840 Gray designated as the type of *Cassidix*, "*C* [*assidix*] *mexicanus* (Gm.) Less." [=*Corvus mexicanus* Gmel.] Thus Cassidix being of earlier date than *Megaquiscalus* (Cassin 1866) must replace it, and *Corvus mexicanus* Gmel. being an earlier name for *Quiscalus macrourus* Swains. and also of earlier date than *Quiscalus major* Vieill. 1819, the boat-tailed Grackles will stand as:

Cassidix mexicanus mexicanus (Gmel.)
" " *major* (Vieill.)
" " *obscurus* (Nels.)
" " *graysoni* (Scl.)
" " *nelsoni* (Rigw.)
" " *assimilis* (Scl.)
" *tenuirostris* (Swains.)
" *nicaraguensis* (Salv. & Godm.)

This action is three-fold in its immediate effect on nomenclature, for in the first place the Rice Grackles will require a different generic name, furthermore the bird hitherto known as *Cassidix oryzivora mexicana* (Less.) must be renamed since Lesson named no such bird but merely cited Gmelin's *Corvus mexicanus* in the synonymy of his "Cassique a mantelet," and it is quite obvious that the same name can not be used for two different species, and lastly the mexican Crow must receive a name, since it never really had one.

There seems to be no generic synonym available for the Rice Grackles. Ridgway, Birds No. & Mid. Am. pt. 2, 1902, p. 196, cites *Scaphidura* Swainson (Classif. Bds. **2**, 1837, p. 272) as a synonym, but after considerable hesitation and on the advice of Dr. Richmond, I have considered it a lapsus or emendation of *Scaphidurus* Swainson (Philos. Mag. N. S. **1**, no. 6, June, 1827). *Scaphidurus* is a substitute name for *Quiscalus* and, under Art. 30, par. f of the International Code, takes the same type, so *Scaphidurus* is a synonym of *Quiscalus* as is also *Scaphidura* (if regarded as an emendation or lapsus).

The Rice Grackles therefore being nameless, I propose the name

Psomocolax

for Cassidix of authors *nec* Lesson, with *Oriolus oryzivorus* Gmelin as the type. The Mexican Rice Grackle I name

Psomocolax oryzivorus impacifus, subsp. nov.

Type, adult male, no. 102320, Museum of Comparative Zoology, from Pasa Nueva, Vera Cruz, Mexico; collected 22 April, 1901, by A. E. Colburn and P. W. Shufeldt.

Characters.—Similar to *Psomocolax oryzivorus oryzivorus* (Gmelin) but averaging larger, plumage of adult male uniformly glossed with violet without trace of bronze.

Remarks: The three races of *Psomocolax oryzivorus* with their characters and distribution are:

P. o. impacifus nob. Size medium, wing of ♂ 183–210, bill 37–38.5; gloss entirely violaceous sometimes with a wash of steel blue, but never bronzy. Southern Mexico to western Panama.

P. o. violeus (Bangs). Size larger, wing of ♂ 196–210; bill 37–40; violaceus gloss confined to pileum and posterior upper and underparts; mantle, neck ruffs and anterior underparts strongly glossed with bronze. Canal Zone through northern Colombia to northeastern Venezuela.

P. o. oryzivorus (Gmel.). Size small, wing of ♂ 180–190, bill 34–36, coloration like *violeus*. Probably from the Guianas south through tropical Brazil to Paraguay and north-eastern Argentina.

This leaves but one more change to make, that of naming the Mexican Crow. It may be called:

Corvus imparatus, sp. nov.

Type: Adult male, no. 49840, Museum of Comparative Zoology, from Rio La Cruz, Tamaulipas, Mexico, collected 24 June, 1909, by Frank B. Armstrong.

Characters.—Similar to *Corvus ossifragus* Wilson but much smaller, plumage much more brilliantly glossed; bill relatively weaker and more slender; nasal plumes shorter and less dense.

In conclusion I tender my warmest thanks to Dr. C. W. Richmond not only for his advice and guidance on the questions here involved, but on the many other occasions when his valued counsel has been sought and freely given.

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PROCEEDINGS

OF THE

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NOTES ON THE SIPHONAPTERAN GENUS CATALLAGIA ROTHSCHILD, INCLUDING THE DESCRIPTION OF A NEW SPECIES.

BY H. E. EWING.

The genus *Catallagia* was established in 1915 by the late Hon. N. Charles Rothschild for a species described by the late Professor Charles F. Baker as *Pulex charlottensis*. Baker's *charlottensis* was taken from a mouse nest at Massett, Queen Charlotte Islands, and although described as a *Pulex*, it was soon transferred to *Odontopsyllus* Baker. Here it remained until the genus *Catallagia* was erected for it and three other species including one new one which Rothschild described as *decipiens*. This latter species was taken from various Murid hosts and at the following places: Horse Creek, Upper Columbia Valley, British Columbia; Blackfalls, Alberta; British Columbia (no other locality given); and Red Deer, Alberta.

The other two species included in Rothschild's *Catallagia* are *telegoni* Rothschild, described in 1905, and *wymani* Fox, described in 1909. The first of these two species was taken from a meadow mouse, *Microtus drummondi*, in the Upper Columbia Valley, and the second was taken from the California field mouse, *Microtus californicus*, at San Francisco, California.

Thus there are known up to the present four species of *Catallagia*, all being taken in western North America. This year, however, the writer has to report a species from the eastern part of the United States. It is a new one taken during the summer of 1928 in Maine, by W. J. Hamilton, Jr. This species, like all of the other known *Catallagias*, was found on a Murid host. Does the finding of this single species of *Catallagia* in Maine indicate that the genus *Catallagia* is dis-

tributed transcontinentally, and will it be found on Murid hosts throughout most of the Boreal Life Zone?

As stated by Rothschild, *Catallagia* is closely related to *Ceratophyllus*. It is, however, distinct in a number of important respects; in having a patch of short spines on the inner surfaces of the hind coxae, in having four instead of five pairs of lateral plantar bristles on the ventral surface of the fifth segment of the hind tarsus, and in having a peg-like frontal tubercle instead of the common type, as well as in some other respects.

The types of Baker's *charlottensis* and Fox's *wymani* are in the United States National Museum and have been examined by the writer. In addition to giving a description of the new species found, keys are given to the males and females of *Catallagia* species.

KEY TO THE KNOWN MALES OF THE GENUS CATALLAGIA.

1. Ninth sternite with but a single pair of subapical ventral spines.....2
   Ninth sternite with more than a single pair of subapical ventral spines....3
2. Ninth sternite uniformly fringed throughout most of its ventral margin with subequal setae.....*C. wymani* (Fox).
   Ninth sternite without any fringe of setae below but with two long, stout subequal setae on each side beyond the middle and with a ventral projection at the middle.....*C. telegoni* (Rothschild).
3. Ninth sternite with three subapical spines on each side and two long ventral spines about one-third the distance from the apex to base of the sternite.....*C. decipiens* Rothschild.
   Ninth sternite with four subapical spines on each side and without the longer ventral spines.....*C. charlottensis* (Baker).

KEY TO FEMALES OF CATALLAGIA SPECIES.

1. Frons with three rows of setae.....*C. telegoni* Rothschild.
   Frons with only two rows of setae.....2
2. Lower antepygidial seta more than half as long as the middle one.....*C. decipiens* (Rothschild).
   Lower antepygidial seta less than half as long as the middle one.....3
3. Frontal tubercle very large, longer than the width of the degenerate eye and projecting beyond the margin of the head. Occurring in northeastern part of the United States.....*C. borealis*, new species.
   Frontal tubercle much smaller, not equal to the width of degenerate eye.....4
4. Degenerate eye extending about two-thirds the distance across the genal lobe. Occurring in California.....*C. wymani* (Fox).
   Degenerate eye smaller, extending scarcely half way across the genal lobe.....*C. charlottensis* (Baker).

Catallagia borealis, new species.

Female.—Maxillary palpi slightly shorter than the labial palpi, the latter being about two-thirds as long as anterior coxae. Frontal tubercle prominent, longer than the width of the degenerate eye, and extending beyond the margin of the head. Four setae in ocular row, the second from the top being much smaller than the others and situated directly in front of the degenerate eye. Frontal row of setae extending from slightly below the insertion of the antenna to the anterior angle of head. It is composed of five setae. Occiput with three rows of setae, there being from four to six setae in a row.

Thorax much longer than head; prothorax shorter than metathorax; its ctenidium with sixteen spines or teeth. Mesosternite divided into two areas of almost equal size by a vertical chitinous rod. The anterior of these two areas has a single large seta almost approximate to the vertical rod; the posterior area has five setae arranged in two vertical rows, three in the front row and two in the last row.

Abdomen rather slender. Apical spines on tergites I–IV, inclusive. Outer of the three antepygidial setae about three-fifths as long as the middle one; the inner antepygidial seta slightly longer than the outer one. Eighth sternite with three subequal apical setae on each side and about five other setae not so stout as the apical ones.

Legs medium. Coxa I with about forty setae well distributed over its lateral surface. Coxae II and III each with a short, subapical vertical row of three setae.

Length, 2.66 mm.; height, 0.87 mm.

Type host.—Meadow mouse, *Microtus pennsylvanicus pennsylvanicus.*

Type locality.—Mt. Katahdin, Maine.

Type slide.—Cat. No. 41633, U. S. N. M.

Described from a female specimen taken from the type host at Basin Pond, Mt. Katahdin, Maine, September 7, 1928, by W. J. Hamilton, Jr. This species is rather closely related to *C. wymani* (Fox) and *C. charlottensis* (Baker) but differs from both of these species in having the head more highly arched, the frontal tubercle more conspicuous and a few other particulars.

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PROCEEDINGS

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A NEW SNAKE FROM CHINA.

BY LEONHARD STEJNEGER.

Doctor David C. Graham, whose explorations in the province of Szechwan, China, have added so much to our knowledge of its herpetological fauna, has recently sent to the National Museum an unusually interesting new ophidian species. It is an exceedingly handsome snake of a rather pale neutral color ornamented with bold black bands on the face and head, and the body festooned across the back with a narrow black ribbon studded with bright round beads of a whitish color. This pattern unlike that of related species, in which it fades and disappears in the fullgrown specimens, seems to retain its brightness in the present species, as the specimen received is an adult male over three feet long. The name has reference to the unique ornamentation.

Elaphe perlacea, new species.

Diagnosis: Scales at the middle of the body in 19 rows, about 13 keeled; anal divided; no subocular, anterior temporal one; supralabials 7; head pattern with a black prefrontal band bifurcating at the eye; body with narrow black cross-bands enclosing whitish scale centers; underside checkered.

Type: U. S. National Museum No. 76257.

Type locality: Yachow prefecture, Szechwan, China.

Description of type-specimen: Adult male; U. S. N. M. No. 76257; Yachow province, Szechwan; June, 1928, D. C. Graham, collector. Rostral much broader than high, broadly visible from above, sutures with internasals much longer than suture between the latter; internasals small, much broader than long, about two-thirds the size of the prefrontals, which are broadly in contact with supraocular; frontal as long as its distance from tip of snout, slightly longer than its width and the interparietal suture, somewhat broader in front than behind; parietals as long as frontal; nostril large between two subequal nasals; loreal trapezoid, much longer than high; one preocular widely separated from frontal; no subpreocular; two

small postoculars, both in contact with parietal, upper not in contact with anterior temporal; temporals 1+2; supralabials 7, third and fourth entering eye; 3 lower labials in contact with anterior chin-shields, which are slightly longer than the posterior; posterior chin-shields separated from each other by two small scales, in contact with one sublabial; 19 rows of scales, 11 to 13 rows very distinctly keeled, four lateral scales smooth anteriorly and three at midbody; towards vent and on tail all scales keeled, ventrals 229, obtusely angulate laterally; anal divided; 69 pairs of subcaudals. Color (in alcohol) tawny gray, more plumbeous on the sides and underneath; upper side of body and tail with a pattern of narrow black equidistant cross-bands formed by the back tips and bases of two adjacent scale rows the centers of most of the scales being whitish; each two cross-bands being joined at or on the ventrals so as to form about 37 oval rings, the effect being a continuous black garland studded with strongly contrasting white beads; underside plumbeous checkered with black blotches edged with white; head pattern black, very distinct; a band from first labial through nostril across the suture between rostral and internasals; another similar but broader, from suture between third and fourth supralabial through eye over posterior half of prefrontals, bifurcating in the eye projecting a broad black line backwards across postoculars, anterior half of first temporal to upper anterior part of sixth supralabial; a black $\wedge$-shaped figure, the apex on the posterior half of frontal, extending backwards over parietals where bifurcating, the outer branch extending across second row of temporals to seventh supralabial, the parallel with the interparietal suture to the neck; on the lower lip one black spot on the suture between third and fourth sublabials appear as a continuation of the ocular band; another smaller spot on suture between second sublabial and anterior chin-shield.

Dimensions: On account of the hardness of the specimen the body can not be stretched sufficiently for very exact measurements. The total length is approximately 940 mm., tail 210 mm., total length 1150 mm. The ratio between body and tail is consequently about 4.5 : 1.

Remarks: The present species has its nearest relative in the Japanese *Elaphe conspicillata,* from which it differs in various important characters. Thus the latter has invariably 21 scale rows with feeble keels on only nine rows. The scale-formula is otherwise almost identical, except that the type of the new species has 229 ventrals, a greater number than the maximum recorded for the species from Japan. The head pattern is also the same, except that the arms of the parietal Λ are double and that a median occipital black line is absent. The body pattern differs considerably, however, apart from the fact that the marking disappears in the adult Japanese specimens, while it is strongly marked in the type of *E. perlacea,* which is full grown.

There is no reason to believe that any of the previous erroneous records of *E. conspicillata* occurring in China refer to the present species.

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NOTES ON THE SPIDERS OF WASHINGTON COUNTY, UTAH.

BY R. V. CHAMBERLIN AND A. M. WOODBURY.

The spiders listed in the present paper were taken mostly at two localities in Washington County, which occupies the extreme southwestern corner of Utah; namely, St. George and Zion National Park. While some specimens were collected by the senior author in 1923 and in 1927 by far the greater number were secured by Mr. Woodbury, who, during the summer season, has served as naturalist for Zion National Park for several years past. We plan through further collecting to bring the list for the Park in particular to essential completeness. Types of the new species described are in the collection of the senior author.

THERAPHOSIDAE.

Eurypelma steindachneri (Ausserer).

St. George. Females and immature specimens are referred tentatively to this species.

DICTYNIDAE.

Dictyna dactylata Chamberlin.

St. George. Six females taken in 1925, 1926 and 1927. A form resembling *volucripes* but much smaller and with a different epigynum in which the septum typically ends caudally in a slender chitinous finger, though this may connect with the caudal rim which does not extend far laterad on each side as it does in *volucripes*.

Dictyna volucripes Keyserling.

St. George. One female referred to this species was taken several years ago by V. M. Tanner.

Dictyna hoples Chamberlin.

Zion National Park. One male. A species readily recognizable in the male sex by the enormously long, curved, distally bidentate apophysis of the tibia of the palpus. This is longer than in *armata* Emerton in which also the tooth on the chelicera is farther removed from the base.

Dictynoides sp.

Zion National Park. One immature female taken in 1927 can not be safely referred to its species.

SCYTOTIDAE.

Loxosceles rufipes (Lucas).

Zion National Park. Two females, not fully mature, seem to be this species.

Plectreurys tristis Simon.

Zion National Park. One young female.

Diguetia canities (McCook).

Zion National Park. One female of this highly interesting and rarely taken spider was secured in 1927.

GNAPHOSIDAE.

Herpyllus piedicus Chamberlin and Woodbury, new species.

Male.—Carapace yellowish red clothed with black hair of medium length. Sternum, legs reddish yellow. Abdomen dark gray with a wide longitudinal lighter band above and ventral region also lighter; basal dorsal scutum and epigastric plates deep yellow. Anterior row of eyes slightly procurved; median eyes nearly as large as the laterals, separated from each other by about their radius, half as far from the laterals; lateral eyes a little more than a radius from edge of clypeus. Posterior row of eyes nearly straight; median eyes oblique, nearly their longest diameter apart and three-fourths as far from the laterals; laterals circular, their diameter equalling the long axis of the medians, two thirds their diameter from anterior lateral on each side. Tibiae I and II with three pairs of spines beneath; metatarsi I and II with a pair of ventral spines at base. Characterized most readily by form of tibial apophysis of palpus. This in lateral view is seen to present a broader basal half and to be abruptly narrowed and flexed at middle, the distal half again running parallel to axis of the basal portion, slender and needle-like, straight; total length of apophysis slightly less than length of tibia without it.

Length, 7 mm.; length of cephalothorax, 3 mm.; width, 2 mm.; tib. pat. I, 3 mm.; tib. pat. IV, 3.5 mm.

Locality.—St. George. Two males.

Herpyllus hesperolus Chamberlin.

St. George and Zion National Park. Specimens from former locality taken in 1925 and 1928 and from latter in 1927.

Poecilochroa montana Emerton.

Zion National Park. Two females taken in 1927.

Sergiolus lowelli Chamberlin and Woodbury, new species.

Male.—Reddish yellow to reddish brown clothed with white pubescence and sparse black hairs. Sternum, chelicerae, palpi and legs reddish yellow, the legs clothed with white pubescence and long black hairs. Abdomen brown to blackish above, with three light transverse bands on basal half, these usually confluent at middle; venter light, with two black stripes diverging forward from spinnerets and gradually fading out. Anterior row of eyes procurved, the medians nearly a diameter apart but less than their radius from the laterals, medians and laterals subequal. Posterior row of eyes recurved; median eyes oblique, their shorter diameter apart and about the longer diameter from the laterals; lateral eye on each side about once and a half its diameter from the anterior lateral. Tibial apophysis of palpus long, in side view gradually narrowing distad, with acute apical portion slightly curved dorsad, its tip abruptly bent so as to produce a transverse ridge much as in *S. unimaculatus* and *S. decipiens.*

Length, 6 mm.; cephalothorax, 2.5 mm., width, 1.5 mm.

Female.—Coloration, spining of legs and eyes as in the male. Epigynum in general form somewhat like that of *S. variegatus* but anterior limiting rim weak at middle and bowed forward, not strongly angled caudad.

Length, 8 mm.; cephalothorax, 3.5 mm.; width, 2.5 mm.

Locality.—St. George. One male (holotype) and two females, the former taken Mar. 14, 1928, by Lowell A. Woodbury, the two latter in 1926.

Gnaphosa gigantea Keyserling.

St. George (one male and two immature females) and Zion National Park (two immature specimens).

Gnaphosa hirsutipes Banks.

St. George. One male taken in Dec., 1925.

Callilepis zionis Chamberlin and Woodbury, new species.

Male.—Entirely black excepting chelicerae and the legs, the latter being tinged with reddish distad of patellae, with the tarsi approaching yellowish. Anterior row of eyes procurved; eyes subequal; medians about their diameter apart, once and a half this distance from the laterals; laterals twice their diameter or a little more from edge of clypeus. Posterior row of eyes procurved; eyes subequal; medians twice their diameter apart, half as far from the laterals; lateral eye on each side separated from the corresponding anterior lateral by its diameter. Tibiae I and II with three pairs of ventral spines; metatarsi I and II with two pairs of ventral spines. Tibia III with median dorsal spine. Palpus of male with embolus at extreme anterior end of bulb, almost attaining end of cymbium, straight and short; tibia without distal apophysis such as present in *clara.*

Length, 8 mm.; cephalothorax, 4 mm., width, 2.5 mm.

Locality.—Zion National Park. One male taken in 1927, and one in 1928.

Geodrassus gosiutus Chamberlin.

Zion National Park. One female, 1927.

Rachodrassus flavus Chamberlin and Woodbury, new species.

Male.—Carapace dark yellow, clothed with short, grayish-black hairs. Sternum yellow, clothed with moderate grayish-black hairs which are more numerous toward edges, Palpi and legs yellow, usually rufous distally. Ground color of abdomen light yellow, with some darker areas confluent posteriorly, the basal plate slightly darker yellow. Anterior row of eyes straight or nearly so; median eyes slightly smaller than the laterals, nearly their radius apart and three-fourths as far from the laterals. Posterior row procurved; medians a little more than their diameter apart and a little less than their diameter from the laterals. Lateral eyes on each side equal, only about one-fourth their radius apart, their tubercles confluent. Tibia I and II with three pairs of ventral spines; metatarsi I and II with two pairs of ventral spines. Tibia III with one dorsal spine; tibia IV with two median dorsal spines in line. Palpus with tibial apophysis sublaminate, in lateral view a little clavately widening distad, the end narrowly rounded.

Length, 5 mm.; cephalothorax 2.25 mm., width, 1.7 mm. Tib. pat. I, 2 mm.; tib. pat. IV, 2.4 mm.

Female.—Posterior row of eyes less procurved than in the male. Epigynum presenting a lunate anterior rim and two lateral chitinous rims converging caudad and meeting at middle line, the general form suggesting that of *Gnaphosa hirsutipes.*

Locality.—St. George. One male (holotype) and one female. This species also occurs in southeastern Utah where it appears to be common.

Haplodrassus dixiensis Chamberlin and Woodbury, new species.

Female.—Carapace reddish yellow, with sparse black hairs and fine, light colored pubescence. Sternum light reddish yellow. Chelicerae reddish brown. Palpi and legs yellowish, somewhat rufous distally. Anterior row of eyes procurved; laterals about once and a fourth the diameter of the medians; medians about their diameter apart, one-fourth as far from the laterals; the laterals their radius from margin of clypeus. Posterior row of eyes procurved; median eyes oblique, one-third their long axis apart; lateral eyes their diameter from median eyes and half as far from anterior laterals. Tibiae I and II without spines. Metatarsi with a pair of ventral spines at base. The epigynum presents a ridge on each side ending anteriorly freely as usual in the genus, the anterior end not at all cornuate.

Length, 7 mm. Cephalothorax, length, 2.5 mm.; width, 1.75 mm. Tib. pat. I, 2.5 mm.; tib. pat. IV the same.

Locality.—St. George. Two females, 1925, 1926.

Zelotes subterreaneus (Koch).

St. George. One male and two females taken in 1926.

Drassyllus apachus Chamberlin.

St. George. One adult male, an immature one and an immature female taken in 1927.

Described originally from a female. It is a common form in San Juan County and other parts of southeastern Utah. It occurs also in Arizona.

PHOLCIDAE.

Psilochorus utahensis Chamberlin.

St. George. Common.

Physocyclus tanneri Chamberlin.

St. George and Zion National Park. Males and females taken in 1925, 1926, and 1928.

THERIDIIDAE.

Latrodectus mactans (Fabricius).

St. George and Zion National Park. Common in both localities.

Latrodectus geometricus (C. Koch).

St. George. Chamberlin collection, 1923.

Steatoda borealis (Hentz).

St. George. A female taken in 1925.

Steatoda grandis Banks.

St. George. Chamberlin collection, 1923.

Theridion placens Keyserling.

St. George. Chamberlin coll., 1923, and A. M. Woodbury, 1926.

Theridion canionis Chamberlin.

Zion National Park. One female.

LINYPHIIDAE.

Linyphia marginata C. Koch.

St. George and Zion National Park. Common.

Linyphia litigiosa Keyserling.

Zion National Park. Five females taken in 1927.

Linyphia tauphora Chamberlin.

Zion National Park. One male and several females taken in 1927.

Microneta sp.

Zion National Park. Several females not to be identified with certainty without the males.

Grammonota sp.

St. George. Three females not specifically identifiable in absence of males.

Pocadicnemis pumila Blackwall.

Zion National Park. Many specimens, male and female, taken in 1927.

ARGIOPIDAE.

Tetragnatha laboriosa Hentz.

Zion National Park. Common.

Tetragnatha extensa (Linnaeus).

Zion National Park. Several males and females taken in 1925.

Metargiope trifasciata (Forskål).

St. George. Males and females taken in 1926.

Neoscona benjamina (Walckenaer).

St. George. Males and females.

Neoscona naiba Chamberlin.

St. George. Two females taken in 1926.

Neoscona vertebrata (McCook).

Washington County. One female, collected by Chamberlin in 1925.

Aranea carbonaria (L. Koch).

