BIRDS OF THE AUSTIN REGION

BY

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FOREWORD

For the past ten years I have spent my leisure moments in field work, in studying collections of birds and eggs, and in gathering records dealing with the birds of the Austin Region, Central Texas. Due to the pressure of many other interests, the completion of this manuscript has been delayed beyond reasonable time. I am bringing my study to a close, realizing that one of this character is never completed, since each new observer adds to the list and to the information amassed before his time.

I wish especially to thank Dr. Elton Perry, Jr., a field companion from whom I received much encouragement in my youth as well as later excellent criticisms; Dr. Harry C. Oberholser, who has given me much information and many suggestions for more than a decade; Dr. Frank M. Chapman and his publishers, D. Appleton & Company, for permitting me to make use of various illustrations from *The Birds of Eastern North America;* and Mrs. Florence Merriam Bailey and Mr. Francis H. Allen, scientific editor of Houghton-Mifflin Company, for permitting the use of illustrations from the *Handbook of Birds of the Western United States.*

Dr. H. Y. Benedict, Dean of the University of Texas, has given me constant encouragement. Mr. Fritz W. Graff and Mr. A. C. Wright have in many ways made possible the publication of the manuscript. Throughout the volume, references are made to others who have rendered valuable assistance.

My best thanks are to my wife, Armede Hatcher Simmons, for continued encouragement and for endless assistance in the field and in preparing this manuscript.

GEORGE FINLAY SIMMONS.

Dakar, Senegambia, Africa, August 13, 1924.

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INTRODUCTION

No detailed study of the avifauna of the region about the city of Austin, capital of the State of Texas and site of the University of Texas, has heretofore been made; and but few accounts of any of its fauna have ever been published. An effort has been made in the present publication to assemble all past records and observations and thus place before the amateur ornithologist the knowledge gained by the present-day workers in the field, together with numerous suggestions for future work and statements of interesting problems which should be solved. This has been done in the hope that this publication may serve as a basis for future observations on the food habits of birds and their economic relations to man, and as a nucleus around which to build through coming years a better and more complete report on the birds of the region under consideration. We could only wish that the report were more complete than it is. It is a well-known truth, however, that a faunal list for a given locality, based on observations covering but a limited space of time, is always subject to the general objection that nothing about it seems complete; but such is the case with any constantly growing subject.

This publication is designed to assist students in verifying the identifications of the birds which it covers, and in recognizing the characters by which each species may be told from all others. Recent works in ornithology have proved, by their system of analytical, differentiating keys based on contrasting characters, to be of immense value to the student; but it is the feeling of some of the naturalists who have led amateurs into the field in an effort to initiate them into the mysteries of the study of rarer birds that there are easier ways of identification for the beginner. The usual plan of finding your bird first, as something unknown, and then identifying it later from books or museum collections, works better in the Northeast than it does in sections of the country where there are no collections and few books to be had. The alternative plan seems to be better suited for an outlying region. Concise accounts, particularly of the abundant species, enable the amateur to familiarize himself with several commoner birds and then to go out into the field and find them before taking up several others, and so on through the list. In order to fulfill this latter plan, an effort has been made to set forth in as simple language as possible a brief account of each of the birds which has been found in the immediate vicinity of Austin; special attention has been paid to a study of bird songs and of field marks to be used in identification, though, in order to prevent the work from becoming too voluminous for ready reference, all descriptions have been cut down to barest essentials, and all information in general has been condensed as much as possible. At the same time enough outside information has been brought in to show the far-reaching connections which a local faunal study may have when carefully made.

In a general way, this publication has three purposes. First, in its local aspects, it is intended as a hand-list, guide, or manual for resident bird students and for transient visitors and naturalists from other parts of the country, principally as a supplement to the standard handbooks and manuals; it is intended to stimulate a love for nature and an interest in the study of birds for (1) the healthy exercise secured by pursuing and watching wild animals, (2) the esthetic pleasure to be obtained therein, (3) the conservation of birds for

future generations, (4) the protection of birds as a means of diminishing the insect pests which prey on farm and orchard, and (5) the purpose of showing to the uninitiated a few of the interesting things that may be learned from an all-absorbing study of the wild life about us. Its second more general purpose is to serve as a contribution to faunal knowledge from a well-nigh virgin field; as a work of reference for ornithologists in other parts of the world who are studying the distribution and habits of birds; as a contribution to our knowledge of the geographical distribution of the birds of the little-known Southwest, where varied physical features of the country and resultant climatic conditions result in a bewildering mixture of northern and southern, eastern and western, races of birds and other animals; as a tiny peg on the broad map of North America around which to weave the lines of the tangled web of distribution and migration, and as a stimulus to local students to add to the size and importance of that peg on the ornithologist's map. The third and last purpose of the publication is to serve as a reference work for local students engaged in studying the interrelationships of plants and animals and their value to man.

The literature on the birds of the Region is, of course, scanty. Most of the field work that has been done is the result of utilization of spare moments during busy week-days, occasional jaunts on holidays and Sundays, and longer trips in vacation periods. The field of investigation is an extensive one and too broad for the limited time given it. Brief accounts of local elevation and contour, floral features, and weather conditions will have to suffice. Dates given in the biographical sketches of the various species of birds are not all the dates, of course, but merely some of the characteristic and some of the unusual ones.

LOCATION OF THE AUSTIN REGION

The Austin Region, as covered by this report, is exactly what the name indicates: the region about Austin, the capital of Texas. No definite physical or geographical boundaries limit this Region, but the term is taken to include such country on every side of the city of Austin as is easily accessible for biological investigations to one making his headquarters in Austin. Practically all of the region lies within Travis County, and within a half day's walk from Austin; but it also includes small segments of three counties immediately to the south that are needed to complete a square with the southward angling point of Travis County.

Austin, a city of approximately 55,700 inhabitants, lies a few miles south-southeast of the geographical center of Texas, on parallel 30°15′ North latitude, and on meridian 97°45′ West longitude. It lies in the fertile blackland farming country, at the foot and immediately east of the Central Texas Limestone Mountains. Through the southern part of the city moves a great river, the Colorado of Texas, which flows on from Austin 200 miles southeastward to the Gulf of Mexico.

The Austin Region is on the same general parallel with southern Mississippi; northern Florida; the great Atlantic Ocean to the south of the famous Bermuda Islands, and nearly 20° south of the southern coast of England; Arabia, the southern slope of the Himalaya Mountains, and the southern tip of Japan; and Lower California, Sonora, and Chihuahua in old Mexico. It is on the same general meridian that passes from the western shore of Hudson Bay southward through central North Dakota in the United States, Tampico in Mexico, and

down across the vast expanse of the Pacific Ocean, from 1000 to 1500 miles west of the South American coasts of Ecuador, Chile, and Patagonia.

PHYSICAL FEATURES

The Austin Region is admirably adapted to the study of natural history, particularly field investigation in plant and animal associations, succession, and the general effects of environmental factors, for its central position places it close to many different biotic formations having highly varied conditions of life. Through the Region passes the line of division between the humid fertile East and the dry and arid West. It lies on the border of the great climactic prairies of North America, where everything would be grassland were it not for local soil conditions resulting from varied geological formations. As a result of over-grazing the grassland was weakened and beaten back, until northern plants gradually play out in the Region; the semi-tropical chaparral thicket, minus the really tropical plants, has steadily marched in from the south, led by the prairie-invading mesquite; the semi-desert plants characteristic of the trans-Pecos arid plateau, except the creosote-bush and the candlewood, have moved in from the west. As a result of erosion and washing along valley slopes, the eastern hardwoods and their associates, minus the excessive-moisture-loving maples and gums and a few of the hollies, have migrated from the Atlantic Forest formation to the east, steadily following water-courses upstream and moving into the lowlands among the hills, from which they have gradually encroached onto hillsides until they have passed up the slopes and taken the flat remnants of the once-grass divides or plateau segments which remain as butte-tops or rounded mountain-caps.

Conditions are ever changing. Striking changes in flora, with resultant changes in fauna, may be observed within a single generation. Nature in all her glory of evolution may be seen at her best. The advances made by different forest types year by year is an all-absorbing study; the effects of over-grazing and over-cutting are questions both interesting and practical; the succession of plants which attempt to, and successfully reclaim wastes of mud or rock are unsung heroes of silent warfare for conservation.

Side by side in the Region are found eastern and western, northern and southern plants and animals, apparently so hopelessly confused that unless the observer has the key to movements of the past, he is at a loss to explain present conditions of distribution. A canyon, cutting through the monotonous barren desert mountainous country, produces in sheltered moisture-laden soil but a few feet away a rich, humid, moisture-loving forest, with different zones of highly diversified vegetation, according to differences of soil conditions, side by side, rapidly changing from one type to another in passing from the crest of the slope to the bottom of the canyon, each one harboring its characteristic animals.

There is a great topographic difference between the country to the west of the city of Austin and that to the east. Austin lies at the foot of an abrupt elevation, the first range of hills, or small mountains, met with in going west in Texas from the Mississippi River. This range of hills extends across the Region just west of the city, following a general north-and-south direction and forming a natural barrier to eastern species; its rocky hillsides and dry, arid ridges offer new environmental conditions, while its moist, humid canyons of a higher

altitude than the rich country to the east support an even richer formation.

Beginning almost immediately at the foot of this precipitous line of hills, the fertile, rolling blackland prairies extend to the eastward. These prairies form the inland border of a very gradual slope of over 175 miles southeast across the varied conditions of soil of the eastern half of Texas to the Gulf of Mexico. Between these fertile prairies and the hill country the line of demarkation is in places sharp and distinct; however, a narrow strip of country in the southern half of the Region, in immediate proximity to the arid, rocky hills, has become gradually influenced by the wash of parched, stony soil from the slopes overlooking it, until at present it stands theoretically and actually midway in general conditions and character of flora and fauna between the fertile eastern half of the Region and the desert hills of the west, and bears in general a chaparral growth intermixed with a few stunted eastern forms and numerous hill trees and shrubs.

The great Colorado River of Texas, winding its way from the Staked Plains of the northwest to the Gulf of Mexico, crosses the Region in a general northwest-southeast direction, further changes local conditions so that an additional area must be recognized. From far beyond the Region its silt-laden waters bring strange soil, which has become deposited over immense areas of lowland running from the edge of the hills in a broad stripe across the middle of the blackland prairies. There eastern conditions reign supreme, and the forest primeval is found in all its glory.

Ages ago the river threw gravels over the terraces on the uplands overlooking its double valley. These strips of gravel follow the valley crests eastward until they meet, just east of the Region, the post oak Lignitic belt of Texas, the vegetation of which is thus given a chance to spread westward into the Region to form a fourth in the contingent of floral areas.

The fifth and last floral area is a small section just south of and alongside Onion Creek, surrounded by blackland prairies in the southeastern part of the Region. It is a slightly rounded cap of an extinct volcano, the rocks of which have weathered to form a soil supporting, particularly along the sandstone slopes of Onion Creek below McKinney Falls, a characteristic vegetation.

SOIL FORMATION

Because of the fact that many species of plants and animals have a distribution so local that it is limited by or coincides strictly with uniformity or continuity of soil conditions, the principal soils of the Austin Region are of especial interest because of their diversity. Of such soils, predominate the gravelly and sandy loams of miscellaneous alluvial deposition. Since the clays and stony clays were formed directly from underlying rock formations, historical geology throws considerable light on their present distribution.

(*a*) Limestone Hill Area

The rough, mountainous country across the western half of the Region is characterized by large exposed areas of bare exposed rock outcrop on most of the higher hills. These rock outcroppings occasionally reach from canyon base to peak summits, though usually they are in big, scattered stretches on slopes.

The whole area is composed of numerous tall hills and buttes rising to an elevation of 1000 feet or more in a series of terraces, evenly and horizontally bedded like the layers in a cake, with different grades of white limestone in huge thicknesses, occasionally separated with a thin filling-layer of clay or of sandstone or marl formation, frequently found associating with such limestones. A general uplifting, a coastward tilting, and subsequent weathering, dissection, and leveling of the great-layered structure which thus formed the basis for the hill area has resulted in varied exposure of different layers in different parts of the area, the more recent formations topping the eastern edge of the hills, and successively older formations being uncovered further west or shown deeper down on the steep, bare hillsides of weathered limestone, the depths of canyon-channels cut through alternate layers of hard and soft limestone by the numerous smaller creeks, or the exposed perpendicular limestone cliffs on the outside of curves of the river and the larger creeks.

Th oldest formation in the area, the Travis Peak beds of conglomerate pebbles, grit, clay, and calcareous sandstones (in all over 100 feet thick), lies along the lower slopes and bottoms of the Colorado Canyon, where it has been cut into near the western edge of the Region. On this lies a great thickness (about 450 feet) of the oldest limestone, the white and yellowish Glen Rose limestone, occasionally flaggy and marly in places, and growing sandy where it meets the beds above and below it; this limestone shows conspicuously where it forms the base of Mt. Barker and the western cliff-face of Mt. Bonnell; it is terraced in bands or beds of varying thickness and hardness, standing out in long slopes on many larger hills and in vertical canyon cliffs, and even forming the flat crests in the western part of the Region. Above this yellowish Glen Rose limestone lies a narrow layer (only about 15 feet) of yellowish Walnut clay, showing in narrow, sterile stretches on steep slopes, surmounted by a more conspicuous thickness (40 feet) of white, chalky Comanche Peak limestone, which is seen in many long, barren, chalky slopes, particularly about edges of the Jollyville and Cedar Valley Plateaus in the rear-middle part of the hill area, and in great slopes and rises capping the Walnut clays of Mt. Barker. The principal and most conspicuous limestone of the area, the massive white Edwards limestone, is of great thickness (about 300 feet), and contains numerous beds of flint; it faces cliff and canyon walls and forms vast areas of rocky summit, particularly on top of the central plateau remnants and highlands along the eastern edge of the hill area; it is particularly conspicuous along the south bluffs and Deep Eddy cliffs of the Colorado River west of Austin. Next above the Edwards limestone, and younger in point of time, is a comparatively narrow layer (80 feet thick) of fractured white Georgetown limestone, slightly sand-containing and with occasional marly beds, forming a narrow line of stony upland prairie along the eastern edge of the hills and the semi-arid strip; it is best seen on the slopes at Taylor's lime kiln, the I. & G. N. cut at West Sixth, and the scattered sections in the Bear Creek country between the Edwards limestone and the I. & G. N. track. This layer is capped by a narrow one (80 feet thick) of unctuous greenish Del Rio clay, weathering to light blue or yellowish, and forming a narrow line of hog-wallow prairie along the edge of the hill country, just east of and touching the Georgetown limestony prairies; this clay shows typically in Fish Pond bluffs near the mouth of Barton Creek and in bluffs along Shoal Creek. The most recent of hill-area formations is the pinkish-yellow Buda limestone, massive and thick-bedded (about 45 feet thick), nodular fractured, and capping the Del Rio clay; it is

conspicuous in rough, unevenly-bedded ledges and vertical bluffs exposed along creeks and in rough, cavity-filled surface exposures marking the half-way zone between the hills and the arable lands of the Blackland Prairie Area; such outcropping is best seen in the steep scarps of Shoal Creek in Austin, the precipitous cliffs and typical toppling projections where Bouldin Creek enters the Colorado River valley and the I. & G. N. crossing of the Oatmanville road.

Rock outcrop occurs principally along steeper slopes and canyon-cuts. On the flat summits of the ridges, and on gentler slopes and the level plateau areas, weathering has gradually formed soil, which has accumulated in more level places to a depth of from 1 to 4 feet. This dark brown to reddish-brown clay, or clay-loam, the common soil of the hill country, is Colton stony clay; the surface soil itself is browner, has a depth of from 8 to 10 inches, and contains around 50 per cent of fragments of flint and hard, honeycombed limestone; the subsoil becomes still more compact and more distinctly reddish as depth increases; beneath the subsoil is usually the hard stratum of white limestone, principally Edwards limestone, from which the soil is largely derived by disintegration, and hence the soil content of flint and limestone fragments.

(*b*) Blackland Prairie Area

The Blackland Prairie area is made up of several formations, arranged in zones or bands lying parallel with the hills. The one nearest the hills is Austin clay, a dark brown or black loam containing a large percentage of silt and clay, with small particles of disintegrated limestone present on the surface and in the soil; it occurs on rolling uplands between rough, hilly country and the rich, black prairie lands proper; where this is washed off, the rocky outcrops and chalky soil or Austin chalk are laid bare.

The next zone to the east is the much wider, true blackland prairie, the Houston black clay, on the higher ridges of which and on the eastern edge of which—where the black prairies give way to the poorer sands of the post-oak area—Houston gravelly clay occurs. Rain washes the soil from the higher ridges, leaving more or less gravelly ridges, hence this formation. These higher ridges are usually fenced off into pastures grown with grasses and mesquite.

The broad, level bottomlands are alluvial Yazoo sandy loam, grayish to light brown in color, and extending along both sides of the river from the hills and the lower end of Barton Creek to where the river leaves the region, gradually growing wider and more extensive as it progresses eastward, averaging a fraction over three miles wide, counting the narrow first and wide second bottoms on both sides, but occasionally ranging slightly over four miles. A long strip runs out from this formation and follows up the broad lower valley of Onion Creek for a distance of about three miles and averaging about a third of a mile wide.

The ordinary creek bottomlands, occupied by rich bottomland timber of ordinary black alluvial type, of the larger creeks of the blackland prairie area, are composed of Yazoo clay, a heavy dead brown to black clayey loam, sometimes mixed with small round pebbles. It is washed down from the black silt and clay of the upland blackland prairies and is the typical alluvial soil of the rich, black bottomlands.

(c) Post-Oak Forest Area

Several rather extensive areas along the edge of the bottomland form terraces or areas higher than the river bottomlands, and yet

slightly lower than the terraces. The soil here is the same as that of the post-oak area lying east of the blackland prairie area and extending into the extreme southeastern corner of the Region. The soil is gray to brownish-red Lufkin fine sandy loam, with sandstone pebbles and fragments on the more sloping parts. These areas are largely covered by a thick growth of post-oak and scrub oak.

Upland terraces overlooking the valley of the Colorado, principally on the north side, where they are rather extensive, but irregular, for a width of from one to three miles, extend west to the hills and form a considerable part of the terrace on which the city of Austin is located. The soil of these terrace remnants is Travis gravelly loam, and consists of coarse, sandy loam and gravel mixed with stiff red clay. There are a few small areas on the rolling uplands, but not far back from the river, for this soil formation is usually found on the higher ridges in the immediate vicinity of the river. It supports a fine, thick hardwood growth of post-oak and blackjack, and results in an extension of a long finger of the post-oak area from the main area itself westward to the edge of the hills.

(*d*) Volcanic Grassland Area

The only other soil formation in the Region covers the rounded cap of the old Pilot Knob extinct volcano, an area about two miles long from north to south and about a mile wide from east to west, situated on the blackland prairies about eight miles south of Austin. This soil is Yakima stony clay, dark, reddish-brown clay with a large scattering of rocky fragments on the surface and in the soil. This area is covered by grasses.

WEATHER CONDITIONS

The climate at Austin is mild and healthful. There is, however, sufficient uncertainty about local weather conditions to make it a question at all times as to just what clothes will be needed during any coming twenty-four hours. Ordinarily, summer weather in the open is hot and oppressive; but in shade, along sheltered canyons, and at nights it is cool and fairly pleasant, largely because of the modulating effects of the prevailing southeasterly winds. Winters are, for the most part, mild, usually with very cool nights, the days gradually growing warmer shortly after noon; about every ten days, however, cold northers sweep down, bringing sudden drops in temperature, which remain for two or three days.

(*a*) Meeting of Humid East and Arid West

Austin is advantageously situated for a study of the effects of humidity and aridity. The rich, moist country of the eastern United States reaches its western limit at Austin, which lies on the eastern edge of the arid desert country of the Great Southwest. Even in the city itself there are very few humid days during the year; and westward over the Edwards Plateau the air is noticeably dry, until it becomes parching in the extreme desert country west of the Devil's River.

The humid eastern country extends westward to include the eastern half of Texas west to Corpus Christi and Austin, and the eastern halves of Oklahoma, Kansas, Nebraska and the Dakotas. Its western

limit is usually taken to be the line of 25-inch annual rainfall. East of this line the rainfall exceeds 25 inches, and conditions are considered humid. West of the line, with the exception of the humid Pacific slope, the rainfall is less than 25 inches, and conditions are certainly arid.

At Austin, however, humid eastern and arid western country do not blend so gradually as might be supposed by those who have studied ecological conditions further north or further south. Due to topographic and local soil conditions in the western half of the Austin Region, the western arid country begins rather sharply, and the conditions are those usually found far to westward in much more arid country. While the rainfall itself will reach 25 inches, or even slightly more, the effective rainfall will be scarcely more than 5 inches. The rocky character of soils prevents absorption, the hard, arid slopes naturally result in rapid throw-off and quick drainage of rain-water into the creeks and the river, and the hot sun on the bare limestone rocks increases amount and rate of evaporation of the little water that remains. During midsummer the long stretches of bare white limestone reflect the light and heat until the traveler is blinded, the air feels like a blast from a molten furnace, the atmosphere is dry and dusty, the baked ground uncomfortable to soles of shoes and seats of trousers, and insects and cactus of many forms complete the picture which Larry Chittenden painted in poetry under the name of "Hell in Texas."

(*b*) Temperature

Austin is semi-tropical in its temperature, the mean annual average being about 67.6°. Seasonal distribution of temperature, however, is of much greater importance than the annual average, for the effect of a uniform moderate temperature throughout the year would be quite different from that of a series of very hot summers alternating with coldly-fluctuating winters.

Warm weather begins at Austin about the first of March and, after a few slight cold spells during that month, holds forth steadily until nearly the middle of autumn. April is usually fairly cool and wet, numerous typical April showers alternating with warm, sunshiny weather. In early May heavy rains retard the increasing temperature, but on their trail comes summer weather, increasing in intensity toward the end of the month. Midsummer is very warm, but the thermometer exceeds 96° only between June and September. July and the first half of August form the hottest part of the year, characterized by hot, dry weather with excessive sunshine, emphasizing the need for rains which do not come. Meats of all kinds spoil hopelessly within a few hours unless kept on ice. The temperature during this hot period occasionally reaches 105° in the shade, at which times the natives take to siestas while newcomers swelter and mop their feverish brows; this excessive heat usually occurs between 2 and 4 in the afternoon, the nights throughout the summer usually being cool and pleasant; it is infrequent during the daytime, however, that the balmy southern breezes, hot in the sunshine, are not cool enough in shady places and along canyons to modulate the temperature.

About August 13 the first signs of autumn appear, heralded a few days in advance by migrating shorebirds; late in the afternoon the leaden sky sulks, and about dusk a shower strikes, bringing a slight drop in temperature and a swirling northwest breeze, both of which help to shake the numerous hackberry shade trees of the city and cause them during the next few days to begin to drop their leaves

to yellow on the ground below. About ten days later, usually between August 22 and 26, another cool wave strikes the Region with shower and swirling breeze, heralded this time by migrating waterfowl. The days are still warm, and the nights are back to the warmer average in a few days. Then the next wave strikes about September 12, as usual about nightfall, or perhaps later in the evening toward midnight; gradually the nights become warmly moderate once more. These cool waves become stronger and stronger as the season advances, occurring usually about September 23, October 11, October 24, November 10, and November 20. They are then blizzardy northers, which bring a sudden drop of many degrees in temperature, frequently within an hour, driving man to overcoat and muffler, birds to thicket shelter in bottomlands, and mammals and reptiles to quick hibernation.