St. George. One female.

Aranea gemma (McCook).

Zion National Park. Females taken in 1927.

Aranea varians (Petrunkevitch).

Zion National Park. One female.

Cyclosa conica (Pallas).

Zion National Park. Abundant.

THOMISIDAE.

Tmarus angulatus (Walckenaer).

Zion National Park. Two immature females seem to be this species.

Misumena vatia (Clerck).

St. George and Zion National Park. Common.

Misumenops utanus Chamberlin.

One male from Zion National Park.

Misumenops admes Chamberlin.

Zion National Park. Several females.

Xysticus nervosus Banks.

St. George. Females.

Xysticus gulosus Keyserling.

St. George. One female taken in 1926.

Xysticus simplicior Chamberlin.

Philodromus utus Chamberlin.

St. George. Several females.

Philodromus hoples Chamberlin.

St. George. Apparently common here. Also known from San Juan and adjacent counties.

Philodromus virescens Thorell.

St. George. One male.

Tibellus duttonii Keyserling.

St. George. One female apparently this species.

AGELENIDAE.

Agelena naevia Walckenaer.

St. George and Zion National Park. Common.

Agelena mimoides Chamberlin.

St. George and Zion National Park. One male from each place.

Agelena californica Banks.

St. George. One female taken in 1926.

Hahnia cinerea Emerton.

Zion National Park. Common.

CLUBIONIDAE.

Anyphaena gracilis (Hentz).

Zion National Park. A male and an immature female taken in 1927.

Anyphaena nigrifrons Chamberlin and Woodbury, new species.

Female.—Carapace yellow, with brown and blackish granulations. often almost black in the ocular region and over the clypeus, carapace

clothed with sparse long dark hairs and more numerous fine grayish hairs. Sternum yellow, typically with a reddish patch opposite each coxa. Chelicerae dark reddish brown with anterior face black. Palpi and legs light yellow, with reddish tinge distally. Abdomen light yellow or whitish, with two longitudinal stripes above, these interrupted in young specimens and tending to disappear in old ones. Anterior row of eyes slightly recurved; median eyes above three-fourths their diameter apart, their radius from the laterals, smaller than the laterals (1:1.25). Posterior row of eyes procurved; eyes about equal and equidistant, each adjacent two being separated by about their diameter; each lateral about its radius from the corresponding anterior lateral. Upper margin of furrow of chelicera with four teeth, the lower with a series of many fine teeth. Tibiae I and II with two pairs of ventral spines. Metatarsi I and II with a pair of spines at base beneath. Tibiae III and IV with two median dorsal spines. Epigynum presenting a lunate rim on each side; between the anterior ends of their lateral rims, but not touching them, a transverse rim concave on caudal side.

Length of female holotype, 6 mm.; cephalothorax, 2.5 mm.; width, 1.5 mm.; tib.+pat. I, 2.5 mm.; tib.+pat. IV, 2.5 mm.

Locality.—St. George. One mature and six immature females taken Dec., 1925, and one mature and four immature females taken Aug., 1927.

Gayenna dixiana Chamberlin and Woodbury, new species.

Female.—Carapace deep yellow with a row of dark maculations extending caudad from each posterior lateral eye. Sternum yellow. Palpi and legs yellow, becoming reddish distally. Abdomen light brown with dark brown or blackish maculations. Anterior row of eyes straight or nearly so; the medians about their diameter apart and three-fourths as far from the laterals; laterals about once and a fourth times the diameter of the medians, about their diameter from edge of clypeus. Posterior row of eyes also straight; medians their diameter or slightly more apart, a little less than their diameter from laterals; lateral eye of each side three-fourths its diameter from the anterior lateral of same side. Tibiae I and II with three pairs of spines beneath or I also with an unpaired extra spine. Tibiae III and IV with a single dorsal spine. Epigynum with a longitudinal, strongly chitinous rim on each side, the posterior ends of which are somewhat nearer to each other than are the anterior; between anterior ends a semicircular chitinous piece.

Length, 4.5 mm.; cephalothorax, 2 mm.; width, 1.5 mm. Length of tib. pat. I, 2.1 mm.; tib. pat. IV, 2.3 mm.

Locality.—St. George. One female.

Clubiona pacifica Banks.

Zion National Park. Two females.

Chiracanthium inclusum (Hentz).

St. George (one male, 1926, and one female, 1928, coll. by Grace A. Woodbury) and Zion National Park (one female, 1927).

Phrurolithus woodburyi Chamberlin.

Zion National Park. Males and females taken in 1927.

Castianeira descripta Hentz.

Zion National Park. One female.

Castianeira zionis Chamberlin and Woodbury, new species.

Female.—Carapace yellowish red, with ocular area black. Sternum reddish yellow with irregular dark markings. Palpi and legs yellowish with femora darker, somewhat reddish. Abdomen purplish black above with indistinct light crossbands, the venter light. Anterior row of eyes procurved; medians about once and a fourth their diameter apart, two-thirds their diameter from the laterals; diameter of laterals to medians as 1.25:1. Posterior row of eyes procurved; medians once and a half their diameter apart and a little more than the diameter from laterals; eyes equal in size; lateral on each side once and a half its diameter from the anterior lateral. Chelicerae with two teeth on each margin. Tibia I with two pairs of spines beneath; tibia II with two unpaired spines beneath. Metatarsi I and II with two pairs of ventral spines. Tibiae III and IV with a single dorsal spine. Epigynum presenting two well-separated openings behind leading into the spermatheca; then bent at middle with anterior globular enlargements nearly in contact at middle line.

Length, 6.5 mm. Length of cephalothorax, 2.5 mm.; width, 1.75 mm. Length of tib.+pat. I, 1.9 mm.; leg IV, 2.5 mm.

Locality.—Zion National Park. One female, 1927.

Micaria formicoides Chamberlin and Woodbury, new species.

Female.—Carapace reddish yellow, eye tubercles on black. Palpi yellow, reddish proximally. Legs yellow distally, brownish or blackish proximally. Abdomen constricted near middle; dark gray or blackish, a light line in constriction on each side. Anterior row of eyes procurved; median eyes about their diameter apart and half as far from the laterals; eyes subequal. Posterior row of eyes procurved in such degree that a line through centers of medians is tangent to posterior edges of laterals; diameter of medians to laterals as 1:1.5; lateral of each side its diameter from anterior lateral. Furrow of chelicera with a tooth on each margin. Epigynum as figured. Length, 4.5 mm. Length of cephalothorax, 1.75 mm.; width, 1 mm. Tib.+pat. I, 1.7 mm.; tib.+pat. IV, 1.5 mm.

Locality.—St. George. One female, 1927.

Trachelas tranquillus (Hentz).

St. George (four females, 1926) and Zion National Park (one male and two females, 1927).

Trachelas deceptus (Banks).

St. George. Two males and one female.

HETEROPODIDAE.

Olios fasciculatus Simon.

St. George (many specimens, 1925 and 1928) and Zion National Park (many specimens, 1925 and 1927).

LYCOSIDAE.

Pardosa lapidicina Emerton.

St. George and Zion National Park. Common along flood bed of the Virgin River.

Pardosa sternalis (Thorell).

St. George and Zion National Park. Common in wet places and along small streams where it is often seen running over the water.

Lycosa antelucana Montgomery.

St. George. Very common.

Lycosa gosiuta Chamberlin.

St. George (four females, 1926) and Zion National Park (seven specimens, 1927).

Lycosa kochii (Keyserling).

St. George (one female, 1925) and Zion National Park (one female, 1927).

Arctosa littoralis (Hentz).

St. George. Five specimens taken in 1926.

OXYOPIDAE.

Oxyopes rufipes Banks.

St. George. Several males and females probably this species.

ATTIDAE.

Phidippus formosus (Peckham).

St. George. One female.

Phidippus workmanni Peckham.

St. George. Common.

Dendryphantes militaris (Hentz).

St. George. Eight specimens, males and females.

Dendryphantes capitatus (Hentz)

Zion National Park. Several females and an immature male.

Dendryphantes diplacis Chamberlin.

Zion National Park. Two males, 1927. Previously known from Lower California and Nogales, Arizona.

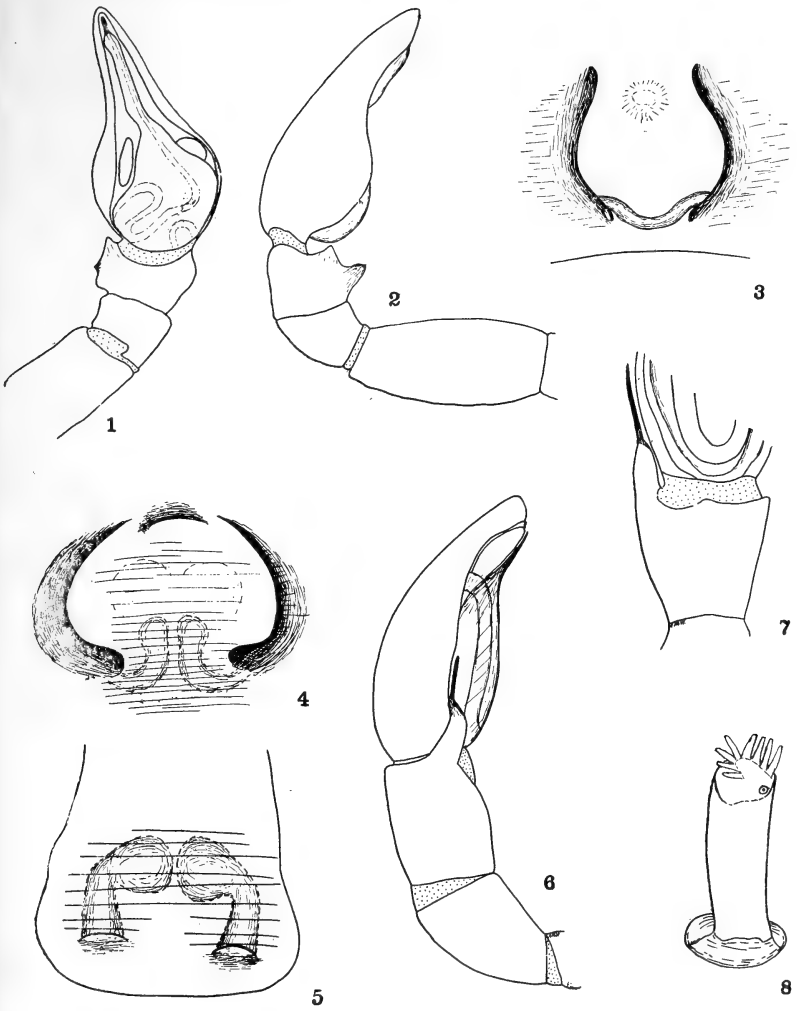


Plate I.

Fig. 1. Epigynum of *Rachodrassus flavus* sp. nov.
Fig. 2. Right palpus, ectal view, of male *Rachodrassus flavus* sp. nov.
Fig. 3. Right palpus, ectal view, of male *Drassyllus apachus* Chamb.
Fig. 4. Ventral view of the same.
Fig. 5. Epigynum of *Micaria formicoides* sp. nov.
Fig. 6. Epigynum of *Haplodrassus dixiensis* sp. nov.
Fig. 7. Epigynum of *Sergiolus lowelli* sp. nov.
Fig. 8. Right palpus, ventral view, of male of same.

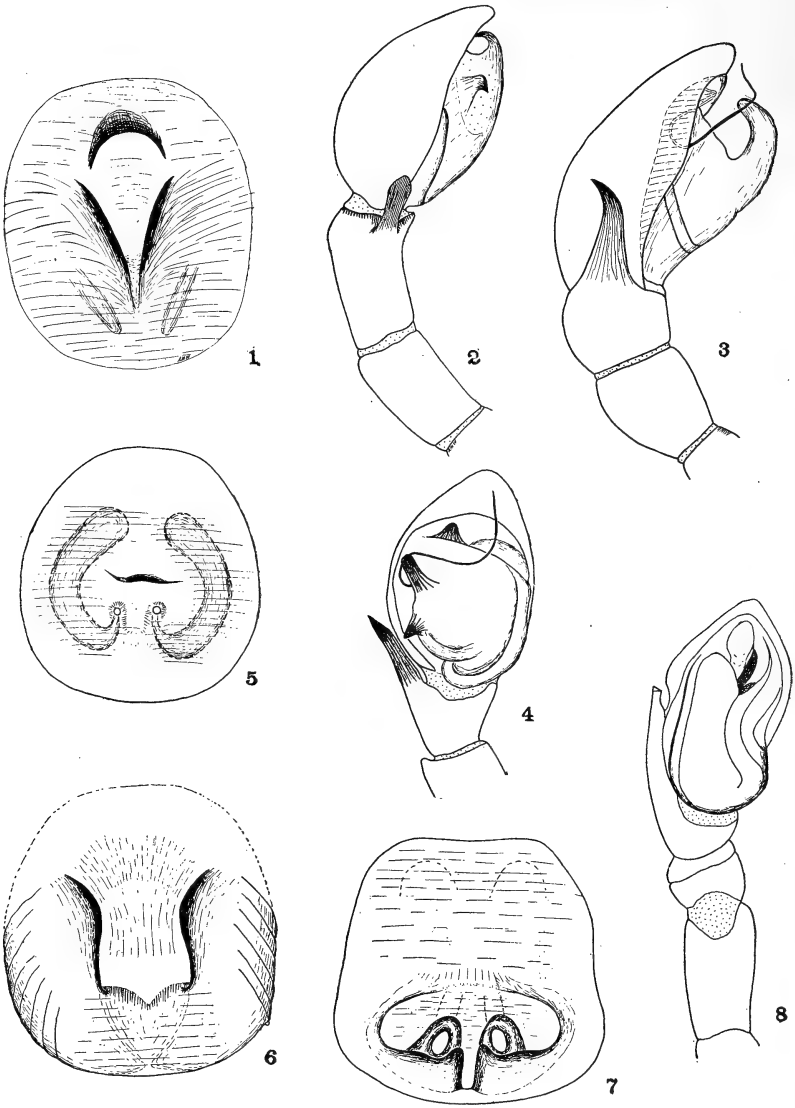


Plate II.

Fig. 1. Right palpus, ventral view, of male *Callilepis zionis* sp. nov.
Fig. 2. Ectal view of the same.
Fig. 3. Epigynum of *Gayenna dixiana* sp. nov.
Fig. 4. Epigynum of *Anyphaena nigrifrons* sp. nov.
Fig. 5. *Epigynum* of *Castianeira zionis* sp. nov.
Fig. 6. Right male palpus, ectal view, of *Herpyllus piedicus* sp. nov.
Fig. 7. Ventral view of portion of the same.
Fig. 8. A right fore spinneret of *Herpyllus piedicus* sp. nov.

Pellenes candidus Peckham.

Zion National Park. One female. This form, originally described from Salt Lake City, occurs also in San Juan Co. and so probably over most of the State.

Pellenes mimula Chamberlin.

St. George. One female collected by L. A. Woodbury.

Pellenes splendens Peckham.

Zion National Park. One not fully mature male. This species has also been taken at Salt Lake City.

Icius annectans Chamberlin.

Zion National Park. Several females. Unlike other species of Icius, excepting *exornatus*, in having the coxae of the first legs separated by less than the width of the labium. Epigynum suggesting that of *Pseudicius siticulosus*, a form from which distinguishable in having two slender spines at distal end of tibia II instead of one at each end.

Salticus albocinctus Peckham.

St. George. One male and one female.

Thiodina sylvana (Hentz).

Zion National Park. One female.

Vol. 42, pp. 143–146 March 30, 1929

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTION OF A NEW LEMMING FROM ALASKA.

BY E. W. NELSON.

The considerable series of lemmings from island and mainland localities in western Alaska, which has accumulated in the Biological Survey collection during recent years, supplies information helpful toward clearing up some obscure points concerning the relationship between *Dicrostonyx rubricatus* and *D. unalascensis*.

In the Proceedings of the Biological Society of Washington, March 14, 1900, vol. 2, p. 25, Dr. C. Hart Merriam described *Dicrostonyx unalascensis* from Unalaska Island in the Aleutian Chain. His type was a broken skull, one of several taken from owl pellets near the village of Unalaska. Since then unsuccessful efforts have been made by several naturalists to capture some of these lemmings at the type locality, in order that their color and other general characters might be determined. Owl pellets found there, however, have continued to yield skulls until the Biological Survey collection now contains more than 130 of them.

Fortunately from 1920 to 1924, while investigating the reindeer herd of the Biological Survey on Umnak Island, lying across a channel about 6 miles broad from the western end of Unalaska Island, Donald H. Stevenson, of the Biological Survey, located runways of lemmings in a few limited areas on the eastern part of the island, and during the months of November and December in different years, secured a series of 14 specimens of which more than half are adults. All appear to be in full, heavy winter pelage, some having been taken as late as December 14. It is interesting to find that adults and young are in varying shades of nearly uniform brownish gray

pelage, without a trace of the white winter coat so commonly worn by the members of this genus. In addition the claws of the two middle toes on the front feet are dusky horn color, and although slightly enlarged they are much less than one-half the size of the great claw of *rubricatus* and *hudsonius*, in their winter condition In fact the Umnak Island specimens must be examined closely to determine the existence of any claw development, thus strongly contrasting with the extraordinary winter claws in the species named. A white specimen of young *rubricatus*, about one-fourth grown, taken in December at Chignik on the south coast of the Alaska Peninsula, has the typical winter claw development of that species.

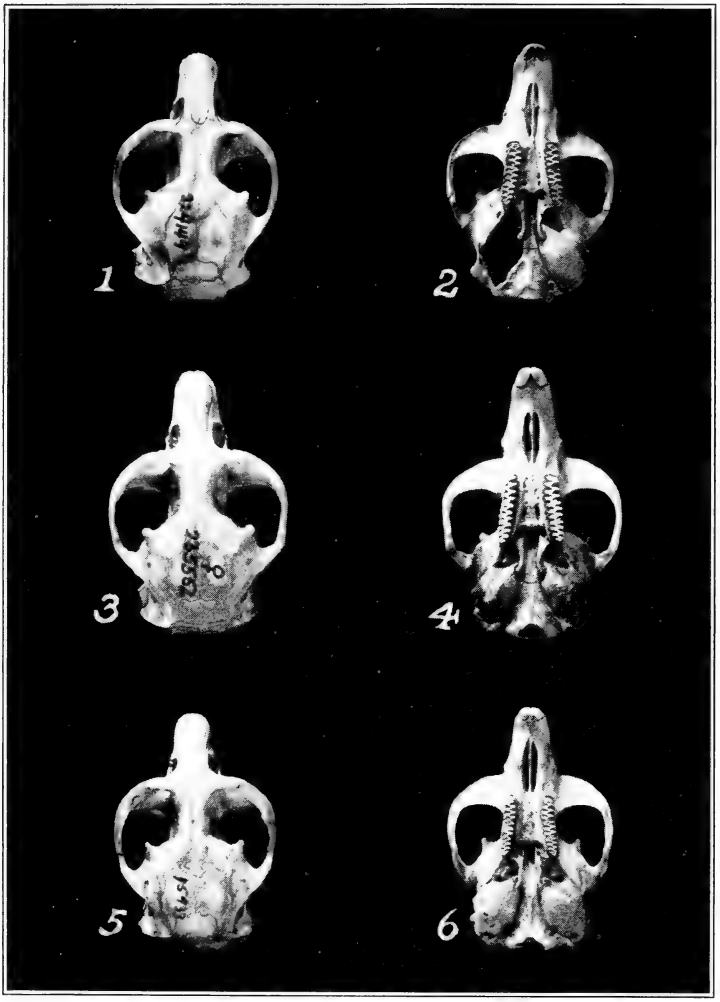
No summer skins from Umnak Island are available to compare with *rubricatus*, but the winter color of the upperparts of the eight adult Umnak Island specimens is in general dingy gray with a slight tinge of buffy brown, overlaid by a very slight wash of reddish on sides and top of shoulders; the underparts are dull buffy or buffy whitish.

The characters given above indicate that we have on Unalaska and Umnak Islands an insular species of lemming, with sufficient differences between the skulls to warrant recognizing the Umnak Island animal as a subspecies of *D. unalascensis*. It should be noted here that three summer specimens of collared lemmings from Unimak Island, adjacent to the western end of the Peninsula of Alaska, in the Biological Survey collection are close to typical *D. rubricatus*, without signs of intergradation toward *D. unalascensis* in size or color.

The retention of a brown pelage in winter by the Umnak lemming, in place of the usual white garb of the other members of the genus *Dicrostonyx*, may be reasonably attributed to the response of this species to the milder winter climate of its habitat. While Umnak Island lies in a very stormy region, yet zero temperatures are uncommon, and while snow falls at intervals during more than six months each year, sometimes remaining on the ground for weeks, yet not infrequently during the winter months the ground lies nearly or quite bare.

This new subspecies is named in honor of the late Donald H. Stevenson, who collected the specimens mentioned here under great difficulties.

Measurements in millimeters.



SKULLS OF DICROSTONYX

[About natural size.]

Fig. 1–2. *D. unalascensis unalascensis*, Unalaska, Alaska (No. 224149, U. S. Nat. Mus., Biol. Survey coll.).

3–4. *D. unalascensis stevensoni* (type), female, Umnak Island, Alaska (No. 235552, U. S. Nat. Mus., Biol. Survey coll.).

5–6. *D. rubricatus*, male, Point Barrow, Alaska (No. 15933, Amer. Mus. Nat. Hist.).

Dicrostonyx unalascensis stevensoni, subsp. nov.

UMNAK LEMMING.

(Pl. III, figs. 3–4.)

Type from Umnak Island, Alaska, No. 235552, ♀ adult, U. S. National Museum (Biological Survey collection), collected by D. H. Stevenson, December 14, 1920.

General characters.—Largest of the known American lemmings, with a massive skull; apparently does not take on a white winter pelage, and lacks the great winter development of the two middle claws on fore-feet so conspicuous in other species of the genus. Skull as in *D. unalascensis* but larger and heavier, with interparietal proportionately longer; supraorbital ridges in adults more closely approaching, sometimes nearly uniting to form a median ridge; upper incisors more exserted, heavier and more decurved and less projecting at tips. Skull much larger and more massively proportioned than in *D. rubricatus*, with interorbital ridges more strongly developed.

Color of type.—Upperparts nearly uniform dull, pale, buffy brown, slightly grayer on rump; dull, rather poorly marked, chestnut patch covering ears; a thin, blackish, median, dorsal line from nape to tail; a pale chestnut wash on sides of neck, fading posteriorly into a buffy line extending along sides of body; underparts pale dull buff; an irregular dull grayish white patch across posterior part of crown, and grayish white hairs about nose—these last being marks of individual variation.

Skull of type.—Larger than in *D. unalascensis*, with interparietal longer; incisors heavier and more decurved.

Measurements of type.—Total length, 165; tail vertebrae, 12; hind foot, 20. *Skull:* Condylobasal length, 33.7; zygomatic breadth, 23.1; interorbital constriction, 4.3; length of nasals, 10.2; alveolar length upper molar series, 8.5.

Remarks.—The eight adult specimens of *D. u. stevensoni* have the upperparts of the head and body a nearly uniform, dull, buffy brownish, a little grayer in some and darker in others; the ears are covered by a small, not strongly marked patch of dull chestnut; a median dark line usually present in the young, is usually absent or obsolescent, in the adults. Some individuals are marked by irregular, dingy, grayish white patches on crown or nape; sides of nose, chin, and throat usually grayish. Sides of neck, lower shoulders, flanks and outside of front and hind legs varying from pale to dingy buffy; the underparts of the body paler buffy than the flanks, sometimes dingy grayish with only a trace of buffy. The front claws are only slightly enlarged about as in *D. rubricatus* in summer.

A series of six half-grown young among the specimens of *stevensoni*, taken between October 19 and December 1, are very similar to the adults in their generally dull buffy brown color of the upperparts, with a tinge of reddish never strongly marked and varying in tone individually. Indistinct chestnut ear spots and a dark median dorsal line usually present, but absent or pale in some. Underparts pale buffy, varying in shade.