Winter weather, with its cool nights, milder days, and warmer afternoons, is tempered on the average about every ten days with similar brisk northers. The Northerner cannot acclimate himself to these sudden changes. The wind shifts suddenly and comes from the north, and within an hour or two the thermometer drops from summer heat to winter cold. Frequently a blizzard of brief duration moves in the teeth of the norther. Ordinarily, these cold spells last but a day or two, rarely a week, and spring-like weather appears once more.

In late winter, however, about February 6 and 22, northers usually strike which bring the coldest weather of the season. Cold periods that follow, particularly the ones commonly appearing about March 11 and 22—the latter dark, cool, sprinkly, equinoxial—grow weaker in force and gradually give way before the advance of warm weather.

Records for fifteen years at Austin show that the first killing frost in fall usually occurs October 12, with average killing frosts only as early as November 18. The average last killing frost in spring occurs about March 12, with the latest about April 30. Severe freezing weather is likely to occur with northers at any time between the end of November and the middle of March, but it is only at rare intervals that ice covers even still water, and then a thin sheet forms during the night, disappearing during the warmer hours of the following day. The length of the growing season at Austin thus averages about 250 days.

Austin and the remainder of the level farming country covering the eastern part of the Region have a much more moderate climate than the higher hill country and plateau to the west. In that western section there are a great variety of conditions affecting the temperature. Ordinarily, with each rise of about 100 feet in altitude in that section, there is a lowering of temperature of about 1°, which would result in that section being on an average of from 4° to 6° cooler than Austin. In the cool, moist shade of canyons and among the overhanging, dripping, fern-laden cliffs, there is also a lowering of temperature; but the deforested, nude areas of rocky ground covering a large part of the area reflect and increase heat, which becomes excessive in summer, a season that as a season exists ordinarily for about eight months of the year instead of for only three. In winter, which covers the other four months of the year not occupied by summer—for there is little spring and fall weather—the peaks and butte-caps of the area are so exposed that the thermometer frequently hovers about 0° Fahrenheit, the average altitude increase in temperature holding very well at that season. During still winter nights, however, when frosts occur, the frosts move into lowlands and creek valleys; then the lowlands are cold and chilly, while the upper slopes and peaks are mild to moderate. The reverse is true on clear nights, the uplands being cold and windy, the lowlands and valleys being quieter and warmer.

Monthly Temperature Averages

	Abs. Min.	Aver.	Abs. Max.		Abs. Min.	Aver.	Abs. Max.
January	15	49.0	82	July	62	83.7	105
February	–1	53.5	87	August	60	82.8	103
March	22	60.6	95	September	44	78.1	102
April	35	67.8	95	October	34	68.1	96
May	41	74.4	96	November	25	58.2	85
June	52	80.8	103	December	15	51.2	83

(*c*) Winds

The prevailing winds of the Austin Region for the greater part of the year are the placid Gulf breezes from the southeast and south. The typical mild southeast breeze continues throughout warmer winter weather, but at that season it frequently gives way to northers, suddenly blowing in from northwest by north, sweeping down across the Great Plains and causing a drop of temperature of many degrees within a few hours. Because of the frequency of these northers, which gradually abate and are replaced by southeast winds, the prevailing winter wind is from the north.

(*d*) Precipitation

The rainfall at Austin fluctuates from year to year. During years when rainfall is heavy, the Region is easily classed with the humid east in its precipitation; and during flood-seasons the amount of rainfall is excessive, at times reaching that of the rich tropical rainforests of the Southeast, as, for instance, in 1900, when it totaled 53.99 inches for the year. At other times, however, there is a decided lack of rainfall, moderate droughts occur, and the country is desert-like; sometimes extreme drought conditions exist, the rainfall dropping as low as that of the parched, flat, lifeless, monotonous deserts of the Southwest, as in 1879, when only 18.34 inches of rain fell during the year, and in 1916 and 1917, when conditions were likewise bad.

Seasonal occurrence of rain is of great importance in considering the amount of efficient moisture of the Austin Region. A rather even distribution through the four seasons would have a decidedly different effect from that of a rainfall of broken, irregular seasonal distribution. At Austin seasonal conditions are markedly dissimilar. The greater part of the rainfall occurs during two brief rainy seasons—one in spring and one in fall; torrential rains during these short seasons represent extremely wet conditions, though rapid run-off makes the precipitation almost useless; these rainy seasons are (1) from middle April to middle May, and (2) during September. Even though rainy, September is a hot month, and is usually classed with summer in south-central Texas. For several years the total rainfall for the four hot months of June to September, inclusive, was only from 2.10 to 2.52 inches, the average four-months total for that period in other years being usually 11.06. Only slightly more than 2 inches of rainfall for four months! And most of that rainfall coming during the month of September, which is usually rainy; such slight rainfall, accompanied by constant high temperature, produces a true desert climate and resultant desert conditions. Often during that season from June to August, inclusive, there is not even a trace of precipitation, and quite

ordinarily the conditions are usually evenly dry. During winter occasional showers and rainstorms occur, generally along with the northers which appear so suddenly.

There is a marked difference of rainfall in different parts of the Region, even though the area covered is small. In the eastern half of the Region the rainfall is usually sufficient for agricultural purposes, ordinarily ranging from 30 to 40 inches annually. Back in the hills, in the western part of the Region, the rainfall averages about 5, and frequently 10, inches less than in the eastern part of the Region. The city of Austin itself lies on the western edge of the farming country, but not quite in the western arid country; its annual rainfall averages about 33 inches, and is, therefore, nearer the condition of the eastern section. In the hills but a short distance west of the city 28 inches of rainfall is considered good; this lowered rainfall is doubtless due to dry conditions of lower and upper air over the surface of the rocky soil, which attains extreme heat. A large percentage of the hill rainfall, however, is lost by rapid run-off and the quick shedding of water by hills, on which it is therefore ineffective; thus precipitation within the hill area is wholly insufficient for agricultural purposes.

Monthly Rainfall Averages

January	1.91	May	4.07	September	3.61
February	2.44	June	2.43	October	2.94
March	2.38	July	2.27	November	2.52
April	3.18	August	2.29	December	2.65

Many interesting problems in biology are presented as a result of this local and seasonal distribution of rainfall. During years of average rainfall forage and crops are good, myriad rainbow-hued flowers spring up in field and along roadside following spring showers, and normal faunal conditions result. With abnormally heavy rainy years come rank growths of vegetation everywhere, weeds matting into impassable thickets; deeper- and richer-colored flowers springing up everywhere, even over slopes and peaks of the limestone hills; field crops are excellent, bringing prosperity to farmers; cattle, sheep, and goats on the ranches of the hill country thrive on the excellent forage; and birds and animals breed and thrive in abundance. During lean years, when little rain falls, crops are parched and little produce of worth is marketed; reptiles, rodents, and many birds are scarce, the latter frequently passing the season without nesting; pastures contain little forage, and the water-holes are dry, so that stock starves and dies of thirst.

Occasional hails are destructive, but rare. Snow is almost never heard of, but occasionally a few flakes appear with falling sleet, and once in a half-score years a one-eighth to five-eighths inch snow blanket covers ground, roofs, trees and shrubbery; if cold, cloudy weather remains, the snow freezes to a thin sheet of ice; if the day grows warmer and the sun comes out, the thin sheet of snow quickly disappears.

(*e*) Evaporation

Rates and amounts of evaporation in the Austin Region vary greatly. A study of conditions of evaporation is very important, for evaporation removes a considerable part of the rainfall. It is not

the amount of rainfall, but the amount of *effective* rainfall, which determines the vegetation.

In the eastern part of the Region, where the ground is decidedly arable, the upper stratum of earth weathers and dries; the moisture in this stratum is rapidly removed by evaporation; a guard against sun's ray and against normal aerial evaporation is thus formed, and lower strata retain their moisture for long periods of time, giving it up very gradually to the plants which root into them. Moisture in this section is continually replaced by gravity from the many small streams, which are fed largely by artesian springs along the edge of the hill country.

On the open, parched, limestone surface of the hills evaporation is exceedingly rapid, annual removal of as high as fifty inches of water being not unusual. Since the rainfall is less than thirty inches, and since most of it runs off the hills very rapidly or seeps to deep strata where it is not available for plant use or evaporation, the effect is as though even less than no rain at all had fallen. The air is, therefore, noticeably dry and parched.

WEATHER CONDITIONS AND FALL WATERFOWL MIGRATION

About the end of September Mallards appear on the river, flying just ahead of or in the teeth of a norther, and usually speeding low along the surface of the water; as soon as the norther strikes, the birds begin flying high. After the weather has settled back to normal, none are seen passing through, for they are content to remain on some more northern lake or river until another cold snap drives them southward. Thus the droves of ducks appear in waves, which occur in fall with sudden weather changes or northers, in spring with spells of warm spring weather in regions to the south and southeast.

The Green-headed Mallard has been observed at Austin as early as September 1, though it is most common from middle October to middle November. The Pintail has been observed arriving in late August, though usually it is not important before late September and early October; its greatest abundance at Austin is from October 15 to November 6. The Shoveller migrates through Austin commonly between October 15 and November 7.

The Blue-winged Teal is the earliest duck to migrate in fall, the first fall flocks appearing at Austin in late August, flying low near the banks of the river, about four or five feet from the water, and very difficult to "sky-line." Later, flocks become larger, amounting sometimes to dense companies, and the birds fly higher. They are common by late September or early October. The Green-winged Teal migrates later, appearing first in late September, and is commonest from early October to middle November.

The Redhead and Canvasback rarely alight on inland waters, for the streams throughout Texas, particularly the northwestern half, are too small and do not furnish suitable food to attract the rapidly-flying birds. The Redhead occurs at Austin early in October, and has been observed as abundant by October 15; during the first week in November it occasionally passes over by the thousands. The Canvasback migrates in late October and during November.

Lesser Scaups are already abundant at Austin by October 15, and Ruddy Ducks reach the height of their migration between October 15 and November 7.

Lesser Snow Geese reach Austin by the third week in October, and the White-fronted Goose by the middle of that month, though goose migration usually occurs during the first ten days of November.

The Canada Goose, and its small subspecies, Hutchins' Goose, appear in waves during migrations. They arrive, usually, with the norther striking Austin about October 8 to 11, flying generally just in advance of the cold wave; they are rather plentiful for a few days, numerous flocks passing down the river or high overhead. Then they are rare and are not seen for perhaps as long as several weeks, when another norther strikes, and they are again common.

Throughout the higher, northwestern and western parts of Texas there are no large bodies of water to hold waterfowl during the interim between northers, so that birds are found only during the waves, which strike the State at fairly regular intervals. The wave in late August brings the Blue-winged Teal and occasionally the Pintail; the norther about September 12 brings many Pintails and some Mallards; by September 23, when another wave strikes, waterfowl migration is really under way, this being the first important flight of ducks across the state; another important flight occurs with the norther of October 11. Only two more good flights occur, October 24 and November 10, after which practically no birds pass, since the bulk has already reached the coastal zones, where they are found throughout the winter in the lowlands, roaming through the innermost of the two zones for the purpose of feeding during warmer spells.

Waterfowl migration is rapid, and the observations made for many years at Austin may be taken as typical for the State. Data from many sources throughout the upper country, and particularly through the lowlands near the coast, bear out the contention that instead of migration taking place in north and south lines, as in the Southeastern States, it occurs in fall from north-northwest to south-southeast, flights being affected by the northwest-southeast flow of streams, which the ducks follow, and by the progressively lower levels of land found in going from the high plateaus of the Panhandle southeastward to the lowlands of the Gulf coast.

EARLY HISTORY OF THE AUSTIN REGION

Although long regarded as one of the most prolific of fields for zoological research, Central Texas has been singularly neglected by ornithologists. This is particularly true of the region about Austin, an area most advantageously situated for the study of faunal zoology, especially because of the location within its bounds of the biological research laboratories of the University of Texas, fruitful in having stimulated and produced, largely as a result of local problems, such famous investigators as Wheeler, Montgomery, Newman, Patterson, Hartman, and Painter.

Early interest in bird life existed only in the eating qualities of game fowl. Indians of the Region hunted and fished; but, unlike the white men who followed them, they were true conservationists, slaughtering no game, killing only when the meat could be used. The delicate balance of species maintained by Nature was not disturbed or upset by their careful demands on her resources.

The open plains and the prairies, the woodlands and scanty forests, were filled with all manner of wild animals, especially game birds, and with waterfowl in season. Herds of buffalo and flocks of prairie chickens roamed about the open grassland country, which covered the greater part of the Region; quail were abundant along the edges of

timber; and in the cover of marginal forest growth, along wooded draws, wild turkeys and beautiful Wood Ducks were common. The white-tailed deer, the jaguar, and the mountain lion, the collared peccary or javaline wild hog, wolves and coyotes, and many smaller mammals spent their lives unmolested in the broken country. During migrations the skies were occasionally darkened with flights of the Passenger Pigeon, and migrating waterfowl and shore birds were myriad along streams and on prairie ponds.

Streams teemed with fish of all sorts, ready to be caught for the table; large-mouthed and small-mouthed black bass were there, together with various species of sunperch, the goggle-eye, the croppie or white perch, gaspergou or fresh-water drumfish, and others equally delectable. Numerous "bee trees" along the creeks held an ample supply of honey. Everywhere a natural food supply was ready, though it required keen observation, a ready wit, and abundant resourcefulness to secure it.

Such were natural conditions when the Austin Region was first settled by white men. A few Indian camps were still to be found along the edges of the hills, where numerous cold artesian springs offered the best of drinking water. The pioneers and first trappers battled with the Indians, and gradually wrested from them the most advantageous locations. Being cut off from foreign supply of food, these early Texans depended on natural resources; and there was a constant struggle for a livelihood. Most of the supplies of the settlers came from within the scanty lines of forest growth, confined to the banks of the Colorado River and its larger tributaries, or growing on slopes and breaks along canyons and valleys in the hills; indeed, all manner of wild animals and game birds were found within these bits of forest and along their borders.

The pioneers were too busy to study the conditions about them. There was the wilderness to be brought within civilization; there was border warfare, which demanded defenses; there was land to be broken to cultivation, and small fields of Indian maize or corn had to be planted for bread. Gradually they cleared and tilled small tracts of land to supplement a diet at first largely venison and game fowl. Then other settlers brought their families and cleared larger and larger areas for cultivation until at last they became independent of that local fauna which rendered easy for them the problem of first settlement. With such independence, there gradually developed a carelessness of attitude toward, and a loss of respect for, the value of natural resources, which has lasted to the present day.

Difficulties there were of many sorts, discomforts and lack of conveniences; but then our forefathers were men trained under more rigorous conditions than those which exist today. In addition to border warfare and the struggle for existence in a little known country, further duties of more vast import settled upon the broad backs of these pioneers—the foundations of a government must be laid.

The State of Texas, though now organized after the manner of other States of the Union, has had a unique, romantic history, dating back almost to the establishment of the colonies on the Atlantic coast. She was once an independent nation; more than that, she has owed allegiance to six governments; over her territory have waved the fleur-de-lis of France; the royal banner of Spain; the caracara-eagle of the Mexican Republic; the Lone Star flag of the Republic of Texas; the Stars and Stripes of the Union; and, for four years, the Stars and Bars of the Southern Confederacy.

Spanish explorers wandered along the Texas coast in their galleons and barques as early as 1519, and penetrated for a considerable distance into the interior of Texas as early as 1535, the whole of the

territory being at once claimed for the Spanish crown. Invading parties rapidly moved in from Mexico, the first of these being that led by Coronado in 1540. Chevalier de la Salle, in 1685, three years after his discovery of the Mississippi River, tried to land along the banks of the Mississippi, for the purpose of establishing a colony. Through an error of nautical reckoning, however, he landed on the west shore of Matagorda Bay, in Texas, erecting Fort St. Louis on the banks of the Lavaca, and establishing the first European colony in the territory. This colony, however, perished, one cause being the treachery of La Salle's own men. Captain de Leon, still adventurous and ever in search of the Fountain of Youth, received with pleasant anticipations the order of the King of Spain to drive out of the territory all other European colonists; he invaded Texas for that purpose, but found that La Salle's colony had perished. He established a Spanish mission in 1690, but it was abandoned four years later. It was not until 1715 that Spain, becoming alarmed at the activities of the French, took steps to protect her territory in the Southwest.

For a brief period following the purchase of the Louisiana Territory by the United States, filibustering parties from the Northeast were quite active, as it was believed by many that Texas was included in such purchase. In 1819, however, the United States recognized the claim of Spain to Texas, and in treaty fixed the Sabine River as the boundary.

Mexico secured her independence from Spain in 1824, and established a Republican form of government. Moses Austin had begun negotiations before this to colonize Texas. After his death in 1821, his son, Stephen F. Austin, continued his work of bringing families into Texas. In 1830 immigration into Texas from the United States was stopped by Bustamente, the usurping Mexican Governor. Conditions were such that the whole territory was given a wide berth by naturalists.

The colonists, however, needed a just government, in order to safeguard them in their struggle for existence. Even before immigration was stopped, they had helped Santa Anna to establish, and they continued their efforts to maintain, a constitutional form of government until 1836. It was in that year, on March 2, at the old town of Washington, near Navasota and Brenham, that Texas declared herself an independent republic, an end attained only after war against overwhelming odds. The historic Alamo fell on March 6, 1836; Colonel James Bowie, with famous Bowie knife in hand, and the immortal Davy Crockett, together with 181 other men, perished under the most heroic conditions that history has ever recorded. Colonel Fannin and his command of 444 men were captured on March 27, and 330 of them were butchered by Santa Anna at Goliad. On April 21, at the San Jacinto battlefield on Buffalo Bayou, near the coast, General Sam Houston and a small force of fighting Texans captured Santa Anna, and scattered his army through marshes and fields, winning the independence of Texas.

On January 14, 1839, an act of the Congress of the Republic of Texas was approved, providing for the permanent location of the seat of Texas government, a capital city to be called "Austin," in honor of one of the most famous sons of the Republic, Stephen F. Austin. The committee named to make the selection reported April 13, 1839; and the present city of Austin was established in a bend of the Colorado River, at the foot of the Central Texas Limestone Mountains.

Mexico, however, did not relinquish her claims on Texas for many years. In 1845, the Texans pushed the proposal to become a part of the United States; a convention to frame a Constitution for the new State assembled on July 4 of that year at the small village of

Austin, which then contained only two or three hundred people. On February 19, 1840, the "Republic of Texas" was declared the "State of Texas" by the Senate and House of Representatives, and by the President of the Republic, Doctor Anson Jones, who was immediately replaced by the first Governor, J. Pinckney Henderson. Final relinquishment of the claims of Mexico was secured in 1848, after the war between the United States and Mexico, in which General Zachary Taylor, General Scott, and Colonel Jefferson Davis distinguished themselves.

Three years after the establishment of the new State, the official census showed only 628 residents in Austin. Growth was slow, as is usual with capital cities. The village drew to it a small coterie of merchants, a school or two, and the asylums and other institutions, until at last it began to attain fair proportions.

With the secession of the Southern States, and the formation of the Southern Confederacy in the early '60's, Texas joined forces with the Confederacy. Her recovery during reconstruction days was slow, but in later years she made wonderful progress in development of natural resources and in population.

Of particular importance in the development of local ornithology was the establishment of the University of Texas. The early settlers, with their usual farsightedness, had planned from the first for an adequate system of education. In 1839 the First Congress of the Republic of Texas had set aside a great deal of land for the purpose of establishing schools, fifty leagues of such land being set aside for "two colleges or universities," in order to provide for the establishment of separate universities for men and women in case one central co-educational institution might not prove advisable. In 1858 the State Legislature had discussed the advisability of executing the plans of the First Congress of the Republic, but political disturbances, followed by Civil War, again delayed, and the question was not taken up until 1871. The new Constitution, adopted that year, provided for and directed the establishment of a university; pursuant to this demand, the Legislature validated a prior endowment of $100,000 in bonds and lands, and added thereto an endowment of 1,000,000 acres of lands in West Texas.

In 1881 sufficient funds were on hand, and the main University was established at Austin. When it was opened in 1883, 221 students were enrolled. In 1891 the Medical Department at Galveston received its first students. Since then the growth of the University has been rapid and substantial, and the enrollment of students has increased by leaps and bounds, until 8000 students a year attend its courses. Departments of Engineering, Law, Education, and Business Administration have been established; and the Medical Department is now classed "A Plus" by the American Medical Association.

The Department of Zoology was early established, and competent instructors brought in from the Northeast. These men, realizing at once the advantageous location of Austin for a combination of field and laboratory research, began a series of investigations, which have continued to the present time to produce results of far-reaching import.

CHANGES IN BIRD LIFE

Nature, under normal conditions, maintains a fine balance or adjustment between her numbers of wild animals. Since the settling up of the country following the coming of the white man, however, the progress of civilization and other agencies which may be laid at

man's door have led to a disturbance of this balance. Under these changed conditions some species of animals cannot live, while others that are better adapted increase far beyond their usual numbers; if the latter are carnivorous, they eat the weaker species; if not, they drive them forth or prevent their multiplying, and the weaker races are gradually reduced until they become extinct. Some birds have thus suffered extinction following a rapid decrease. Among the most famous are the Great Auk or Gare-fowl of the Arctic North and Canadian coasts, last seen in 1853; the Labrador Duck of the northern Atlantic coast, last seen in 1875, gone absolutely, wiped out by shooting and egg-hunting; the Passenger Pigeon of Canada and the United States, last seen in 1908, the last captive dying in 1914; the once-abundant Eskimo Curlew of the middle plains and the Atlantic coast, last seen in 1913. Of these, some were very abundant, particularly the Passenger Pigeon, which occurred years ago east of the Rocky Mountains in enormous numbers, flocks of millions and millions passing over and not infrequently darkening the sun.

The Carolina Paraquet and Whooping Crane are nearing extinction. A few of the former may be found in the everglades of Florida, and only a few of the latter are now known, and these from the coast of Texas. The Hudsonian Godwit is another bird that is practically extinct today, though a pair of these birds appeared on the coast of Texas in the spring of 1923. The beautifully painted Wood Duck, the Snowy Egret, American Long White Egret, Attwater Prairie Chicken, Golden Plover, Upland Plover, and Pectoral Sandpiper have decreased alarmingly. Water-birds and game-birds in general have decreased in large numbers, and hawks and owls have decreased to some extent; only in song-birds in the country has there been little change in numbers.

Early hunting and trapping in the Austin Region did little to decrease bird life. When man became independent of wild life for food, he became careless. He began to slaughter for the pure love of killing, until at present the buffalo is gone, and deer and the larger mammals can only be found in the fastnesses of the mountainous hills; the Prairie Chicken, the Passenger Pigeon, the Carolina Paraquet, and the Pileated Woodpecker are known no more in the Region; and the Wild Turkey is on the verge of extermination.

The status of water-birds, their occurrence or absence, depends to some extent on the abundance or scarcity of water. Though water is always found in the river and the larger creeks, the effects of wet and dry seasons is quickly apparent on ponds and smaller creeks. During a wet season, when the Upland Prairies are moist and the ponds are filled with water, water-fowl and shorebirds are abundant; in dry seasons few are to be seen. The settling up and cultivation of the country makes water-birds much scarcer in the eastern half of the Region. For years a rapidly diminishing number of water-fowl returned to Austin each year, but the protection given them by the Federal regulations has done much to stop this decrease and show a decided turn for the better. Hunters now do not have an opportunity to slaughter these birds as they once did.

Another factor in the South in the killing of birds is the lazy negro, who for many years has grown fat on strings of song-birds killed in the woods near Austin. In such strings the commoner birds were abundant, particularly the Southern Blue Jay, Gray-tailed Cardinal, Eastern Bluebird, Western Mockingbird, and the wintering White-crowned, White-throated and Eastern Fox Sparrows.

Present protection of State and Federal game and migratory bird laws has done much to save the birds, many of which are now once more on the increase. Bird-baths and feeding-places scattered about dooryards and in back-yards have attracted birds into towns. Conservation of forest areas and the closing of natural breeding areas against trespass are also having their effect in saving wild bird life.

In a general study of causes of decrease in bird life, the following must be considered:

1. Cultivation of lands, destruction of natural habitats by drainage, clearing of timber and shrubbery, the cutting of timber along creeks and on hillsides, and the clearing of roadside and fence-line shrubbery.
2. Thick settling of country, conducive to driving out shyer birds.
3. Hunting by sportsmen; game-hogs; pot-hunters, usually negroes or foreigners, for song-birds; and small boys with air-rifles, slings, and nigger-shooters.
4. Egg-collecting by boys and some men.
5. Increase of the English or European House Sparrow, introduced in America in 1851.
6. Plume-hunting for millinery-trade; egrets, tanagers, orioles, bluebirds, gulls, terns, pelicans, and the albatrosses of Laysan Island.
7. Destruction of migrating birds by striking lighthouses, light-towers, electric wires, and fence-wires.

SOURCES OF INFORMATION

The annotated list of species which forms the main part of this publication is compiled from various sources:

1. Extensive field notes of the author.
2. Lists of species and observations thereon, gleaned from other observers by personal interview and through correspondence.
3. Subspecific determination of a rather large series of specimens collected by Dr. Elton Perry, Jr., and the author; the greater number of specimens determined were in the large private collections of Dr. Louis B. Bishop and Dr. Jonathan Dwight, Jr., Fellows of the A. O. U., who kindly examined and identified many specimens of special interest.
4. The few published records, reference to which has heretofore been made.
5. Data accompanying the few fragmentary collections of birds' eggs located and examined by the author.
6. The standard ornithological books, journals, and magazines, from which publications data covering descriptions and general habits has been freely drawn by the author of this report, for as should be the case in any scientific study, "what he thought he might require, he went and took."

The author of this publication moved to Austin in October, 1899, residing there until June 19, 1909, when he moved to Houston, Texas. Two summer vacations—June 14 to July 25, 1910, and July 10 to August 13, 1911—were spent in and about the city, along Deep Eddy, and in the Barton, Onion, and Shoal Creek valleys; during these periods only fragmentary notes on bird life were taken. On September 13, 1914, he returned to Austin for a year's work, departing on August 30, 1915; during that year considerable field work was done, and spare moments were spent in locating and examining collections of eggs of local birds, interviewing persons who in the past had been interested in birds, and, with the notes and data thus secured as

a basis, working out puzzles of occurrence and distribution, verifying records, and filling up some of the more obvious gaps in the records for the Region. Again, on January 3, 1919, he returned to Austin, where he resumed his investigations in faunal distribution, which he has continued to September 1, 1923, absences during summer vacations being excepted.

Efforts have been made to communicate with all persons known to have made observations on the birds of the Austin Region, and it is believed that nearly all available data has been gathered.

Unfortunately, records of the Bureau of Biological Survey (including fragmentary data for the years 1888 by E. P. Stiles, 1890 by the late C. D. Oldright, and 1892 and 1893 by J. H. Tallichet) were packed away where they were not available. However, on advice of the late Prof. Wells W. Cooke that these notes contained practically nothing which would add to our knowledge of the birds of the Austin Region, as indicated in our collection of local data, no further effort was made to locate them.

Field notes and unpublished data of the late Prof. T. H. Montgomery, Jr., and the late J. A. Singley have not been located; these will doubtless add to the list of species, and will add much to our knowledge of habits and migration of birds of the Region.

In using the notes of others, whether they have been published or not, the author has been free to edit both in the compilation of list of species and in selection of annotations thereunder. Where at all questionable, records were thrown out freely; where records seemed plausible, yet unacceptable because of insufficient evidence, such records are included with a statement of their hypothetical nature.

In order that, as far as practicable, sources of information might be acknowledged without the tiresome repetition of dozens of names, and in order that there might be some measure of the abundance of local species in terms of the number of observers recording each, a system of letters of the alphabet has been used to indicate observers responsible for records, each observer whose notes were of importance being assigned a letter.

List of Observers Referred to by Letter

Observer.	*Sign.*	*Residence.*
Bailey, Mrs. Florence Merriam	T	Washington, D. C.
Benedict, H. Y.	I	Austin.
Brinkmann, Otto	O	Austin.
Brown, T. A.	K	Austin.
Crenshaw, B. Mills	P	San Antonio and Austin.
Farr, T. J.	N	Austin.
Fenner, A. P.	Z	Austin.
Hinrichs, Theo.	V	(Deceased).
Holden, Oliver F.	Q	Austin.
Howell, Arthur H.	S	Washington, D. C.
Kirk, Louis H.	J	Austin.
Kofahl, Harry J.	E	San Francisco, Cal.
MacLaughlin, Guy	W	Houston.
Montgomery, T. H., Jr.	X	(Deceased).
Oberholser, Harry C.	R	Washington, D. C.
Oldright, Charles D.	D	(Deceased)
Perry, Elton, Jr.	B	Austin.
Schneider, Al., Jr.	M	Austin.
Schutze, A. E.	H	Austin.
Simmons, George Finlay	A	Austin, and Cleveland, O.

Sterzing, H. F.	L.	El Paso.
Strecker, J. K., Jr.	U.	Waco.
Tadlock, Hugh	Y.	Austin.
Tallichet, J. H.	C.	Houston.
Taylor, W. S.	F.	State College, Pa.
Warren, W. H.	G.	Commerce.

List of Observers Referred to by Name

Caldwell, Frank		Williams, Murphy M.	Austin
Dresser, Henry Eeles	(Deceased)	Rogers, Elmor	Austin
Green, Edward K.	(Deceased)	Jones, Chas. G.	Austin
Haschke, Theodore	Austin	Kempen, Will	
Miller, E. T.	Austin	Klein, Carl	
Nehrling, Henry	Gotha, Fla.	Lewis, Paul, Jr.	
Simmons, D. A.	Houston, Texas	Lindolph, Alf.	
Singley, J. A.	(Deceased)	McAllister, Frederic	Austin
Stiles, E. P.		Evans, Chas. D.	Austin
Waechter, Edmund		Dowell, George S.	Austin
Wolfe, A. B.	Austin	Conley, Guy	
Easterwood, Oliver Perry		Eanes, Robert	Austin
Odell, Jas. M., Jr.		Terry, Wm.	
Pfannkuche, Henry C.			

HOW BIRDS ARE CLASSIFIED

In view of the fact that the members of the animal kingdom number into the hundreds of thousands, and the further fact that, roughly, twenty thousand of these are birds, the student of nature will at once realize that these many forms of animal life must be arranged in good systematic order before they can be made of use. Without this arrangement, our knowledge of them would be but a jumble of disconnected facts of little real value.

We might arrange these thousands of animals in groups according to analogy, or similarity in general appearance, in habitats, in food; but such arrangement would be far from satisfactory, for those characteristics might vary in different localities, with the result that zoologists would disagree as to which animals should be grouped together. This **artificial classification** cannot, therefore, be used as a standard for systematic arrangement.

By further pursuing our investigations, however, we soon find other ways of classifying animals. We learn that the many kinds of animal life with which we meet are not entirely distinct from each other. Repeatedly we find different animals which are strikingly similar in structure and appearance. Each shows individual differences which are constant enough to entitle their bearer to be known as a separate kind of animal. Yet, there are types of structure which it bears in common with several other animals, but which are not shared by the remainder of the animal kingdom. The more of these characters, or points of difference, which two animals bear in common, beginning with those of the greatest importance, the closer they are said to be related. This study of the relationship of animals according to structure, as shown by comparative anatomy and comparative embryology, and their systematic arrangement according to such relationship, is called **natural classification**—natural, since it aims to show their natural blood relationships and lines of descent from common ancestors, instead of associative relationships with other animals.

The characters, or points of structure, by which we distinguish animals, and on which our system of classification is based, range

from those involving the most profound differences in structure to those which rest upon the most superficial impressions of external appearance. Each step in this chain of characters has a definite grade and value, and the character that marks the step constitutes the definition of the group thus set apart from the remainder of the animal kingdom.

For instance, we find that the character of possessing an unsegmented axial supporting rod, the notochord, to give the body rigidity and form, is common to all animals of an immense series, known as chordates. This immense group, so characterized by such a very broad and fundamental plan of structure, is called a **Phylum** (or Branch) of the animal **Kingdom.**

A large group of these chordates differ from others of that phylum in the possession of a skull and backbone, and are hence separated into a **Subphylum** and called vertebrates.

Some of these skulled, backboned animals differ from the others of that subphylum in the possession of a reptilian plan of structure; they breathe by means of lungs, yet are furnished with an incomplete diaphragm, and they have but one occipital condyle, or skull hinge-bone. They are thus separated into a **Province** and called sauropsidians.

The character of possessing feathers is peculiar to a still smaller division, or **Class,** of these reptilian animals, called birds.

The class of birds is divided into **Orders,** each of which represents a type of structure common to its members alone, generally a structure of skeleton and muscle which enables such members to secure their food in a particular manner. Thus, the character of being hen-like, with feet built for scratching and stout bills for cracking seeds, is common to the **Order** of gallinaceous birds.

Within this order of hen-like birds, the character of having feathered head and unfeathered legs belongs to a smaller group, or **Family,** which includes the Bob-whites and Quail.

But the Bob-whites may be distinguished from the Quails by the character of having no distinct crest of head feathers, and they are therefore placed by themselves in a group called a **Genus.**

The members which comprise this smaller group are known in scientific language as **Species** of birds, in popular language as "kinds" of birds. Each has certain specific characters which distinguish it from every other species in that genus. The common Bob-white of the United States is characterized by its large size, white throat, and black-an-white underparts, which serve to distinguish it from the Masked Bob-white of Mexico and southern Arizona, a small species with black throat and cinnamon underparts.

A species of bird consists of a number of individual birds, ranging from a few score to hundreds of thousands, according to whether the species is rare or common. All of these individuals resemble each other very closely, usually varying only on account of age or sex, but differ as a group from every other species in a definite manner. For example, all individual Bob-whites of the eastern United States belong to one species, all Wild Turkeys to another, and so forth.

Many instances are known, however, where the individuals of a species living in widely separated regions differ very greatly in general appearance and habits. These forms might be termed separate species but for the fact that on the margins of their ranges they are found to intergrade or shade off into one another, thus making it practically impossible to identify the intergrading birds as belonging to either one form or the other. Often, in the country, between two forms which resemble each other very closely, there occurs a third

form, intermediate between the two and intergrading with them on the extremes of its range. From this intergrading we know that all belong to the same species, but that a change has been effected by the climatic conditions to which each has been subjected. These forms are called geographical varieties or **Subspecies**. For example, in different portions of the range of the common Bob-white, the birds are found to vary on account of geographical and climatic conditions. The form which occurs in the dry, arid portions of central and southern Texas is small and pale, quite different from the large-sized, normally colored Bob-white of the eastern United States. The form which occurs in moist, semi-tropical Florida is also different from the normal Bob-white, being small and very dark in color.

As an example of how subspecies intergrade, consider the occurrence of Bob-whites in central Texas. At Austin, none but the typical pale Texas Bob-white occurs. Northeast of Austin the birds are larger and darker, approaching the type of the Eastern Bob-white, and it is difficult, particularly along the Brazos River, to determine to which of the two forms these individuals belong. And when north and northeastern Texas is reached, individual birds are easily identified as typical Eastern Bob-whites.

Oftentimes these differences between individual birds of the same species are very trifling and hardly worthy of recognition. Still, for convenience in studying the relation between birds and their surroundings, and in observing the gradual making of subspecies into species in the course of evolution, constant differences, however slight, ought to be recognized and indicated in the name applied. Then, in the distant future, when the forms have become more distinctly different, the course of such differentiation can be carefully traced and its cause discovered.

Still another valuable use which can be made of the recognition of these geographical races of birds, is in the case of migratory species, where the naming of subspecies furnishes a means by which their wanderings can be accurately traced and the winter homes of birds from different sections can be determined.

This careful, detailed work of classifying and arranging birds into a huge, yet not unwieldy, system according to their blood relationships, is the work of systematic ornithologists, who comprise but a small division of the army of scientists striving to bring order and understanding out of the chaos of unknown things.

HOW BIRDS ARE NAMED

In order that information relating to birds may be recorded so that not the least doubt can exist regarding the identity of each bird to which reference is made, it is necessary that each kind or species of bird should have a distinct name by which it shall be known to bird students throughout the world.

It will be seen at a glance that common or popular English names or nicknames will not answer this purpose: often, in different portions of its range, a single kind of bird may be known by totally different names. These local names, not infrequently, as in the case of the common Flicker of the United States, number into the hundreds. In the New England States the Flicker is called the "High-hole," while in Texas it is called the "Yellow-hammer." The Bobolink of spring is the Reed-bird of autumn. The Water-turkey is used by most Southerners to name the Anhinga, but the name Water-turkey on the Texas coast is applied to the Mexican Cormorant. This careless application

of a common name to one bird in one region and to some other bird in another region causes frequent misunderstanding. For instance, consider the case of the Bob-whites and their near relatives. When a Texan mentions a Quail or Partridge, he is really thinking of a Bob-white. But the Californian would understand him to mean the Quail of the Southwest when he speaks of Quail, while the New Englander's Partridge is not the Bob-white at all, but a Grouse. The local name is easily remembered when used in a given locality, and is of value there—but it is worthless when used elsewhere.

Again, let us suppose that two ornithologists, each from some remote section of the United States, are discussing Hawks—of which approximately thirty different kinds are found in the United States alone—and one of these ornithologists wishes to convey to the other a bit of detailed information about a particular species of Hawk which he observed. He cannot use the popular English name, Chicken Hawk, for it is a very broad, indefinite term, applied to many different kinds of hawks in his own home region as well as in the home region of his naturalist friend. He must have a special name which the other will immediately recognize as belonging to one particular Hawk and to no other. He cannot use an English name, unless he gives it one, for the bird has none; and, even should he give it one, it would mean nothing to his friend.

For these reasons, we must look elsewhere for our system of bird names. Since the study of the relationship of birds is of world-wide interest, and a study which has existed through centuries, we find that the early students used the common language of European centers of culture—Latin. Besides being, along with Greek, the early language of science, Latin forms the basis of etymology—the science of the formation and derivation of words—and the foundation of the romance languages of the world. Therefore, Latin words are more easily understood by scientific workers of all countries than any other words which might be used. Hence a system of Latin names, or Greek names in Latin form, has in course of time been applied to the various groups and species of birds. This system of names is called **scientific nomenclature.**

The name of each group or grade division in the vast scheme of natural classification is carefully chosen, as indicated in the following illustration of the classification of a subspecies of bird, the Bob-white of the Austin Region, central Texas, and the nomenclature applied to such classification:

Kingdom, *Animalia:* Animals.
Phylum, *Chordata:* Animals with notochord or backbone.
Subphylum, *Vertebrata:* Back-boned, skulled animals.
Province, *Sauropsida:* Lizard-like, skulled animals.
Class, *Aves:* Birds, feathered and lizard-like animals.
Subclass, *Neornithes:* Modern birds.
Division, *Carinatæ:* Birds with keeled breastbone.
Order, *Gallinæ:* Hen-like birds.
Suborder, *Phasiani:* True fowls.
Family, *Odontophoridæ:* Bare-legged fowls without wattles or combs.
Genus, *Colinus:* Inconspicuously-crested fowls with variegated coloration everywhere.
Species, *virginianus:* White-throated kind found to be common in Virginia.
Subspecies, *texanus:* Pale variation found in Texas.

This nomenclature, although it tells the scientific zoologist much about the Bob-white and its relation to the remainder of animal life, is far too long for every-day use in referring to a bird. Therefore, only the most essential parts—those dealing with characters of structure and appearance in which no other bird shares—are considered in naming the bird.

The ordinary Latin or scientific name applied to an animal usually consists of two words. The first, used as a noun, is the **generic name**, or name of the genus to which the bird belongs, and designates a closely related group, just as "Smith" indicates a related group of people. This generic name is followed by a modifying adjective, the **specific name,** or name given to the species itself to distinguish it from all other species belonging to the same genus, just as we use "John" and "Henry" to distinguish the Smiths. This application of a two-word scientific name to a bird is called the **binomial system of nomenclature.** A careful scientist will use no other system, just as any exact person will refer to a Jersey cow instead of merely a cow, or to an Indian Elephant, or an African Elephant, instead of merely an elephant.

In cases where well-marked forms, varieties, or geographical races of a species are described, each such form, variety, or race bears the two-word name of the species; in addition, to distinguish it from all other varieties of the same species, it bears a third word in its name. This third word, which follows the specific name, is used very much as a third name is selected to distinguish between several John Smiths, as in a city directory we see the name "Smith, John James." This third distinguishing name is called the **subspecific name**, and the application of a three-word name to a bird is known as the **trinomial system of nomenclature.**

Thus we may expect in scientific literature to find all Bob-whites, as members of the same generic group, bearing the name **Colinus,** while the white-throated species alone will bear the name **Colinus virginianus.** In a similar manner, only the small, light-colored Texas form of the white-throated species of Bob-white will be known by the name **Colinus virginianus texanus.**

These Latin names, however, are not simply a mixture of alphabetic symbols. Each word has a meaning that, for its appropriateness, led to its application to a bird group. Examine, for instance, the following bird names, and note their descriptive qualities:

Florida Blue Jay.
Cyanocitta cristata cristata.
cristata—crested
cyano—blue
citta—jay, or chatterer

Golden-cheeked Warbler.
Dendroica chrysoparia.
chryso—golden
paria—cheeked
dendroica—tree dweller

Western Mockingbird
Mimus polyglottos leucopterus.
leuco—white
pterus—wing
poly—many
glottos—tongued
mimus—mimic

Red-headed Woodpecker.
Melanerpes erythrocephalus.
erythro—red
cephalus—head
melan—black
erpes—creeper

Following the name of the bird in technical literature, whether such name consists of two or of three words, is the name of the authority responsible for such name. Such authority is the naturalist who first described the species or subspecies so named. The use of

signifies that the late Captain Chas. E. Bendire, connected for many years with the United States National Museum, described this subspecies, and gave it the name which it now bears. Where the name of the authority is enclosed in parentheses, the name is not the same as that which such describer originally used to designate the bird; for instance, in using the name *Colinus virginianus texanus* (Lawrence), we know that George B. Lawrence described the Texas Bob-white, but that some later naturalist has found reason to change the generic name which Mr. Lawrence gave this bird in 1853. If we look up the original description, we find that the original name was *Ortyx texanus* Lawrence; during the past half-century, however, investigation has shown that all Bob-whites of the United States belong to the genus *Colinus*.

CLASSIFICATION AND NOMENCLATURE

The present report has, of course, been planned to enable the reader to locate, and identify with as little difficulty as possible, certain southwestern birds, particularly those found in the vicinity of Austin. With the attainment of that result in mind, information has been arranged, and technical terms have been simplified as much as terseness would permit. Yet, since the investigation has been carried on in a region where little ornithological work has heretofore been accomplished, the utmost care has been given to names used in designating the different birds discussed, to the end that the results may be of some use to ornithologists in other sections of the world.

Technical students of ornithology divide and subdivide the birds into a great many orders, families, genera, species, and subspecies, which at first sight confuse and discourage the general reader. This work of division is constantly going on, ever keeping step with the progress of taxonomic research. Specially trained men are working out the evolution of the general groups of birds and their proper relationships, constantly looking for help in the solution of their problems to the general zoologists whose knowledge is not limited to the Class *Aves*. Other specialists are concerned with the splitting of genera, the separation of species and geographical races, and the careful searching of literature for all names that have been applied to birds in the past. All of this work results in great instability.

Stability and universal acceptance of names and their arrangement, however, can only be attained after a long period of such constant change. Unfortunately, frequent change strikes discouragement into the enthusiasm of the beginner in bird study. Hence the question of expediency in the matter of classification and nomenclature to be used in a publication such as this is an important one.

(*a*) Classification

The classification adopted for use in this publication is that of the Third Edition of the American Ornithologists' Union *Check-List of North American Birds* (1910), the *Sixteenth Supplement to the Check-List* (1912) and the *Seventeenth Supplement to the Check-List* (1920); for the sake of uniformity, standard classification should, of course, be used in a general publication not dealing directly with the physical characters of birds or with their arrangement to indicate new ideas of genetic relationships.

In matters of generic splitting or division, or the raising of subgenera to generic rank, names in everyday use are affected. For this reason recognition is given in the present report to such changes in genera as are justified by recent careful investigations in avian anatomy. In every case where such changed name has been used, however, reference is made to the appendix, where the Check-List name will be found.

In their proper places, there have been included several newly described races or subspecies, upon which no ruling has yet been given by the A. O. U. Committee on Classification and Nomenclature of North American Birds, a judicial body established over forty years ago, somewhat inactive for the past decade, but recently reorganized and revivified by the selection of the following members: Witmer Stone, chairman; Harry C. Oberholser, secretary; C. W. Richmond; Jonathan Dwight, Jr. and T. S. Palmer. Several geographical races, which the Committee, with its general policy of conservation, has seen proper to reject, are also included, for the reason that in the opinion of various careful students of geographical distribution and variation, such forms are valid and worthy of recognition. The recognition of even the most minute differences may prove of inestimable value in the study of evolution; these slight differences may, as decades pass by, be accentuated, until they may lead to the formation of easily recognized subspecies, and so into well-marked species. For the benefit of the more conservative readers, reference numbers call attention to notes in the appendix where the nearest-related Check-List form is indicated.

As this publication is intended for the use of the popular rather than the scientific student of ornithology, and since it seems desirable to make it as brief as possible, the classification is not given complete. For further study of the classification of North American birds, reference is made to the A. O. U. *Check-List*, the sequence of which has been followed in this report.