Skulls of both *D. unalascensis unalascensis* (Pl. III, figs. 1–2) and *D. u.*

stevensoni are distinctly larger and more massively proportioned than those of typical *Dicrostonyx rubricatus* (Pl. III, figs. 5–6) from near Hooper Bay and Point Barrow on the mainland of Alaska, or in any of the American collared lemmings of which *D. hudsonius* appears to be the smallest. Postorbital process characteristic of *Dicrostonyx* proportionately and actually heavier and more prominent than in the others; rostrum proportionately heavier and interparietal averaging proportionately larger. Molar series longer and broader than in the other species of *Dicrostonyx*, with pattern of enamel folds similar in general character to that of *D. rubricatus*, but with closed areas on all upper molars more compressed in the antero-posterior plane, so they have a distinctly less deltoid and more spur-like form. Even more than in others of this group, both forms of *D. unalascensis* have marked supraorbital ridges which with age nearly join on median line.

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PROCEEDINGS
OF THE
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FOUR NEW POCKET GOPHERS OF THE GENUS HETEROGEOMYS FROM MEXICO.

BY E. W. NELSON AND E. A. GOLDMAN.

In "Monographic Revision of the Pocket Gophers" (North Amer. Fauna, No. 8, January 31, 1895) Merriam named the genus *Heterogeomys*, to which he assigned *H. hispidus* and *H. torridus* as distinct species, with type localities only a few miles apart, but at different altitudes, and in differing general faunal areas. *H. hispidus* inhabits the humid "cloud" forest region on the seaward slope of the lofty Cofre de Perote, while the type locality of *H. torridus* is on the adjoining arid tropical coastal plain. *Heterogeomys lanius* Elliot (Proc. Biol. Soc. Washington, vol. 18, p. 235, Dec. 9, 1905) was later described from a high altitude on the southeastern side of Mount Orizaba, about 50 miles southwest of the type locality of *hispidus*. Comparatively few specimens of this genus were available for study by Merriam. Subsequent field work has resulted in the accumulation of specimens from a number of localities extending the known range of the genus northward to eastern San Luis Potosi, and into several other Mexican states.

Study of material now at hand has resulted in the conclusion that *H. hispidus* and *H. torridus* are very closely related subspecies. *H. lanius* is imperfectly known and may be retained for the present, with full specific rank. Four new subspecies are described here, and the forms assignable to the genus, with type localities, are as follows:

Heterogeomys hispidus hispidus (Le Conte)..... Near Jalapa, Vera Cruz, Mexico.

Heterogeomys hispidus torridus Merriam..... Chichicaxtle, Vera Cruz, Mexico.

Heterogeomys hispidus concavus, subsp. nov.
Pinal de Amoles, Queretaro, Mexico.
Heterogeomys hispidus isthmicus, subsp. nov.
Jaltipan, Vera Cruz, Mexico.
Heterogeomys hispidus yucatanensis, subsp. nov.
Campeche, Campeche, Mexico.
Heterogeomys hispidus chiapensis, subsp. nov.
Tenejapa, 16 miles northeast of San Cristobal, Chiapas, Mexico.
Heterogeomys lanius Elliot.....Xuchil, Vera Cruz, Mexico.

Heterogeomys hispidus concavus, subsp. nov.

QUERETARO POCKET GOPHER.

Type.—From Pinal de Amoles, Queretaro, Mexico (altitude 5,500 feet). No. 81227, ♂ adult, U. S. National Museum (Biological Survey collection), collected by E. W. Nelson and E. A. Goldman, September 9, 1896. Original number 10130.

Distribution.—Eastern slope of the tableland and mountains to 7,000 feet in Queretaro, and lower elevations in San Luis Potosi.

General characters.—A large subspecies, allied to *H. h. hispidus* and *H. h. torridus*, but upper parts in fresh pelage near chestnut brown (near Mars brown in *hispidus* and *torridus*) and underparts a lighter, russet brownish tone; skull more angular and massive, the upper outline decidedly concave in adult males, and differing in details of structure. Pelage similar to that of *hispidus* in density and texture, denser especially on under parts, and softer than in *torridus*.

Color.—*Type* (partly worn pelage): Upper parts and outer sides of limbs near Prout's brown; under parts light cinnamon brownish; feet and tail scantily clothed with brownish hairs, the tail becoming naked at tip. Specimens in fresh pelage near chestnut brown above, and dull russet brownish below.

Skull.—Similar in size and general form to that of *H. h. torridus*, but more angular and massive; frontal region in adult males more depressed, the upper outline concave; zygomata broader and heavier, the squamosal arm overlapping jugal strongly developed, with a prominent knob-like end (end more tapering in *torridus*); lambdoid crest higher, more abruptly upturned, the squamosal portion heavier, more strongly inclined forward; auditory bullae rather broad, but usually less extended below level of surface of basioccipital; dentition about the same. Compared with that of *H. h. hispidus* the skull is shorter and broader, with rostrum more flattened, zygomata more widely and squarely spreading anteriorly, and it differs otherwise in about the same details as from *torridus*.

Measurements.—*Type:* Total length, 343 mm.; tail vertebrae, 84; hind foot, 48. Two adult male topotypes, respectively: 315–340; 75–74; 47.5–47. Average and extremes of four female topotypes: 332 (330–335); 77 (75–79); 48.1 (48–48.5). *Skull* (type): Condylobasal length, 64.2; length of nasals, 25; zygomatic breadth, 45.8; greatest breadth across squamo-

sals (over mastoids), 43.1; interorbital breadth, 11.5; alveolar length of upper molar series, 14.9.

Remarks.—Heterogeomys h. concavus occupies a northern extension of the range of the species. It appears to be most closely allied to *H. h. torridus* in cranial characters, but the pelage in density and softness is more like that in typical *hispidus* which also inhabits mountain slopes at altitudes above 5,000 feet. Denser, softer pelage is apparently associated with the lower temperatures prevailing at the higher levels, while thinner, harsher pelage characterizes typical *torridus* which is found at low elevations. Specimens from the lowlands of San Luis Potosi are similar to *torridus* in thinness and harshness of pelage, but in color and cranial characters are nearer to the present form to which they are referred.

Specimens examined.—Total number, 9, as follows:

Queretaro: Pinal de Amoles (type locality), 7.

San Luis Potosi: Tancanhuitz, 1; Valles, 1.

Heterogeomys hispidus isthmicus, subsp. nov.

ISTHMIAN POCKET GOPHER.

Type.—From Jaltipan, Vera Cruz, Mexico (altitude 100 feet). No. 78062, ♂ adult, U. S. National Museum (Biological Survey collection), collected by E. W. Nelson and E. A. Goldman, May 2, 1896. Original number 9574.

Distribution.—Semi-forested coastal plains on the Gulf side of the Isthmus of Tehuantepec, in southern Vera Cruz, Mexico.

General characters.—A large subspecies most closely allied to *H. hispidus torridus*, but color lighter brown, and cranial characters, especially the remarkable sinuosity of the lambdoid crest, distinctive. Similar to typical *hispidus*, but skull with shorter rostrum, and differing otherwise in about the same characters as from *torridus*.

Color.—Type (fresh coat replacing worn pelage on anterior part of body and along median line of back): Upper parts in fresh pelage near chestnut brown, worn portions a lighter cinnamon brownish tone; a narrow transverse white stripe extending from median line on lower part of back to upper part of left flank where it is interrupted, and appears again as a stripe below across abdomen; under parts in general, limbs, and feet thinly haired, light brownish; tail naked, dull flesh-colored.

Skull.—Similar to that of *H. h. torridus*, but median part of lambdoid crest with a marked crescent-shaped anterior deflection, maxillary arm of zygoma heavier, encroaching upon premaxillae which are correspondingly narrowed posteriorly; nasals usually longer; dentition about the same. Compared with that of typical *hispidus*, the rostrum is shorter and flatter, and the skull differs otherwise about as from *torridus*.

Measurements.—Type: Total length, 325 mm.; tail vertebrae, 86; hind foot, 46. Average and extremes of four adult male topotypes: 320 (309–334); 89 (82–99); 46. Average and extremes of four adult female topotypes: 308 (292–317); 81 (76–85); 45 (43.5–46). *Skull* (type): Condylobasal length, 59; length of nasals, 24.4; zygomatic breadth, 41.5; greatest

breadth across squamosals (over mastoids), 38.7; interorbital breadth, 11; alveolar length of upper molar series, 13.5.

Remarks.—This subspecies is known only from the low, Gulf coastal plains on the Isthmus of Tehuantepec, the adjoining coastal regions to the east and west, as well as the interior, being occupied by other forms. While close relationship is evident it is readily distinguished from the other subspecies of *hispidus* by the abrupt, median, crescent-shaped, forward deflection of the lambdoid crest. The distance from Jalapa and Chicaxtle, Vera Cruz, the type localities of *hispidus* and *torridus* respectively, is not great, and the form on the peninsula of Yucatan is different. The differentiation of *isthmicus* from *torridus* may be due to its isolation between the Papaloapam and the Grijalva rivers which, although not long, drain excessively humid regions and are of sufficient size to present effective barriers. Three specimens have a narrow white stripe extending from the median line on the lower part of the back down one of the flanks to a whitish area on the abdomen. In two of these it is on the left and in the third example on the right side. A similar marking is present in the type specimen on the left side, but is interrupted or faintly indicated on the middle of the flank. White markings occur sporadically in pocket gophers, but usually lack the regularity noted in this instance. In an adult male (No. 78061) the outer squamosal border, on both sides of the skull, bears a tapering, pointed process about 3.5 millimeters in length, directed upward and forward over the auditory meatus. These peculiar processes, evidently affording additional muscular attachment, are not present in the other specimens from the same locality, and have not been observed in other pocket gophers.

Specimens examined.—Sixteen, from localities as follows:

Vera Cruz: Catemaco, 1; Jatipan (type locality), 15.

Heterogeomys hispidus yucatanensis, subsp. nov.

YUCATAN POCKET GOPHER.

Type.—From Campeche, Campeche, Mexico (altitude 50 feet). No. 100344, ♂ adult, U. S. National Museum (Biological Survey collection), collected by E. W. Nelson and E. A. Goldman, June 7, 1900. Original number 14233.

Distribution.—Lowlands of the Yucatan peninsula and northern Guatemala.

General characters.—A rather small subspecies, similar to *H. h. hispidus* and *H. h. torridus*, but smaller, with relatively longer tail; pelage thinner, under parts nearly naked; color lighter, light chestnut-brown, or inclining toward cinnamon brown (near seal brown in *hispidus* and *torridus*); skull differing in detail, especially the relatively broader and heavier maxillary arm of zygoma. Similar in color to *H. h. isthmicus*, but smaller and cranial characters distinctive.

Color.—Type: Upper parts (moderately worn pelage) near chestnut brown; under parts, limbs and feet nearly naked, the scattered hairs light brownish; tail dull flesh colored, with a few brownish hairs on proximal half, becoming naked distally.

Skull.—Similar in general form to those of *H. h. hispidus* and *H. h. torridus*, but smaller; maxillary arm of zygoma relatively broader, heavier, more decurved, the anterior margin turning more abruptly outward from rostrum and curving slightly backward to external angle; dentition much lighter, molariform toothrows decidedly shorter; premaxillae broad posteriorly as in *torridus*, with little or no encroachment by maxilla. Compared with that of *H. h. isthmicus* the skull is smaller and lacks the deep, median anterior deflection of the lambdoid crest distinctive of that form; molariform toothrows shorter; nasals broader posteriorly.

Measurements.—Type: Total length, 328 mm.; tail vertebrae, 101; hind foot, 47. Two adult female topotypes respectively: 308–303; 93–95; 45–44. *Skull* (type): Condylobasal length, 58.5; length of nasals, 22.3; zygomatic breadth, 38.5; greatest breadth across squamosals (over mastoids), 36.8; interorbital breadth, 11.2; alveolar length of upper molar series, 11.7.

Remarks.—The Yucatan pocket gopher has an extensive general range at very low elevations, probably embracing the whole of the peninsula for which it is named, and reaching southward to undetermined limits. The skulls examined from various localities indicate small bodily size which is not so evident from external measurements, owing to apparently greater length of tail and hind foot.

Specimens examined.—Total number, 22, as follows:

Campeche: Apazote (near Yohaltun), 1; Campeche, 5.

Yucatan: Chichen Itza, 2; Yaxcach, 10.

Guatemala, Department of Peten: Chuntuqui, 2; Libertad, 1; Nuevo Pueblo, 1.

Heterogeomys hispidus chiapensis, subsp. nov.

CHIAPAS POCKET GOPHER.

Type.—From Tenejapa, about 16 miles northeast of San Cristobal, Chiapas, Mexico (altitude 7,800 feet). No. 76737, ♀ adult, U. S. National Museum (Biological Survey collection), collected by E. W. Nelson and E. A. Goldman, November 28, 1895. Original number 8682.

Distribution.—Highlands of Chiapas and Guatemala from about 3,000 to 8,000 feet altitude, and descending to lower elevations in southern Tabasco.

General characters.—Size large, color dark, pelage rather short, soft and velvety for a *Heterogeomys*. Similar to *H. h. hispidus* and *H. h. torridus* in size and color, but pelage shorter and softer, and cranial characters distinctive. Similar to *H. h. isthmicus* in size, but color darker, pelage softer, and skull differing in detail, especially the straighter outline of lamboid crest (deeply indented in *isthmicus*). Distinguished from *H. h. yucatanensis* by larger size, softer pelage, and cranial features, notably the relatively narrower rostrum.

Color.—Type: Upper parts, and outer surfaces of limbs, near seal brown; under parts thinly haired, cinnamon brownish; hind feet and toes of front feet scantily clothed with brownish hairs; tail nearly naked beyond

base, becoming entirely bare near tip, the dried skin dull flesh-colored. In one specimen a white spot, irregular in shape, appears on the middle of the abdomen.

Skull.—Similar in general contour to that of *H. h. torridus*, but rostrum narrower, less flattened, the nasals rising more prominently above the level of the premaxillae; maxillary arm of zygoma heavier, more broadly expanded at outer angle; auditory bullae smaller, less inflated, not usually extending below plane of basioccipital; dentition lighter, molariform toothrows shorter. Differing from that of *H. h. isthmicus* in straighter, less deeply sinuous lambdoid crest, narrower rostrum, and lighter dentition. Contrasted with that of *H. h. yucatanensis* the skull is decidedly larger, with relatively slenderer rostrum, and less inflated auditory bullae.

Measurements.—Type: Total length, 323 mm.; tail vertebrae, 86; hind foot, 48. Two adult female topotypes, respectively: 322–320; 84–79; 48–48. *Skull* (type): Condylobasal length, 58.5; length of nasals, 22.1; zygomatic breadth, 39.3; greatest breadth across squamosals (over mastoids), 37; interorbital breadth, 11.8; alveolar length of upper molar series, 12.8.

Remarks.—The range of this subspecies is in a region varying greatly in elevation and general topography. Specimens from the type locality and at the higher elevations elsewhere have softer, somewhat denser pelage than those from lower elevations as at Montecristo, Tabasco, but the latter do not appear to be satisfactorily separable. Two specimens of *Heterogeomys* from Guatemala were referred by Merriam (North Amer. Fauna, No. 8, p. 185, Jan. 31, 1895) to *H. torridus*, although he pointed out an apparent difference. These specimens are referred by us to the form here described, from which they appear indistinguishable.

Specimens examined.—Total number, 14, as follows:

Chiapas: Ocuilapa, 2; Tenejapa (type locality), 3; Tumbala, 1; Yajalon, 1.

Tabasco: Montecristo, 2; Teapa, 3.

Guatemala: Guatemala City, 1; without locality, 1.

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PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

THE GENUS OF TEIID LIZARDS, *VERTICARIA* COPE, 1869, CONSIDERED AS A SYNONYM OF *CNEMIDOPHORUS* WAGLER, 1830, WITH A KEY TO THE PRIMITIVE GENERA OF THE TEIIDAE.[1]

BY CHARLES E. BURT.

The genus *Verticaria* has been separated from *Cnemidophorus* on the basis of only one character, namely, the frontoparietal or postfrontal plate. In *Cnemidophorus* this shield is characteristically divided into two or more plates, while in *Verticaria* it is supposedly single. The union of two head plates, such as the frontoparietals in this case, may usually be regarded as a poor generic distinction if used alone. Even though that character be fairly constant in a small series, a detailed examination of a large number of individuals, especially if they represent wide-ranging species, is fairly certain to bring to light numerous intermediates in both the primitive and derived stocks. Thus, the frontoparietals of *Cnemidophorus tessellatus tessellatus* are rather frequently partly united into one scute (Mus. Vert. Zool. Univ. Calif. Nos. 3195 and 3216) and sometimes they are entirely united or nearly so (Calif. Acad. Sci. Nos. 43223 and 42459). This line of variation in *Cnemidophorus tessellatus tessellatus* tends toward the production of a *Verticaria*, such as has recently been found by Van Denburgh and Slevin (1921) in *Verticaria ceralbensis* from Ceralbo Island, Gulf of California, Mexico. So obvious is this relationship that the writer upon considering its degree of morphological specialization believes *Verticaria ceralbensis* to be directly derived from *Cnemidophorus tessellatus tessellatus*. The frontoparietals of the much smaller *Verticaria hyperythra*

[1]Contribution from the Zoological Laboratory of the University of Michigan.

stock may occasionally be divided into two parts. A number of such variants have been recorded during this study for *Verticaria hyperythra hyperythra* (Calif. Acad. Sci. Nos. 53555, 53569, and 57539; U. S. N. M. No. 12613; and M. C. Z. No. 569), but none have been found in *Verticaria caerulea* or *V. picta.* In addition, *Cnemidophorus deppei deppei* of Mexico has varied in the opposite direction by producing individuals with one frontoparietal only partly divided (Amer. Mus. Nos. 18959, 18924, 19188, and 19186) or with the two usually separate elements completely united (Calif. Acad. Sci. Field No. 6045 from Mixtequillo, Oaxaca, Mexico). It is significant that the *Verticaria hyperythra* group is related to the *deppei* and *perplexus* stocks of *Cnemidophorus* and not to the *tessellatus* group as is *Verticaria ceralbensis.* Because of these divided relationships within the supposed genus *Verticaria,* in addition to the inconstancy of the only distinguishing character, it is necessary to consider *Verticaria* a synonym of *Cnemidophorus.*

The placing of *Verticaria sericea* Van Denburgh (1895) in the genus *Cnemidophorus* makes necessary the formulation of a new name, since it is now preoccupied by *Cnemidophorus gularis sericeus* Cope (1892). The writer recognizes the lizard hitherto known as *Verticaria sericea* as a subspecies closely allied to *Cnemidophorus hyperythrus hyperythrus,* and therefore proposes that the form be henceforth designated as—

Cnemidophorus hyperythrus danheimae,[1] new name.

In order to make clear at this point the distinctions among the primitive genera of the Teiidae, with which *Cnemidophorus* is allied, the following key has been prepared. It is, essentially, a rearrangement of the one presented by Boulenger (1885).

KEY TO THE PRIMITIVE GENERA OF THE TEIIDAE.

1. Ventral plates in more than 20 longitudinal series.....2
   Ventral plates in 20, or less than 20, longitudinal series.....5
2. Tail strongly compressed, bicarinate above.....3
   Tail not strongly compressed, somewhat rounded, not bicarinate.....4
3. Dorsal scales small, granular, uniform in size or slightly graded.....
   1. *Crocodilurus*
   Dorsal scales not uniform or graded; many smaller dorsal granules

[1]This name is given to this lizard as a token of appreciation from the writer to his wife, May Danheim Burt, who has been his constant inspiration, aide, and companion during the period of his study of these Teiid lizards.

present, these intermixed and abruptly contrasted with a number of large, keeled tubercules.....2. *Dracaena*

4. Head shields all large and comparatively few.....3. *Tupinambis*
   Head shields small and numerous; prefrontals and nasals split into many smaller scutes or granules.....4. *Callopistes*
5. Ventral plates keeled 6
   Ventral plates smooth 7
6. Femoral pores present .....5. *Kentropyx*
   Femoral pores absent.....6. *Monoplocus*[1]
7. Hind foot with five well developed toes.....8
   Hind foot with only four well developed toes, the fifth remaining as a mere vestige.....7. *Teius*
8. Scaly portion of tongue bifid posteriorly and heart-shaped or arrow-headed in outline.....9
   Scaly portion of tongue not split posteriorly and not heart-shaped or arrow-headed in outline.....8. *Ameiva*
9. Larynx usually close to the extreme tip of the posterior wings of the scaly portion of the tongue, often between them; intervening sheath extremely small and thin, or entirely absent.....10
   Larynx usually a considerable distance back of the extreme posterior portion of the scaly part of the tongue; intervening sheath always discernible, usually well developed, never extremely reduced..... 8. *Ameiva*
10. Teeth longitudinally compressed (especially posteriorly and laterally) so that they are longer than they are wide.....9. *Cnemidophorus*
    Teeth transversely compressed so that they are wider than they are long. (Confined to western South America.).....10. *Dicrodon*

The following table gives the present views of the writer in regard to the synonymy of the genus.

Cnemidophorus Wagler.

Cnemidophorus Wagler, Nat. Syst. Amph., 1830, p. 154 (type, *C. murinus*).
Aspidoscelis Fitzinger, Syst. Reptilium, 1843, p. 20 (type, *C. sexlineatus*).
Verticaria Cope, Proc. Amer. Philos. Soc., 1869, p. 158 (type, *C. hypery-thrus*).

In conclusion it may be stated that the writer is now preparing independent revisions of the two closely related genera, *Cnemidophorus* and *Ameiva*. An interpretation of genetic relationships, together with de-

[1]Boulenger (1885) gave the citation of the original description of this genus (*Monoplocus* Gunther, Proc. Zool. Soc. London, 1859, p. 404) and drew all of his characters from it. He stated his belief that the supposed type of the genus in the British Museum is not that type at all but a substituted specimen of *Kentropyx pelviceps*. If this is the case, it is now impossible to determine whether the type was a male or a female. If it was a female, there is every reason to believe that the males would possess femoral pores, since in certain other genera of the Teiidae the disappearance of these organs is confined to the female sex only. If such a sexual difference is found, either a new generic split must be formulated, or *Monoplocus* must pass into the synonymy of *Kentropyx* Spix, which apparently differs merely in the possession of femoral pores in *both* sexes.

tails of classification and synonymy, may be expected to appear in the larger works.

The writer wishes to take this opportunity to express his appreciation to Dr. Frank N. Blanchard of the Department of Zoology of the University of Michigan for his kind criticism of this manuscript.

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Vol. 42, pp. 157–160 April 4, 1929

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

THE SPOTTED SKUNK OF THE CHANNEL ISLANDS OF SOUTHERN CALIFORNIA.[1]

BY DONALD R. DICKEY.

For many years Spotted Skunks of the genus *Spilogale* have been known from at least one of the islands of the Channel group, lying off the coast of southern California. Over twenty years ago, in fact, Howell in his revision of the genus[2] listed one specimen from Santa Cruz Island, Santa Barbara County, California, but the material remained scant indeed, if not unique, and the island animal has been assigned to *Spilogale phenax phenax* Merriam on general geographic grounds, without opportunity being afforded for critical study of specimens in series.

More recently the naming of *Spilogale phenax microrhina* from the San Diegan district by E. Raymond Hall[3], and its separation from the coastal animal *phenax* of northwestern California, has lent added interest to the capture and study of the animal from these islands which have been isolated from the mainland for such untold centuries.

Luckily material in adequate series, particularly from Santa Rosa Island, has become available in the last year or so, largely through the efforts of H. H. Sheldon and Paul Trapier. Mr. Sheldon in particular has made a number of short trips to Santa Rosa and Santa Cruz Islands in my behalf. In the study of the resulting material comparative use has been made not only of some 37 specimens in local collections, but also a series of topotypes of both *phenax* and *microrhina* in the University of California collections. For the courteous opportunity of making

[1]Contribution from the California Institute of Technology.

[2]N. A. Fauna 26, 1906, p. 32.

[3]Journal of Mammalogy, 7, no. 1, 1926, p. 53–56.

the latter comparisons my thanks are due Joseph Grinnell, Director, and E. Raymond Hall, Curator of Mammals in the Museum of Vertebrate Zoology.