(*b*) Nomenclature

The nomenclature, or system, of names used in this publication, is also that of the *Check-List* and its supplements, with such additions and corrections as have appeared from time to time in more recent publications. In any branch of biology, where systematic work is being considered, rapidly shifting nomenclature due to antiquarian research and to application of the Law of Priority, makes difficult the inclusion in any publication of all revisions to be found in scientific literature; from time to time an official list, or standard of names, is generally indicated in an effort to secure partial stability, and under normal conditions such standard is usually adhered to for a decade or more.

In ornithological nomenclature the standard is always the latest edition of the Check-List, together with such supplements as may be published during the interim between issues. A new Check-List is in course of preparation, and in it will be included many valid revisions which do not appear in the 1910 edition or in its supplements; because of this situation, and because of necessarily delayed action on the part of the A. O. U. Committee, it occasionally becomes necessary to ignore the standard list, and use the new name combinations. Such course has been found necessary in the preparation of the present report; in each case, however, reference numbers again lead to the appendix, where may be found the standard A. O. U. nomenclature, together with a discussion of needed revision; the use of such appendix is strongly recommended to those whose interest in birds is but casual or temporary, and those whose interests do not lie along lines of nomenclatural research, in order that use may be made of this report.

in connection with various more popular works on ornithology where older names are used.

It seems best in scientific work to comply strictly with the Law of Priority of scientific names, which holds that where doubt arises as to which of several synonymous names shall be applied to a zoological group or unit, the earliest published shall be adopted, and all later names be regarded as obsolete synonyms of such adopted name; provided, however, that such name shall be a binomial, a specific name linked with an identifiable generic group, of adequate designation; and, provided further, that generic names, or names of groups higher than the genus, shall not be used for any group of similar rank in the animal kingdom, and specific names shall not be used for any other species in the same genus; in case of prior use of an accepted name, that name shall be discarded, and the next available name in point of time shall be used. This law further holds that in the naming of groups or units there shall not be considered any name published prior to 1758, the date of publication of the Tenth or Standard Classification of Linnæus, the starting point of zoological classification and of the Law of Priority.

Because of paucity of detail in early descriptions, and resultant wrong identification by subsequent authors, numbers of bird names are still misapplied. Careful research in libraries and museums brings to light the correct identification of early described species. Frequently, as the result of such identification, it becomes necessary to change a name from one bird to another in order to follow the accepted rules of nomenclature.

The validity of some of the described subspecies, or geographical races or varieties of birds included herein is in dispute: some have been refused recognition by the more conservative ornithologists as well as by those who have no conception of the intricate problems of geographical variation and speciation. Such questions of classification can only be settled in course of time through careful study and comparison of large series of specimens, through investigation of mutations, or through modern methods of genetics. The fact that one man cannot distinguish differences of structure, shape, size, or color-tone noted by another may be a matter of observation or training; more commonly, it is a matter of misunderstanding as to the purpose and definition of the subspecies.

A subspecies, with the trinomial as its designation, is used to indicate a relatively small degree of difference from the type of the species, and perhaps based only on average characters. It is also used to indicate even more strikingly different forms which have been found to intergrade or blend in geographical or individual variation. Overlapping in certain portions of their range, where it will be exceedingly difficult to determine to which of two forms of the species a given specimen should be referred, is the basis of the subspecific theory of geographical races or varieties; the bridging over of differences by individual variation should always be found in such cases.

Geographic intergradation is not always necessary to constitute a form or subspecies; in the case of certain island birds, where intergradation with other races of mainland or other island is impossible because of isolation, overlapping of characters results in apparent "intergradation," with difficulty of identification unless locality from which the specimen came is known; understanding of the problem of speciation requires the recognition of such island races, not as species but as subspecies.

A seeming inconsistency arises here when we refuse to recognize, in a case where geographical intergradation is impossible because of isolation, the criterion of overlapping of characters for the recognition of

subspecific relationship between two forms separated by great distance and by other species of the same genus. An example of this is our refusal to recognize Dr. Hartert's listing of the Carolina Chickadee, *Penthestes carolinensis*, as a subspecies of an old world species, from which it is separated by the Atlantic and by other species of *Penthestes;* the overlapping of characters may be there, but it is a case of convergent or returning evolution working toward a common goal from two different species rather than variation within a species working toward the formation of two new species.

Some of our present-day subspecific forms are undoubtedly based on somatic variations due directly to the action of the environment, and hence are unstable, superficial, of no genetic or evolutionary value, and subject to quick disappearance where the organism is transferred to an environment of a different nature. Others are based on variations of genetic value, resulting from the accumulation of countless small mutations massed into prominence through cross-breeding within the mutating stock of unstable individuals. Professor F. B. Sumner's experiments with geographical races of *Peromyscus* mice in California, where a dark-colored race bred true after transference to the desert environment of a pale-colored race, have demonstrated the stability and permanence of subspecies bearing color characters.

In any case, however, the differences or apparent differences should be recognized in nomenclature, in order that the problems of ornithology may be attacked by the oncoming student, and some of the more serious phases solved through study of variation. Even though frequently misunderstood, the subspecies is of inestimable value when considered from this viewpoint.

It is not necessary, in a work of this character, to make reference to closely related subspecies found in foreign countries. Nevertheless, in case of the recognition of extralimital races of species with which we are concerned, and in which definite variation has not heretofore been found, a doubling of the specific name becomes necessary in order to give trinomial standing to our form, which is known as the first or typical race.

(*c*) Popular Names

In view of the fact that popular English names applied to each bird are principally for the convenience of the amateur, who has other and greater difficulties in his mastery of ornithology, careful choice should be exercised in their selection. A popular name should immediately call to mind some characteristic of the bird—appearance, song, habits, habitat,—anything by which the bird may be readily identifiable to the amateur. A short, easily remembered, everyday, American word is best, where such a word is possible. In any case, however, an effort should be made to secure a name which will, without reference to scientific terms, distinguish the bird from every other North American bird.

In the present report qualifying terms have frequently been placed before the names of species whose popular names might possibly be confused with those of other species or subspecies. A student must never forget that names are but the handles we use to grasp facts; careless names lead to confusion of facts, particularly in the West and Southwest, where ornithology is little known. The man of the West has his "Kingbird," but it is not the Kingbird of the Easterner who has published the greater number of bird books; if you compel him to call his bird the "Western" Kingbird, or "Arkansas" Kingbird, it is none the less fair to distinguish that eastern bird, which

would appear to him as unusual and far from common, by such a name as "Black and White" Kingbird; no matter the name used by careful observers, the ordinary man in either case will still continue to insist that his bird is *the* Kingbird.

Following modern scientific usage, the popular or vernacular names of birds, where they are exact in their reference, are begun with capital letters, a prominence which is justified in a report or work on birds because of the ease with which such names may be found among a mass of heterogeneous matter.

In the case of geographical races, the nominative instead of the adjective form has been adopted; for instance, "Texas" Woodpecker has been used instead of "Texan" Woodpecker. Modern scientific usage, however, has *not* been followed in the matter of common names of birds and beasts named after men who discovered them or in whose honor they were so named; dropping the possessive form and using the nominative causes frequent confusion, as in the case of the Bell Vireo and Cooper Hawk. "Black, White, Brown, Green, Gray; Hill, Pond, Moor, Marsh, Wood, Lake, Beach; Fish, Bush, Crane, Stone; Little, Strong, Swift, King, Small;—these and others of the same sort, are common surnames," says Gerald H. Thayer, "and as likely to belong to naturalists as to anybody else." The possessive *s* and apostrophe have, therefore, been used: for example, Bell's Vireo and Cooper's Hawk.

Popular names which have been rejected, and those which are merely of local interest, have in each case been listed in a paragraph toward the end of the biography of each species, where they are arranged somewhat in order of preference and popularity. Consulting such common names will frequently aid unornithological persons in making more easy their identification of certain puzzling birds.

WHO'S WHO IN AUSTIN ORNITHOLOGY

In order to make the historical portion of this report complete, it has been thought best to give a brief biographical sketch of each of the more important ornithologists, both amateur and professional, who have had some influence on the advances made in local ornithology.

Bailey, Florence (Augusta) Merriam,[1] 1834 Kalorama Road, Washington, D. C. Author; ornithologist. *B.* Locust Grove, N. Y., Aug. 8, 1863; *dt.* Hon. Clinton L. and Caroline (Hart) Merriam, and sister of C(linton) Hart Merriam, distinguished Chief of the U. S. Bureau of Biological Survey from 1885 to 1910, when he resigned to conduct investigations under the Harriman Fund; Smith College, Northampton, Mass., B.A. 1886; *m.* Dec. 16, 1899, to Vernon Bailey, Chief Field Naturalist of the U. S. Biological Survey for the past thirty years. Spent a few hours in and about Austin, Texas, on April 10, 1900, when she identified and took notes on 20 species of birds. Mem. Amer. Ornithologists' Union, Cooper Ornith. Club, Wilson Ornith. Club, etc. *Author:* Handbook of Birds of Western United States, 1902;[2] Birds of Village and Field, 1898; Birds Through an Opera Glass, 1889; A-Birding on a Bronco, 1896; and many other volumes, as well as numerous papers in scientific and popular ornithological journals.

Benedict, H(arry) Y(andell),[3] 3401 Guadalupe St., Austin, Texas. College dean; author; naturalist. *B.* Louisville, Ky., Nov. 14, 1869; *s.* Joseph and Adele (Peters) Benedict; moved to Young Co., Texas, in 1877, and there in 1884 began study of birds and collection of their nests and eggs; entered Univ. of Texas, 1889, discontinuing active field work, though retaining interest in ornithology through subsequent years; Univ. of Texas, B.S., 1892, and M.A., 1893; Univ. of Va., McCormick Astronomical Observatory assistant, 1893-5; Harvard, 1895-8, Ph.D., 1898; Baylor Univ., LL.D., 1921. *M.* Ada Stone of Henderson, Texas, June 27, 1900. Fellow in pure mathematics, 1891-2, and tutor in pure and applied mathematics, 1892-3, Univ. of Texas; instructor in charge, mathematics and astronomy, Vanderbilt U., 1899; University of Texas, instructor in applied math., 1899, adjunct professor, 1899-1902, associate professor, 1902-7, professor, 1907-, director Dept. of Extension, 1909-11, and Dean of College of Arts (Main University) and dean of men, 1911-. Has observed birds about Austin during his years of residence, 1889-93 and 1899 to date, particularly during earlier period, when he and fellow student, Chas. D. Oldright, planned State list of Texas birds. Fellow A. A. A. S.; mem. Amer. Math. Soc., Soc. Promotion Engineering Edu., Phi Beta Kappa, Sigma Alpha Epsilon, etc.

Brinkmann, Otto, 1606 Lavaca St., Austin, Texas. Fireman; fire prevention. *B.* Austin, Texas, Dec. 10, 1866; educated in Austin public schools; began collecting single eggs of Austin birds in 1882, soon becoming dissatisfied with and discontinuing that form of collecting; resumed active collecting in 1887, from then until middle '90s an enthusiastic collector of full sets of carefully prepared eggs with complete data, exchanging with Ingersoll of California, Raine of Canada, and many other famous collectors; particularly interested in birds of Barton Canyon and of the country west and southwest of Austin; good observer, though he has done no collecting for twenty-five years.

Brown, T(imothy) A(lvin), 803 West 23rd St., Austin, Texas. School teacher; naturalist. *B.* near Marion, Va., Nov. 14, 1856; *s.* Levi and Elizabeth (Atkins) Brown; four years, 1868-1872, spent on grandfather's farm, where interest in nature study was first aroused; educated, Marion High School; Hiwassee College, Tenn., graduating 1882; Univ. of Texas, special courses of study; *m.* Mary Rebecca Robertson of Williamson Co., Texas, June 24, 1885. Elected in 1892 to position of Principal, West Austin (now "Pease") Ward School, Austin; position held without break to present time; endeavors by frequent lectures and demonstrations and countless exhibits to arouse interest in nature among the thousands of ward school pupils who come under his direction, a public service of inestimable benefit in moulding character and making for better citizens.

Crenshaw, B(enjamin) Mills, 101 West 30th St., Austin, Texas. Merchant; captain United States Army. *B.* Terrell, Texas, July 6, 1894; moved to Austin 1896; became interested in birds and the collecting of their eggs, 1904, but discontinued collecting several years later; Mexican border service with Texas National Guard at Sam Fordice from May, 1916, to February, 1917; stationed Corpus Christi, Texas, February, 1917, to March 31, 1917; in May attended first Officers' Training Camp, where received second lieutenancy; September, 1917, went overseas with Second Division; landed N. Y., March 9, 1919; well acquainted with the more common land birds, enthusiastic hunter with fair knowledge of commoner water birds.

Farr, Thomas James, 300 E. 12th St., Austin, Texas. Traveling salesman; druggist. *B.* Austin, Texas, February 3, 1882; educated in Austin public schools; became interested in collecting bird eggs in 1894; collected on the south and southeastern edges of Austin for several years; early entrance into business compelled his discontinuing active field work; still maintains interest; careful observer and true sportsman; druggist at Austin until September, 1915; returned to Austin September 19, 1917, and again in June, 1923.

Green, Edward K.—Mr. Green had been a diligent collector for several years, and was becoming well known to the ornithological fraternity, when he died at his home in Austin, Texas, on the second day of February, 1891, at the age of eighteen.

Holden, Oliver F(ranklin), Aldridge Place, Austin, Texas, and Garden City, New York, Journalist. *B.* Dallas, Texas, April 24, 1895; *s.* Thomas Steele and Nellie (Wylie) Holden, former dead for many years, latter now Mrs. A. P. Wooldridge; moved to Austin, 1904, and educated in public schools, graduating from Austin High School, 1913; attended University of Texas and Columbia University; rather careful observer of nature; military service, border duty with Troop C, Texas Cavalry, at Laredo and in Big Bend of Rio Grande, beginning June 13, 1916; commissioned provisional Second Lieut., March 22, 1917; transferred to Provisional Officers' Battalion, Fort Leavenworth, Kan., April 15, 1917; sailed for France, June 12, 1917, with Sixteenth Infantry; landed at St. Nazaire, June 26, 1917, and promoted to First Lieut., infantry; promoted to Captain, infantry, Sept. 5, 1917; wounded July 18, 1918, near Soissons, in Second Battle of the Marne, or "Chateau Thierry"; patient on hospital ship, from Brest to Newport News, Oct. 9 to 24, 1918, and returned to San Antonio for convalescence, Nov. 11, 1918; retired for wounds, Nov. 24, 1919; newspaper reporting, New York *Times* and *Sun*, 1919 to 1921; reporter and assistant city editor, San Antonio *Express* and *Evening News*, 1921 to 1923. Member Amer. Econ. Assn.; Fellow, Royal Econ. Soc. of Great Britain; Army and Navy Club, New York. Contrib.: New York *Sun* and *Times;* Baltimore *Sun*, Philadelphia *Public Ledger*, various magazines and other newspapers.

Howell, Arthur H(olmes),[4] 2919 S. Dakota Ave., Washington, D. C. Naturalist. *B.* Lake Grove, N. Y., May 3, 1872; *s.* Elbert Richard and Anne Judson (Holmes) Howell; educated Brooklyn (N. Y.) schools, graduating Brooklyn High School, 1888; *m.* Grace Bowen Johnson of Washington, D. C., June 20, 1900. Asst. Biologist, U. S. Bureau of Biological Survey, since 1895; in charge of explorations in Texas, 1893, summer and fall of 1905, September of 1906, and February 11 to April 24 in 1907, pursuing field investigations in central and southeastern Texas with reference to relation of birds to the cotton boll weevil, which was then spreading rapidly into the United States from Mexico and doing much damage to the crops of Texas. Stopped off for field trip about Austin with Prof. T. H. Montgomery, Jr., February 10, 1907. Member American Orn. Union, Amer. Soc. Mammalogists, Cooper Orn. Club, Biological Soc., Washington, etc. Author of many scientific papers, including Birds of Arkansas, 1911; Biological Survey of Alabama, 1921; many revisions of mammals, found in Government reports.

Kirk, Louis H(arry), 2511 Rio Grande St., Austin, Texas. Physician and surgeon. *B.* Austin, Texas, July 1, 1877; *s.* John Palmer and Kathrine (Nugent) Kirk; although Protestant, attended Catholic school until 1892; business college, year and a half, graduating 1893; Bickler School, Austin, and Carrington Preparatory School; University of Texas, B.S., 1900; University of Texas Medical College at Galveston, M.D., 1903; Assistant Superintendent, Texas State Insane Asylum at Austin, 1903-1906; general practice in Austin since 1906; *m.* Helen McDonald, McKinney, Texas, February 7, 1907. Careful observer and enthusiastic hunter; collected eggs of Austin birds from 1889 to 1897, discontinuing active work on entrance into University of Texas. Member Amer. Medical Association, Texas State Medical Association, Masons (32° and Knight Templar), etc.

Kofahl, Harry J(oseph),[5] 311 E. First St., Austin, Texas, and San Diego, Cal. Printer; barber. *B.* Austin, Texas, May 7, 1886; *s.* Christian and Charlotte Kofahl; educated in Austin public schools until 1904, learning printer's trade, which he followed until protracted strike caused him to enter his father's shop in Austin and learn barber's trade; left for Pacific Coast in September, 1909, living in British Columbia, California, and Oregon. Began keeping data with a few sets of eggs collected during late '90s; thoroughly explored Austin Region for nesting birds in company with A. E. Schutze and Elton Perry, Jr., actively collecting nests and eggs from 1905 to 1909, his nesting records of Austin birds being very valuable.

MacLaughlin, Guy, Franklin Life Ins. Co., Houston, Texas. Insurance manager. *B.* Galveston, Texas, March 11, 1873; moved to Austin in 1875, later attending Bickler's Texas German and English Academy, acquiring an interest in birds and nature study from Professor Jacob Bickler, who customarily took boys of entire school for long walks and outings in woods and fields on Saturdays; at early age began studying nesting habits, and collecting and studying birds and eggs in vicinity of Austin; moved to Houston, Texas, 1896, engaging first in typewriter business, and then in newspaper business, with considerable traveling; Spanish-American War service, enlisting with Houston Light Guard, promoted to regimental clerk, then brigade clerk, and finally chief clerk, First Division, Seventh Army Corps, under Adjutant General Benjamin Alvord, Adjutant of the A. E. F. during the World War; on return to United States, traveled out of New York for four years, Chicago one year, and San Francisco four years; returned to Houston, where he has lived since 1908, as general agent, Franklin Life Ins. Co.; now South Texas manager for that company, with supervision of work in sixty Texas counties; Chief of Registration at Houston, and member of Bureau of Investigation, World War. Good newspaperman, and writer of poems for New York press and others.

Montgomery, T(homas) H(arrison), Jr.,[6] Zoologist. *B.* New York City, N. Y., March 5, 1873; *d.* Philadelphia, Pa., March 19, 1912; educated in the Episcopal Academy of Philadelphia, University of Pennsylvania, University of Berlin; Ph.D., Berlin, 1894; assistant professor of zoology, University of Pennsylvania, 1898-1903, professor 1908-1912; professor of zoology, University of Texas, 1903-1908; enthusiastic and accomplished ornithologist; conducted classes in ornithology during four years at Austin. Dr. Conklin, his biographer, found no data on Austin birds among his papers and notebooks, and Mrs. Montgomery does not recall that he ever kept any records of his observations while

living at Austin; see Dr. Conklin's admirable account of the life and works of this fine naturalist for further details. Conklin, Edwin G., Professor Thomas Harrison Montgomery, Jr. Science, N. S., Vol. XXXVIII, August, 1913, pp. 207-214.

Nehrling, Henry, Gotha, Fla. Author; ornithologist; botanist. *B.* Howard's Grove, Sheboygan Co., Wis., May 9, 1853; *s.* Carl and Elizabeth (Ruge) Nehrling; grad. Teachers' Sem., Addison, Ill., 1873; *m.* Sophia Schoff, Oak Park, Ill., July 20, 1874 (died Nov. 7, 1911); second, Mrs. Betty P. Mitchell, of DeKalb, N. Y., June 7, 1916. Visited Austin, Texas, and Lee County, Texas, in March, 1879. Moved from Houston to Lee County in May, 1881, and left Texas at the beginning of October, 1882. Deputy collector and inspector customers, Milwaukee, 1887-90; secretary and custodian Pub. Mus., Milwaukee, 1890-03. Investigator in ornithology, botany, horticulture; specialist in ecology of N. Am. birds; collaborator Bur. Plant Industry, U. S. Dept. Agr.; Fellow Am. Ornithologists' Union; mem. German Ornith. Soc. (Berlin), Wis. Acad. Sciences, Arts and Letters, Audubon Soc., Wis. German History Soc., Nat. Geog. Soc.; hon. mem. Wilson Chapter Agassiz Assn. (now Wilson Orn. Club). *Author:* Die Nordamerikanische Vogelwelt, 1891; Our Native Birds of Song and Beauty (2 vols.), 1893,[7] 1896;[8] Die Amaryllis, 1908. Extensive contributor to American, German and English ornithological, botanical, and horticultural journals.

Oberholser, Harry C(hurch),[9] [10] U. S. Bureau of Biological Survey, Washington, D. C. Ornithologist. *B.* Brooklyn, N. Y., June 25, 1870; *s.* Jacob and Lavera S. Oberholser; Columbia University, 1888; B.A. and M. S., George Washington University, 1914, Ph. D., 1916; *m.* Mary Forrest Smith, June 30, 1914. U. S. Bureau of Biological Survey, ornithologist, 1895-1914,[11] [12] Assistant Biologist since 1914; Professor of Zoology, Biltmort (N. C.) Forest School, 1904-1910; Professor of Ornithology, Pa. Summer School for Teachers, 1914. Conducted explorations in Texas for Biol. Surv., 1900-1902; studied birds of Austin, Sept. 23 to Oct. 4, 1902; for over twenty years has worked on report on Birds of Texas, not yet published. Fellow, Amer. Association for Advancement of Science and American Ornithologists' Union; member, Wilson Orn. Club, Cooper Orn. Club, Amer. Soc. Mamalogists, Ecological Soc. of America; Vice President, Biological Society of Washington; honorary member and member, ornithological and natural history societies throughout all leading countries of the world. Author of thousands of monographs and papers on birds in Auk, Proc. U. S. Nat. Mus.,[13] Wilson Bull., and other journals.

Oldright, Charles Durand,[14] Zoologist. *B.* Austin, Texas, June 23, 1872; *d.* Austin, Texas, January 19, 1896, at age of 23; family moved to Waco, and lived there until 1888, when Charles returned to Austin to enter University of Texas; showed aptitude for natural history from early boyhood, collecting birds, nests and eggs in both Waco and Austin; educated principally at home, practically self-taught when he entered the University; during summer between school years worked on the U. S. Geol. Survey in Texas; member class of 1892;[15] June, 1893, engaged in marine biological work with party of zoologists in the Bahamas; after six weeks of study went from there to Germany, where two years were spent in work in the Universities of Breslau and Munich; in 1895 his mother became very ill, and he returned to Austin, fall, 1895; accepted position as assistant of biology and continued here until his death; diligent collector and careful student, especially of geographical distribution, and always cherished taste for ornithology; sent in mi-

gration records to Biological Survey in 1890; left among his papers manuscript list of Austin birds; while he was in Germany bird specimens became moth-eaten and were destroyed; egg collection data lost after death, as well as many notes, diaries, and papers; member several ornithological clubs.

Perry, Elton, Jr.,[16] [17] 610 Baylor St., Austin, Texas. Dental surgeon; naturalist. *B.* Austin, Texas, June 5, 1873; *s.* Elton and Mary Ann (Smith) Perry; second of five children, from old Southern family; father an expert machinist, wished son trained for business; after finishing public schools of Austin he attended business college two years, finally determining to make dental surgery his profession; apprentice in local dental office for year and half; Baltimore College of Dental Surgery, Baltimore, Md., 1891-1894, graduating with unusual honors and degree of D.D.S.; began practice in Gloversville, N. Y.; *m.* Eugenia Van Slyke of Gloversville, N. Y., April 1, 1896; New York City, 1897-1899, practice of dental surgery; Bridgeport, Conn., 1899-1904, intensive practice, both day and night, with breakdown in health and operation for appendicitis, resulting in retirement and final return to Austin in March, 1906. Fondness for natural history acquired during school days, wandering about woods and fields surrounding Austin, early amassing a small collection of single eggs of Austin birds, though his methodical mind was early dissatisfied with that form of collecting; during vacations, while at Baltimore, roamed farm meadows near Baltimore; at Bridgeport, Conn., became friends with Jesse C. A. Meeker and the late Henry W. Beers, and collected eggs extensively with them in Connecticut, New York, and Maine; planned cruise of Florida waters, making several trips to New York City to consult with Dr. Frank M. Chapman of the American Museum of Natural History as to necessary equipment; trip given up on breakdown of health; two trips to Texas, with considerable field work, February, 1901, to March 27, 1902, and December 9, 1904, to August, 1905, physician's instructions keeping him in the open as much as possible; acquaintance in 1904 with Dr. Louis B. Bishop of New Haven and Dr. Jonathan Dwight, Jr., of New York City, both Fellows of the American Ornithologists' Union, led to collecting study skins of birds, many of his Texas specimens now resting in the Bishop and Dwight collections. Vast amount of material collected in and about Austin, numerous notes recorded, and many fine photographs of birds and their nests taken.[18] [19] Associate member, American Ornithologists' Union, 1902-1912.

Schutze, Adolph Emil,[20] R. F. D. No. 5, Barton Road, Austin, Texas. Linotype operator. *B.* Austin, Texas, Feb. 8, 1885; became interested in egg collecting in 1897, and gradually took up other branches of the study; in 1900 began a systematic study of nesting habits, collecting full sets of eggs and keeping notebooks on Austin birds;[21] for next few years was an enthusiastic student and photographer of birds, nests, and eggs; in 1904,[22] at the age of 19, Mr. Schutze was compelled to leave school and enter business; education was received in Austin Public Schools; after leaving school his time became so involved that he has since been unable to resume his study of birds; his interest, however, he still maintains; unfortunately, in limiting the present paper to the Austin Region, Mr. Schutze's most interesting notes are excluded, for he selected as the field for his summer work a section just outside of but joining the Austin Region on the southeast, in Caldwell and Bastrop Counties; portions of 1909 to 1913 were spent on the Pacific Coast; *m.* Bertha Sterzing of Austin in 1914.

Sterzing, Herbert Frederick, El Paso, Texas. Physician and surgeon. *B.* Austin, Texas, July 23, 1875; *s.* Fred and Agnes (Pressler) Sterzing; *m.* Emma Maud Holtzmann, 1906. Attended public and private schools at Austin; Univ. of Texas; M.D., Medical College of Univ. of Texas, Galveston, 1900. Interne, Sealy Hospital, Galveston, 1900-1901. Settled at Austin, Texas, to practice medicine, 1901. At age of 14 began collection of birds' eggs, keeping careful data, and using care in preparation of eggs. After college entrance spare time spent in study of birds. Published "The Naturalist" at Austin, later transferring this publication to the "Oregon Naturalist." Time now filled by active practice, with little time for bird study. Removed to El Paso, 1915, on account of climate. Address: Supt. County Hospital, R. F. D. No. 1. Box 220, El Paso, Texas.

Stiles, E. P., Austin, Texas. Doctor. Contributed records on bird migration at Austin in 1888, to the files of the Bureau of Biological Survey.

Tallichet, J(ules) H(enri),[23] 3220 Fannin St., Houston, Texas. Lawyer. *B.* Nashville, Tenn., April 20, 1877; moved to Austin, Texas, November, 1884; educated in Austin public schools. University of Texas, Academic 1895-1898, Law 1898-1901, LL.B. 1900, LL.M. 1901; general practice of law, Austin, 1901-1909; moved to Houston, May, 1909, to become member of firm of Baker, Botts, Parker & Garwood; now General Attorney for Sunset Central Railroad lines. Became interested in bird study at early age, attracted to investigation of migration and general habits, as well as to collecting of birds and eggs; migration records from Austin contributed to Biological Survey files for three years, 1892-1894; extensive study of Austin birds, gradually discontinued with increase of legal interests.

Taylor, W(illiam) S(eptimus),[24] [25] Pennsylvania State College, State College, Pa. College professor. *B.* near Beaver Dam, Ky., January 20, 1885; University of Kentucky, B.S., 1912; University of Wisconsin, M.S., 1913; Associate Professor and Chairman, School of Agricultural Education, University of Texas, at Austin, September 13, 1913, to February 1, 1918,[26] [27] with leave of absence from February 1, 1917, to August 17, 1917, to attend Teachers College, Columbia University, New York City; Professor of Rural Education, Cornell University, Ithaca, N. Y., February 1, 1918, to April 1, 1918; Professor of Agricultural Education and Chairman of Department of Rural Life, Pennsylvania State College, since April 1, 1918, with special duty in charge of agricultural education work in seven Western States with Federal Board for Vocational Education during 1919. First became interested in birds from an economic point of view in study of agriculture, studying birds in Kentucky, Wisconsin, Texas, and New Jersey; many lectures on economic value of birds given in Wisconsin and Texas;[28] enthusiastic observer, though field work necessarily carried on in spare moments.

Warren, William Henry,[29] East Texas State Normal College, Commerce, Texas. School teacher. *B.* near Redland, Pontotoc County, Miss., Sept. 18, 1871; moved to Hill County, Texas, 1895; to Matagorda County, Texas, 1897; returned to Hill County in 1898, where he taught in rural and village schools from 1900 to 1910; graduated from State Normal School at Denton, Texas, 1912; again, 1915; principal, Plainview High School, 1912-1913; assistant to Secretary of Denton Summer

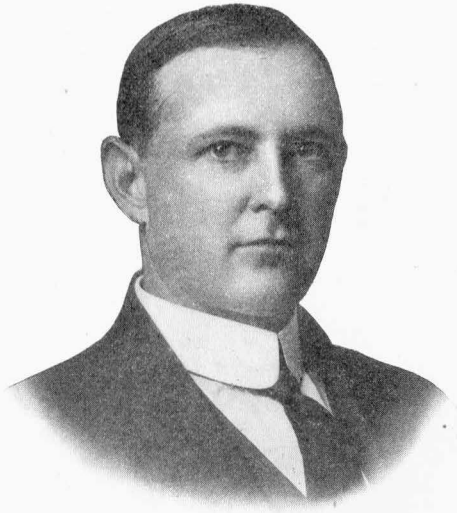
Normal summers of 1913-1915; special study, Univ. of Texas, 1913-1914 and 1915-1916; taught in Univ. Summer Normal, 1916; assistant School of Agricultural Education, Univ. of Texas, 1916-1917; summer school teaching, 1917; September 1, 1917, to December 15, 1917, teaching at South Park School, Beaumont; Associate Professor of Agriculture, East Texas State Normal College, Commerce, Texas, since December 16, 1917; became interested in bird study in Matagorda County, Texas, in 1898, and has since continued his observations; began keeping careful and systematic notes in 1914; has full records and census of birds through 1917, nesting census; enthusiastic observer.

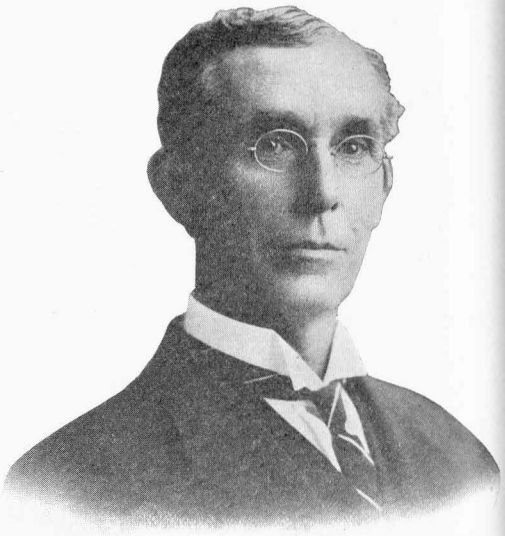
H. G. Benedict.

Thos. H. Twitty County C.

Adolph E. Schultz

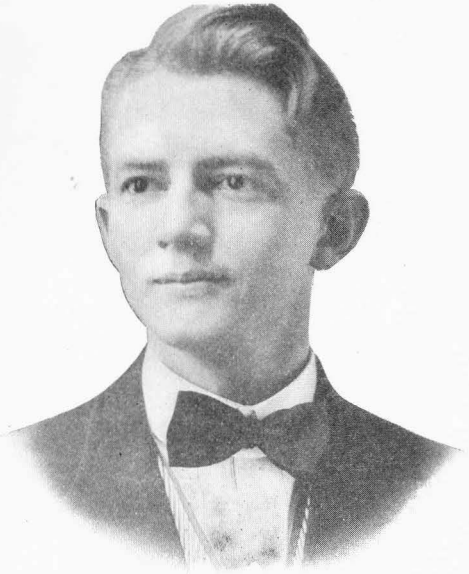
W. H. Warren.





H. F. Sterzing

Elton Perry Jr.



Harvey J. Kofahl.

BIRDS OF THE AUSTIN REGION

AMERICAN EARED GREBE

Colymbus[30] *nigricollis californicus* (Heermann)

Very rare migrant, probably occurring very irregularly in summer; doubtless moves southward from middle September to late October; in spring, moves northwestward most commonly about April 5 to 10. Pair observed April 6, 1919 (A); April 10, 1922, male shot by local hunter (A). *Recorded:* A.

Geographical Distribution.—Western North America, breeding southward to Nebraska, middle Texas (Mitchell's Lake near San Antonio), northern New Mexico, and southern California; from the Great Plains west to the Cascades and Sierras. Winters in Mexico and Central America, north to central Texas (San Antonio), central California, and the Pacific Coast of western United States.

Habitat.—Inland shallow marshy lakes of the western plains; larger bodies of water, particularly rivers, lakes, and sloughs.

Local Haunts.—Lake Austin and its backwater sloughs.

General Habits.—Not a shy bird like other grebes. Glides through water with scarcely a ripple, or moves stealthily in and out among the tules and rushes. To gain impetus for deep-water diving, it frequently leaps into air and plunges straight down, diving with closed wings and probably swimming under water by using only its feet. The only grebe which nests in close dense colonies or populous and thickly-settled grebe communities, often containing scores to hundreds of birds, nests almost touching, with only narrow lanes of water between them. Birds in these colonies live quite peacefully, swimming slowly along the narrow channels of the colony or perching on their nests. At the approach of danger the birds slip off their nests and swim slowly away; prefer to come to surface and watch from safe distance rather than remain under water or skulk in reeds; birds from a colony will form a closely-massed flock and watch the intruder as they swim slowly about on the open water. Nests are everywhere thick in such a colony, which Dr. Herbert K. Job has aptly termed "cities of the submerged tenth." Grebe-like, the parent conceals the eggs with debris on leaving the nest; many have claimed that this is an incubator idea, the bird leaving the eggs to hatch from the heat generated by decaying vegetation of the nest or by the sun's rays, which could not be, however, for the nests are wet and always cool and the eggs cool below from the cold water in which they are placed; both birds take turns in incubation, which is industriously carried on and which lasts for about three weeks. When they climb upon them, the birds tip their flimsy nests precariously; there they incubate or lie on one side with a foot slowly waving in air, basking in the sun. Baby grebes just out of the shell and only half the size of a chick can dive and swim skillfully about. By rising in front, parents submerge the posterior portion of their bodies, and young grebes scramble aboard for a ride to safety; taking on an additional infant, parent occasionally dumps whole brood into the water; swimming about in water, adult shelters young alongside with partially raised wings. Formerly killed in great numbers during the breeding season by market hunters for millinery trade, breasts being used for ladies' capes, muffs, and hats; and for years their eggs were taken by thousands and salted down in barrels for food.

Feeding Habits.—Dives for its food. Consumes immense numbers of dragon-fly nymphs, on which young are also fed; devours various species of water insects and their larvae, many of which are harmful;

also takes a very few small frogs, shrimps, tadpoles, beetles, and bits of various water plants.

Flight.—Seldom seen in flight, preferring to submerge gradually or to dive like a flash, or else to swim smoothly and easily away from danger. Usually seen in flight only when migrating; rises from water easily and flies swiftly.

Courtship.—Usually mated before arrival at breeding grounds. Courtship takes place between sunset and darkness, when night animals are beginning to awaken.

Breeding.—Possibly, late April to early July.

Nest Location.—Floating in shallow water 1 to 3 feet deep among flags and rushes, usually in small patch of comparatively open water about 50 to 100 feet across, in sheltered nook where it will not be destroyed by wind or waves; almost always in open situations, with no apparent attempt at concealment.

Nest Construction.—Floating green raft of grasses, rushes, rotten reeds, old flag leaves, water mosses, and other water-soaked vegetation, flimsily and carelessly constructed of about a handful of material, and usually attached to rushes. Almost submerged, smaller and less elaborately built than nests of the Pied-billed Grebe. Building commenced with a number of stems of long marsh grass, laid in triangle with ends crossed to keep them from floating apart; a second triangle across the first, to make a five- or six-pointed star, moored by stems of grass left growing between the points; on top of this the very flat nest proper is built of mud and moss, usually brought up from the bottom; cavity slight, but due to partial submergence it is usually filled with about an inch of water.

Nest Measurements.—Outside, diameter 12 to 14. Inside, diameter 5 to 6, depth 1 to 2.

Eggs.—4 to 8, rarely 3 or 9, usually 4 to 5, elongate, bluish white, often soiled to a brownish-buff by wet nesting material, with pieces of vegetation usually adhering to eggs; indistinguishable from those of the Pied-billed Grebe: 1.75 × 1.16.

Voice.—Courtship calls, deliberate mellow *poo-eep poo-eep*, with a gently rising inflection; or an excited *hicko rick up, hicko rick up, hicko rick up.* A loud, musical *hoy-ee-up, hoy-ee-up*, carrying far across water. Calls suggestive of those of the Pied-billed Grebe. In fall migration, each bird utters a short, high-pitched, harsh *wa-a-a*, a migrating flock on the wing or at rest making a noise like the honking of a flock of Snow Geese. Young grebe, a chick-like *cheep*, growing louder and clearer as the bird increases in size. Rasping shrill calls and piercing cries.

Description.—Back, crown, chin, neck all around, and breast, black; reddish-brown or wine-red side and wash across breast; silvery-white belly; black ruff-feathers standing out across back of head. Chocolate-brown primaries, with white secondaries. Conspicuous long, tawny ear-tufts, fan-shaped against a black background, spreading more behind and slightly below eye (instead of above, as in Horned Grebe), giving them the appearance of ears. Short, straight, sharp-pointed black bill. Iris, orange. Feet, pale blue. In fall and winter, without ear-tufts; with white chin and throat, black sides to neck, and slaty sides and flanks; acquired by molt about August and lost by molt beginning about December or slightly later. Downy young, dusky head, glossy black back, white under-parts; spotted or striped white on head, striped grayish or brownish on shoulders; shading pinkish-buff on breast and throat and dusky on sides. L. 13. W. 5.30, or less. B. 1.

Field Marks.—Slender, graceful, bob-tailed, short-winged bird, with pointed crest and (in summer) light ear-patch; silvery-white belly shows as it dives; feet attached at rump. Slender shape of head and neck held straight up, long pointed crest usually erected; quite different from smooth head of Pied-billed or round fluffy head of Horned Grebe. Straight, sharp-pointed bill, blackish, depressed, at base wider than high (that of the Horned Grebe being compressed, higher than wide). In winter, darker back and head.

Popular Names.—Hell-diver; Little Eared Grebe; California Black-necked Grebe; Crested Grebe.

PIED-BILLED GREBE

Podilymbus podiceps podiceps[31] (Linnæus)

Uncommon and irregular migrant and winter resident, more common during fall; extremely rare in summer; migrating, March and April, and late August to early October; August 7, 1915, early migrant shot (B). *Recorded:* ABCGLMNPQR.

Geographical Distribution.—North and South America, breeding from southern Canada south across the United States to the Gulf Coast and the Pacific, and through Middle and South America to Argentine Republic and Chili; rather local in distribution, particularly southward. Winters from southern part of United States southward.

Habitat.—Quiet, reedy pools and ponds, or other bodies of fresh water in more secluded sections, particularly where banks are shielded by grasses and rushes; flooded buttonbush thickets; pasture land waterholes; usually quiet, more or less open, water in rivers, creeks, sloughs, and ponds. In migrations, small sheltered ponds and streams of comfortable seclusion, with protective vegetation on overhanging banks or with nearby shoreline cover of bushes, reeds, and grasses.

Local Haunts.—Along Shoal Creek; in small marshy lake, now drained, in eastern edge of Austin; rarely, rush-grown sloughs along Lake Austin. In migrations and winter, Colorado River, especially between Avenue and Montopolis bridges, and on Deep Eddy and Lake Austin; Barton and Shoal creeks, and the mouth of Bull Creek; backwater sloughs along Lake Austin; small cattle tank ponds or waterholes in the blackland prairie area near Austin and Delvalle.

General Habits.—Very shy water bird, usually seen singly or in pairs, occasionally in family parties in fall, at which season it rarely assembles in large close flocks or associates with ducks and similar water-fowl. Skulks near banks or in some sheltering nook with only its bill showing above water; swims slowly about, half submerged, perhaps only head and neck showing; dives at intervals in open water near the middle of creeks and ponds; and perhaps gradually sinks backwards and disappears beneath the surface without a ripple. As it swims about, it nervously lowers its flat, snaky head, sometimes rising or turning in such a way as to show its white grebe-breast or belly. Occasionally crawls out on lily pads or in shallows to preen.

Home Life.—Nests in small scattered colonies, only a few pairs to each slough. One of the shyest of grebes, slipping from nest on slightest alarm, and keeping well out of sight; when it has time to do so, the departing bird hides its eggs by covering them with some of the soft dead vegetation of the nest. Parents take turns incubating the eggs, which hatch after 23 or 24 days. When danger approaches a nest containing young grebes, the parent on guard stays at close range, beating and slapping the water with wings each time after coming to surface from repeated short dives. Newly-hatched young frequently leave nest almost before down has dried, and swim, dive, double, periscope with only bill above water, and lie concealed in bunches of water weeds, with all the agility and cleverness of their parents, though necessarily on account of their youth they can stay under water but a few seconds. Parents force young, which obey

willingly enough, to climb to parental backs for transportation to safe distances; occasionally they hang on tenaciously and the parents dive and come up again with them still in place.

Hunting Responses.—At the flash of a gun the little Pied-billed Crebe dives beneath the surface of the water with a quick forward plunge, vanishing mysteriously, disappearing as if by magic, gone by the time the shot spatter the water. Then it swims some distance under water, coming up after an incredible time to breathe again and plunge once more beneath the surface. Eventually it may slide in among rushes, where it rests in concealment and watches the nonplussed hunter. Audubon, the famous naturalist, says that it uses both wings and feet in swimming under water.

Feeding Habits.—Feeds in fresh-water ponds and streams, where it secures small fish, small frogs and tadpoles, aquatic worms and insects, snails, leeches, and a few seeds and bits of soft water plants, all of which it secures by means of its expert diving. Only when its fresh-water hunting grounds have been frozen over does it take to the bays, bayous, and brackish lagoons for small fish and shrimp.

Flight.—Though extremely clumsy and awkward on land, where it rarely strays, resting back on its heels and almost never walking, the Pied-billed Grebe is a strong, rapid, straight-line flyer, speeding with neck and legs outstretched; when about to rise in flight from the surface of the water, it runs rapidly along, with much splashing, until it has secured sufficient speed to rise on its small wings; this bird, like other grebes, is apparently unable to start its flight from the ground.

Courtship.—The male displays for the female by actively rushing about, pattering or splashing over the surface or diving and coming up close by, softly cooing the while.

Breeding.—Probably May to late August, though no nest has been discovered in the Region. Doubtless only one brood.

Nest Location.—Anchored among tules, rushes, or buttonwood bushes, in shallow water 1 to 3 feet deep, in some secluded, reed-grown slough, creek, or pond; sometimes well concealed in clumps of reeds, though usually easily seen for a distance of several rods.

Nest Construction.—Floating, slimy, raft-like pile of soft, water-soaked and decaying reeds, flags, rushes, and grasses; occasionally with a few green flags mixed in, and the whole plastered together with soft green vegetable scum; when in shallow water the nest is usually placed on a subsurface mass of dead aquatic vegetation piled up from the bottom.

Nest Measurements.—Outside, diameter about 12, height above water about 2 to 4. Slightly hollowed on top, usually with eggs partially buried in mass.

Eggs.—4 to 8, elliptical-oval, usually smooth though sometimes dotted with tiny shell-lumps, soiled bluish-white or pale olive-white to brownish-white or deep buff, unspotted, but more or less stained by the decaying vegetation with which the grebe covers them on leaving the nest: 1.70×1.17.

Voice.—Generally silent except during the breeding season. A rather loud, rarely heard, sonorous *cow-cow-cow-cow-cow-cow-cow*, quite cuckoo-like, and sometimes brought to a close with *cow-uh, cow-uh, cow-uh-cow-uh*. An odd, bubbling and exceedingly rapid *keggy, keggy, keggy, keggy, keggy, keggy, keggy*. A peculiar *pr-r-r-r-r- tow tow tow tow tow*. Sometimes a *cluckukuk;* a slower *ugh, ugh, ugh;* a single excited *aow;* a short *uh;* odd whinnying cries; alarm-note of *keck, keck* or a softer *cup, cup;* a slower *ugh, ugh;* response call of female, *cuk-cuk-cuk*, followed by a slower *ugh, ugh, ugh*.

Description.—Upper-parts, dull-colored, blackish; under-parts, silvery-ash, spotted with dusky; chin and throat black; short, stout bill, dirty whitish, crossed by black band (whence the name, pied-billed); bill higher than broad, tip of upper mandible decurved; legs far to rear, apparently attached to body at extreme rear end of rump; foot not webbed like that of duck, but each toe with broad flaps along each side. In winter, under-parts quite rusty; chin and throat whitish; bill brownish, without black band. Downy young, strikingly striped white and glossy black on head, neck, and back; 4 distinct white stripes on crown, which is sparingly marked with walnut-brown; shading to grayish-white below, lighter on belly. L. 14. W. 5.10. B. 1.