Two additional skulls-without-skins from Santa Cruz Island have been kindly loaned me by D. B. Rogers of the Santa Barbara Museum of Natural History, and have supplemented our own limited series from that island in important fashion.

When this combined material was assembled for study it became quickly evident that the island animal does not closely resemble the San Diegan form *microrhina*, which pushes up the mainland at least as far as Ventura County. Instead, the Santa Rosa and Santa Cruz Island series which seem to differ from each other in no essential respect, are closer, particularly in tail proportion, rostral region and external nares, to the northern form *phenax*. Looking at a map of the California coast and remembering the persistence still on near-by San Miguel Island of the Northern Sea-Lion (*Eumetopias jubata*) and remembering, too, the presence on the adjacent mainland of Pleistocene remains of northern trees such as the Monterey Pine, etc., it need not surprise us unduly to find this isolated colony of skunks perpetuating to some extent the characters of the race which is now found in northwestern California. If it does not resemble the form *microrhina* now found on the near-by mainland of Ventura County, may it not at least logically be suggested that the latter has perhaps come in as an intrusive element, spreading north and west with the change of conditions from humid to more arid on that part of the coast.

Further study, however, shows that many differences set the island series off sufficiently from the closely related *phenax* to demand its naming. It may be known as follows:

Spilogale phenax amphialus, subsp. nov.

CHANNEL ISLANDS SPOTTED SKUNK

Type.—Male adult; no. 13,400, collection of Donald R. Dickey; 2½ miles north of ranch house near coast, Santa Rosa Island, Santa Barbara County, California; November 6, 1927; collected by H. H. Sheldon; original no. 14.

Characters.—Externally the island animal has the short total length of *microrhina*, but differs strikingly from it in having the tail not long as in that form, but even shorter both actually and relatively than the short-tailed northern form *phenax*.

Cranially *amphialus* has a comparatively massive skull, nearer in general to *phenax* than to *microrhina*, but differing from *phenax* in being shorter and more compact posterior to the supraorbital processes, with sagittal and lambdoidal ridges developed into striking crests; mastoid bullae as viewed from the side rounder, more compact and sharply tilted upward posteriorly; dentition lighter throughout, canines shorter and line of cingulum closer to alveolar border.

Measurements of type.—Total length, 426 mm.; tail, 121; hind foot, 48. Skull: condylo-basal length, 57.1; occipito-nasal length, 51.0; width of opening of external nares, 6.8; zygomatic breadth, 37.8; greatest mastoid breadth, 33.9; interorbital constriction, 16.9; palatal length, 23.0; post-palatal length, 28.5; length of tooth row (c^1 to m^1 inc.), 18.6.

Range.—Santa Rosa and Santa Cruz Islands, Santa Barbara County, California. Association, chiefly cactus patches, on Santa Rosa at least.

Remarks.—Since intergradation with mainland species is now obviously impossible and since overlap in composite characters is not yet fully demonstrated, some might urge the desirability of describing *amphialus* as a species. However, the hiatus is so small as to lack significance in a group that is as variable as the Mustelids, and in addition, I am myself so convinced that *phenax* and *amphialus* are of common stock that the use of the trinomial gives to my mind a far truer picture of the situation.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTIONS OF FOUR NEW BIRDS FROM THE MOUNTAINS OF NORTHERN SIAM.

BY J. H. RILEY.[1]

While carrying on an investigation of the fish resources of the country for the Siamese Government, Dr. Hugh M. Smith has been making a collection of birds in his spare time and generously presenting the results of his labors to the U. S. National Museum. In November and December of last year Dr. Smith visited the Khun Tan mountains, near the northern boundary and collected on Doi Angka (or Doi Intanon), the highest mountain in the country, which rises to 8500 feet, and on Doi Sutep (5600 feet). He was the first Caucasian to ascend Angka. The birds collected on this trip have been recently received and many of them appear to represent forms not previously recorded from Siam. The following four are apparently new and are herewith described:

Niltava grandis nobilis, subsp. nov.

Type.—Adult male, U. S. National Museum, No. 311593, Doi Angka, Siam, at 6000 feet, December 4, 1928, collected by Hugh M. Smith (original number 2672).

Similar to *Niltava grandis grandis*, but with the blues above somewhat lighter and brighter; outer surface of closed wing more extensively edged with blue, and the breast and belly more extensively dusky violet blue. Wing, 105.5; tail, 91; culmen, 14 mm.

Remarks.—A pair, taken on the same day at the type locality. The male more nearly resembles *Niltava grandis decipiens* in color, but the blues are not quite so purplish. In size it agrees with *Niltava grandis grandis*. At present I have no female of typical *grandis* for comparison, but the female of *nobilis* is quite different from the same sex of *decipiens*. It is not so deep a brown (tawny olive instead of snuff brown); the nape is barely tinged with grayish, instead of the whole pileum being dusky violet-blue;

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the throat is cinnamon buff, much lighter than the chest, instead of being nearly of the same color, and there are numerous other differences. This can hardly be *Niltava grandis griseiventris* La Touche (Bull. Brit. Orn. Club, 42, 1921, p. 14), from southeast Yunnan, which is described as being grayer on the lower abdomen with less blue edging to the wing, while in the present race the conditions are reversed.

Niltava smithi, sp. nov.

Type.—Adult female, U. S. National Museum, No. 311595, summit of Doi Sutep, Siam, December 15, 1928, collected by Hugh M. Smith (original number 2769).

Similar to *Niltava sundara denotata*, but jugular patch deep colonial buff instead of white; outer edging to wing-feathers saccardo umber instead of sayal brown, with the unexposed inner webs darker; inner webs of outer tail feathers chaetura drab, the middle pair and outer webs of the outer feathers saccardo umber instead of the whole tail sayal brown; upper tail-coverts dresden brown instead of tawny. Wing, 95; tail, 68; culmen, 12 mm.

Remarks.—Only the type was taken. It is so different from the same sex in *denotata* that in my opinion it must represent a related species.

Zosterops palpebrosa vicina, subsp. nov.

Type.—Adult male, U. S. National Museum, No. 311617, summit of Doi Sutep, Siam, December 15, 1928, collected by Hugh M. Smith (original number 2780).

Similar to *Zosterops palpebrosa palpebrosa*, but lighter, more yellowish above, flanks less grayish, the chest suffused with a yellowish wash, with a well pronounced yellow streak down the center of the chest. Wing, 54; tail, 36.5; culmen, 11 mm.

Remarks.—This agrees with the description of *Zosterops palpebrosa cacharensis* Stuart Baker (Ibis, 1922, p. 144), but Ticehurst (Bull. Brit. Orn. Club, 47, 1927, p. 89), after examining the type, regards it as only an abnormal specimen of *palpebrosa* and states that the yellow abdominal streak is very faint and does not hold good in the majority of Assam specimens. As the mountain form of northern Siam is clearly different from *palpebrosa*, I have given it a name. Dr. Smith took a male and female at the type locality on the same day. The female lacks the yellow suffusion on the chest, the belly is whitish, and the yellow line down the center of the chest is narrower than in the male, though well defined.

Aethopyga nipalensis angkanensis, subsp. nov.

Type.—Adult male, U. S. National Museum, No. 311620, Doi Angka, 8400 feet, Siam, December 5, 1928, collected by Hugh M. Smith (original number 2692).

Similar to *Aethopyga nipalensis nipalensis*, but chest grenadine red

instead of being only streaked with red; secondaries tinged on the outer web with english red instead of warbler green. Wing, 52.5; tail, 59.5; culmen, 18 mm.

Remarks.—Dr. Smith took two adult males and one adult female at the type locality, between 8000 and 8400 feet. The second male is like the type. The female resembles the same sex of typical *nipalensis*, but the head and throat are tinged with grayish and the secondaries are more deeply colored (near orange-citrine instead of citrine) on the outer web. The principal difference between the males of the present form and typical *nipalensis* is the grenadine red chest, without streaks, of the former.

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PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTIONS OF THREE NEW BIRDS FROM THE MOUNTAINS OF NORTHERN SIAM.

BY J. H. RILEY.[1]

Further study of the collection of birds made by Dr. Hugh M. Smith in the mountains of northern Siam,[2] has made it necessary to name three additional forms. They may be described as follows:

Hypothymis azurea montana, subsp. nov.

Type.—Adult male, U. S. National Museum, No. 311580, Chiengmai, Siam, November 25, 1928, collected by Hugh M. Smith (original number 2613).

Similar to *Hypothymis azurea styani,* but the blue of the head, throat, and back much lighter; the white of the lower-parts extending farther forwards; outer tail-feathers with white tips. Wing, 75; tail 74; culmen, 13.5 mm.

Remarks.—Only the type was taken at Chiengmai, but a female was taken at Lampang. The male is quite different from the same sex of *Hypothymis azurea atyani* from south-east Siam of which a good series of males has been available for comparison. In *montana* the forehead and crown is ultramarine ash, the throat only a little deeper in color, while in *styani* the forehead and crown are dull violaceous blue shading off on the throat into deep dull violaceous blue. As a matter of fact the blue in *montana* is purer and lighter without the violaceous cast seen in *styani.* A few specimens of *styani* show the merest trace of white at the tips of the outer tail-feathers, while in *montana* the white tip is 4 mm. broad on the outer tail-feather, decreasing inwardly, almost disappearing on the fourth. The single female of *montana* does not seem to differ materially from the same sex of *styani;* the outer tail-feathers are more broadly tipped with whitish, but the series of this sex available for comparison is rather poor. It is rather surprising to find such a well-marked form of this genus in the highlands of Siam.

[1]Published by permission of the Secretary of the Smithsonian Institution.
[2]For previous paper, see: Proc. Biol. Soc. Wash., vol. 42, 1929, pp. 161–164.

Rhipidura albicollis celsa, subsp. nov.

Type.—Adult female, U. S. National Museum, No. 311586, Khun Tan mountains, 4,000 feet, November 23, 1928, collected by Hugh M. Smith (original number 2591).

Similar to *Rhipidura albicollis albicollis,* but the forehead, crown and lores slate color rather than sooty black; back deep neutral gray rather than mouse gray; lower-parts neutral gray rather than brownish gray, the feathers of the center of the chest and breast tipped with white making a rather broad whitish line down the center. Wing, 73; tail, 96; culmen, 11 mm.

Remarks.—The above type has been compared with a female from Tenasserim, a male from Dehra, India, two females from south Annam, and three specimens from Yunnan. The latter are grayer, less brownish than those from India, but the forehead, crown, and lores are darker, more blackish than in *celsa.* In none of the Indian, Annam or Yunnam specimens is there an indication of the white line down the center of the chest and breast. It is rather surprising to find such a well-marked form of this species in the highlands of Siam.

Sibia picaoides cana, subsp. nov.

Type.—Adult male, U. S. National Museum, No. 311496, Doi Angka, Siam, at 7,500 feet, December 6, 1928, collected by Hugh M. Smith (original number 2704).

Similar to *Sibia picaoides picaoides,* but a clearer, purer, and less brownish gray, especially below; the bill smaller. Wing, 114; tail, 166; culmen, 21.5 mm.

Remarks.—Two males and one female were taken on Doi Angka, between 5,000 and 7,500 feet, December 4–6, and a male and female on the summit of Doi Sutep (5,600 feet), December 15. This series is very uniform and differs from a male from Upper Assam and an unsexed specimen, probably a male, from Sikkim as indicated above. The clearer, purer gray may be due to the freshness of the Siamese specimens, but the smaller bill alone is sufficient to establish the race. I am indebted to the authorities of the Museum of Comparative Zoology for the loan of the Sikkim specimen. The three males from Siam measure as follows: Wing, 114–121.5 (118.8); tail, 166–183.5 (177.7); culmen, 19.5–21.5 (20.2). The two females from Siam: Wing, 118–122; tail, 167–176; culmen, 21–21.5. The male from Assam measures: Wing, 115; tail, 186.5; culmen, 22.5. The Sikkim specimen: Wing, 130; tail, 212; culmen, 23.5. Stuart Baker (Fauna Br. India, 2 ed. Vol. 1, 1922, p. 295) gives the culmen of *picaoides* as "about 24 mm."

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW GENUS AND SPECIES OF AMPHIPOD FROM GRAND MANAN, N. B.[1]

BY CLARENCE R. SHOEMAKER.

Dr. Mary J. Rathbun while at Grand Manan, N. B., in 1898 made a collection of crustacea which she presented to the U. S. National Museum. When looking over the amphipods of this collection I noticed specimens which were apparently new to science. They proved to be representatives of a new genus which I now designate as *Amphiporeia*, and briefly define. A fuller description and figures of the genus and species will be published in my report upon the Amphipoda of the Cheticamp Expedition of 1917 in the Gulf of Saint Lawrence.

Amphiporeia, new genus.

Diagnosis.—Body compressed. Head without rostrum. Side-plate 4 with upper posterior margin excavate. Pleon segment 4 without process or sinus. Antenna 1 shorter than antenna 2, geniculate between first and second joints, accessory flagellum small, 2-jointed. Antenna 2, fourth and fifth joints subequal. Mandible with strong molar, many spines in spine-row, second joint of palp broad, third joint straight and about equal in length to second. Maxilla 1, inner plate broad with many plumose marginal setae, second joint of palp broad, about four times as long as first joint. Maxilla 2 very much as in *Bathyporeia*. Maxillipeds with outer plate strong and armed with spine-teeth on inner edge, inner plate reaching to about the middle of outer plate, palp stout with third and fourth joints well developed. Lower lip much as in *Bathyporeia*. Gnathopods closely resembling those of *Pontoporeia* except that gnathopod 2 is subchelate instead of chelate. Peraeopods 1 and 2 alike and much resembling those of *Bathyporeia*. Peraeopod 3 is doubly geniculate as in *Bathyporeia*. Peraeopod 4 longest, with second joint expanded. Peraeopod 5 short, much as in *Pontoporeia*, second joint greatly expanded. Uropod 3, outer ramus long, 2-jointed, inner ramus about half the length of

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the outer. Telson cleft nearly to base. Genotype *Amphiporeia lawrenciana.*

Amphiporeia lawrenciana, new species.

Characters as given for the genus. Eyes small, oval and composed of about twelve elements. Lateral angles of the head about 45° with apices narrowly rounded. Antenna 1 short, in normal position not reaching the end of peduncle of antenna 2, flagellum about as long as first joint of peduncle and composed of five joints, accessory flagellum with second joint small. Antenna 2 with flagellum shorter than peduncle and composed of 6 joints. Side-plate 1 straight, front margin very slightly concave. Lower margins of side-plates 1–4 bearing long slender spines. Mandible with spines of spine-row long and numerous, second joint of palp very broad with front edge very convex and armed with long bristles, third joint straight, nearly as long as second and armed on distal half of lower margin with long slightly-curved bristles. Maxilla 1, inner plate very broadly truncated and armed with about 10 plumose setae, outer plate armed with about 11 long toothed spines, palp with the obliquely truncated end bearing five short teeth and several stout bristles. Maxilla 2 with apices of both plates broadly rounded and bearing numerous stout spines, inner plate with an oblique row of plumose setae. Maxillipeds with inner plate well developed and bearing a row of stout plumose setae on their distal ends and upper inner margins, distal ends also armed with three short spine-teeth, palp stout, third joint about half the length of the second, fourth joint well developed and bearing a nail and several setae at distal end. Lower lip with inner lobes well developed, lateral angles prominent. Gnathopod 1, fifth and sixth joints equal in length, palm oblique, slightly concave and defined by a stout spine, finger as long as palm and bearing a few setae on the inner distal edge. Gnathopod 2, sixth joint shorter than fifth, palm oblique, convex, defined by a stout spine and armed throughout by low rounded teeth and short bristles, finger as long as palm and having a few slender setae on inner edge near apex. Peraeopods 1 and 2 alike, sixth joint longer than fifth, dactyl rather short, posterior margin of fifth joint with a group of long curved, bifurcate bristles and a few short simple ones, posterior margin of sixth joint with many short stiff bristles on lower half. Peraeopod 3, second and fourth joints greatly expanded, fifth and sixth joints short and straight, dactyl very small and weak. Peraeopod 4 not much longer than 3, second joint greatly expanded, fourth joint about two-thirds as wide as long, fifth joint equal in length to fourth, sixth joint longer than fourth or fifth but narrower, dactyl very short and weak. Peraeopod 5 much shorter than 3 or 4, second joint greatly expanded backward and slightly downward, fourth and fifth joints subequal in length, but the fourth the broader, sixth joint longer, but narrower than fourth or fifth, dactyl very short and weak. Pleon segment 3, lower part of posterior lateral margin slightly concave and bearing three short spines, lower posterior angle narrowly rounded, lower margin evenly convex. Pleon segment 4 with dorsal surface nearly straight. Uropod 1 extending a little

farther back than 2, rami equal in length and a little shorter than peduncle. Uropod 2, rami equal in length and as long as peduncle. Uropod 3 extending much farther back than 1 or 2, outer ramus long with short second joint, inner ramus slender and a little over half the length of the first joint of outer ramus. Telson a little over half the length of the outer ramus of uropod 3, nearly as wide as long, cleft nearly to the base, lateral margins convex and bearing near the center one or two stout bifurcated spines and a few plumose setules, apices of lobes rounded and bearing on outer side a notch containing one or two short bifurcated spines.

Length.—7 mm.

Holotype.—Female, U. S. N. M., catalogue number 62686. Collected by Dr. Mary J. Rathbun off Long Beach, Grand Manan, N. B., August 16, 1898.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

ADDITIONAL INFORMATION ON THE RANGE OF URSUS PLANICEPS, A COLORADO GRIZZLY.

BY C. HART MERRIAM.

Sixty years ago Dr. F. V. Hayden, when working in the Rocky Mountains, sent the Smithsonian Institution, from what is now the State of Colorado, the skull of a Grizzly bear, but omitted to mention the locality where it was obtained.

In 1918 this specimen was described by me as the type of *Ursus planiceps*.[1] In reference to its probable locality I stated:

"Dr. Hayden worked in Colorado in 1869, mainly in the mountains and foothills of the east-central part of the State. In as much as two other grizzlies, *bairdi* and *macrodon*, inhabit the higher mountains of Colorado it seems highly probable that the home of *planiceps* was in the foothills or along the western edge of the plains." (Ibid, p. 37 ftnote.)

Recently the skull[2] of a grizzly from Middle Creek (south of Creede) near the head of the Rio Grande in southern Colorado, was sent to the Biological Survey by Charles L. Calar, one of its predatory animal hunters.

It is labeled male, but has every appearance of a female. The sagittal crest is long and low, its posterior half only moderately elevated, and the canines are slender as in females of allied species. The molars also are distinctly small—nearly as small as in the type of *texensis*. Skull in general like *planiceps* the type of which, an old male, came from some unknown locality in Colorado. The Middle Creek skull is small and flattish, with flatly outstanding postorbital processes, flat narrow frontal shield, slightly and evenly sloping naso-frontal region; truncate nares; moderately spreading zygomata, and nearly flat palate. Rostrum compressed laterally immediately below the nasals; postorbital constriction hardly noticeable (only 66 mm.); frontal shield flat, conspicuously narrower than in *navaho*, thus agreeing with what would be expected in female *planiceps;* mandible similar to that of type of *planiceps* except for smaller size.

[1] *N. Am. Fauna*, No. 41, *Review of the Grizzly and Big Brown Bears of North America*, pp. 37–38, 1918.

[2] U. S. National Museum, Biological Survey Collection No. 248537 ♀ ad. (X Catalog No. 25014). Collected October 18, 1927.

In my judgment the skull is that of a fully adult female *Ursus planiceps*.

Cranial measurements.—Condylo-basal length 298; basilar length of Hensel 278; occipito-nasal length 270; palatal length 142; postpalatal length 138; zygomatic breadth 179; interorbital breadth 63.5; postorbital breadth 66.

Tooth measurements.—Upper molariform series 67; lower molariform series 62; length of incisor series 38.5.

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PROCEEDINGS
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URSUS HOLZWORTHI, A NEW GRIZZLY FROM THE TALKEETNA MOUNTAINS, ALASKA.

BY C. HART MERRIAM.

John M. Holzworth of New York, who for several seasons has hunted big bears in Alaska and British Columbia and has succeeded in taking a remarkable series of photographs and moving pictures of some of the big Alaska bears, has recently presented the Biological Survey with the skull of a large male Grizzly killed by him on the east slope of the Talkeetna Mountains near the headwaters of the Oshetna or the Black River. The locality is nearly due north of the Matanuska region and about fifty miles northnortheast of Chickaloon.

Ursus holzworthi, sp. nov.

Type No. 248691, ♂ ad., U. S. National Museum, Biological Survey Coll., from Talkeetna Mts., Alaska. Collected September 23, 1928, by John M. Holzworth.

Cranial characters.—Compared with the type of *cressonus:* Basilar length about 1½ inch shorter; frontal region, though arched over orbits, decidedly less highly and less abruptly elevated; sagittal crest shorter and less produced posteriorly; postorbital breadth (135 mm.) practically identical with that of *cressonus,* but interorbital breadth much less (85 contrasted with 96); zygomatic breadth about the same; anterior nares closely similar (rather truncate—not strongly sloping as in many species); palate flat with postpalatal shelf about as in *cressonus;* nasal region rather short, sloping strongly to frontals, which are not nearly so high as in *cressonus;* frontal sulcus very shallow, contrasting with the deeply sulcate groove of *cressonus.* The floor of the palate is broad and flat as in *cressonus,* showing no trace of the dishing between the posterior molars that is noticeable in *eximius,* and the postpalatal shelf is distinctly shorter than in *eximius,* the interpterygoid notch broader. In the underjaw the infraangular surface is distinctly shorter than in *eximius,* and the interior border of the ramus correspondingly longer. *Eximius* has an exceptionally narrow skull giving it the appearance of greater length. This narrowness is

conspicuous in the frontal, interorbital, and palatal regions; and the rostrum is obviously longer and the nares more sloping (less truncate). The canines and molars as already stated are much smaller than in *cressonus*, in this respect agreeing far better with *eximius*. In fact, the length of the upper series is essentially the same as that of *eximius*, but the canines are materially smaller. In the lower jaw particularly, the canines are notably weaker (thinner basally) than in *eximius*, and the carnasial is distinctly smaller. In both jaws the teeth are too badly worn to admit of comparison of cusps. Last upper molar only slightly emarginate. In total length the Holzworth skull agrees essentially with *eximius*, and therefore is considerably smaller than *cressonus*.

Measurements.—Condylo-basal length 357; basal length 339; basilar length of Hensel 333; occipito-sphenoid length 96; palatal length of Hensel 182; post-palatal length 150; foramen magnum to plane of last upper molar 180; occipito-nasal length 322; greatest length of skull 374; zygomatic breadth 243; interorbital breadth 85; postorbital breadth 135; breadth of postorbital constriction 72; breadth across mastoids 189; breadth across squamosal shelves 166; facial length (front of nasals to plane of postorbitals) 136; length of braincase (plane of postorbitals to junction of lamdoid and sagittal crest) 111; greatest breadth of rostrum (over canine roots) 89; height of rostrum at front of pm. ^{4} 70; height of cranium above palate at plane of postorbital processes 115; height of cranium at plane of intersphenoid suture 110.

Condyle of jaw to front of canine 244; mandibular symphysis to base of angular process 246; mandibular symphysis to subangular process 218; height of ramus between m_{2} and $^{m}{}_{3}$ 51; alveolus of m_{3} to coronoid notch 75; alveolus of m_{3} to condyle 94.

Tooth measurements (teeth worn).—Pm ^{4} length 18, breadth 14; m^{1} (too badly worn to admit of measurement); m^{2} length 38.5, breadth 18; pm_{4} length 13, breadth 8; m_{1} length 25, breadth 12; m_{2} length 26+, breadth 15.5; m_{3} length 21.5; breadth 15+; upper molariform series 79; lower molars 56; diameter of lower canines 16; length upper incisor series 50.

Remarks.—Critical comparison of the skull of this specimen with those of other Alaska Grizzlies in the collection of the Biological Survey indicates that its nearest relative is *Ursus cressonus* from the Copper River region, the type of which was collected on Lakina River in 1914 by Capt. J. B. Hubrick.

The Holzworth skull is of the normal generalized *ursine* type—lacking the highly arched frontals or other striking characters that distinguish some of the species. It is an old male, nearly if not quite as old as the type of *cressonus*, from which it differs in somewhat smaller size, less development of the sagittal crest, much less posterior overhang, less elevation of the frontal shield, blunter and more outstanding (less decurved) postorbital processes, and much shallower frontal sulcus. The dentition is very much weaker than in *cressonus*, in this respect agreeing much more closely with *Ursus eximius* from Knick Arm, although the canines are even smaller and weaker than in *eximius*. In the Holzworth skull the molars are badly worn though much less so than in the type of *cressonus*. In *cressonus* the molars and canines are exceedingly broad and massive while in Holzworth's skull they are very much smaller and narrower.

Type skull of *Ursus holzworthi*, No. 248691 ♂, U. S. N. M.

Type skull of *Ursus holzworthi*, No. 248691 ♂, U. S. N. M.

Ursus eximius
122495 ♂, U. S. N. M.

Ursus holzworthi
248691 ♂, U. S. N. M.

Ursus cressonus
206529 ♂, U. S. N. M.

Ursus eximius
122495 ♀, U. S. N. M.

Ursus holzworthi
248691 ♂, U. S. N. M.

Ursus cressonus
206529 ♂, U. S. N. M.

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PROCEEDINGS
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THE RACES OF SITTA PYGMAEA VIGORS.[1]

BY A. J. VAN ROSSEM.

As long as twenty-five years ago Mr. Ridgway (Birds of North and Middle America, 3, 1904, p. 457, footnote) mentioned certain differences between the Pygmy Nuthatches of Mexico, the Rocky Mountain district and California, but lacking proper material from California, he did not attempt further subdivision of the species. The present writer has lately had the opportunity of examining adequate series from Lower California, the California coastal district, the Sierra Nevada and the Rocky Mountains, as well as a small series from Chihuahua. Most important of all is the fact that these series are made up for most part of birds in fresh, unabraded plumage whose characters are unobscured by wear. Comment on the geographic characters displayed is given below.

Sitta pygmaea pygmaea Vigors.

MONTEREY PYGMY NUTHATCH.

Sitta pygmaea Vigors, Zool. Beechey's Voyage, 1839, p. 25, pl. 4 (Monterey, California).

Range.—Coast of California from Monterey Bay north to Mendocino County.

Remarks.—The range occupied by typical *pygmaea* is much more restricted than was formerly supposed. I have examined specimens collected at many stations from Monterey Bay to Mendocino City and Gualala, Mendocino County, but I know of no coastal records north of these two latter points. The record for Vancouver Island has been shown to be an error (Swarth, Birds of British Columbia, 1925, p. 115).

The color characters distinguishing *pygmaea* from *melanotis* (see postea) are more brownish pileum and nape, combined with a relatively indistinct ocular streak which is never prominent and in extreme cases so nearly

[1]Contribution from the California Institute of Technology.

concolor with the head as to be almost indistinguishable. From *chihuahuae* it is set off by much shorter wing, slightly larger bill and somewhat paler dorsal coloration. Forty-five specimens examined.

Sitta pygmaea melanotis, subsp. nov.

ROCKY MOUNTAIN PYGMY NUTHATCH.

Type.—Male adult; no. 25,938 collection of Donald R. Dickey; Chiricahua Mountains, Cochise County, Arizona; September 19, 1919; collected by H. H. Kimball; original no. 3102.

Subspecific characters.—Similar in size to *Sitta pygmaea pygmaea,* but top of head and nape decidedly darker and more slaty (less brownish); streak from bill through eye broader and often nearly black, contrasting strongly with the white or buffy white malar region. Differs from *Sitta pygmaea leuconucha* in decidedly smaller size and very much darker coloration.

Range.—Rocky Mountain region of the United States (and British Columbia?) from the United States-Mexican boundary north, at least to northern Idaho; west to eastern Washington, eastern Oregon, the Sierra Nevada and south to the San Bernardino Mountains in southern California.

Remarks.—The characters of this form are best developed in the Rocky Mountain region. The Sierra Nevada, San Gabriel and San Bernardino population is individually extremely variable, but adequate series from all these mountains show that in mass aggregate, they should be referred to this form. In southern California, intergradation with *leuconucha* is very gradual and birds from the extreme southern Sierras, Mt. Pinos, the San Gabriel and San Bernardino Mountains are definitely larger than northern Sierra and Rocky Mountain series. These intergrades have heretofore been called *leuconucha,* probably on account of their approach to that race in size. Ninety-seven specimens examined.

Sitta pygmaea leuconucha Anthony.

SAN PEDRO MARTIR PYGMY NUTHATCH.

Sitta pygmaea leuconucha Anthony, Proc. Calif. Acad. Sci., Ser. 2, no. 2, October 11, 1889, p. 77 (San Pedro Martir Mountains, Baja, California, Mexico).

Range.—San Pedro Martir Mountains, Lower California, north through the Sierra Juarez to the Cuyamaca and San Jacinto Mountains of California.

Remarks.—*Leuconucha* in typical form occurs only south of the Lower California boundary. Birds from north of that point are somewhat intermediate toward *melanotis,* but a good series from the San Jacinto Mountains demonstrates clearly that *leuconucha* extends to that range.

Compared with the other races, *leuconucha* is characterized by largest size, particularly of bill; paler, more ashy coloration of the upper parts, and least buffy underparts. I can not agree that the amount of white on the nape is of diagnostic value. Fifty-one specimens examined.

Sitta pygmaea chihuahuae, subsp. nov.

CHIHUAHUA PYGMY NUTHATCH.

Type.—Male adult; no. 115,701, Museum of Comparative Zoology; Mound Valley, Chihuahua, Mexico; September 3, 1905; collected by W. W. Brown, Jr.

Subspecific characters.—Most nearly like *Sitta pygmaea pygmaea* and, like that form, with pileum tending to brownish rather than slaty, and streak through eye ill defined; but dorsal coloration slightly darker, wing longer and bill shorter. Measurements of type: wing, 67.0 mm.; tail, 35.0; culmen from base, 15.0.

Remarks.—Ridgway has previously commented on the similarity in color of Californian and Mexican examples and the present investigation verifies his findings in this respect. Except for the longer wing, shorter bill and slightly darker color of the head, there is nothing to distinguish specimens from these two widely separated regions. They are, however, separated from one another by the wide territory occupied by *melanotis*. I have examined 20 specimens of this race, only 8 of which are suitable for purposes of camparison. All are from the State of Chihuahua, Mexico.

In addition to the splendid series of Pygmy Nuthatches in the collection of Mr. Dickey at the California Institute of Technology, I wish to express my appreciation for the loan of specimens by the Museum of Comparative Zoology and the Museum of Vertebrate Zoology.

MEASUREMENT TABLE.

	Wing.	*Tail.*	*Culmen from base.*
pygmaea 17 ad. ♂'s from Monterey Co., Cal.	60.0–63.0 (61.8)	30.0–33.0 (31.8)	15.0–17.7 (16.3)
melanotis 21 ad. ♂'s from the Rocky Mts.	61.0–66.0 (63.3)	30.0–36.0 (33.6)	14.9–16.9 (16.0)
leuconucha 10 ad. ♂'s from San Pedro Martir Mts.	66.0–70.0 (68.0)	35.0–39.0 (36.5)	17.4–19.0 (18.2)
chihuahuae 4 ad. ♂'s from Chihuahua	63.0–67.0 (65.5)	32.0–35.0 (33.7)	14.1–15.1 (14.7)

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW NAME NECESSARY FOR THE CALAVERAS WARBLER.[1]

BY A. J. VAN ROSSEM.

In describing a new race of Hartlaub's Warbler from Nicaragua, Messrs. Miller and Griscom (Am. Mus. Novit., 183, July 18, 1925, p. 7) pointed out that the genus *Oreothlypis* Ridgway is not separable from *Vermivora* Swainson. The two species formerly included in *Oreothlypis* and now placed in *Vermivora* were *Compsothlypis gutturalis* Cabanis and *Conirostrum superciliosum* Hartlaub. As Cabanis' specific name for the Irazú Warbler antedates by some fourteen years Ridgway's use of it for the Calaveras Warbler, a new name must be provided for the latter. To that end I propose **Vermivora ruficapilla ridgwayi** nom. nov. to replace *Vermivora ruficapilla gutturalis* (Ridgway), preoccupied.

[1]Contribution from the California Institute of Technology.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A REVIEW OF THE VIREONINE GENUS PACHYSYLVIA.

BY W. E. CLYDE TODD.

To the late Robert Ridgway, more perhaps than to any other one man, ornithologists the world over are indebted for the great advance in our systematic knowledge of North American birds that has marked the last fifty years. The eight published volumes of his "Birds of North and Middle America," brought out at the culmination of his scientific career, stand as a monument to his erudition, his sound judgment, his tirelessness in pursuit of truth. His treatment of many of the difficult problems encountered as his work progressed will doubtless stand as the final word for many years to come. While primarily concerned with the birds found north of the Isthmus of Panama, numerous extralimital genera and species are treated incidentally. One wonders what Ridgway's genius could have accomplished with South American birds had he had access to the series now available for study, instead of to the wholly inadequate material on which in most cases he was forced to rely. In offering the present modest contribution to help fill this gap, the writer is well aware that his own efforts fall far short of the standard set by the master workman, but the work itself is the model he has tried to keep before him.

During the past several years the growth of the bird collections of the Carnegie Museum, largely coming from tropical America, has resulted in bringing in good series of many species which have heretofore been little known. Among others the birds of the genus *Pachysylvia* have benefited, until the series of this group alone have reached an even six hundred specimens,

representing no less than twenty-four species and subspecies. In attempting to identify these some difficulty has been encountered, due to the eminently unsatisfactory and out-of-date treatment accorded the group by Gadow, the latest available authority, in Volume VIII of the Catalogue of the Birds of the British Museum, and to the scattered references in the literature. The present paper has been prepared with the object of collating the synonymy and descriptions of the several forms, and bringing our general knowledge of them down to the present date. In addition to the series in the Carnegie Museum, access has been had to a certain amount of material in other collections, as follows: the American Museum of Natural History, the Museum of Comparative Zoology, the United States National Museum (including the Biological Survey Collection), the Field Museum of Natural History, and the private collection of Mr. Donald R. Dickey of Pasadena, California. To the authorities in charge of these several collections thanks are due for such courtesies extended. I am also under obligations to Dr. C. E. Hellmayr of the Field Museum for his valuable manuscript notes on several species, kindly placed at my disposal. No effort has been made to give a full list of references to the literature, only the first citation under each name having been quoted. The names of colors are mostly from Ridgway's "Color Standards and Color Nomenclature." Measurements, where given, are in millimeters, and unless otherwise stated are the average of a series of specimens. The length of the bill is that of the exposed culmen. Measurements of specimens of this group in the Carnegie Museum collection have mostly been made by Miss Ruth Trimble.

Genus **Pachysylvia** Bonaparte.

Hylophilus (not *Hylophila* Hübner, 1816) Temminck, Pl. Col. III, livr. 29, 1822, pl. 173, fig. 1 and text (type, *H. poicilotis* Temminck, by designation of Gray, 1840).

Pachysylvia Bonaparte, Consp. Avium, I, 1850, 309 (type, by monotypy, *Sylvicola decurtata* Bonaparte).

The taxonomic history of this group, given in full by Sclater (Ibis, 1881, 293), need not be here repeated. His arrangement was followed by Gadow (Catalogue Birds British Museum, VIII, 1883, 305–313), since which time no comprehensive review of the genus has appeared, although no less than twenty-two additional forms have been described. It was Dr. Oberholser

who first called attention to the preoccupation of Temminck's name (Proceedings Biological Society of Washington, XVI, 1903, 101). Nevertheless the International Code would permit the use of the name, but I prefer to adhere to the A. O. U. Code in this regard. The diagnosis of the genus will stand in the main as given by Ridgway in his "Birds of North and Middle America" (Bulletin United States National Museum, No. 50, III, 1904, 214–215). The relative length of the tail, however, varies greatly, from slightly longer than the wing in *P. poicilotis* to the diminutive dimensions found in *P. minor* and *P. decurtata*, at the other end of the series. Twenty-three species and twelve additional subspecies, two of which are here described as new, are recognized in the present review. Only one form, *P. flaviventris*, the type of which is unique, has not been examined in this connection. The *Sylvia flaveola* of Wied (Beiträge Naturgeschichte Brasilien, III, ii, 1831, 719), which has been placed in this genus, is not identifiable from the description, and the type is not extant, so that the name may be disregarded. The geographical range of the group is from southern Mexico to northern Argentina, but only one outlying species reaches the former country, while all those occurring north of Panama are obviously related to forms from the South American continent. The genus as a whole is essentially one of the Tropical Zone, but there are three species which are characteristic of the Subtropical.

Much difficulty has been encountered in drawing up the following key, which is based on comparative characters observable in a series, and one form, *P. flaviventris*, had to be omitted from consideration.

Key to the Species and Subspecies of Pachysylvia
(exclusive of *P. flaviventris*).

A. Pileum rich rufous brown, sharply defined from the rest of the upper parts.
  b. Under parts strongly tinged with yellow; tail usually longer than the wing.....*Pachysylvia poicilotis.*
  b′. Under parts with little or no yellow tinge; tail shorter than the wing.....*Pachysylvia amaurocephala.*
A′. Pileum otherwise (grayish, tawny, or olivaceous).
  b. Breast yellowish green, contrasted with the whitish or grayish throat and abdomen.
    c. Bill and feet dark-colored (plumbeous in life?).....*Pachysylvia thoracica.*
    c′. Bill and feet pale (flesh-color in life?).
      d. Posterior under parts whitish, yellow-tinged.
        e. Wings and tail yellowish green.....*Pachysylvia pectoralis.*
        e′. Wings and tail grayish.....*Pachysylvia sclateri.*
      d′. Posterior under parts pale grayish.
        e. Pileum strongly washed with gray.....*Pachysylvia griseiventris griseiventris.*
        e′. Pileum with little or no grayish tinge.....*Pachysylvia griseiventris æmula.*

b′. Breast otherwise.
  c. Under parts (at least from the breast down) pallid neutral gray, almost uniform, or with a slight tinge of yellowish green on the breast and sides, but no buffy.
    d. Fore crown pale olive green.
      e. Nape with a broad gray band.....
        Pachysylvia semicinerea semicinerea.
      e′. Nape with no decided gray band.....
        Pachysylvia semicinerea viridiceps.
    d′. Fore crown dull sepia.....*Pachysylvia brunneiceps.*
  c′. Under parts otherwise (if grayish, also with a buffy tinge on the breast).
    d. Tail brownish.
      e. Crown olivaceous, like the back.
        f. Supraloral spot or streak pale buffy.....
          Pachysylvia luteifrons.
        f′. Supraloral spot or streak antique brown.
          g. Under parts not uniform; throat and breast honey yellow; abdomen ecru olive.....
            Pachysylvia rubrifrons rubrifrons.
          g′. Under parts nearly uniform, primrose yellow.....
            Pachysylvia rubrifrons lutescens.
      e′. Crown ochraceous, different from the back.
        f. Back more olivaceous.
          g. Paler, purer olivaceous above.....
            Pachysylvia ochraceiceps viridior.
          g′. Darker, duller olivaceous above.
            h. Wing-edgings more olivaceous; general coloration darker.....
              Pachysylvia ochraceiceps ferrugineifrons.
            h′. Wing-edgings more brownish; general coloration lighter.....
              Pachysylvia ochraceiceps bulunensis.
        f′. Back more brownish.
          g. Back, wings, etc., more olive brown; breast less buffy.....*Pachysylvia ochraceiceps nelsoni.*
          g′. Back, wings, etc., deeper brown; breast more buffy.....*Pachysylvia ochraceiceps ochraceiceps.*
    d′. Tail greenish.
      e. Tail relatively longer, averaging 44 mm. or more in male.
        f. Pileum greenish, like the back.
          g. Larger; wing of male averaging 60 mm. or more.
            h. Under parts deep olive buff, almost uniform
              Pachysylvia insularis.
            h′. Under parts buffy whitish, the throat, breast, and sides olive yellow.....*Pachysylvia olivacea.*
          g′. Smaller; wing of male averaging less than 60 mm.

h. Under parts deep olive buff.....
Pachysylvia flavipes acuticauda.
h′. Under parts dull buffy yellow.....
Pachysylvia flavipes flavipes.
h″. Under parts brighter (amber) yellow.....
Pachysylvia viridiflava.

f′. Pileum more or less brownish.
g. Under parts (except the throat) yellowish.
h. Upper parts purer, lighter green.
i. General coloration paler.....
Pachysylvia aurantiifrons aurantiifrons.
i′. General coloration darker.....
Pachysylvia aurantiifrons saturata.
h′. Upper parts duller, darker green.
i. Throat paler, more grayish white; rest of under parts richer and purer yellow.....
Pachysylvia hypoxantha albigula.
i′. Throat more buffy; rest of under parts duller and darker yellow.....
Pachysylvia hypoxantha hypoxantha.
g′. Under parts dull grayish white, tinged with greenish and buffy.
h. Pileum and sides of neck Brussels brown.....
Pachysylvia semibrunnea.
h′. Pileum dull brown (between sepia and snuff brown), the sides of the neck paler.....
Pachysylvia inornata.

f″. Pileum gray.
g. Throat and breast paler buffy.....
Pachysylvia muscicapina muscicapina.
g′. Throat and breast deeper buffy.....
Pachysylvia muscicapina griseifrons.

e′. Tail relatively shorter, averaging less than 40 mm. in male.
f. Pileum greenish, like the back.
g. Under parts more brightly colored.....
Pachysylvia minor minor.
g′. Under parts less brightly colored.....
Pachysylvia minor darienensis.
f′. Pileum gray, different from the back.....
Pachysylvia decurtata.

Pachysylvia poicilotis (Temminck).

Hylophilus poicilotis Temminck, Pl. Col., livr. 29, 1822, pl. 173, fig. 2, and text ([Ypanema, São Paulo], Brazil—cf. Hellmayr, Field Mus. Zool. Ser., XII, 1929, 263, note).

Description.—Pileum dull antique brown, with (sometimes) a dull

grayish nuchal band behind; upper parts, and wings and tail externally, warbler green, the outer primaries narrowly edged with grayish white; sides of the head grayish, the ear-coverts mottled with darker color; throat dull grayish, with more or less buffy yellowish wash, which increases and deepens on the breast, and becomes almost "solid" dull wax yellow on the sides and flanks, leaving only the middle of the abdomen buffy white; crissum pale yellow; under wing-coverts and inner edgings of the remiges also pale yellow; bill and feet dark-colored (in skin).

Measurements.—Male: wing, 57; tail, 57.5; bill, 11; tarsus, 17.2. Female: wing, 55; tail, 57; bill, 11; tarsus, 17.5.

Range.—Southern Brazil (Rio de Janeiro to Santa Catharina), westward to Paraguay and Misiones, Argentina.

Remarks.—Temminck's figure is easily recognizable as applicable to the present form, although the coloring is none too accurate. His type was a skin in the Vienna Museum collected by Natterer at Ypanema, as we learn from Dr. Hellmayr. Other travellers have since extended its latitudinal range somewhat, and Mr. Ernest G. Holt has recently traced it to an altitude of 5900 feet on the slopes of Itatiaya. This is the only species of *Pachysylvia* which has the tail regularly equal to or even a little longer than the wing.

Pachysylvia amaurocephala (Nordmann).

Sylvia amaurocephala Nordmann, in Erman's Reise, Naturhist. Atlas, 1835, 14 ([boundary between Minas Geraës and Bahia], Brazil—cf. Hellmayr, Field Mus. Zool. Ser., XII, 1929, 262).

Pachysylvia amaurocephala cearensis Snethlage, Journ. f. Orn., LXXIII, 1925, 266 (São Paulo, Serra de Ibiapaba, Ceará, Brazil).

Description.—Pileum Brussels brown, sharply defined from the neutral gray of the nape, which passes into the dull serpentine green of the upper parts, tail, and wing-coverts; remiges externally similar but rather brighter (yellowish citrine); sides of the head dull grayish white, with indistinct paler superciliaries; throat and upper breast pale smoke gray, passing into dull pinkish buff on the abdomen and crissum; sides and flanks shaded with olive lake; under wing-coverts and inner edges of the remiges citron yellow; "iris brown; feet gray; bill black, the mandible light gray."

Measurements.—Five specimens (both sexes): wing, 52.5; tail, 48.5; bill, 10.5; tarsus, 17.

Range.—Eastern Brazil, from Piauhy and Ceará to São Paulo.

Remarks.—Dr. Hellmayr (l. c.) says that this form completely intergrades with *P. poicilotis* in São Paulo, as shown by Natterer's series in the Vienna Museum. There are two skins from "Bahia" in the series examined which are brighter above and below, and might be considered as approaching the form in question. The single São Paulo skin of *poicilotis* seen, however, is perfectly typical, and moreover, I can not understand why intergradation should take place in this State when specimens from Rio de Janeiro, farher east, are also typical *poicilotis*. Aside from the color-differences, which are well marked, there is a difference in pro-

portions, the tail being shorter than the wing in *amaurocephala*, but a little longer in *poicilotis*. So I should prefer to keep them specifically distinct for the present. But I fully agree with Dr. Hellmayr in relegating *cearensis* Snethlage to synonymy.

Pachysylvia thoracica (Temminck).

Hylophilus thoracicus Temminck, Pl. Col., livr. 29, 1822, pl. 173, fig. 1, and text ([Rio de Janeiro], Brazil—cf. Hellmayr, Nov. Zool., XIII, 1906, 355, and XV, 1908, 20).

Description.—Upper parts in general, wings externally, and tail dull green (between warbler green and citrine); pileum and nape deep grayish olive, tinged with dull citrine, especially on the forehead; sides of the head similar but duller; throat dull grayish white, passing into wax yellow on the breast; under wing-coverts brighter (strontian yellow), and inner webs of the remiges edged with the same color; rest of the under surface white, with a light tinge of creamy buff; bill and feet dark-colored (bluish gray in life?).

Measurements.—One male: wing, 59; tail, 55; bill, 12; tarsus, 19.

Range.—State of Rio de Janeiro, southeastern Brazil.

Remarks.—Temminck's figure is a fairly good representation, except that the gray on the head is of too blue a shade, and his description fits the single specimen examined (No. 147,075, Collection American Museum of Natural History, La Raiz, foot of Organ Mountains, Rio de Janeiro) very well. The bill and feet are represented as dark-colored. This is important, showing that this feature is of diagnostic value, and is not due to immaturity.

Sclater (Ibis, 1881, 298) and Gadow (Catalogue Birds British Museum, VIII, 1883, 307) confused this species with *P. pectoralis*. The error was corrected by von Berlepsch and Hartert (Novitates Zoologicæ, IX, 1902, 11). It is in fact unknown beyond the confines of the State of Rio de Janeiro, as shown by Dr. Hellmayr (Novitates Zoologicæ, XV, 1908, 20).

Pachysylvia flaviventris (Cabanis).

Hylophilus flaviventris Cabanis, Journ. f. Orn., 1873, 64 (Monterico, Peru).

Description.—"Pileum and nape (abruptly defined posteriorly) light earthy brown, with a slight olivaceous tinge, caused by certain feathers being laterally edged with dull yellowish olive; back brownish olive green (hard to define); rump and upper tail-coverts light yellowish olive green, contrasting with the more brownish mantle (or upper and middle back). Lesser wing-coverts brownish like the upper back; median and greater series duller, more brownish gray, edged with greenish; remiges dusky, exteriorly margined with yellowish olive green, this margin passing into whitish along the apical half on the second to sixth primaries; rectrices dull olive yellowish green, brighter on the edges. Lores and orbital rim dingy white; sides of the head pale earthy brown; cheeks and auriculars slightly

variegated with whitish; throat and foreneck white; remainder of the under surface pale olive yellow, rather dull in tone, the flanks more greenish, and the crissum more yellowish; quill-lining nearly white. Bill pale horn brown, the mandible brownish white; feet dark horn. Fourth primary longest; third and fifth equal and about 1.5 mm. shorter than the fourth; the second is equal to the ninth (counting from without)."

Measurements.—"Wing, 62; tail, 49; bill, 14; tarsus, 16."