Field Marks.—Small, brownish-gray, duck-like diver, with smooth head and bob-tail. On wing resembles small duck (from which it may be told by its pointed bill and by its feet stretched out behind rudimentary tail) or the Coot (from which it may be told by absence of white in wing in flight). At rest, its bob-tail, and its white-black or brownish-black bill, distinguishes it from the Coot. In summer, white eye-ring and black throat-patch. At all times, from other grebes, brownish appearance, absence of white in wings, and short, stout, hen-like bill.

Popular Names.—Hell-diver; Dabchick; Water-witch; Die-dapper; Dipper; Divedapper; Di-dapper; Dipchick; Bob-tailed Diver; Rump-footed Diver; Thick-billed Grebe; Pied-billed Dabchick; Mainland Pied-billed Grebe.

LOON

Gavia[30] *immer immer* (Brünnich)[32]

Very rare and irregular migrant, none remaining to winter. Middle of November; last week in March to middle of April, most frequently during second week of April. One shot, November, 1913 (B). One seen, April 11, 1915 (A). *Recorded:* ABC.

Geographical Distribution.—North America, breeding from northern United States northward, and wintering from Canada to the Gulf Coast. Migrates across central and eastern Texas on its way to the Gulf, where it winters in bays and lagoons along the Texas coast.

Habitat.—Large, open bodies of water, in clear, midstream portions of rivers and lakes; never found near grassy banks like the grebes.

Local Haunts.—Colorado River, from Lake Austin to Deep Eddy downstream to mouth of Barton Creek.

Habits.—Observed singly or in small companies. Expert diver and submarine swimmer; when alarmed, it dives at the flash of a gun and swims long distances under the water. Rarely seen on land, where it is nearly helpless and scarcely able to walk, progressing awkwardly by use of feet, wings, and bill. Migrates by day, generally at considerable height.

Flight.—Strong, direct, goose-like, much stronger on wing than grebes.

Voice.—A loud, mournful wail, followed by a wild, wierd, quavering laugh, heard in its summer home in the lakes of the Far North, giving rise to the expression, "as crazy as a loon." A long-drawn, melancholy, laughing scream, quite uncanny and blood-curdling.

Description.—Large, heavy-bodied, long-necked bird, with legs set far back near rear end of body. Foot fully webbed. Bill long, sharp, pointed, spear-like. Upper-parts, including wings and tail, slaty-blackish and grayish; under-parts, white; throat washed with ashy. In summer, it becomes black on head and throat, and black and white above. L. 32. W. 14. B. 3.

Field Marks.—Large size. Gray and white, duck-like or goose-like, but with slender, dagger bill. Smooth head, with no ruffs.

Popular Names.—Big Hell-Diver; Diver; Great Northern Diver; Common Loon.

HERRING GULL

Larus argentatus argentatus[33] Pontoppidan.

Very rare and irregular migrant. Early October to early December, usually in November; and late February to early May, usually in March. Flock, middle of November, 1914 (B); female shot, November 6, 1912 (B). Migrating northward, March 9, 1919 (A). *Recorded:* AB.

Geographical Distribution.—Artic Circle, northern Canada, and northeastern border of the United States. Winters along Atlantic, Pacific (Washington and Lower California), and Gulf Coasts, and rarely the Mississippi Valley, southward to Yucatan. Common in winter along the Texas Coast.

Habitat.—Sea coast, sand bars, shores, and inland lakes; bays and harbors.

Local Haunts.—Open water and rapids along the winding valley of the Colorado River (especially Lake Austin and Deep Eddy).

Habits.—Generally singly or in pairs, occasionally in flocks. Flies apparently aimlessly about over the water, but really watching for floating morsels of refuse and carrion for food; gracefully sails on motionless wings or slowly flaps low over the water, sweeping close to the surface. Fishes in the rapids on the river, which it follows downstream in fall and upstream in spring. Circles over the water.

Voice.—Scream, barking *akak kakak* or *cack-cack-cack.*

Description.—Large gray or grayish-white gull, with pearl-gray mantle and black-ended wings tipped with white. First primary black, tipped with white, and crossed near end by large white patch. Under-parts whitish. Bill chrome-yellow, with red spot near tip of lower mandible. Legs and feet pale flesh color. Young, dark grayish, primaries and tail brownish-black. Winter, head and neck streaked with dusky and bill duller. L. 24. W. 17. B. 2.25. T. 7.5.

Field Marks.—This and the Ring-billed Gull will probably be confused. The Herring Gull is larger (24 or more, instead of 20 or less), the size difference useful when near at hand; with plain bill (that of the Ring-billed being greenish-yellow, ringed with black band near tip in adult); and flesh-colored feet (those of the Ring-billed being yellowish).

Popular Names.—Sea Gull; Winter Gull; Big Gray Gull; White Gull (adult); Gray Gull (immature); Silvery Gull.

RING-BILLED GULL

Larus delawarensis Ord.

Rare migrant. Late September to early December, usually appearing about the second week in October; March to third week in April, and rarely early May. Female shot, September 27, 1912 (B). One observed, December 7, 1919 (A). Two observed, May 11, 1917 (B). *Recorded:* ABW.

Geographical Distribution.—Canada and northern United States. In winter, coasts of southern United States, rarely in the interior, southward to southern Mexico. Winters along the Texas Gulf Coast.

Habitat.—Coasts and inland lakes.

Local Haunts.—Wide, open stretches of water along the Colorado River (Lake Austin and Deep Eddy), and rapids below the Dam or at the lower end of Deep Eddy.

Habits.—Circles and sails over the open stretches of water and over the rapids, where it fishes. Occasionally alights on the moist gravel bars. In the interior, the Ring-billed Gull feeds partly on insects which it secures from the air or the ground; late in afternoons, in fall, it has been seen catching grasshoppers and beetles.

Description.—A pale gray gull, with pearl-gray mantle (wings and back). Head and neck lightly spotted or streaked with grayish-brown. Black primaries tipped with white; the first primary black, crossed near end by white patch, but lacking white tip. During breeding season, bill greenish-yellow, crossed by a distinct black band in front of the nostril, and with the tip yellow or orange. Feet pale yellowish or greenish-yellow. Immature, more streaked with brownish, particularly over mantle; brown primaries; tail crossed near end with broad blackish-brown band, tipped with whitish; bill yellow, with black tip. L. 18.50 to 20. W. 15. T. 6. B. 1.60.

Field Marks.—Quite similar in general appearance to Herring Gull, but 5 inches shorter, with legs greenish-yellow instead of flesh-colored, with black ring on bill, and with black tip to first primary. Immatures may be identified by size difference and by the broad band of blackish across tail near end.

Popular Names.—Sea Gull; Little Gray Gull.

Remarks.—At intervals during the migrations a few gulls pass up and down the river. It is practically impossible to identify these mid-channel birds from the bank, but doubtless the greater number belong to this species.

LAUGHING GULL

Chroicocephalus[34] *atricilla atricilla*[35] (Linnæus)

Accidental. Driven inland sometimes in large numbers by tropical storms on the Gulf of Mexico, generally during August, less commonly any time during summer and fall from July to October. *Recorded:* AO.

Geographical Distribution.—Atlantic and Gulf Coasts, from Maine to Texas, southward; straggling north and west to Colorado and New Mexico.

Habitat.—Bays, islands, and marshes along the sea coast.

Local Haunts.—During the height of storms observed over the open country and over the city of Austin; at other times, along the river and over the river flood plains.

Habits.—Sails and soars about over the city. As soon as the storm abates, this gull seeks the river, where it fishes, and which it follows back to its home along the Texas Coast, disappearing within a few days after the storm.

Voice.—Strange cackling notes, *cuk-cuk-cuk*, or a wild, screaming laugh, *hah-ha-ha-ha-ha, hah-hah-hah-hah-hah*, that gives the species its popular name. When the bird is excited, the cry is loud and startling, resembling prolonged peals of derisive, cackling laughter.

Description.—A white or grayish-white gull, with slaty-black head and throat, white neck, and dark grayish or slaty mantle (back and wings). Primaries (flight feathers of wing) black, the smaller ones edged behind with white; three outer primary quills black, fourth and fifth black toward end. Bill dark reddish, lighter at tip. Feet red. Under-parts sometimes with rosy tinge, generally on breast. In winter, under-parts pure white; head whitish, mixed with black; feet dusky. Narrow white eye-ring. Immatures, primaries wholly brownish-black. L. 15 to 17, about 16.50. W. 13. T. 5. B. 1.70.

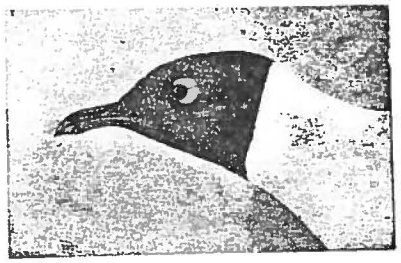
Field Marks.—White gull, with gray back and wings, black primaries marked with white, deep slaty head and throat, and dark reddish bill. First primary entirely black.

Popular Names.—Black-headed Sea Gull; Southern Gull.

FRANKLIN'S GULL

Chroicocephalus[34] *franklinii*[36] (Richardson)

Not uncommon migrant, rather irregular. October and early November; April and the first two weeks in May. October 10-11, 1914, 165 birds passed over in scattered formation (A). October 20, 1917, 1 shot (B). November 9, 1914, flock of 20 passed over (A). April 1, 1912, flock moving northward (B). April 20, 1915, 2 passed northward (A). May 2, 1920, 40; May 3, 1 wounded bird (Rogers). May 13, 1919, 7 passed northward (A). *Recorded:* ABJW.



Bailey

FRANKLIN GULL

Geographical Distribution.—Interior North America, about the marshy lakes of south-central Canada and south to the Dakotas. Winters in Mexico and Central and South America.

Habitat.—Inland marshes, marshy lakes, and flooded lands.

Local Haunts.—The Colorado River (particularly along Lake Austin), lakes, ponds, shallow valleys and rain-soaked or inundated fields of the open country east of the Limestone Hill Area.

Habits.—Generally appear in fall in the teeth of sudden northers and heavy rains, in loose, scattered flocks, which beat slowly about over the open country and larger bodies of water. Float, circle, and sail gracefully back and forth with slow, easy strokes of their wings as they drift over the city in the wind following a heavy rain. Usually fly so high that it is not often they are observed. Generally feed on grasshoppers and other insects of the prairies, flocks of birds numbering from 50 to 500 often following the plow to secure upturned morsels.

Description.—White or pale grayish-white, with sooty black head and throat, and pearl-gray back and wings. Primaries light-colored, the first white with only the outer web black. Distinct, broken white eye-ring. Bill bright red. Feet carmine. Under-parts sometimes flushed with pink. Immature, feet brownish or blackish, and bill brownish. In winter, head mixed with white and black, mainly white; bill blackish or dusky, tipped with orange-reddish; no pink flush to white under-parts. L. 14.5 or 15. W. 11. B. 1.30.

Field Marks.—Whitish gull, smaller than Laughing Gull and with darker head and lighter gray mantle, and with light-colored primaries. Some birds with black heads, some mixed with black and white, some with smoky crowns and whitish foreheads, and others with whitish heads.

Remarks.—Named in honor of Sir John Franklin.

FORSTER'S TERN

Sterna forsteri Nuttall

Accidental. Driven inland by tropical storms on the Gulf of Mexico in the late summer and early fall, generally during August. September 14, 1919, 7 observed (A). *Recorded:* A.

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FORSTER TERN

Geographical Distribution.—Coasts of New Jersey, Virginia, Louisiana, and Texas, and inland lakes of south-central Canada and northwestern and western United States. Winters from southern coasts of the United States southward.

Habitat.—Marshes along seashore and inland lakes.

Local Haunts.—Open country east of hills. As soon as the high winds die down, it takes to the Colorado River Valley, which it follows to its coast habitat.

Habits.—Appears only after unusually severe storms on the Gulf, and may be seen, sometimes in large numbers, flying about over the city. It stays for only two or three days, and then moves southeastward to the Gulf. Flies about singly, rarely in small companies, at no great height over the water, frequently poising, ever alert for fish, or dropping to or beneath the surface. Like all terns, it flies with the bill pointed down instead of straight ahead after the manner of gulls.

Flight.—Light and rapid, its long and slender wings beating the air with easy strokes.

Voice.—Noisy, grating, and monotonous *cack;* a long-drawn, reedy cackle; and a *tweet-tweet-tweet.*

Description.—White or grayish-white, pure white below, with pearl-gray back and wings. Long and slender wings and deeply forked tail. Black cap without crest. Long, slender, orange-red bill, tipped with black. Orange feet. In winter, whitish cap and dark stripe back across ear coverts. Immature, without black cap. L. 15. W. 10. T. 6.50, forked 2.50 to 5. B. 1.50 or more.

Field Marks.—Slender, forked-tail, whitish tern, with black cap. Gulls fly with their hooked bills pointed ahead; and usually (all species recorded from the Austin Region) have square tails. Terns fly with their straight bills pointed downward; they have deeply forked tails. This and the Common Tern are similar, but the outer tail-feather of the present species has the inner web dusky, the outer web white (the Common Tern has the reverse: the inner web white, the outer web dusky).

Popular Names.—Sea Swallow; High Diver.

Remarks.—Named in honor of John Reinhold Forster, eminent naturalist and voyager, who first pointed it out as a distinct species.

COMMON TERN

Sterna hirundo hirundo[37] Linnæus.

Very rare migrant, April and October. One examined, April 6, 1919 (A). *Recorded:* A.

Geographical Distribution.—Canada and northeastern United States, south to North Dakota, Ohio, and North Carolina. Winters from Florida to Brazil. Casual in migrations on the Pacific Coast from Canada southward.

Habitat.—Barren shores and sandy beaches, principally along the Atlantic Coast of the northeastern United States.

Local Haunts.—Colorado River Valley and the open country east of the hills.

Habits.—Flies back and forth over the water, bill pointed downward in typical tern fashion, looking for minnows and aquatic insects. Rarely perches on rocks, piles. or debris.

Voice.—Alarm scream, a harsh *tearr, tearr.* Chase call, *a tue, tue, tue.* A sharp *chirp.*

Description.—Grayish-white, with breast and belly pearl-gray, back and wings pearl-gray, cap (whole top of head) black, and thoat and tail white. Bill vermilion-red, changing to black at tip. Feet orange-red, brighter and more reddish in summer than those of the Forster Tern. Winter, bill mostly black, and with front of head and under-parts white. L. 15. W. 10.75. T. 6, forked 1 to 3.50. B. 1.40.

Field Marks.—Similar to Forster's Tern: slender-winged, forked-tailed, grayish-white bird with black cap, flying with bill pointed downward. Distinguished from the Forster's Tern by smaller bill, the pale pearl-gray breast and belly in summer plumage, and the shades of the outer, longer tail feathers, which have the outer webs dusky and the inner webs white.

Popular Names.—Sea Swallow; High Diver.

LEAST TERN

Sternula albifrons antillarum[38] (Lesson)

Rare and irregular migrant and accidental visitor. Occasionally driven inland by tropical storms on the Gulf of Mexico. Late May and early June; August and September. May 20, 1919, 3 observed (A). September 17, 1919, 2 observed (B). *Recorded:* AB.

Geographical Distribution.—Atlantic and Gulf Coasts, from Maine to Texas, and the lakes and river shoals of the Mississippi Valley, from the Great Lakes southward and west to the Dakotas, Kansas, and the Red River of the Texas Panhandle. Winters from the Gulf Coast to South America.

Habitat.—Sandy beaches between the surf and the tide marshes, edges of lakes, and river shoals.

Local Haunts.—The Colorado River Valley, and the open country east of the hills.

Habits.—Flies quickly and gracefully about over the surface of the water, looking for minnows near the surface; flits and darts gracefully about like a swallow. Observed singly, in pairs, or little companies and scattered bunches. Occasionally flies back and forth over the willows.

Voice.—A shrill, sharp, quick *yip, yip, yip.*

Description.—Small white tern; with wings, back, and tail pearlish-gray; and black cap, with distinct white forehead. Outer primary, edging wing, narrowly black. Tail with rounded fork. Bill yellow with black tip. Legs yellowish. Immature, more brownish mottled mantle and

streaked brownish cap, but much lighter above than immature Black Terns, and with pure white under-parts. L. 9. W. 6.75. T. 3.50, forked 1.75. B. 1.1.

Field Marks.—Small size (an inch shorter than the Robin), with 20-inch wing expanse (4 inches more than the Robin). White, with black cap, distinct white forehead. Black-tipped yellow bill.

Popular Names.—Tiny Tern; Yellow-billed Tern; White-forehead.

BLACK TERN

Chlidonias[39] *nigra surinamensis* (Gmelin)

Uncommon, irregular migrant, sometimes common; rather rare in spring, tolerably common in fall. Middle of April to latter May; last of August to second week in October. April 15, 1919, 7 (A). May 23, 1915, 3 (A). August 28, 1915, 20 (B). October 13, 1914, 6 (A). *Recorded:* ABCKLW.

Geographical Distribution.—Central Canada, south to the inland marshes and marshy lakes of northern United States, from Ohio to California. Winters from Mexico to Chile. East coast of the United States in fall migrations.

Habitat.—Inland marshes, marshy lakes, and wet prairies of the middle north.

Local Haunts.—Colorado River Valley (Lake Austin, the eddies just below the Dam, the rapids, and the gravel island below the Avenue bridge), ponds and prairie marshes, and occasionally the moist, wet prairies and inundated lowlands of cotton fields in the open country of the Blackland Prairie Area after rains.

Habits.—Usually most common immediately before distinct changes in fall weather or just after showers in spring and fall. Circles, hovers, darts, and skims the surface of the river waters, occasionally diving vertically into the water after minnows and other small fish. When fish are common and moving upstream, they are stopped by the Dam; there the terns collect in numbers over the eddies to catch the smaller fish. After spring showers and extremely heavy rains, loose flocks skim the moist, wet prairies. Rarely alight, and then usually on something flat on the water. Observed in scattered flocks, usually from 6 to 12, rarely as many as 50 or 75. Quite noisy along the river before distinct changes in weather.

Voice.—Harsh, grating *kek-kek*, or a repeated sharp *peek* or *cheek*, resulting in a continued chittering.

Description.—Head, neck, and under-parts jet black. Back, wings, and tail slaty. Front edge of wing, wing lining, and patch under tail white. Short, slightly forked tail. Exceedingly long, slender wings. Sharp, slender black bill. Blackish feet and legs. In winter, back, wings, and tail deep pearl-gray; back of head mixed with black and white;; under-parts, forehead, nape, and sides of head white or mottled whitish. L. 10. W. 8.25. T. 3.50, forked .90. B. 1.

Field Marks.—Dainty, resembling large swallow, flapping low over the water, bill pointed down. Dark colors distinguish this tern, other terns being chiefly white. Silver line from neck to elbow, and white patch under tail.

Popular Names.—Water Swallow; Black Water Swallow; Black Striker; Short-tailed Tern; Dusky Tern.

WATER-TURKEY; ANHINGA

Anhinga anhinga (Linnæus)

Extremely rare summer resident. March to September; most commonly late in summer. *Recorded:* ABCHJW.

Geographical Distribution.—Tropical America, north to western Mexico, Texas, Illinois, and North Carolina.

Habitat.—Dense swampy bottom woods and cypress swamps, feeding in nearby shallow ponds and creeks; wooded ponds and streams.

Local Haunts.—Colorado River and the larger creeks of the Blackland Prairie Area, and at least 12 miles back in the hills along Barton Creek canyon. Edges of small water holes and sink holes with soft, mossy, marshy stretches, in the semi-dried creek beds of summer. Marshy spot on the river flood plains at the mouth of Walnut Creek. Most commonly along Onion and Barton creeks.

Habits.—Stands beside water hole or perches on low branch or limb overhanging the water, where it awaits the appearance of fish or frog. Occasionally leaves its perch and dives beneath the surface. It is a remarkable swimmer and pursues and catches fish under water. Its habit of swimming with all but its serpent-like head and neck submerged gives it the appearance of a water snake. Nests in isolated pairs or small colonies of as many as fifteen pairs. Its sharp bill makes a formidable weapon against enemies.

Flight.—Sails along evenly and steadily in smooth, gliding flight, and soars with great ease in sliding circles on outspread wings. Its wing motion is quite regular, about five flaps with peculiar rowing motion, and then sliding along, wings evenly spread, long tail and neck extending at full length fore and aft. Takes flight with much hesitation and seems to distrust its wings. Alights clumsily and with much flapping before it can recover its balance.

Breeding.—Probably. No definite record. Should be looked for from late April to June.

Nest Location.—6 to 22 feet up over water, in vertical triple crotch or on horizontal fork of a cypress by preference, or a low, thick buttonbush or sycamore tree, along wooded, swampy shores of sluggish streams or pools.

Nest Construction.—Firm and substantial, much heavier and thicker than heron nests, and composed of sticks and twigs averaging a bit smaller than a lead pencil, generally picked from cypress or similar tree while still bearing living leaves. Firmly and smoothly lined with a few small twigs and numerous broad strips of bark, and finished with a quantity of fresh green willow or cypress leaves. Rarely, Spanish moss is used in the nest.

Nest Measurements.—Outside, diameter 11, height 5.50 to 7. Inside, diameter 9, depth of saucer 1.75 to 3.

Eggs.—2 to 5, pale greenish-blue, covered with a thick chalky deposit, 2.10×1.35.

Voice.—Harsh, grating calls.

Description.—Very slender bird, with glossy black body and whitish wing-coverts. Snake-like neck, with bill long and slender and straight at tip. Long tail. Very short legs. Red eyes. Small yellow pouch under bill. Female with head, neck, and breast buffy-brownish; remaining black of plumage overcast with brownish; and shoulders of wings whitish. In summer, male has a few tiny grayish plumes on back of neck and silvery dots on back. L. 34. W. 13.50. T. 10.50. B. 3.25.

Field Marks.—Large size and slender body: about a third neck, a third body, and a third tail. Legs can hardly be seen. Blackish or brownish colors. Long bill straight at tip.

Popular Names.—Snakebird; Darter; Nigger Turkey; Lance Beak.

DOUBLE-CRESTED CORMORANT

Phalacrocorax auritus auritus (Lesson)

Very rare migrant. May 11, 1919, 7 flying north by northwestward (ABH). *Recorded:* ABH.

Geographical Distribution.—Eastern North America, from eastern and central Canada south to Maine, South Dakota, and Utah. Winters from central and central-southern United States southward to the Gulf Coast.

Habitat.—Edges of swampy lakes, marshy ponds, and river margins. Cliffs.

Local Haunts.—Observed passing over the Colorado River flood plains just east of the edge of the hills.

Habits.—Perch with bodies erect and necks curved into distinct S. Sit on trees near or over water, into which they dive for fish; their slender, sleek bodies, broad paddles, and strong leg muscles enable them to pursue their prey through the water with ease. In migrations, pass overhead in flocks of varying size, in close formation; flight strong and duck-like, resembling mergansers on the wing. Breed in colonies.