Range.—Known only from the type-locality, Monterico, Central Peru.

Remarks.—This species is known from the type-specimen alone. Dr. Hellmayr has kindly sent me the above detailed description and following notes, made some years ago on the specimen in question, in the Warsaw Museum. "A very peculiar species, not to be confused with any other member of the genus. It is particularly well characterized by its elongated slender bill. By possessing a distinct cap this species approaches *P. pectoralis*, but has a much longer, slenderer bill, and differs furthermore, by its brownish mantle, uniform, dull olive yellowish ventral surface (excepting the white throat), without any white on the abdomen, and brownish (instead of light gray) sides of the head, etc."

Pachysylvia pectoralis (Sclater).

Hylophilus pectoralis Sclater, Proc. Zool. Soc. London, 1866, 321 ([Villa Bella de Mattogrosso], Brazil—cf. Hellmayr, Nov. Zool., XV, 1908, 20).

Hylophilus griseiceps Penard and Penard, Vog. Guyana, II, 1910, 538 (Surinam).

Pachysylvia araguayæ Reichenow, Journ. f. Orn., 1920, 88 (Leopoldina, Rio Araguaya, Goyaz, Brazil).

Pachysylvia thoracicus abariensis Chubb, Birds Brit. Guiana, II, 1921, 395 (Abary River, British Guiana).

Description.—Pileum and nape plain dull gray (near mouse gray), the sides of the head similar but paler; back, wings externally, and tail dull yellowish green (between warbler green and citrine); throat dull grayish white; breast olive yellow; under wing-coverts strontian yellow; inner webs of the remiges edged with yellowish citrine; tibiæ and crissum washed with the same color; abdomen whitish with a faint buffy grayish wash; bill and feet pale (in skin). The juvenal dress is grayish above, tinged with greenish posteriorly; below whitish, with a pale yellow tinge on the flanks and crissum.

Measurements.—Male: wing, 56.5; tail, 45; bill, 12.3; tarsus, 16. Female: wing, 53.5; tail, 44.5; bill, 12; tarsus, 16.

Range.—Guiana, south to the States of Matto Grosso and Goyaz, Brazil.

Remarks.—This species differs from *P. griseiventris* in having no greenish wash on the pileum, which is uniform gray; and also in the greater extent of the yellow color below, which covers the upper abdomen as well as the breast. The abdomen is more buffy white, less grayish. Otherwise the colors are about the same in both.

I can find no constant differences between specimens from Brazil (States of Maranhão and Pará) and our large series from French Guiana. Birds from British Guiana have been described by Chubb under the name *abariensis*, but topotypes of the latter are also the same. Even if there were a northern race it would have to bear the name applied by the Messrs. Penard in 1910, as Dr. Hellmayr points out (Field Museum Zoological Series, XII, 1929, 262). He adds that the *P. araguayæ* of Reichenow is also indistinguishable. Gadow's unfortunate error in the description of *P. pectoralis* may have been responsible for the perpetration of these synonyms.

Pachysylvia sclateri (Salvin and Godman).

Hylophilus sclateri Salvin and Godman, Ibis, 1883, 205 (Mount Roraima, British Guiana).

Description.—Pileum and nape deep neutral gray, the forehead and lores tinged with clay-color, the sides of the head paler gray; back dark warbler green; wings and tail deep mouse gray externally, the outer remiges edged with paler and purer gray; throat buffy white; breast washed with primuline yellow, passing into yellowish citrine on the sides and into dull whitish on the middle of the abdomen; under wing-coverts pale yellow; inner edgings of the remiges whitish; bill and feet brownish (in skin).

Measurements.—Male: wing, 61; tail, 51; bill, 11.7; tarsus, 17.5. Female (one specimen): wing, 60; tail, 49; bill, 12; tarsus, 17.

Range.—Mount Roraima district, British Guiana.

Remarks.—The above description is based on freshly collected specimens in the American Museum of Natural History. A skin collected by Whitely in 1883 has faded appreciably. Some of the specimens have the wings and tail partly edged with the color of the back, instead of grayish; they are perhaps not fully mature. The crissum in some individuals is pure white, while in others it is tinged with pale yellow.

This form combines the yellowish green breast-band of the *thoracica-pectoralis* group with the rufescent forehead of *P. muscicapina, luteifrons*, etc. It is obviously a Subtropical Zone representative of some lower-ranging form.

Pachysylvia griseiventris griseiventris (von Berlepsch and Hartert).

Hylophilus thoracicus griseiventris von Berlepsch and Hartert, Nov. Zool., IX, 1902, 11 (Suapure, Caura River, Venezuela).

Description.—Upper parts, wings externally, and tail dull warbler green (between warbler green and olive green); forehead the same, but crown and nape more or less extensively neutral gray; throat dull grayish white, passing into pyrite yellow on the breast; under wing-coverts and inner edges of the remiges similar but brighter; rest of the under parts white with a decided grayish shade (near pallid neutral gray); bill and feet pale (in skin).

Measurements.—Male: wing, 55.5; tail, 45; bill, 13; tarsus, 17. Female: wing, 55; tail, 46; bill, 12.5; tarsus, 16.

Range.—From eastern Venezuela (south of the Orinoco) and Guiana southward to the Rio Purús, Brazil.

Remarks.—This bird was described as a race of *P. thoracica*, but after comparing our series with a specimen of the latter from southern Brazil I am confident that they represent a form specifically distinct. The pale bill and feet and grayish-tinged posterior under parts are very different from those of *thoracica*, in which the bill and feet are dark-colored and the posterior under parts creamy buff. The discontinuous range of *thoracica* and *griseiventris* with reference to each other is another point to be considered.

We have fifteen specimens from French Guiana (Tamanoir and Pied Saut), one from the north bank of the Amazon at Obidos, four from the Rio Purús (Hyutanahan, Nova Olinda, and Arimã), and one from the upper Amazon (São Paulo de Olivença). The skins from the last two regions vary among themselves to a certain extent, in the direction of *æmula*, but some of this variation may be due to age.

Pachysylvia griseiventris æmula Hellmayr.

Pachysylvia thoracica æmula Hellmayr, Anz. Orn. Ges. Bayern, No. 3, 1920, 15 (Yahuarmayo, Carabaya, southeastern Peru).

Subspecific characters.—Similar to *P. griseiventris griseiventris*, but gray color of the pileum less in extent, sometimes entirely wanting; and throat and posterior under parts more buffy, less grayish in tone. Size about the same.

Range.—Tropical Zone along the eastern base of the Andes, from Colombia to southeastern Peru.

Remarks.—This form is closely related to true *P. griseiventris*, of which it is the western or Andean representative, but in my opinion it is not subspecifically related to *P. thoracica*, which latter has dark-colored feet and bill, and whose known range is moreover disconnected and far removed. An immature example (No. 53,506, Collection Field Museum of Natural History), however, moulting out of the juvenal dress, has dark-colored feet (by comparison) and bill, suggesting such a derivation as would be implied.

Of this form I have examined four specimens, one from "Bogotá," Colombia, one from La Pampa, Peru, and two from Rioja, Peru.

Pachysylvia semicinerea semicinerea (Sclater and Salvin).

Hylophilus semicinereus Sclater and Salvin, Proc. Zool. Soc. London, 1867, 570, pl. 30, fig. 2 (Pará, Brazil).

Description.—Above pale olive green (between olive green and dark citrine), with a neutral gray nape-band, poorly defined anteriorly; wings externally and tail like the back; under parts pallid neutral gray, the sides of the breast shaded with sulphine yellow, the abdomen medially nearly

white, the crissum whitish or with a faint yellowish tinge; under wing-coverts and inner edgings of the remiges lemon yellow.

Measurements.—Male: wing, 56.5; tail, 45; bill, 13; tarsus, 17.5. Female: wing, 55; tail, 47; bill, 12.8; tarsus, 17.

Range.—Brazil, south of the Amazon, from the Rio Madeira east to the State of Maranhão.

Remarks.—Dr. Hellmayr (Novitates Zoologicæ, XIII, 1906, 355; XIV, 1907, 5; XV, 1908, 21) long regarded this form as a race of *P. thoracica*, to which I can not agree, holding that the broad colored breast-band of the latter is a good specific character. He has recently been induced to reverse his opinion (cf. Field Museum Zoological Series, XII, 1929, 261), but on entirely different grounds. The amount of gray on the nape varies considerably, but there is no difference between birds from Pará (Benevides), the type-locality, and the Rio Tapajóz, as he at one time thought might be the case. Birds in immature ("first winter") plumage, with soft skulls, are precisely like adults.

Pachysylvia semicinerea viridiceps, subsp. nov.

Type, No. 65,377, Collection Carnegie Museum, subadult male; Pied Saut, French Guiana, December 14, 1917; Samuel M. Klages.

Subspecific characters.—Similar to *P. semicinerea semicinerea*, but pileum and nape with less grayish tinge, sometimes almost uniform with the back; and under parts averaging paler, more whitish, with the green wash on the breast paler and less extensive. Size about the same.

Range.—Southern Venezuela (Mount Duida) to French Guiana, and southward to the Amazon.

Remarks.—The present form is based on a series of eleven specimens in the collection of the Carnegie Museum from the following localities: Pied Saut, French Guiana; Obidos and Manacapurú, Brazil. In addition there is a skin in the collection of the American Museum of Natural History from the foot of Mount Duida, Venezuela, which I consider referable to the same form. At first glance I thought these were young birds of *P. griseiventris*, but upon closer comparison they appear to represent an unnamed race of *P. semicinerea*, differing in the more greenish, less grayish pileum, and slightly paler lower parts. In *semicinerea* the pileum is decidedly grayish, at least posteriorly, and well contrasted with the back, while in the new form the gray is duller, more overspread with green, and less contrasted with the back. Individual specimens from the two series respectively approach each other, but the series as a whole are sufficiently distinct. As nearly as I can tell, however, all but a few of the series have soft spots in the skull, indicative of immaturity, but on the other hand several examples of *griseiventris* are in the same condition, but are exactly like adults in coloration. Moreover, the juvenal dress of *griseiventris* is yellowish below (the throat and breast), while none of the present lot have any more of this color below than *semicinerea*, and most of them have less.

The discovery of an undoubted geographical variant of *P. semicinerea*, coming from the same localities as *P. griseiventris*, of course disposes of the idea that these two are conspecific.

Pachysylvia brunneiceps (Sclater).

Hylophilus brunneiceps Sclater, Proc. Zool. Soc. London, 1866, 322 ("Ypanema" [error]=Rio Vaupe, Brazil—cf. von Pelzeln, Orn. Brasiliens, 1868, 70, note, and Sclater, Ibis, 1881, 306).

Description.—Pileum dull sepia with a wash of citrine, passing into dull warbler green on the back, tail, and wings externally; sides of the head dull brownish, paler than the pileum; throat and upper breast soiled white, washed with deep olive buff; rest of the under parts white with a grayish shade, the sides and flanks washed with yellowish citrine, the crissum with pale yellowish green; under wing-coverts and inner edges of the remiges amber yellow; bill and feet pale brown (in skin).

Measurements.—One male: wing, 51; tail, 41; bill, 13.5; tarsus, 16.5.

Range.—Northern Brazil (Rio Negro) to southern Venezuela (and east to Guiana?).

Remarks.—In describing this species Sclater attributed it to southern Brazil, having in some way mixed up his specimens and transposed his notes, as pointed out by von Pelzeln (l. c.) and later corrected by Sclater himself. I have seen but one example (No. 121,032, Collection American Museum of Natural History), from San Fernando, upper Orinoco, Venezuela; it fits Sclater's figure (Ibis, 1881, pl. 11, fig. 1) very exactly. I doubt if it occurs in Guiana—French Guiana, at any rate, where Mr. Klages' researches have failed to discover it. It probably occupies the little known region north of the Amazon, along the Rio Madeira and northward to the Orinoco. South of the Amazon it is replaced by *P. inornata* Snethlage.

Pachysylvia luteifrons (Sclater).

Hylophilus luteifrons Sclater, Ibis, 1881, 308 (Bartica Grove, British Guiana).

Hylophilus surinamensis Penard and Penard, Vog. Guyana, II, 1910, 538 (Surinam).

Description.—Above dark citrine, the pileum a little darker, more olivaceous, the remiges externally more brownish (orange citrine), the tail still deeper (medal bronze); forehead and supraloral region tinged with dull buffy yellow (but not conspicuously); under parts washed with primrose yellow, the breast usually more buffy (near dark olive buff), the crissum deep colonial buff, as also are the under wing-coverts and inner edgings of the remiges.

Measurements.—Male: wing, 57; tail, 41; bill, 12.5; tarsus, 15. Female: wing, 56; tail, 39; bill, 12; tarsus, 15.

Range.—Guiana, south to the Amazon River, Brazil.

Remarks.—Little is on record concerning the present species, which was at first supposed to be confined to British Guiana. It was found in French Guiana by Mr. George K. Cherrie (cf. von Berlepsch, Novitates Zoologicæ, XV, 1908, 109), and Mr. S. M. Klages has also sent a good series from that country to the Carnegie Museum. The same collector took a single specimen at Obidos, and Miss Snethlage records it from St. Antonio da

Cachoeira, on the Rio Jary, showing that its range reaches to the north bank of the Amazon.

Pachysylvia rubrifrons rubrifrons (Sclater and Salvin).

Hylophilus rubrifrons Sclater and Salvin, Proc. Zool. Soc. London, 1867, 569, pl. 30, fig. 1 ([Pará ?], lower Amazon River, Brazil).

Description.—Upper parts dark citrine, the pileum sometimes a little more olivaceous, in but slight contrast; wings externally like the back, the wing-coverts with slight rufescent edgings; tail brown (between Prout's brown and Brussels brown); forehead and supraloral region antique brown; sides of the head in general, and throat and breast, honey yellow, passing into ecru olive on the abdomen and crissum; under wing-coverts reed yellow, and inner edgings of the remiges buffy yellow (near honey yellow).

Measurements.—Male (three specimens): wing, 56; tail, 39; bill, 12.5; tarsus, 15. Female (two specimens): wing, 56; tail, 38.5; bill, 13; tarsus, 16.

Range.—Pará region of northeastern Brazil.

Remarks.—Dr. Hellmayr (Novitates Zoologicæ, XVII, 1910, 267) says that the type of this species must have come from the Rio Negro. Reasoning by analogy, it would seem unlikely that a form such as *rubrifrons*, which is replaced farther west on the same bank of the Amazon by a different race, would reappear unchanged on the opposite bank. The only specimens with definite localities attached all come from the vicinity of Pará, and in my opinion it is entirely likely that the type-specimen actually came from this place too, where Wallace also collected for a time. An error in labeling may easily have occurred. Dr. Hellmayr's description of the type (an immature bird) points to its being the same as the series from Benevides studied in this connection, the specimens from the Rio Madeira with which he compared it doubtless belonging to *lutescens*. *P. rubrifrons* appears to be represented on the north bank of the Amazon by *P. luteifrons*, as already pointed out. The range of the typical form is probably limited to the westward by either the Rio Tocantins or Rio Xingú.

Pachysylvia rubrifrons lutescens Snethlage.

Pachysylvia rubrifrons lutescens Snethlage, Orn. Monatsb., XXII, 1914, 43 (Boim, Rio Tapajóz, Brazil).

Subspecific characters.—Similar to *P. rubrifrons rubrifrons*, but upper parts purer green (near citrine); tail paler brown (Dresden brown); and under parts more uniform, washed with primrose yellow. Size about the same.

Range.—Northern Brazil, south of the Amazon, from the Rio Xingú west to the Rio Madeira.

Remarks.—This form was described as new on the assumption that birds from Pará belong to the typical *rubrifrons*. It differs very decidedly from the latter in being brighter, more yellowish green below, as well as above. Some of our specimens from Mirituba, however, are darker

above and more buffy yellow. Twenty-six specimens in all have been examined in this connection, all from various localities on the Rio Tapajóz (Colonia do Mojuy, Villa Braga, Miriti tuba, and Apacy).

Pachysylvia ochraceiceps viridior, subsp. nov.

Type, No. 79,588, Collection Carnegie Museum, adult male; Rio Surutu, Bolivia, September 23, 1917; José Steinbach.

Subspecific characters.—Similar to *P. ochraceiceps ferrugineifrons,* but brighter, purer yellowish green (between citrine and dark citrine) above, with less of the brownish suffusion usually so conspicuous in the latter; forehead paler russet (orange citrine rather than antique brown); tail paler and less brownish. Size about the same.

Range.—Santa Cruz region of Bolivia to southeastern Peru, in the Tropical Zone.

Remarks.—The characters above specified, while subject to individual variation in the series of sixteen specimens examined, are sufficiently constant to require the separation of the Bolivian birds under the name here proposed. Under this name I would place also the specimens from southeastern Peru referred to by Dr. Chapman (Bulletin American Museum of Natural History, LV, 1926, 589).

In juvenal dress (No. 50,767, Collection Carnegie Museum) this form is dull buffy citrine above, almost uniform, and soiled white below, shaded with buffy, the crissum pale yellow.

Pachysylvia ochraceiceps ferrugineifrons (Sclater).

Hylophilus ferrugineifrons Sclater, Proc. Zool. Soc. London, 1862, 110 (["Bogotá"], Colombia).

Description.—Forehead dull antique brown, passing into dull dark citrine on the crown and upper parts, including the wings externally; tail dull medal bronze; under parts in general dull whitish, more or less heavily washed with olive lake or ecru olive, the throat paler, more whitish; under wing-coverts and inner edgings of the remiges reed yellow.

Measurements.—Male: wing, 58.5; tail, 42; bill, 13.3; tarsus, 15.3. Female: wing, 55.5; tail, 40.5; bill, 13; tarsus, 15.

Range.—Tropical Zone of Colombia and Ecuador (east of the Andes), east to the Guiana frontier of Venezuela, and south to the Rio Purús, Brazil.

Remarks.—The above description is based on a skin from Tonantins, Brazil, the place nearest to the type-locality from which a specimen is at present available. It corresponds closely to Sclater's figure of the species in the Ibis, 1881, pl. 11, fig. 2. In a series from eastern Venezuela (Rio Caura and Rio Yuruan) the iris is variously marked as "brown," "white," "gray," and "grayish white"; the bill as "blackish, pale below"; and the feet as "pale leaden blue," etc. They are exactly the same as another series from the Rio Purús, Brazil, and show a decided brownish cast above as compared with birds from Bolivia (*viridior*). We have specimens from Rio Yuruan, Venezuela, and Manacapurú and Caviana, on the middle

Amazon River, Brazil, which localities probably mark the extreme eastern limits of the range of the species. Dr. Chapman records it from eastern Ecuador, so that it evidently occupies an immense area in the drainage systems of the Amazon and Orinoco Rivers, right up to the eastern base of the Andes. West of this range it is replaced by the next form. After study and comparison I have come to believe with Dr. Chapman (Bulletin American Museum of Natural History, LV, 1926, 589) that *ferrugineifrons* should be considered as conspecific with *ochraceiceps* and *bulunensis*.

Pachysylvia ochraceiceps bulunensis (Hartert).

Hylophilus bulunensis Hartert, Nov. Zool., IX, 1902, 617 (Bulún, Ecuador).

Subspecific characters.—Similar to *P. ochraceiceps nelsoni*, but still more greenish, less brownish; back and wing-coverts almost uniform dark citrine; and lower parts strongly washed with olive yellow, the throat a little duller, grayish white.

Measurements.—Male (two specimens): wing, 58.5; tail, 40; bill, 12.7; tarsus, 16.7. Female: wing, 55; tail, 41; bill, 13; tarsus, 16.3.

Range.—Tropical Zone, Colombian-Pacific Fauna, from eastern Panama to western Ecuador.

Remarks.—This form must stand as a subspecies of *P. ochraceiceps*, all of its characters being merely a further development of those of *P. ochraceiceps nelsoni*, which connects the two extremes systematically as well as geographically. Dr. Chapman did not find it in Colombia, but we have four specimens from the Chocó region (Potedo and Malagita). These are slightly more greenish above than skins from eastern Panama (Mount Pirri and Cana), but are without question the same form. On the other hand, this form is so exactly intermediate in its characters between *nelsoni* and *ochraceiceps* on the one hand and *ferrugineifrons* and *viridior* on the other that I have no choice but to consider them all conspecies, in spite of the fact of their discontinuous distribution by reason of the interposition of the Andean chain.

Pachysylvia ochraceiceps nelsoni, nom. nov.

Pachysylvia ochraceiceps brevipennis (not *Helinai brevipennis* Giraud) Nelson, Smithsonian Misc. Coll., LVI, No. 22, 1911, 1 (Lion Hill, Panama).

Subspecific characters.—Similar to *P. ochraceiceps ochraceiceps*, but upper parts and wings externally with less brownish wash, more greenish; and under parts also slightly more greenish, the breast with less buffy shading.

Measurements.—One male (?) (the type): wing, 54; tail, 38; bill, 13; tarsus, 17. One female (?): wing, 58; tail, 43; bill, 13; tarsus, 17.5.

Range.—Isthmus of Panama.

Remarks.—I strongly suspect that both the above examples are wrongly sexed. If so, then the difference in size to which the describer alludes is of

little importance. After seeing these two specimens, I would recognize the form they represent as a valid one, standing as an intermediate between *ochraceiceps* and *bulunensis*. But because of *Helinai brevipennis* Giraud, Annals Lyceum Natural History of New York, V, 1852, 40, pl. 3, fig. 1, which is a synonym of *Pachysylvia decurtata*, a new name will be necessary in this case, which I supply above, in honor of the original describer.

Pachysylvia ochraceiceps ochraceiceps (Sclater).

Hylophilus ochraceiceps Sclater, Proc. Zool. Soc. London, 1859, 375 (Playa Vicente, Oaxaca, Mexico).

Pachysylvia ochraceiceps pallidipectus Ridgway, Bull. U. S. Nat. Mus., No. 50, III, 1904, 219 (Angostura, Costa Rica).

Description.—Pileum dull yellowish brown (near old gold), passing into Dresden brown on the back, wing-coverts, and tail, the nape more olivaceous, and the rump washed with yellowish citrine; primaries margined externally with old gold, passing into Dresden brown on the secondaries, the primary-coverts olive; supraloral line olive ocher; sides of the head and upper throat dull grayish with a wash of olive; rest of the lower parts dull buffy yellow, the breast and sides more or less strongly washed with olive ocher or olive lake, the flanks more with yellowish citrine; under wing-coverts pale lemon yellow, and inner webs of the remiges edged with deep colonial buff; "iris gray; bill horn brown above, paler below; feet flesh-color."

A juvenal example is almost uniform Dresden brown above, with whitish throat, and the rest of the under parts washed with clay-color.

Measurements.—Male: wing, 59; tail, 44; bill, 13.2; tarsus, 16.5. Female: wing, 57; tail, 44; bill, 13; tarsus, 16.5.

Range.—Southern Mexico (Tropical Zone) to western Panama.

Remarks.—There is so much individual variation in the series examined, considered as a whole, that I fail to see how *pallidipectus* can possibly be maintained. Every character ascribed to this supposed form, tested by this series, fails.

Pachysylvia insularis (Sclater).

Hylophilus insularis Sclater, Proc. Zool. Soc. London, 1861, 128 (Tobago).

Hylophilus pallidifrons Dalmas, Mém. Soc. Zool. France, XIII, 1900, 135 (Tobago).

Description.—Above varying from deep grayish olive to citrine, grayer on the head, more greenish on the rump, wings externally, and tail; supraloral streak and lower eyelid pale buffy whitish; under parts deep olive buff, almost uniform, the flanks sometimes with a greenish wash, and the crissum sometimes tinged with yellow; under wing-coverts and inner edgings of the remiges pale yellow (amber yellow to naphthalene yellow); bill dark above, pale below; feet pale brown (in skin).

Measurements.—Male: wing, 61; tail, 47; bill, 12.7; tarsus, 19. Female: wing, 61; tail, 47; bill, 13; tarsus, 18.5.

Range.—Island of Tobago.

Remarks.—Dr. Hellmayr writes that he has compared the type of *H. "pallidifrons"* (now in the Tring Museum) with that of *H. insularis*, and found them identical. The type-specimen of the latter is slightly immature. The description of *"pallidifrons"* fits the series examined very well, except for the measurement of the tail, 57 mm., which is probably an error for 47 mm. The variation in the color of the upper parts is astonishing, but may be due in part to post-mortem changes in the skins. The large size, heavy bill, and grayish coloration serve to separate this species from *P. flavipes acuticauda*, its nearest relative on the mainland. Curiously enough, *P. flavipes* has no representative on Trinidad, and *P. insularis* is an isolated and well differentiated form.

Pachysylvia olivacea (von Tschudi).

Hylophilus olivaceus von Tschudi, Arch. f. Naturg., 1844, 284 ([eastern slope of the Andes], Peru).

Description.—Above dull yellowish olive, duller and more brownish on the pileum, the wing- and tail-edgings a little lighter; below buffy whitish, the throat, breast, and sides heavily shaded with olive yellow, and the crissum with amber yellow; under wing-coverts and inner edgings of the primaries massicot yellow; bill and feet pale brown (in skin).

Measurements.—One male: wing, 60; tail, 48; bill, 11.5; tarsus, 17.5. One female: wing, 56; tail, 48; bill, 11.5; tarsus, 18.

Range.—Subtropical Zone, central Peru to eastern Ecuador.

Remarks.—This species, of which I have seen but two specimens (from eastern Ecuador), is hard to place, but gives the impression of being related to *P. flavipes acuticauda*, from which it differs in its relatively longer tail, and more olive greenish or yellowish under parts. It appears to be a Subtropical Zone species. Very few specimens are known at the present time.

Pachysylvia flavipes acuticauda (Lawrence).

Hylophilus acuticaudus Lawrence, Proc. Acad. Nat. Sci. Philadelphia, 1865, 37 (Venezuela).

Hylophilus griseipes Richmond, Proc. U. S. Nat. Mus., VIII, 1896, 687 (Margarita Island, Venezuela).

Subspecific characters.—Similar to *P. flavipes flavipes*, but general coloration duller; upper parts duller citrine; under surface deep olive buff, paler posteriorly, with little or no yellow tinge.

Measurements.—Male: wing, 56; tail, 44; bill, 12; tarsus, 17.5. Female: wing, 53; tail, 43; bill, 11.7; tarsus, 17.5.

Range.—Venezuela, south (at least) to the Orinoco River and east to the Guiana frontier.

Remarks.—While Ridgway (Bulletin United States National Museum, No. 50, III, 1904, 216, note) would keep this form a distinct species, von

Berlepsch and Hartert (Novitates Zoologicæ, IX, 1902, 12) reduce it to a subspecies of *P. flavipes*—rightly so, as I believe. It is much more buffy below than true *flavipes*, lacking the yellow tinge present in most specimens of that form, at least in fresh plumage. The supposed difference in the color of the feet apparently does not hold, judging from the labels; both forms vary in this respect, but do not differ from each other. In juvenal dress (No. 34,042, Collection Carnegie Museum) the under parts are white, shaded anteriorly and laterally with buffy; the pileum is ashy brown; and the bill is blackish.

Intergradation between this form and true *flavipes* takes place in western Venezuela, in the Maracaibo basin. The southern range of *acuticauda* remains to be worked out. I can find no records from Guiana, but specimens in the Carnegie Museum bring it close to the borders of that country.

With eight specimens from Margarita Island before me (including the type of *H. "griseipes"* Richmond), I can find no sufficient grounds for separating them from mainland specimens of *acuticauda*. Dr. Richmond does not mention the latter at all; he compared his skins from that island directly with *flavipes* from Colombia, from which they of course differ just as he says. So *"griseipes"* falls as a synonym of *acuticauda*.

Lawrence's type-specimen no doubt came from the coast region of northern Venezuela. In order to get a definite starting-point I hereby propose to fix the type-locality as Puerto La Cruz, State of Carabobo, Venezuela.

Pachysylvia flavipes flavipes (Lafresnaye).

Hylophilus flavipes LAFRESNAYE, Rev. Zool., 1845, 342 ("Bogotá," Colombia).

Description.—Above dark citrine, duller on the pileum, brighter on the rump and wings externally; tail similar; a pale supraloral streak; sides of the head, and breast and throat, dull buffy yellow, brightening into deep colonial buff on the abdomen and crissum; under wing-coverts amber yellow, and inner webs of the remiges citron yellow; "iris straw yellow; bill blackish horn, flesh-color below; feet flesh-color" (Carriker).

Measurements.—Male: wing, 57; tail, 46; bill, 12; tarsus, 17. Female: wing, 55; tail, 45.5; bill, 11.7; tarsus, 17.

Range.—Tropical Zone of Colombia.

Remarks.—The above description is based on the more yellowish extreme examples. There is a great deal of variation in color in the series examined, due partly to season and age, and partly to individual differences. The feet are marked variously "bluish flesh-color," "pale purplish flesh-color," "dusky flesh-color," and even "pale leaden blue." As might be expected, specimens from the eastern base of the Eastern Andes vary more in the direction of *acuticauda*, and moreover are somewhat larger than the average bird of the region of the Rio Sinu, where this form appears to reach its greatest degree of differentiation, and from which the most brightly colored examples in the main seem to come. It is thus unfortunate that "Bogotá" remains the type-locality for this form. Of

course it does not occur so high up as that, but only at the foot of the mountains. Specimens from Villavicencio should doubtless be considered topotypical.

Pachysylvia viridiflava (Lawrence).

Hylophilus viridiflavus Lawrence, Ann. Lyc. Nat. Hist. New York, VII, 1861, 324 ([Lion Hill ?], Panama Railroad, Panama).

Description.—Upper parts in general (including wings externally and tail) warbler green, the pileum duller (near citrine); supraloral streak dull whitish; sides of the head dull brownish gray; under parts (near) amber yellow, the throat paler, more grayish, and the breast shaded with olive lake; under wing-coverts and inner edgings of the remiges amber yellow; "iris straw-color; feet plumbeous; bill light horn-color above, flesh-color below" (Carriker). Younger birds may readily be told by their black bills; the iris is marked as "gray" in all such.

Measurements.—Two males: wing, 57, 60; tail, 44, 46; bill, 12, 12.5; tarsus, 18, 18.5. Two females: wing, 56, 56; tail, 47, 48; bill, 12, 12.5; tarsus, 17.5, 18.5.

Range.—Panama and southwestern Costa Rica (Tropical Zone).

Remarks.—The nearest known ally of this form is *P. flavipes flavipes* of Colombia, than which it is much more brightly colored. There appears to be a break in the distribution of the forms, however, in eastern Panama, where neither has yet been found, and this circumstance, taken in connection with the degree of difference between them, suffices to justify the recognition of *viridiflava* as a distinct species. In southwestern Costa Rica, according to Mr. Carriker (Annals Carnegie Museum, VI, 1910, 777) it ranges from sea-level up to about 2000 feet.

Pachysylvia aurantiifrons aurantiifrons (Lawrence).

Hylophilus aurantiifrons Lawrence, Ann. Lyc. Nat. Hist. New York, VII, 1862, 324 ([Lion Hill ?], Panama Railroad, Panama).

Description.—Pileum buffy brown, the forehead strongly tinged with olive ocher or isabella color, the sides of the head paler and more buffy; back, wings externally, and tail yellowish citrine; throat and breast dull whitish with more or less of a buffy wash; the rest of the under parts washed with barium yellow, deepest and purest on the flanks and crissum; under wing-coverts and inner edgings of the remiges citron yellow to barium yellow; "iris brown; feet plumbeous; bill dusky horn, flesh-color below."

Measurements.—Male: wing, 56; tail, 44; bill, 13; tarsus, 16.5. Female: wing, 54; tail, 43; bill, 12.7; tarsus, 16.

Range.—Caribbean coast region of Colombia, westward to the Isthmus of Panama.

Remarks.—The restricted range of this form is a marked feature. It is not known to enter the Magdalena and Cauca Valleys, or the Pacific coast region of Colombia.

Pachysylvia aurantiifrons saturata Hellmayr.

Pachysylvia aurantiifrons saturata Hellmayr, Nov. Zool., XIII, 1906, 12 (Caparo, Trinidad).

Subspecific characters.—Similar to *P. aurantiifrons aurantiifrons*, but under parts more brightly colored, with more buffy or ochraceous wash on the chest.

Measurements.—Male: wing, 56; tail, 45; bill, 13; tarsus, 16.3. Female: wing, 53; tail, 43; bill, 12.5; tarsus, 16.5.

Range.—Caribbean coast region of Venezuela, eastward to Trinidad. Also in the interior of Colombia, east of the Eastern Andes.

Remarks.—Selected individual specimens of the series at hand are quite indistinguishable from the average example of true *aurantiifrons*, but the respective series are separable by the difference in general coloration, the present form being more richly colored—more suffused with yellow, with the buffy shade on the breast more in evidence, especially in birds in freshly assumed plumage, like those from Trinidad shot in August. Specimens from the Carabobo region of Venezuela average less brightly colored than those from Trinidad. Birds from the Maracaibo region, on the other hand, are richly colored, although mostly collected in early May, and rather worn.

Ridgway (Bulletin United States National Museum, No. 50, III, 1904, 215) was the first to distinguish this race, but confused it with *P. hypoxantha*, which is another bird entirely, and it remained for Dr. Hellmavr to give it the name under which it now passes.

A single specimen (No. 60,643, Collection Carnegie Museum) from Palmar, Colombia, at the eastern foot of the Eastern Andes, which could be referred to *aurantiifrons* as easily as to *saturata*, shows that the species is not as strictly confined to the coast as has been supposed. Further light on its range in this part of the country will be awaited with interest.

Pachysylvia hypoxantha albigula Chapman.

Pachysylvia fuscicapilla albigula Chapman, Am. Mus. Nov., No. 18, 1921, 11 (Sta. Julia, Rio Iriri, Brazil).

Subspecific characters.—Similar to *P. hypoxantha hypoxantha*, but throat paler, more grayish white, less buffy; rest of the under parts richer and purer yellow (pale lemon yellow); and upper parts more richly colored (citrine instead of buffy olive).

Measurements.—Three males: wing, 60; tail, 45; bill, 14; tarsus, 15.5. Four females: wing, 56; tail, 42; bill, 13; tarsus, 15.

Range.—Brazil, south of the Amazon, from the Rio Xingú to the Rio Purús.

Remarks.—The type-specimen I have not seen, but eight specimens from the Rio Purús (Hyutanahan, Nova Olinda, and Arimã) and one from Caviana (on the south bank of the Amazon, opposite Manacapurú) differ from two skins from Tonantins, presumably representing true *hypoxantha*, as above said. It will be noted that while Dr. Chapman describes the

under parts as "paler and less uniform than in *fuscicapilla*" (i. e., *hypoxantha*), I find the opposite to be the case. So there is a possibility that we are dealing here with a different race from the one he has described.

Pachysylvia hypoxantha hypoxantha (von Pelzeln).

Hylophilus hypoxanthus von Pelzeln, Orn. Brasiliens, ii, 1868, 71, 136 (Rio Içanna and Rio Vaupé, Rio Negro, Brazil).

Hylophilus fuscicapillus Sclater and Salvin, Proc. Zool. Soc. London, 1880, 155 ("Sarayacu," Ecuador).

Description.—Pileum dull olive brown, passing into the buffy olive of the back; wings externally and tail somewhat brighter (yellowish olive); sides of the head pale buffy brown, the eyelids slightly paler; throat dull buffy whitish; rest of the under parts (including under wing-coverts) pale yellow (barium yellow), the breast with a slight buffy wash; inner webs of the remiges edged with pale dull yellow, as also are the inner webs of the rectrices.

Measurements.—One male: wing, 60; tail, 46; bill, 12; tarsus, 16. Two females: wing, 56; tail, 41; bill, 12.5; tarsus, 15.

Range.—Northwestern Brazil, north of the Amazon, east to the mouth of the Rio Negro, and west to eastern Ecuador.

Remarks.—Two females from Tonantins, Rio Solimoës, in the Carnegie Museum collection, answer pretty well to Sclater's description and figure of *Hylophilus fuscicapillus* in the Ibis, 1881, 303, pl. 10, fig. 2, the throat, however, not being yellow as in the figure, but dull buffy or soiled whitish. Dr. Hellmayr writes me as follows: "*P. fuscicapilla* = *P. hypoxantha.* I have compared a bird from Pebas, Peru, with the types in the British Museum, and later with von Pelzeln's examples, and could not discover any difference. So their identity is well established." This is what we would expect in view of the relatively close positions of the respective type-localities. The species is a near relative of *P. aurantiifrons.*

A male example from Manacapurú (No. 98,651, Collection Carnegie Museum) greatly extends the known range of this form. It differs from the Tonantins skins in its rather darker, duller coloration, and may possibly represent a different race.

Pachysylvia semibrunnea (Lafresnaye).

Hylophilus semibrunneus Lafresnaye, Rev. Zool., 1845, 341 ("Bogotá," Colombia).

Pachysylvia semibrunnea leucogastra Chapman, Am. Mus. Nov. No. 143, 1924, 1 (below San José de Sumaco, eastern Ecuador).

Description.—Pileum and nape Brussels brown, this color spreading over the sides of the neck as far as the ear-coverts, and sometimes over the back also; upper parts in general, and wings and tail externally, dull green (near serpentine green), the wing-coverts and primaries with slight paler edgings, and the tail also with slight yellowish internal edgings; lores, slight eye-

brow, subocular region, and throat soiled whitish; under parts dull whitish, tinged with buffy rufous on the sides of the breast and with pale greenish yellow on the sides and flanks; crissum and under wing-coverts barium yellow, and inner webs of the secondaries edged with the same color, becoming whitish on the primaries; "iris brown; feet leaden blue; bill blackish above, flesh-color below" (Carriker).

Measurements.—Male: wing, 62.5; tail, 50.5; bill, 13.5; tarsus, 16.7. Female: wing, 61.7; tail, 50; bill, 13.3; tarsus, 16.7.

Range.—Subtropical Zone of the Andes of Colombia and of eastern Ecuador.

Remarks.—A topotype of "*leucogastra*" from eastern Ecuador can be closely matched by certain examples of true *semibrunnea*. In the light of our fine series (21 skins) from Colombia, the characters on which this supposed subspecies are based prove to be individual rather than geographical. The amount of brown wash on the back is a variable feature.

P. semibrunnea is a Subtropical Zone species, belonging to the *aurantiifrons-hypoxantha* group, of one of which it is probably a derivative.

Pachysylvia inornata Snethlage.

Pachysylvia inornata Snethlage, Orn. Monatsber., XXVII, 1914, 43 (Cametá, Rio Tocantins, Brazil).

Description.—Pileum dull brown (between sepia and snuff brown), the upper back paler and more greenish (dull orange citrine), and the lower back, tail, and wings externally warbler green, without any brownish wash; sides of the head like the pileum, but paler, with a poorly defined pale orbital ring; throat and upper breast pale olivé gray, and rest of the under parts similar, the breast, sides, and flanks more or less strongly washed with yellowish citrine, the crissum citron yellow; under wing-coverts and inner edgings of the innermost secondaries citron yellow; rest of the remiges edged internally with naphthalene yellow.

A bird in juvenal dress (No. 74,383, Collection Carnegie Museum) differs in having the pileum and back rusty buff, and the lower surface much duller.

Measurements.—Male: wing, 59; tail, 47; bill, 13; tarsus, 16. Female: wing, 58; tail, 46; bill, 13; tarsus, 16.5.

Range.—Brazil, south of the Amazon, from the Rio Tapajóz east to the Rio Tocantins.

Remarks.—This form differs from *P. brunneiceps* in its larger size, more decidedly brownish upper parts, grayish (instead of pale brownish) throat and breast, and greenish-suffused lower breast and abdomen. The yellow of the remiges is also paler (except that on the inner secondaries). I would keep the two specifically distinct, and while Dr. Hellmayr does not agree to this disposition, he may be quite right in insisting on the close relationship of the two forms in question. For the present, however, I am suggesting a relationship to the group represented by *P. aurantiifrons*, *P. hypoxantha*, etc., as shown by the key to the species (*antea*). Twenty-one specimens have been examined in this connection, all from the Rio Tapajóz.

Pachysylvia muscicapina muscicapina (Sclater and Salvin).

Hylophilus musicapinus Sclater and Salvin, Nom. Avium Neotrop., 1873, 156 (Cayenne, French Guiana).

Description.—Pileum and nape neutral gray, the superciliaries and sides of the head buffy rufous in abrupt contrast; upper parts, wings externally, and tail bright serpentine green; under parts white, the throat and breast washed with rufous buff, the sides of the breast with dull greenish, and the abdomen with grayish; crissum and under wing-coverts citron yellow.

Measurements.—Male: wing, 60; tail, 46; bill, 14.5; tarsus, 15.5. Female: wing, 56; tail, 43; bill, 13.5; tarsus, 15.

Range.—Eastern Venezuela (Caura River) and Guiana, south to the Amazon River, Brazil.

Remarks.—Venezuelan specimens closely resemble those from French Guiana, the type-locality, and birds from Obidos, on the north bank of the Amazon, are also the same. On the south bank of that stream the species is represented by the next form. *P. muscicapina* is a rather isolated species genetically, without any very close allies.

Pachysylvia muscicapina griseifrons Snethlage.

Pachysylvia musicicapina griseifrons Snethlage, Orn. Monatsber., XV, 1907, 160 (Villa Braga, Rio Tapajóz, Brazil).

Subspecific characters.—Similar to *P. muscicapina muscicapina*, but upper parts slightly brighter green; sides of the head, superciliaries, etc., deeper buffy rufous; and throat and breast more strongly suffused with the same color. The gray of the pileum continues over the forehead as a pure color, instead of being tinged with buffy, as usual in the typical race. Size about the same.

Range.—From the Rio Tapajóz, west to (probably) the Rio Madeira, Brazil.

Remarks.—A series of seventeen specimens from the type-locality, and one more from Apacy, bear out Dr. Hellmayr's remarks (Novitates Zoologicæ, XVII, 1910, 268) on the characters of this race. It is evidently confined to the region south of the Amazon, between the Madeira and Tapajóz Rivers.

Pachysylvia minor minor (von Berlepsch and Taczanowski).

Hylophilus minor von Berlepsch and Taczanowski, Proc. Zool. Soc. London, 1883, 542 (Chimbo, Ecuador).

Description.—Above warbler green, the pileum and wings externally darker (near olive green), the outer primaries edged with pale greenish white; tail still duller olive greenish; lores, sides of the head, and throat pallid neutral gray; rest of the under parts white with a pale buffy tinge, the sides of the breast, the flanks, and the crissum shaded with strontian yellow; under wing-coverts and inner edgings of the primaries pale buffy yellow; bill and feet pale brown (in skin).

Measurements.—Two males: wing, 54, 56; tail, 37, 41; bill, 12, 13.5; tarsus, 18, 18.5. One female: wing, 52; tail, 36; bill, 12.5; tarsus, 17.5.

Range.—Tropical Zone of western Ecuador.

Remarks.—This was described by von Berlepsch and Taczanowski from three specimens collected at Chimbo by Stolzmann, and has since been taken by other collectors in various localities in this general region (cf. Chapman, Bulletin American Museum of Natural History, LV, 1926, 590). With *P. decurtata* of Central America, it belongs to a group characterized by small size and a relatively short tail, and standing thus at the opposite end of the series from *P. poicilotis*.

Pachysylvia minor darienensis Griscom.

Pachysylvia minor darienensis Griscom, Am. Mus. Nov. No. 282, 1927, 7 (Cape Garachiné, eastern Panama).

Subspecific characters.—Similar in size and general coloration to *P. minor minor*, but under parts not so brightly colored, the greenish yellow of the sides and flanks paler and more restricted.

Range.—Tropical Zone of Colombia (Magdalena Valley and Pacific coast district), northward to eastern Panama.

Remarks.—Dr. Chapman, in recording the heretofore only known specimen of *P. minor* from Colombia (Bulletin American Museum of Natural History, XXXVI, 1917, 541), commented on the differences it showed in comparison with Ecuador skins. We have four examples from the Choc6 region of western Colombia (Andagoya, Malagita, and Cordoba) in the collection of the Carnegie Museum, and also two from El Tambor, in the valley of the Rio Lebrija, a tributary of the Magdalena. These have been compared with the Los Cisneros specimen cited by Dr. Chapman, and found to be identical. They also agree well with a skin from Mt. Sapo, and with a topotype of *darienensis* from Cape Garachiné. This indicates that this pale race of *minor* is the one inhabiting Colombia as well as eastern Panama. According to Mr. Griscom it lives in the tops of the tallest trees, and is consequently very difficult to collect. In our two skins from El Tambor the iris is marked as "brown; feet pale leaden blue; bill black, bluish flesh below" (Carriker).

Pachysylvia decurtata (Bonaparte).

Sylvicola decurtata Bonaparte, Proc. Zool. Soc. London, 1837, 118 (Mexico).

Helinai brevipennis Giraud, Ann. Lyc. Nat. Hist. New York, V, 1852, 40, pl. 3, fig. 1 ("Mexico and Texas").

Hylophilus cinereiceps Sclater and Salvin, Proc. Zool. Soc. London, 1860, 299 (Choctum, Vera Paz, Guatemala).

Hylophilus pusillus Lawrence, Ann. Lyc. Nat. Hist. New York, VII, 1862, 323 ([Lion Hill ?], Panama Railway, Panama).

Pachysylvia decurtata pallida Dickey and Van Rossem, Proc. Biol. Soc. Washington, XL, 1927, 4 (Puerto del Triunfo, Usulutan, Salvador).

Description.—Pileum and nape neutral gray to deep neutral gray, and the sides of the head similar but paler, with a brownish wash; orbital ring white; upper parts warbler green, and wings externally the same, except the outer primaries, which are more grayish; tail similar but duller; under parts dull whitish, the sides, flanks, and crissum more or less washed with pyrite yellow or yellowish citrine; under wing-coverts pale yellow, and inner edges of the remiges whitish; "iris dark hazel; bill light bluish; feet light blue" (Peck).

Measurements.—Male: wing, 53; tail, 36.5; bill, 12; tarsus, 16. Female: wing, 51.5; tail, 34; bill, 12; tarsus, 16.5.

Range.—Isthmus of Panama northward through Central America to Vera Cruz, Mexico, in the Tropical Zone.

Remarks.—This is one of the few species of *Pachysylvia* which has suffered from too many names. Ridgway suspected the existence of a small southern race, and very recently Mr. Bangs (Bulletin Museum Comparative Zoology, LXVII, 1927, 483) has agreed to recognize such a race under Lawrence's name *pusilla.* Messrs. Dickey and Van Rossem have also named a supposed pale Pacific coast race. With some of their skins before me, and a series from western Nicaragua called by the same name, also a good series from Mexico and Costa Rica, my finding is that the differences alleged to exist between *decurtata,* "*pusilla,*" and "*pallida*" are too slight to recognize by name.

Pachysylvia decurtata is the Central American representative of *P. minor.* In its pattern of coloration it bears a remarkable resemblance to the Tennessee Warbler, *Vermivora peregrina.*

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW SILENE FROM THE UMPQUA NATIONAL FOREST.

BY IVAR TIDESTROM AND W. A. DAYTON.

In 1924 Grazing Examiner Douglas C. Ingram of the U. S. Forest Service made a collection of forty-one plants on the Umpqua National Forest in southwestern Oregon. Among these was his specimen No. 1489, Forest Service serial No. 51202, the very showy characters of which at once gave it distinction. This plant (plate VIII) was collected on Mt. Nebo, near Roseburg, Douglas County, at 1,200 feet (400 meters), on a south slope, open grass-browse type; shallow, rocky red clay loam of basaltic formation. Mr. Ingram noted that the species was occasional in this type, did not appear to be grazed by livestock and was associated, among others, with *Agoseris elata*, *Calochortus elegans*, *Festuca rubra*, *Phacelia heterophylla* and *Poa sandbergii*. It is obviously closely related to *Silene hookeri* A. Gray, but differs in its much larger and more erect habit, different root system, showier flowers of a different color, more acuminate calyx lobes, and long-stipitate ovary. The diagnosis follows:

Silene ingrami, sp. nov.