Description.—Glossy blackish or blackish-brown, with sealy appearance to back. Long neck, and long bill sharply hooked at the tip. For a water-fowl, rather long, distinct tail, composed of 12 feathers. Short legs; 4 toes all connected by web. Eye-lids deep blue; bare skin of face and throat orange. Distinct tuft of curly black feathers rising up from behind each eye. In winter, no crest; eye-lids dull. Immature, brownish, with bare skin of face dirty yellowish. L. 35. W. 13. T. 7. B. 3.

Field Marks—Blackish colors, short legs, and hooked bill. Attitude when perching: erect body and S-shaped neck. In flight, long neck and tail, duck-like formation.

Popular Names.—Nigger Goose.

MEXICAN CORMORANT

Phalacrocorax vigua mexicanus (Brandt)

Fall visitor from the South. Probably occurs irregularly in fall and winter, more frequently in late July and August. August 23, 1919, 1 (A). *Recorded:* A.

Geographical Distribution.—Middle America and Mexico, north to New Mexico, Texas, and rarely to Kansas and southern Illinois. Subtropical, moving northward in late summer.

Habitat.—Swampy lakes and the slower-flowing streams, lagoons and inlets; prefers vicinity of brackish or salt waters.

Local Haunts.—Observed on Barton Creek, above Campbell Hole, southwest of Austin.

General Habits.—Perches on dead branches of trees or on stakes over water. Observed singly, in pairs, or in small flocks. Flight swift and duck-like.

Breeding.—Possibly. Nests should be looked for between May and October.

Nest Location.—At low height in tree or bush near or over water, generally in a deserted, marshy lake.

Nest Construction.—Rude structure of sticks, weeds, and leaves.

Eggs.—3 or 4, greenish-white, with a slight chalky deposit; 2.25×1.35.

Description.—Slaty to blackish above and behind, brownish in front, feathers bordered with black. Bill slender, abruptly hooked at tip; brown throat pouch, with grayish or whitish border and brownish throat patch. Eyes green. Comparatively short tail. In breeding season, white patch of feathers on each side of head, and slender white filaments on neck and belly. L. 26. W. 10.25. B. 1.80.

Field Marks.—Similar to Double-crested Cormorant, but smaller, and having feathers of scapulars and wing-coverts pointed.

Popular Names.—Nigger Goose; Black Swan; Water Buzzard; Water Turkey.

WHITE PELICAN

Pelecanus erythrorhynchos Gmelin

Uncommon and irregular migrant, more common years ago; more common in fall. Late March to fourth week in April; second to last week in October. *Recorded:* ABCDLNPQ.

Geographical Distribution.—Central and western Canada south to Utah and southern California; an isolated colony breeds on the lower Texas Coast. Winters from southern California and the Gulf States southward, commonly along the Gulf Coast of Texas.

Habitat.—Shores and islands of fresh-water lakes. In winter, salt water.

Local Haunts.—Generally passes over without stopping, rarely alighting to rest or to fish. Observed along the Colorado River (Lake Austin, Deep Eddy, and the open waters from the Avenue Bridge downstream) and in small cattle tank ponds in pastures of the Blackland Prairie Area.

General Habits.—Gregarious at all seasons. Drive fish into shallows, and scoop them up with wide bill-pouches as the birds wade or swim along; never dive for food as does the Brown Pelican. Rarely seen singly; generally in flocks, sometimes of considerable size, moving in regular form in slow, dignified flight. Soar and sail, and wheel in great circles.

Description.—Entirely white except for its black primaries, which are sometimes in evidence. Large, stout-legged, web-footed bird; long bill, with great pouch of skin swung from lower mandible. Eye white. Pouch, bill, and feet yellowish. Wing expanse, 8 or 9 feet. Immature, brownish on top of head and on wing coverts. L. 60. W. 23. B. 14.

Field Marks.—White plumage. Huge bill, with yellowish pouch beneath. Immense size: one of the largest of American birds.

Popular Names.—Rough-billed Pelican.

BROWN PELICAN

Pelecanus occidentalis occidentalis[40] Linnæus

Rare straggler, and accidental. Wanders inland at irregular intervals in late summer and fall; occasionally driven inland by tropical storms on the Gulf of Mexico. Late August to early November. August 17, 1915, 1 (I); November 9, 1919, 1 (A). *Recorded:* ACE[illegible]

Geographical Distribution.—Gulf Coast, from Florida to Louisiana and Texas, south to Atlantic Coast of Central and South America. Accidental north to Nova Scotia and northwest to Wyoming.

Habitat.—Almost exclusively marine, breeding on islands along the coast and fishing in nearby bays and salt water lagoons.

Local Haunts.—Colorado River valley, generally along Lake Austin, Deep Eddy, and the river below town.

General Habits.—When fishing, it flies about 20 or 30 feet over the water, hesitates, pivots forward and drops down like a shot, diving headfirst beneath the surface with a resounding splash; surplus water is drained out of the immense pouch on return to the surface, and the fish is swallowed. Usually observed singly, rarely in small flocks, numbering as many as 12 birds. Observed resting on the lake and swimming about, but it never fishes from the surface as does the White Pelican.

Flight.—Regular, usually three wing strokes, then a gliding, sailing flight, and then again three strokes. Flocks fly in diagonal single file formation.

Description.—Blackish and grayish body; white head and neck, with brown stripe down back of neck during breeding season; under-parts dark brown. Bill mottled, with dark greenish-brown elastic pouch. Wing spread, 7 or 8 feet. L. 50. W. 20. B. 11.

Field Marks.—Plumage mainly grayish-brown, never white. Large size. Huge bill with dark pouch beneath.

AMERICAN MERGANSER; BUFFY-BREASTED MERGANSER

Mergus merganser americanus[41] Cassin

Very rare winter visitor, more common in the mid-winter of severe winters; late November to March. Common, winter 1901-02. *Recorded:* BCN.

Geographical Distribution.—Northern North America, breeding from Alaska and far-northern Canada south to Pennsylvania, Colorado, and California. Winters from Canada and northern United States south to Florida, the Gulf Coast, and northern Mexico, more commonly along coasts than in interior.

Habitat.—Running water, rushing currents, and rapids of mountain streams; rivers and open lakes. In winter, bays and lagoons, rivers and lakes; less commonly, salt marshes or the open Gulf beyond the breakers.

Local Haunts.—Colorado River, particularly on Lake Austin and Deep Eddy.

General Habits.—One of the handsomest of swimmers, at a distance strikingly black and white. Usually observed singly, occasionally in pairs and small family parties, but never in large flocks. Hardy, remaining much further north in winter than the majority of ducks; occurs where open water is found, even among ice, and is therefore rare in the southern United States. Excellent swimmer and diver, swimming with body low in water and diving quickly. Largest of the mergansers.

Feeding Habits.—Spends much of the time under water, through which it swiftly pursues its prey: fish, crawfish, and other aquatic animals; its red feet flash as it dives. Swims slowly along, neck outstretched, bill just at surface and head submerged to eyes, filtering water for food.

Flight.—Strong, straight, rapid flyer. When it takes wing, rising against the wind, it splashes and patters along on the water with its feet after the manner of all mergansers.

Voice.—A quickly-repeated, purring *dorr-dorr* or *krr-krr*. That of female, a coarse masculine *quack*.

Description.—Head and upper neck blackish-green, duller and blacker on chin and throat; hind-neck, wing-coverts, large wing-patches, wing-lining, and flanks, white; breast and belly, white, delicately tinted salmon-yellow or creamy; back and shoulders black; rump and tail ashy; indistinct, single, short crest; deep red feet; slender, cylindrical, serrated red bill, hooked at black tip. Female smaller, with very slightly longer crest; upper-parts ashy-gray; speculum wing-patch and under-parts, white; under-parts tinted salmon; shaggy head brown, and upper neck reddish-brown, darker than in female Red-breasted Merganser, and with neat white throat-bib. L. 25. W. 10.50. T. 5. C. 2.08.

Field Marks.—The three mergansers may be recognized by their long, narrow body; broad, strong feet; and narrow, slender, cylindrical, saw-toothed bill with sharp-edged, hooked tip, contrasting distinctly with the ordinary broad, flattened duck-bill. This and the Red-breasted Merganser have red bills, that of present species with nostril midway between eye and tip of bill, distance from nostril to tip slightly less than 1.50. In flight, white on wing. Black and white

plumage; green head and pale buffy breast. Larger, head-crest with but one point, nostril nearer middle than base of bill, and (in male) no reddish-brown breast-band distinguish this species from the Red-breasted Merganser.

Popular Names.—Saw-bill; Fish-duck; Dun-colored Diver; Dun Diver; Fishing Duck; Sheldrake; Goosander; Wheezer; Tweezer.

Remarks.—A poor bird for the table, tough and with an unpleasant fishy taste. Wounded, it clings to grass on bottoms. Wary, difficult to shoot and bag because of its expert diving.

RED-BREASTED MERGANSER

Mergus serrator Linnæus

Very rare winter visitor. Late November to March or early April; occasionally perhaps to early May. *Recorded:* B.

Geographical Distribution.—Northern North America, breeding south to New York, Minnesota, and southwestern Canada. Winters south over the United States to Florida, the Gulf States, and Lower California, more common along the coasts than in the interior.

Habitat.—Generally running water in clear streams and lakes; bays.

Local Haunts.—Colorado River, usually along Lake Austin, Deep Eddy, and the backwater sloughs.

General Habits.—Usually in pairs; rarely in flocks to a dozen birds, generally from five to eight, undoubtedly parents and young of the year. Flies along stream with powerful wing strokes.

Feeding Habits.—Fishes in some quiet bend of the larger streams, where it swims and dives with wonderful skill. In shallow, salt water bays the bird hunts in companies of large size, proceeding line broadside and driving its prey in to the beaches.

Description.—Head dark blackish-green; upper-parts and shoulders blackish; flanks, rump, and tail grayish; wing-patches, belly, and breast white, the latter with a broad band of cinnamon or rusty black streaks across its upper part. Distinct crest of a few long feathers, older males having a long, double crest. Eyes, feet, and slender, cylindrical, saw-toothed bill, red. Female, shaggy crest; upper-parts grayish; head, neck, and lower hind-neck brown, palest on throat; speculum wing-patch and under-parts white. L. 22. W. 9. T. 4. B. 2.50.

Field Marks.—Similar to Buffy-breasted Merganser, but slightly smaller, and with nostril much nearer eye than tip of bill, from tip to nostril 1.75. Adult males, long crest, white neck ring, and broad cinnamon reddish band across chest. Female and young, throat pale cinnamon-rufous, with no white bib; double crest; decided angle extension of feathers on side of mandible; top of head grayish-brown instead of rufous-brown.

Popular Names.—Fish-duck; Gar-bill; Red-breasted Saw-bill; Pied Sheldrake; Spanish Drake; Indian.

Remarks.—Flesh rank and ill-flavored, the result of its fishy food.

HOODED MERGANSER

Lophodytes cucullatus (Linnæus)

Rare migrant and winter resident. November to March. *Recorded:* AD.

Geographical Distribution.—North America, breeding south to Oregon, northern New Mexico, Louisiana, and Florida. Winters south to Mexico, the Gulf States, and Cuba, more commonly along the coast.

Habitat.—Quiet ponds, lakes, and other still water.

Local Haunts.—Colorado River, generally along Lake Austin. Occasionally the small, still-water ponds in pasturelands.

General Habits.—Inhabits smaller bodies of water than the other mergansers, where it feeds on fish and aquatic insects, and on roots, seeds, and other vegetation. Skillful in swimming and in diving for fish. Male can open and shut its crest like a fan.

Description.—Handsome. Head, neck, and back black; whitish below, with cinnamon flanks. Large, high, thin, semi-circular, fan-shaped or wheel-shaped, erect, white crest extending from base of bill back across top of head, bordered along the top edge by black. Bill dark. Female, grayish-brown, with tips of crest feathers at back of head tinged with reddish-brown; wing-patch, lower breast, and belly whitish. L. 18. W. 7.60. T. 4. B. 1.50.

Field Marks.—Smallest and most beautiful of the mergansers. Male, striking, with wonderful crest. Female, slender bill, small size; head brownish or grayish, with large cinnamon crest, smaller than male and not flaring or thin. Dark bill.

Popular Names.—Fish Duck; Hairy-head; Cotton-head; Swamp Sheldrake; Water Pheasant; Hairy-crown; Straw-bill.

MALLARD; GREEN-HEAD

Anas platyrhyncha platyrhyncha[42] Linnæus

Moderately common migrant, and not uncommon winter resident; September to April, most common, middle October to middle November, and middle February to early April. Very common years ago (O), but growing gradually scarcer for two decades (L), until quite abundant for the single season of 1917 (B). In fall, recorded September 1 and 14, 1893, and September 10, 1894 (C)[43]; October 15 and November 7, 1917, hundreds (B); October 11, 1921 (A). In spring, February 17, 1894 (C),[43] and February 20, 1916 (O), moving northward; last observed, April 22, 1893 (C),[43] April 12, 1894 (C),[43] April 17, 1915 (A), and April 20, 1919 (A). *Recorded:* ABCDEFGHJKLMNOPQWY.

Geographical Distribution.—Northern North America, breeding south to Lower California, New Mexico, Kansas, and Maryland, and the extensive Louisiana marshes; rather rare on Atlantic Coast. Winters from Alaska and northern United States southward to Panama.

Habitat.—Fresh water rivers, lakes, sloughs, creeks, ponds, and even small irrigation ditches.

Local Haunts.—Colorado River (particularly Lake Austin and its sloughs, Deep Eddy, and other larger expanses), the larger creeks (Walnut and Onion), and rarely, usually in early migrations, the small prairie ponds and water holes.

General Habits.—Observed singly, in pairs, small companies, and, less commonly, flocks and composite flocks, seldom gathering in large flocks as do many other species of ducks. Finds it much easier to walk on land than the majority of ducks.

Migration.—About the end of September Mallards appear on the river, flying just ahead or in the teeth of a norther, and usually speeding low along the surface of the water; as soon as the norther strikes, the birds begin flying high. After the weather has settled back to normal, none are seen passing through, for they are content to remain on some more northern lake or river until another cold snap drives them southward. Thus the droves of ducks appear in waves, which occur in fall with sudden weather changes or northers, in spring with spells of warm spring weather in regions to the south and southeast.

Feeding Habits.—Surface feeder, skimming the surface rather than diving; occasionally dives, very clumsily, with much flapping and splashing. It feeds largely by dabbling in shallow waters, tipping up and practically standing on its head, tail sticking straight up, and gathering its food by touch from the muddy bottoms, thus being able to feed equally well by day or night. Omnivorous, eating roots, wild celery,

pondweed, wild rice, weeds, grasses, mast, buds, grain, seeds, and small aquatic animal life, particularly insect larvae, small crustaceans, and worms, together with grasshoppers. Frequently forages a considerable distance from water; in the hills, flocks often alight on divides to feed on acorns.

Flight.—Makes as much as 100 miles an hour, flying in long lines or square-shaped figures; continuous, rapid, whistling wing-strokes, with no sailing. When leaving a pond, a Mallard flies straight up for about thirty or forty feet and then away, with level, outstretched head and neck, instead of flying directly from the water, through the reeds, and away, teal-fashion.

Voice.—Loud, oft-repeated *quack, quack* or a low, *quack-quack, quack-quack*, similar to that of the domestic duck. Female, louder; male, softer, lower, more wheezy.

Description.—Brilliant dark metallic-greenish head, overlaid with black at forehead; narrow white ring around neck; rich chestnut breast; speculum wing-patch rich purple, bordered on each side by white and narrow black bands; rump and patch under tail, black; wing-lining, axillars or arm-pit feathers, outer tail-feathers, white, the two middle tail-feathers black and slightly curled upward, the two longest upper tail-coverts curled upward; remaining parts gray; iris of eye, brown; distinct greenish-yellow bill. Female, mottled brownish all over, without green head or chestnut breast, but with characterictic speculum. L. 23. W. 11. B. 2.20.

Field Marks.—Absolute identification of male and female against all other ducks: rich violet-purple speculum wing-patch, edged on both sides with black and white borders. White under wing-coverts in flight. Large size. Male, green head and white neck-ring; white-bordered blackish tail. Female, mottled, lighter than Black Ducks, shorter neck than in female Pintail, and with white wing-linings.

Popular Names.—Green-head; Wild Duck; Common Wild Duck; Tame Duck; Domestic Duck; French Duck; Irish Mallard; Gray Mallard (female); Green-headed Mallard.

Remarks.—Shot for the table. Highly prized because of large size, weighing to 3 pounds, and because of delicious flavor. Birds feeding on duck potato, wild celery, grain, and similar vegetation, grow exceedingly fat and are almost as palatable as the Canvasback. Soon learns to keep out of gunshot range, and flies high after hunting season begins.

RED-LEGGED BLACK DUCK

Anas rubripes rubripes[44] Brewster

Not uncommon migrant and scarce winter resident; formerly very common migrant and not uncommon in winter. October to early April; commonest, late November and early December, late February and March. November 20, 1913, 2 shot (B); October 8, 1916, 4 observed (FG); April 7, 1915, 2 observed (A). *Recorded:* ABCEFGOW.

Geographical Distribution.—Breeds from northeastern Hudson Bay southward and westward around Hudson Bay and James Bay, Canada. Winters south to Florida and southern Texas, more common along the coast.

Habitat.—Ponds, marshes, rivers, and creeks; bays and lagoons.

Local Haunts.—Colorado River (Deep Eddy to the railroad bridge), the larger creeks, water tank ponds, and hog-wallow prairie ponds. Years ago, mouth of Barton Creek, where reeds and rushes grew in such profusion as to form a favorite feeding place for ducks.

General Habits.—Small flocks, generally from 2 to 5 birds, often in composite flocks with the Green-headed Mallard. Flies along streams at dawn, in the daytime staying under overhanging willows along sheltered banks of the river. Wary.

Feeding Habits.—Formerly a day-feeder, but due to persecution of hunters it has become a night feeder, hiding during the daytime. The stomach of one shot in New York by Dr. E. H. Eaton contained 23,704 weed seeds, 13,240 of them being pigweed seeds, 7264 knot grass seeds, 2624 ragweed seeds, and 576 dock seeds.

Voice.—Loud, resonant *quack*, resembling that of the Green-headed Mallard. The drake has a low, reedy *quack*. Often the female, when frightened, will slowly and sharply repeat her loud *quack, quack, quack*, many times.

Description.—Dark brown, darker above, lighter below. Feathers of back narrowly margined with buffy, giving the bird a dark, mottled appearance. Cheeks paler, streaked with black. Purple patch in middle of wing edged with white only on one side, instead of both as in the Green-headed Mallard; this single white line is on the edge of the patch toward the end of the wing. Bill plain olive-green or yellowish-green. Legs and toes bright red in life. Sexes alike. L. 22. W. 11. B. 2.20.

Field Marks.—Dark colors; purple wing patch with only one white edge. In flight, the whole lower surface or lining of the wings is very conspicuous, white against the dark plumage.

Popular Names.—Black Mallard; Dusky Duck; Northern Black Mallard.

Remarks.—Another form, the Brown-legged Black Duck, should be looked for. It is slightly smaller, with unstreaked throat and chin, olive bill, and brownish legs and toes.

GADWALL

Chaulelasmus streperus (Linnæus)

Tolerably common migrant, and not uncommon winter resident. Late September and early October to middle April or, rarely, second week in May. Commonest, early and middle November; March and early April. Begins moving northward late in February. *Recorded:* ABCHJW.

Geographical Distribution.—North America, breeding south to California, Colorado, Wisconsin, and the extensive Louisiana marshes. Winters southward to central Mexico and Florida.

Habitat.—Prairie ponds and marshes.

Local Haunts.—Colorado River (Lake Austin and Deep Eddy), larger creeks, and shallow margins of lakes and ponds.

General Habits.—Observed singly or by twos and threes in flocks of other ducks. Occasionally large numbers are observed. It is a good swimmer and diver.

Feeding Habits.—It rarely displays its skill as a diver, preferring to grub on the bottom in shallows by dabbling, or standing on its head in the water, with its tail and feet sticking up.

Flight.—Long, pointed wings, and a rather long-geared appearance when flying.

Voice.—Its quack is very similar to but louder than that of the Green-headed Mallard. Often repeated on the wing. Generally uttered more frequently than that of the Green-headed Mallard, and is shriller.

Description.—Grayish or brownish-gray, marked with fine wavy lines of black and white; rump patch and patch under tail black. Large chestnut patch on shoulder of wing; distinct white speculum patch in wing, conspicuous against dark plumage. Dark streaked crown with wide, low crest. Bill bluish black with orange edges. Feet orange-yellow. Female, grayish without wavy bars on sides and neck; no crest; axillars and under wing coverts pure white; chin and speculum patch white; bill blackish, or dusky mottled with orange. L. 19.50. W. 10.25. B. 1.65.

Field Marks.—Gray, with conspicuous white speculum patch in wing. Male, chestnut shoulders to wings. Female, white wing-lining showing in flight.

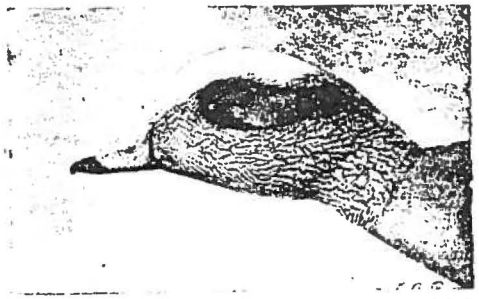
Popular Names.—Gray Duck; Canvasbelly; Creek Duck; Gray Gadwall.

Remarks.—The abundance of the Gadwall in Texas has apparently changed less in the last four decades than that of any other duck.

BALDPATE

Mareca americana (Gmelin)

Scarce migrant and winter resident; migrating, middle October to early December, and late February to April, rarely to second week in May. In fall, October 15 and November 6, 1917, hundreds (B). In spring, May 10, 1919, small flock (A). *Recorded:* ABC.



Bailey LAF

BALDPATE DUCK

Geographical Distribution.—Northern North America, breeding south to Utah, the Dakotas, northwestern Texas (Cooke), and the extensive marshes of Louisiana. Winters from the Canadian border south to the West Indies, Texas, and Lower California.

Habitat.—Edges of lagoons, grassy lakes, and pools; fresh water rivers and sloughs; shoal waters; open surface of larger bodies of water.

Local Haunts.—Colorado River (Lake Austin, Deep Eddy, etc.) and its lagoons.

General Habits.—Not shy. Observed in flocks, or in composite flocks with Pintails; commonly flies high. Can usually be located while feeding by the whistling of the males.

Feeding Habits.—Changed by persecution of hunters from a day-feeding to a shy, night-feeding duck, spending the day in hiding. Poor diver, but excellent sneak thief, often snatching bunches of wild celery or eel grass from the bills of better-diving Redhead or Canvasback. In fall, seeds, soft roots, water weeds, and a few insects. In winter, roots and young grass dug from water-soaked fields; young, inch-tall grass alongside sloughs.