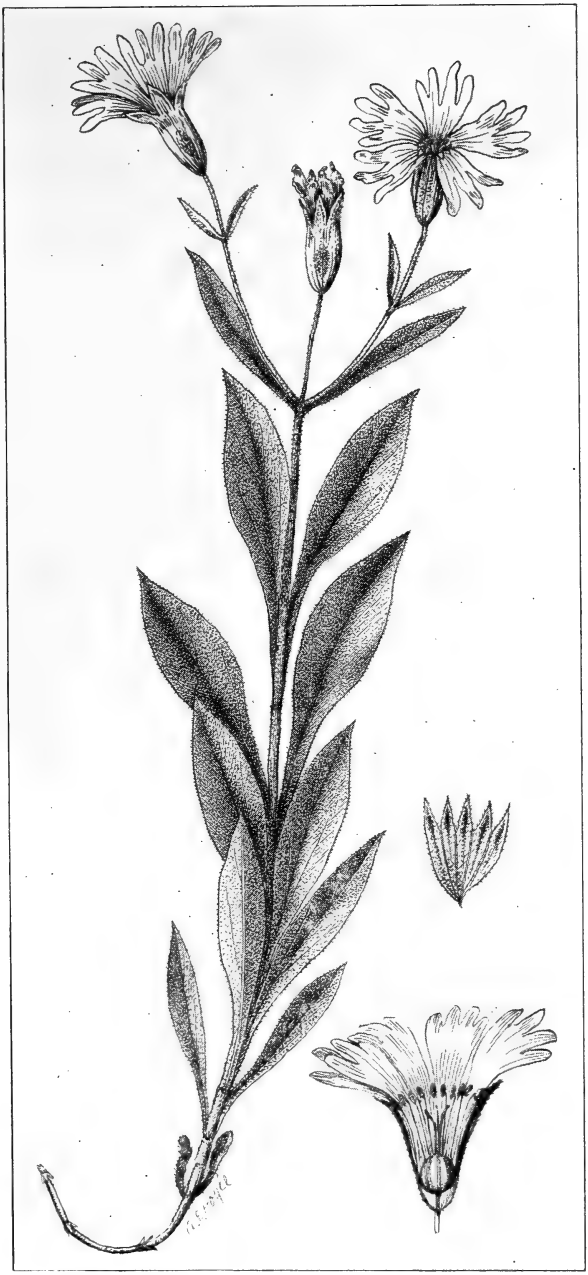
Perennial with a slender stramineous rhizome. Stem apparently solitary, slender, striate, simple or branched, 20 to 32 cm. high, with an indument of short crisp white hairs, sometimes slightly flocculose, the lower part usually purplish. Foliage somewhat grayish green, the leaves white-crisp-hairy especially on the margins and on the midrib below; lowest pair of leaves reduced, narrowly oblanceolate, often subsessile; middle leaves the largest and broadest, acute or acuminate, the blade oblong-lanceolate or oblanceolate, tapering below into the petiole, 7 to 9 cm. long (including the petiole); uppermost leaves lanceolate to linear-lanceolate, reduced. Flowers evidently diurnal, solitary or in pairs, about 2 to 5 or occasionally

as many as 8 in the cyme, showy, often 4 cm. broad, or probably even more when fully expanded; calyx 15 to 23 mm. long, about 10-ribbed, white-crisp-hairy, rather narrow at the base, of a cylindro-funnelform type becoming turbinate (not bladdery-inflated) in fruit, the lobes lanceolate and acuminate, shorter than the tube; petals when fresh apparently varying from light hortense violet to amparo purple (according to Ridgway's Color Standards) but shading towards amethyst violet in drying, with a broad, mostly 4- (occasionally 5- or 6-) lobed limb, the lobes 3 to 4 mm. broad; ovary stipitate, the stipe about equaling it; styles 3. Seeds purplish-black, reniform, about 2 mm. long, tuberculate in concentric lines.

Herba perennis; rhizoma tenue; caulis tenuis erectus circiter 30 cm. altus; folia plerumque oblanceolata vel oblongo-lanceolata 7–9 cm. longa subgrisea cum pilis brevibus crispis albis nullo modo viscidis, superiora lanceolata breviora; calyx circiter 10-striatus cylindro-infundibuliformis accrescens; corolla speciosa, 4–5 cm. lata pallide violacea, petalis quadrifidis; ovarium stipitatum.

It gives the authors a sense of satisfaction to name this handsomest of western silenes after its discoverer, Mr. Douglas C. Ingram, who not only is a highly efficient forest officer and an authority on range management, but is also recognized as one of the best field naturalists of the Northwest. If seed becomes available it is a certainty that this native campion will become popular in cultivation.

The type specimen will be deposited in the U. S. National Herbarium.



Silene ingrami, sp. nov.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

THE RACES OF LAMPORNIS VIRIDIPALLENS (BOURCIER AND MULSANT).[1]

BY DONALD R. DICKEY AND A. J. VAN ROSSEM.

Specimens of *Lampornis*[2] *viridipallens* collected in El Salvador in 1927 show that not only is the supposedly distinct species *Lampornis sybillae* (Salvin and Godman) in reality a form of *viridipallens*, but that all told there are four recognizable geographic races. Below is given a synopsis of these with their differential characters.

Lampornis viridipallens viridipallens (Bourcier and Mulsant).

GUATEMALA MOUNTAIN GEM.

T[rochilus] viridi-pallens Bourcier and Mulsant, Ann. Sci. Phys. et Nat. Lyon, 9, 1846, p. 321 (Coban, Vera Paz, Guatemala).

Subspecific characters.—Resembles *Lampornis viridipallens nubivagus* (see postea) in more bronzy green posterior upper parts and buffy tinged posterior underparts, but differs in greater extent of green spotting on sides of breast and flanks, lighter and more metallic sub-ocular streak, lighter green forehead and crown and paler and more brownish remiges.

Range.—Highlands of extreme southern Mexico (Tumbala, Chiapas) south throughout the highlands of Guatemala (Coban; Chilasco; Santa Maria; Pie de la Questa; Toliman; Volcan Fuego; Guatemala City).

Lampornis viridipallens connectens, subsp. nov.

SALVADOR MOUNTAIN GEM.

Type.—Male adult; No. 18,546, collection of Donald R. Dickey; Los Esesmiles, Dept. Chalatenango, El Salvador; altitude 8,000 feet in cloud

[1]Contribution from the California Institute of Technology.

[2]Although M. Eugene Simon in his Histoire Naturelle des Trochilidae, 1921, has treated "*Coeligena*" [*Lampornis*], "*Leuconympha*" and "*Oreopyra*" as distinct genera, the writers believe that the slight differences, which are chiefly those of shape of tail and color, are amply recognized by according these groups subgeneric rank. Essentially this course has already been tentatively suggested by Ridgway (Birds of North and Middle America, 5, 1911, p. 502). That the type of *Lampornis* Swainson is *Lampornis amethystinus* Swainson and not, as designated by Gray, *Trochilus mango* Linnaeus would appear to be definitely settled by Opinion 30 of the International Zoological Congress, 1913.

forest of Upper Tropical Zone; March 5, 1927; collected by A. J. van Rossem; original No. 11,409.

Subspecific characters.—Wing longer than in any other race of the species. Dorsal coloration, including remiges and central rectrices, precisely like that of *sybillae* and therefore darker and less bronzy than either *viridipallens* or *nubivagus;* underparts intermediate between *viridipallens* and *sybillae* in extent of green spotting, but color of spotting dark as in *sybillae;* abdominal region only slightly tinged with buff; under tail coverts edged with clear gray as in *sybillae;* lateral rectrices gray as in *viridipallens* and *nubivagus.*

Range.—Upper Tropical Zone at 8,000 feet in the humid cloud forest on Los Esesmiles, Chalatenango, El Salvador.

Remarks.—This race, occupying as it does a region in a direct line between the areas inhabited by *viridipallens* and *sybillae,* combines naturally enough, the characters of the two. It is not an intermediate in the sense that all of the characters are blended. The dorsal coloration, the color of the green spotting on the underparts and the color of the under tail coverts are all those of *sybillae;* the tail is that of *viridipallens* and only in the amount of green on the underparts and in the coloration of the abdominal region is it an intermediate in the commonly used sense.

Lampornis viridipallens sybillae (Salvin and Godman).

NICARAGUA MOUNTAIN GEM.

Delattria sybillae Salvin and Godman, Ibis, April, 1892, p. 327 (Matagalpa, Nicaragua).

Subspecific characters.—Resembles *Lampornis viridipallens connectens* in relative darkness of wings; upper parts, and spotting below, but entire underparts except abdominal region so thickly spotted with green as nearly to obliterate the grayish white ground color. Differs from all other races in that the inner webs of all except the central rectrices are largely white or grayish white instead of pale gray. Culmen averaging longest of the four races.

Range.—Highlands of north-central Nicaragua (Ocotal; Matagalpa; San Rafael del Norte).

Lampornis viridipallens nubivagus, subsp. nov.

SANTA ANA MOUNTAIN GEM.

Type.—Male adult; No. 19,184, collection of Donald R. Dickey; Volcan Santa Ana, Dept. Santa Ana, El Salvador; altitude 7,000 feet in the cloud forest on the southeast slope of the main cone; May 17, 1927; collected by A. J. van Rossem; original No. 12,065.

Subspecific characters.—Resembles *Lampornis viridipallens viridipallens* in size, in more bronzy green posterior upper parts and in buffy tinged posterior underparts, but differs in darker green back and crown, darker and more bluish remiges, blacker and less metallic sub-ocular streak and in the virtual elimination of green spotting on sides of breast.

Range.—Upper Tropical Zone at 5,000 to 7,000 feet in the cloud forest on Volcan Santa Ana proper and on the subsidiary cone of Cerro Los Naranjos, El Salvador.

Remarks.—The isolated mountain inhabited by this race lies to one side of the highlands occupied by the *viridipallens-connectens-sybillae* chain. The form is ventrally the palest of the group, although in relatively dark wings and upper parts, it shows some approach to *connectens* and *sybillae*.

Specimens examined.—*L. v. viridipallens*[1]: "Mexico," 2; "Guatemala," 2; Guatemala City, 3; Coban, 2. *L. v. connectens:* Salvador: Los Esesmiles, 1 (the type). *L. v. sybillae*[2]: Nicaragua: San Rafael del Norte, 6. *L. v. nubivagus:* Salvador: Volcan Santa Ana, 2; Cerro Los Naranjos, 5.

Measurements of Males.

	Wing.	*Tail.*	*Exposed Culmen.*
L. v. viridipallens (5)	64.0–65.0	39.0–40.0	19.0–20.3
	(64.8)	(39.5)	(19.6)
L. v. connectens (1)	(69.0)	(41.0)	(20.0)
L. v. sybillae (5)	64.0–65.0	38.0–40.0	20.7–21.6
	(64.8)	(39.3)	(21.4)
L. v. nubivagus (6)	64.0–66.0	40.0–42.0	19.8–20.0
	(64.8)	(41.3)	(20.0)

[1] 8 from U. S. National Museum; 1 from Robert Moore.

[2] 6 from Field Museum of Natural History.

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PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW WREN OF THE GENUS SPELAEORNIS FROM YUNNAN, CHINA.

BY J. H. RILEY.[1]

When a list of the birds collected by Dr. Joseph F. Rock in Yunnan was published, a specimen of a wren was there referred doubtfully to *Spelaeornis souliei* (Proc. U. S. Nat. Mus., vol. 70, Art. 5, 1926, p. 33), as a possible young plumage. In 1928 Dr. Rock took a second specimen west of Yungning, Yunnan, which though differing somewhat in detail undoubtedly belongs to the same species. As both of these specimens are quite different from the figure of the type of *Spelaeornis souliei* given by Hartert (Nov. Zool., vol. 17, 1910, pl. 7, fig. 1) and do not agree with any published description consulted, I have reached the conclusion that they represent an undescribed species. To the American Museum of Natural History I am indebted for the loan of their specimen of *Spelaeornis*, the basis of the record of *Spelaeornis souliei* from Tai-ping-pu, Yunnan (Bull. Am. Mus. Nat. Hist., vol. 44, 1921, p. 590). Unfortunately the specimen has been incorrectly determined. The wings and tail are unbarred and there are no white spots on the upper parts. The tail is shorter than the wing. The bill is dull black. As near as can be made out from Stuart Baker's key and description (Fauna Br. India, Birds, 2 ed., vol. 1, 1922, pp. 451, 453) it belongs to *Spelaeornis longicaudatus sinlumensis*. If this determination is correct, it is a new record for Yunnan. For many years this was the only specimen of the genus in the United States until Dr. Rock sent the specimen described below and later a second specimen, also mentioned beyond. It gives me great pleasure to name this species after the collector:

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Spelaeornis rocki, sp. nov.

Type.—♀ ad. female, U. S. National Museum, No. 296,784, Mountains of Hofuping, Mekong Valley, Yunnan, November, 1923. Collected by Joseph F. Rock. (Original No. 1304.)

Pileum argus brown, each feather rather broadly tipped with black and with a rather large sub-apical white spot; upper-parts sudan brown, each feather tipped narrowly with black and with a small triangular buffy-white spot; cheeks and sides of neck a little lighter than the back, with buffy shaft streaks, the feathers with narrow black tips; the feathers around the eye white posteriorly; throat and jugulum white; breast, sides and flanks ochraceous-tawny, the feathers of the breast and abdomen with rather broad white shaft-streaks and rather narrow black tips; the flanks with a few narrow white shaft-streaks; the under tail-coverts a little darker than the flanks, each feather with a sub-apical white bar and black tip; wing-coverts deep mouse gray with a brownish wash with a few white shaft-streaks and barred with black; flight feathers snuff brown rather broadly barred with black; tail snuff brown with narrow, irregular black bars; the upper mandible fuscous-black; the lower mandible chamois (in the skin). Wing, 48; tail, 50; culmen, 10; tarsus, 20; middle-toe, 13 mm.

Remarks.—The specimen from west of Yungning, 13,000 feet, Yunnan, May, 1928 (U. S. Nat. Mus. No. 312,284), differs from the type in having the forehead more profusely spotted with white; the white sub-apical spots and black tips to the feathers of the pileum smaller; the basal color of the crown and occiput of the same color as the back; below, the white of the jugulum extends down the center of the breast, the black apical spots are obsolescent, and the white shaft-streaks on the flanks have almost disappeared. It measures: Wing, 47.5; tail, 50.5; culmen, 10.5; tarsus, 19.5; middle-toe, 12 mm.

Comparing *Spelaeornis rocki* with Hartert's figure of the type of *Spelaeornis souliei*, the former is lighter above with the black apical spots more conspicuous; the flanks are lighter and the black apical spots smaller; and the white of the throat extends down on the jugulum and breast. It seems strange that this species should occur so near the type locality of *Spelaeornis souliei.*

Vol. 42, pp. 215–216 De ber 4, 1929

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WAS[illegible]TON

THE GLORIOSA RACE OF IXOCINCLA MADAGASCARIENSIS.

BY HERBERT FRIEDMANN.[1]

Some months ago Mr. Hermann Grote called my attention to the fact that the bird described by Ridgway (Proc. U. S. Nat. Mus. xvi, 1893, p. 597) as *Ixocincla madagascariensis rostrata* was said to inhabit Aldabra and Gloriosa Islands, and that inasmuch as all the islands off the east coast of Africa, such as the Comoro group, the Seychelles, Mauritius, etc., are inhabited by distinct races, he wondered if Gloriosa birds were really identical with those from Aldabra (type locality of *rostrata*). On looking through the literature I find that Grote's hesitancy in regarding the birds of Gloriosa as true *rostrata* is not without reason. In fact, two years after describing *rostrata*, Ridgway (*ibid*, xviii, 1895, p. 525) lists Gloriosa birds as only questionably of this race. He writes that, "... owing to their bad condition of plumage, I have not been able to make out satisfactorily whether the Gloriosa and Aldabra birds of this species are really different or not." The series from Aldabra (the type and three other birds) are all in fresh plumage, while the three specimens from Gloriosa are all extremely abraded, making plumage comparisons difficult. The collector, Dr. W. L. Abbott, noted that the birds of Gloriosa Island have an entirely different call from that of the closely allied group on Aldabra.

I have compared the two series and find that the Gloriosa birds have constantly larger bills than do typical, Aldabra specimens. The wing and tail measurements are fairly similar, allowing for the difference in wear. The bill character, together with the knowledge that the Gloriosa birds differ in

[1]Published by permission of the Secretary of the Smithsonian Institution.

habits from those of Aldabra, justifies their taxonomic separation. The Gloriosa birds I take pleasure in naming after Mr. Grote, who first suggested that they might represent an undescribed form.

Ixocincla madagascariensis grotei, subsp. nov.

Type.—U. S. Nat. Mus. 128664, adult male in worn plumage, collected on Gloriosa Island, 26 January, 1893, by Dr. W. L. Abbott.

Subspecific characters.—Similar to *rostrata* but with longer, stronger bill, the culmen 27 mm. in the male, 25.5–26 mm. in the females, as against 25.5 mm. in the male of *rostrata* and 24–24.5 mm. in the female of the latter form. Also the bill wholly bright orange red in life in *grotei*, while in *rostrata* it is orange red only for its basal half, and dusky, almost blackish, towards the tip. This character is not well shown in dried skins, but the collector noted this feature on the label of each of the seven birds collected, so it seems to be fairly constant.

The dimensions of the series examined are as follows:

Form	*Locality*	*Sex*	*Wing*	*Tail*	*Culmen*
rostrata	Aldabra (type)	♂	112	101.5	25.5
do	do	♀	106	97.0	24.5
do	do	♀	110	100.0	24.0
do	do	—	109	95.0	24.0
grotei	Gloriosa (type)	♂	109	95.0	27.0
do	do	♀	110	97.0	26.0
do	do	♀	110	95.0	25.5

Remarks.—In the original description of *rostrata* (*cit. supra*) Ridgway states that it is, "... similar to true *I. madagascariensis*, but larger, the bill especially, and coloration paler." The bill character is based wholly on the Gloriosa birds, and the generally larger size I find does not hold true. If anything, *rostrata* averages slightly smaller than typical *madagascariensis*, of which race I have examined some 13 specimens. The only reliable character by which *rostrata* differs from *madagascariensis* is in the paler coloration of the former, which has the underparts more brownish, less grayish than in the latter.

Neumann (Orn. Monatsb., xxxiv, 1926, pp. 110–111) has recently described a whitish-bellied race, *albiventris*, from Anjouan Island, and has referred the present species to the genus *Microscelis* as he finds no noteworthy differences between it and *Ixocincla*. There can be no question but that the two are closely allied, but I prefer not to go into this matter without more extensive material of all the forms of both genera.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW ATTILA FROM EL SALVADOR.

BY DONALD R. DICKEY AND A. J. VAN ROSSEM.

In describing a new race of *Attila spadiceus* from El Salvador, the writers are not unmindful of the somewhat startling array of synonyms which have resulted in the past from failure to appreciate the extraordinary amount of individual variation to which the species is subject.[2] However, the large Mexican races, *Attila spadiceus flammulatus* Lafresnaye of the Atlantic slope and *Attila spadiceus cinnamomeus* Lawrence of the Pacific slope, are well known to be characterized by a brown dorsal coloration, regardless of the variation displayed in the underparts. It is with this large, brown-backed group that the series of ten birds from El Salvador belongs, not one of them possessing the slightest trace of olive above, even on the head. But since they seem to differ consistently from these other races we propose to call them:

Attila spadiceus salvadorensis, subsp. nov.

EL SALVADOR ATTILA.

Type.—Male adult; no. 17,757, collection of Donald R. Dickey; Lake Olomega, Dept. San Miguel, El Salvador; April 7, 1926; collected by A. J. van Rossem; original no. 10,835; altitude 200 feet; "breeding condition."

Subspecific characters.—Resembles *Attila spadiceus flammulatus* Lafresnaye, of southeastern Mexico, in yellow rump and upper tail coverts and grayish brown pileum, but rest of upper parts and tail very much paler. Resembles *Attila spadiceus cinnamomeus* Lawrence, of western Mexico, in dorsal coloration, but rump and upper tail coverts bright orange-yellow (not ochraceous) and pileum more grayish, less brownish. Measurements

[1] Contribution from the California Institute of Technology.

[2] For reviews of the Central American forms of *Attila* see Bangs and Penard, Proc. Biol. Soc. Wash., 35, 1922, pp. 223–224, and Miller and Griscom, Am. Mus. Novit. 183, 1925, pp. 11–14.

of type: wing, 97.0; tail, 80.0; culmen from base, 28.7; tarsus, 26.0; middle toe minus claw, 17.7.

Range.—Coastal slope and coastal range of El Salvador. Northwestern and southeastern limits not yet determined.

Remarks.—This form is not unlike the ochraceous phase of *Attila spadiceus citreopygus* (Bonaparte) which was described by Ridgway as "*Attila citreopyga luteola*," but is of course decidedly larger. All of the ten examples of the new race are remarkably uniform above, but show the usual range of olive green, tawny and yellow suffusion on the underparts.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW RACE OF THE HAIRY WOODPECKER FROM EL SALVADOR.[1]

BY DONALD R. DICKEY AND A. J. VAN ROSSEM.

Five specimens of *Dryobates villosus* collected in the high mountains in north-central Salvador, prove to belong neither to the Chiapas-Guatemala race *sanctorum* nor to *fumeus* of Nicaragua. The new race is characterized below.

Dryobates villosus parvulus, subsp. nov.

EL SALVADOR HAIRY WOODPECKER.

Type.—Male adult; no. 18,507, collection of Donald R. Dickey; Los Esesmiles, Dept. Chalatenango, El Salvador; March 2, 1927; altitude 8,000 feet in the Upper Tropical Zone; collected by A. J. van Rossem, original no. 11,370.

Subspecific characters.—Identical in coloration with *Dryobates villosus sanctorum* Nelson of Chiapas and Guatemala, but size smaller, in fact, smaller than any of the heretofore described races of *Dryobates villosus* in bill, tarsus and foot. Differs from *Dryobates villosus fumeus* Oberholser of Nicaragua in darker underparts, browner dorsal stripe and smaller size. Differs from *Dryobates villosus extimus* Bangs of Costa Rica and western Panama in browner dorsal stripe and smaller bill, tarsi and feet.

Range.—8,000 to 9,000 feet in the cloud forest of the Upper Tropical Zone on Los Esesmiles, Chalatenango, El Salvador, and in contiguous parts of Honduras.

Remarks.—The fact that this smallest of the races of the Hairy Woodpecker occupies a territory between two larger forms, may be accounted-for by the hypothesis that it is a diminutive local derivation of *sanctorum*, just as *extimus* is the small southern extension of *fumeus*.

Hairy Woodpeckers in Salvador were confined strictly to the Upper Tropical Zone and in no case was one noted in the Sonoran Zone. One of the birds collected was taken exactly on the Salvador-Honduras border, so that its extension into the southern Honduras highlands is a matter of certainty. It is notable that neither Oberholser (Proc. U. S. Nat.

[1]Contribution from the California Institute of Technology.

Mus., 40, 1911, pp. 595–621) nor Ridgway (Bull. U. S. Nat. Mus., 50, pt. 6, 1914) had available any specimens from Honduras and both speculate on the identity of the record of "*Picus jardinii*" from Sisquatepeque, Honduras. Geographical proximity to Los Esesmiles suggests its allocation to the new form.

Specimens examined.—*D. v. sanctorum*, small series in Biological Survey, including the type. *D. v. fumeus*, three in Field Museum of Natural History. *D. v. parvulus*, five including the type. *D. v. extimus*, large series in several collections.

MEASUREMENT TABLE.

AVERAGE FOR MALES.[1]

	Wing	*Tail*	*Exposed Culmen*	*Tarsus*	*Middle Toe Minus Claw*
parvulus (3)	103.3	59.3	21.4	18.0	12.9
sanctorum (7)	109.4	63.9	24.2	19.2	13.7
fumeus (7)	108.1	61.6	25.1	19.1	13.1
extimus (19)	102.8	58.6	24.9	19.8	13.8

[1]Averages for *sanctorum*, *fumeus* and *extimus* are taken from Ridgway and Oberholser, with which the specimens we have examined agree.

INDEX

New names are printed in **heavy type.**

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