Flight.—Flock moves in long line abreast, flying swiftly with whistling wings.

Voice.—Male, a mewing, whistled *whew, whew, whew;* a lisping, throaty whistle, repeated 3 times in quick succession; a low, short chattering. Female, a loud *kaow, kaow* or *hue, hue, hue,* strongly accented on second note; noisier than the male.

Description.—Handsomely-marked, pale-colored duck, with snowy-white crown; head and neck spotted or flecked with black, and green stripe along side of head from eye to nape; chest and sides grayish-lavender or light brownish, sides finely barred with wavy black lines; belly white; shoulder of wing gray, large white patch across middle of wing with a black-margined green patch behind it; tail light grayish, with sides and upper and lower coverts black; white flank-patch. Bill pale blue, with a black tip. Feet pale bluish-gray. Female, duller, without the distinctive head-markings of the male, and with whitish wing-patch largely gray. L. 20. W. 10.25. B. 1.40.

Field Marks.—Extensive, conspicuous white of lower breast, belly, and wings. At rest, the gray, white, and green wing-patches. In flight, the line abreast, with wings whistling a shrill, feeble *whee, whee, whee.* Pure white arm-pit feathers or axillars. Male, white cap, and green patch behind eye; sides of head gray instead of reddish-brown as in the European Widgeon. Female, dull black speculum or wing-patch; gray under-wing; white axillars.

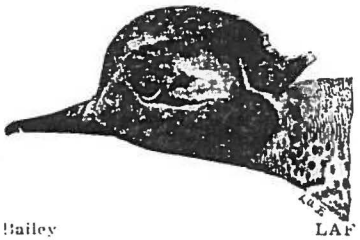
Popular Names.—Widgeon; Whistler; White-capped Duck; Whistle-wing; Whistle-duck; Whistling-duck; American Widgeon.

Remarks.—When well-fed, this species makes an excellent dish, though ordinarily considered inferior. Decoyed by calls or well-placed wooden ducks; however, considered nuisance by wing-hunters, avoiding points of land and alarming other species by its confused, whistling flight.

GREEN-WINGED TEAL

Nettion carolinense (Gmelin)

Not uncommon migrant and winter resident; hardiest of the teals, and practically as common during winter as in migrations; migrating, late September or early October to November, when it is commonest, and middle of February to early April. In fall, September 20, 1919, earliest (A); October 15 and November 6, 1917, hundreds (B). In spring, February 23, 1915, migrating northward (A); April 11,1915, latest (A). *Recorded:* ABC-DEHILMNOW.



Bailey LAF

GREEN-WINGED TEAL

Geographical Distribution.—North America, breeding south to Illinois, Colorado, and California. Winters from western Canada and New York south to Cuba and Honduras.

Habitat.—Grass-fringed ditches and fresh-water marshes; grass-margined pools and meadow creeks; prefers small bodies of water, temporary ponds, irrigation ditches, wet-season pools in hills and on desert; small meadow ponds; less commonly, open water of rivers, larger lakes, and ponds; occasionally along coast it moves from coast lowland marshes to smooth waters just outside surf.

Local Haunts.—Colorado River, particularly at Deep Eddy and along base of Mt. Bonnell; less commonly on the creeks, small brooks, and prairie ponds.

General Habits.—Small, compact bunches or densely-packed flocks, except during winter, when flocks are more open. Rapid swimmer, seldom diving. Flies along the river, or sits quietly in the shallows. Flocks pass over swiftly during the periodic northers beginning about October 10.

Feeding Habits.—Because of persecution of hunters, feeds chiefly at night. Tips tail in air, and plunges head and neck under edges of grasses and rushes where, in the shallow water of ponds and lagoons, it can secure roots, water plants, and weed seeds without diving, at which it is not very adept; kicks water to maintain desired balance while feeding. Also feeds on insects, crustaceans, snails, and similar water animals.

Flight.—Like that of all teals, the flight is exceedingly swift, likened to a high-speed projectile; considered the fastest of ducks, making at least 100 miles an hour in close flock, wings almost touching those of other birds in the squadron, suddenly turning at right angles, wheeling, twisting, and away, in absolute, incredible unison, as one bird—not one

jostling or interfering with another. In smaller ponds, usually makes straight away without rising into the air. Flushed from larger pond, river, or marsh, it usually ascends to a considerable height before making off. Small size, close formation, and erratic flight are characteristic of the teal.

Voice.—Much noisier than the Blue-winged Teal. Male utters a series of short, shrill, piping, mellow whistles; also numerous other musical calls, including a flute-like *perp, perp*, a rattling *wher-er-er*, and a *wher-a-loo*. Female frequently utters a small, high-pitched *quack*.

Description.—Very small, generally grayish duck, with reddish-brown or chestnut head, blackish on forehead and chin; and a large, broad, glossy-greenish patch through eye to nape. Shoulder and front half of wing gray; speculum-patch across middle of wing is half purplish-black and half bright green; on shoulder, just in front of wing, is a white crescent bar; breast white, spotted with black; under tail-coverts, black; bill black; iris of eye dark brown. Female, brownish-gray, with speckled head, whitish throat and breast, the latter marked with cinnamon and black, the cinnamon as a wash; wings similar to those of the male; iris yellow. L. 14.50. W. 7. B. 1.40.

Field Marks.—Small size. Absence of blue in wing distinguishes this from Blue-winged and Cinnamon Teals, both of which have large blue wing-patches. White bar across side of breast distinguishes it from the rare European Teal. Male, chestnut-brown head; green patch back of eye.

Popular Names.—Green-wing; Winter Teal; Little Red-head; Red-head; American Green-wing.

Remarks.—Of fair abundance, and greatly desired for the table, with tender juicy flesh and fine flavor; easily decoyed, but wary. Shot on the wing by long lead and quick shot; close formation results in frequent "potting" of a number of birds at one shot.

BLUE-WINGED TEAL

Querquedula discors (Linnæus)

Common migrant, scarce winter resident; and extremely rare and irregular summer resident; migrating, late August or early September (commonly by early October) to November, and late February to late March or occasionally early May. In fall, August 13, 1915, 2 (H)[45]; September 23 to October 4, 1902, common in small flocks (R); October 15, 1917, extremely abundant, and November 6, 1917, thousands (B). In spring, February 15, 1915, 9 moving northward (F); April 18, 1915, migrating (A); May 20, 1915, migrating (A). *Recorded:* ABCDEFHIKLMNOPQRWY.

Geographical Distribution.—North America, from southern Canada south to Maine, Indiana, and Nevada, chiefly east of the Rockies; breeds in Louisiana and casually in Texas (Spring Lake and San Antonio); rare breeder south of Ohio, Missouri, and Oregon. Winters from Delaware, Illinois, and southwestern Canada southward to Chili.

Habitat.—Marshes and marsh-fringed pools; coastal marshes, similar to those along Louisiana and Texas coasts. Grassy edges of streams, ponds, and sloughs.

Local Haunts.—Colorado River (Lake Austin, Deep Eddy, etc.), larger creeks (Onion and Barton), and the water tanks on the blackland prairie. In summer, small streams and grassy, marshy edges of pools and ponds, particularly in pasturelands, between Creedmoor and Mendoza.

General Habits.—Usually observed in flocks of about 15 birds, flying rapidly down the river, occasionally circling and alighting in shallows and on soft mud flats. In closed season, tame and unsuspicious; in open hunting season, shy and retiring, but easily decoyed

or shot while feeding. Flocks waver and swing about when looking for feeding grounds, spreading out and closing up. Occasionally in small flocks in summer (H), though usually singly or in pairs at that season.

Migration.—The first fall migrants appear late in August, flying both up and down the river, in small bunches of 7 or 8 birds, evidently family groups, generally flying low near the bank, about 4 or 5 feet from the water, very difficult to "sky-line." Their flight then is very rapid, even though the birds are not at all shy. Later the flocks become larger, amounting sometimes to dense companies, and the birds fly higher.

Feeding Habits.—Feeds in shallows along banks, where it searches for wild rice, seeds, and similar food.

Flight.—Extremely swift, its two-miles-a-minute speed making it one of our most rapid birds; drops suddenly down to reeds or water on alighting, as do many shorebirds. Usually flies in closely-packed flocks, lower than the Green-headed Mallard.

Breeding.—Probably in April and May.

Nest Location.—Nest hidden in tufts of tall grass along secluded ponds or brooks, on dry ground in meadows near fresh water, in marsh tangles, and along railroad embankments.

Nest Construction.—Composed of grasses and weeds, and lined with down feathers from the parent bird.

Eggs.—4 to 12, blunt ovate to ovoidal, pale greenish-buffy-white or pale olive-buff; 1.89×1.28.

Voice.—Low, feeble *quack*, rapidly repeated, hoarser than that of the Green-winged Teal; not frequently uttered, as the bird is generally a quiet species. Male, a whistled *peep*, repeated five or six times.

Description.—Head, lead-gray, with purplish gloss, blackish on crown and chin; under-parts vinaceous, spotted on breast with dusky or black; upper-parts scalloped and streaked with dusky and vinaceous. Front half of wing blue in both sexes, with green speculum-patch further out toward tip of wing, separated from blue by a white line. General color, grayish-brown, spotted below, and with bluish head and neck; otherwise, female similar in wing-markings to male. Black patch below tail, and white patch on either side margined with black. Male, spring and summer, broad white crescent in front of eye, conspicuous at quite a distance. L. 15.50. W. 7.25. B. 1.60.

Plumage Peculiarities.—A geographical race inhabiting the Gulf Coast from Florida to Louisiana, Texas, and Mexico, and doubtless including the Austin Region for summer birds, has been named *Q. d. albinucha* Kennard, 1919, and variously called Southern Blue-winged Teal, Louisiana Blue-winged Teal, White-crested Teal, or Necktie Teal. It is characterized by thin white line over eye, running from crescent-shaped white spot of face to back of head and down to nape, where it converges with line from opposite side to form a white nuchal spot or patch, pronounced in some younger birds, becoming fainter with age.[46]

Field Marks.—Small; narrow bill; blue shoulders; general grayish-brown, spotted appearance; and swift flight. Occasionally confused at a distance with the Shoveller, but the latter's big bill is diagnostic. Male in spring, large blue patch on shoulder of wing like that of the Cinnamon Teal, but without deep cinnamon color below, and with white crescent in front of eye, visible at quite a distance. Female, without head markings, but with whitish chin and neck; resembles female Cinnamon Teal, which is darker and more brownish on breast, with lighter speckled head and neck, and darker, dusky, rufous-tinged chin and throat.

Popular Names.—Common Teal; Blue-wing; Keel Duck; Summer Teal; White-faced Teal; Northeastern Teal; Northern Blue-wing.

CINNAMON TEAL

Querquedula cyanoptera (Vieillot)

Very rare migrant; late September and early October, and early March to early May; April 24, 1921, 2 pairs (A, H). *Recorded:* ABHR.

Geographical Distribution.—North and South America, from southern Canada and western United States south to Chili: breeds eastward to southwestern Texas (Marathon, Rock Springs, and Mitchell's Lake near San Antonio). During migrations, eastward as far as Louisiana. Winters from the Mexico-United States boundary, from Pacific Coast to Brownsville, southward.

Habitat.—Shallow tule lakes of the West; open patches of water in tule marshes; fresh-water ponds. In migrations, rivers and creeks.

Local Haunts.—Colorado River, between Bull Creek and Mt. Bonnell; Barton Creek, about 6 to 10 miles upstream.

General Habits.—Occurs in small flocks, flying along the river and the larger creeks in the western part of the Region; never in large flocks, even during migrations. One of the tamest of ducks, and may frequently be approached at quite close range. Female sticks close to nest, flushing only at closest approach; nests are easily located, along with other meadow and marsh-nesting birds, by dragging long rope over grass-tops and flushing female direct from nest. Young newly-hatched ducklings are remarkably agile; take to water at once, diving and swimming with ease, often for long distances under water, and instinctively hiding under floating water-moss with only tip of bill above surface. Parents escort newly-hatched brood from nest to nearby water, and guard them solicitously, feigning a broken wing if they are approached too closely, giving ducklings time to hide in grasses or under water-moss.

Feeding Habits.—Tilts in shallow waters along borders of ponds and streams, obtaining insects and seeds from the mud of bottoms; also gleans food from grasses along shores.

Flight.—Like that of all teals, exceedingly rapid; wing-beat less rapid than that of the other teals.

Breeding.—Possibly late April to late June.

Nest Location.—Among tules, in open grassy fields, or in grain fields, on damp ground, occasionally over shallow water, sometimes some distance back from water; usually on edge of small pond or stream.

Nest Construction.—Deeply saucer-shaped, composed of grasses, weed stems, and occasionally tules, compactly woven together; considerable dark gray down in nest, particularly by time the full set is laid, occasionally completely covering and hiding eggs when female is away from nest.

Eggs.—5 to 13, elongate-ovate, creamy-white to pale buff, 1.89 × 1.36; larger than eggs of the Blue-winged Teal.

Voice.—Female, a tiny *quack*.

Description.—Entire body, including head, neck, breast, and underparts, deep bright cinnamon-brown, duller on belly, blackish on chin and crown; back dusky; wings, marked like those of the Blue-winged Teal, sky-blue coverts separated from green speculum by white line; arm-pit feathers, white; eye with orange iris; bill black, tinged on edges and below with pink. Female, closely resembles Blue-winged Teal female, but darker and more spotted, with browner breast; chin and throat dusky, tinted with rufous; sides of head dull white, speckled with black. L. 16.25. W. 7.35. B. 1.75.

Field Marks.—Small size, though a rather large teal. Large blue patch on wings. Male, strongly-cinnamon body. Female, brownish-ashy; dusky throat, and chin; head and throat more speckled than that of Blue-winged Teal female, and with strong cinnamon suffusion and pale reddish-brown horseshoe markings instead of ashy edgings.

Popular Names.—Silver Teal; Red-breasted Teal; Cinnamon-breasted Blue-wing; Western Blue-winged Teal.

Remarks.—Not considered as desirable as the two smaller teals; flesh sweet and saturated with blood like that of a dove, but does not keep well..

SHOVELLER

Spatula clypeata (Linnæus)

Not uncommon migrant, and rare winter resident; migrating, October and November, and March and April, with rarely a few stragglers to the middle of May. In fall, October 15, and November 6, 1917, hundreds (B); November 8, 1915, one shot (B). In spring, April 18, 1915, small flock (A); May 17, 1919, pair (A). *Recorded:* ABCFHLNOW.

Geographical Distribution.—Breeds from Alaska and Canada southward to Missouri, central New Mexico, and southern California, mainly north of Texas and Arkansas, though rare and local through Texas (Mitchell's Lake near San Antonio, and along the Texas Coast, generally non-breeders). Winters from Delaware, southern Missouri, and southwestern Canada, commonly through the Lower Mississippi Valley, to northern South America.

Habitat.—Marshy water; shallow, reed-margined sloughs; less commonly, open water of slowly-flowing larger streams and the prairie ponds.

Local Haunts.—Colorado River and its backwaters and sloughs, the larger streams, and the prairie ponds of the blackland prairies.

General Habits.—Very similar to those of the Pintail. Usually occurs in pairs and small bunches, never in large flocks; rather commonly two or three birds in composite flocks with the Mallards and Blue-winged Teals. Tamer than most ducks, frequently allowing close approach.

Feeding Habits.—The Shoveller keeps to shallow waters, skimming the surface or tipping up and feeling around or grubbing on the bottom in the shallows with its shovel bill, scooping up and straining ooze and decaying vegetation through the comb-like strainers or lamellae along the edges of its bill, feeding on insects, tadpoles, larvae, worms, mollusks, tiny crustaceans, and other forms of animal life, mixed with a few seeds.

Flight.—Swift, spending considerable time on the wing; teal-like, more hesitating and hovering, less direct. Noisily flaps wings when rising from surface of water.

Breeding.—Possibly in April and early May.

Nest Location.—Usually on dry ground, well concealed in grass or under bushes, either near or far from water, in open country dotted with shallow ponds and marked with sloughs.

Nest Construction.—Made of dried grasses and weeds, and lined with down feathers.

Nest Measurements.—Diameter 14, depth 5.

Eggs.—6 to 14, thin-shelled, pale olive-buffy to greenish-gray, 2.13 × 1.43.

Voice.—Generally silent; rarely heard to utter its few feeble quacks, or a more or less conversational *took-took*, repeated a number of times while feeding; some of its notes have been likened to the sound of a rattle turned by short jerks.

Description.—Large, spade-shaped bill, about 2.50 long, and over 1 wide near tip, where it is twice as broad as near head; in comparison with size of head, much larger than in any other duck. Front half of

folded wing blue; green speculum-patch across middle of wing. Eyes orange-yellow; feet orange-red or vermilion. Male, green head, white breast, and reddish belly; in winter, closely resembles female. Female, dull-colored, brownish, but with bill and wing as in male. L. 20. W. 9.50. B. 2.50.

Field Marks.—Chunky head and short neck. Large sky-blue patch over front half of folded wing; broad green wing-stripe. Large, ungainly, spade-shaped bill, black, much wider at tip than at base, distinguishable even in flight. In spring, reddish belly and pure white ring around body at breast are characteristic of the male.

Popular Names.—Spoon-bill; Broad-bill; Shovel-bill; Shovel-nose; Shovel-mouth; Scooper; Spoonie; Spoon-bill Teal.

Remarks.—Popular table duck, though rarely fat; juicy and of fine flavor during early part of hunting season, though becomes tougher and less palatable in season. Decoys readily.

AMERICAN PINTAIL

Dafila acuta tzitzihoa[47] (Vieillot)

Tolerably common migrant, more common in spring, and rare winter resident; in migrations, rarely from late August or usually from late September and early October to November, and February and March or rarely to middle April. In fall, October 15 and November 6, 1917, very common, hundreds on the latter date (B); November 8, 1915, 1 shot (B). In spring, latest, April 18, 1915, 18 (A). *Recorded:* ABCKLMNPW.

Geographical Distribution.—Arctic Coast of Alaska south to southern California, Arizona, Missouri, and the extensive Louisiana marshes. Winters from Canada and north-central United States southward to Panama and Cuba.

Habitat.—Wet prairies and muddy flats; reedy, grassy edges of flood-plains, streams, and prairie ponds.

Local Haunts.—Colorado River, particularly Lake Austin and Deep Eddy, sloughs, and along under the willows bordering the Sand Beach; rarely, the prairie ponds.

General Habits.—Occurs in open or scattered flocks during migrations; when looking for a feeding ground, the birds chatter, and the flight is wandering. Graceful swimmer, sitting high on water; dives when wounded. When disturbed at feeding, stretches graceful long neck almost straight upward. Along coast, birds occasionally assemble in dense, rafted companies outside the breakers.

Feeding Habits.—Moves about in shallows at dusk, after the manner of Green-headed Mallard and Baldpate, its long neck usually permitting it to reach bottom without tipping; vegetable food by preference, aquatic weeds, roots of the horsetail rush, bulbous roots, seeds, and grain, together with insects, crustaceans, and worms; gleans at night on the stubble grain fields.

Flight.—Extremely swift, at great height, usually V-formation, or in long lines or square-shaped figures; wing-motion steady, with little noise. Hunters recognize it in air at once because it slants in to pond for long distance with wings set and curved downward, with distinct noise of wind against primaries.

Voice.—Drake, a mellow whistle; a loud *qua, qua*, in flight; in spring, a low-keyed, soft, rolling whistle. Duck, a hoarse, muffled *quack*, rarely heard during the daytime, usually heard at night on the feeding grounds. In spring, during courtship, males utter a few low, soft, throaty notes.

Description.—Grayish, with brown head; sides and front of neck and breast, white; black patch at upper edge of "arm-pit"; small greenish patch in wing, edged by reddish-brown on one side and black and white on the other. Tail gray, with long black central pair of feathers sticking far out to rear; black patch above and below tail, and white patch on either side; back of neck, blackish; belly white; bill blackish, edged with grayish-blue. Female, generally mottled brownish, without the brown head, white breast, or black markings of the male; dull brownish speculum-band in wing; under wing-coverts dusky; central tail-feathers shorter than in male, sharply pointed. L. 28 (female 22). W. 10.20. T. 7.30 (female 4.50). B. 2.

Field Marks.—Long trim body, narrow head, very long and slender neck, and long, pointed tail—in the male, the central feathers very much elongated and pointed. Large size; no crest. Male, dark brown head with white neck-stripes; white under-parts.

Popular Names.—Sprig; Sprig-tail; Spike-tail.

Remarks.—Popular as game-bird because of large size and fine flavor.

WOOD DUCK

Aix sponsa (Linnæus)

Formerly a somewhat common resident; now very rare, nearly extinct, though occasionally observed in early summer or from midsummer to fall. *Observed:* CDLNW.[48]

Geographical Distribution.—Southern Canada, southward to Florida, the Gulf Coast, Texas, and California. Winters through the United States.

Habitat.—Secluded wooded streams and sloughs in timbered tracts; swamps and shallow sloughs in heavy, hardwood growths in bottoms; crooked forest water courses; thick lowland woods and wooded swamps; woodland ponds; flooded lands bordering lakes and streams.

Local Haunts.—Swampy places and wooded pools along the Colorado River, Onion and Barton creeks, most commonly along wooded valleys west to the Pedernales River, where it seems to be making a last stand. In winter, southeastern part of Region, along protected water holes of Onion Creek.

General Habits.—Occurs singly or in pairs, rarely in flocks in autumn. Perches on limbs near water or on fallen logs in water; floats on water under marginal bottoms timber overhanging the banks of streams; sits and perches on stumps, mossy logs, or the dead parts of trees overhanging water. The most beautiful of American ducks, fully as beautiful as the Mandarin Duck of Asia. Eggs incubated by female for about 4 weeks; young tumble from nest into water or onto soft grasses and dead leaves beneath nesting tree and are led to water, or are carried one by one in mother's bill from distant nesting site to water.

Feeding Habits.—Feeds on seeds of aquatic plants, wild rice, celery, pond-weed, and aquatic insects; in fall, forages woods for acorns; gleans nearby stubble fields for corn and wheat.

Flight.—Swift and marvelously easy. Flies through woods at full speed, twisting and turning among branches of trees with perfect ease.

Breeding.—Probably from March to May.[48]

Nest Location.—Hollows, holes, natural cavities, and hollow ends of broken branches, or decay-enlarged woodpecker holes, generally 4 to 6 feet deep, usually 30 or 40 feet from ground in stumps or in decayed or living trees not far from water, though occasionally at some distance.

Nest Construction.—Nest of twigs, weeds, leaves, and grass, lined with down from the bird.

Eggs.—8 to 14, short elliptical, more globular than those of most ducks, glossy, rich pale buff-colored or creamy-white, 2.00×1.50.

Voice.—A mellow, sharply whistled *peet, peet;* or, when frightened, a harsher, shrill, plaintive *oo-eek, oo-eek* or *hoe-eek*. Female with brood, a soft, low, prolonged *pe-ee, pe-ee*. Downy young, a mellow rapidly uttered, *pee, pee, pee-e*.

Description.—Beautiful, gorgeously-colored duck with patches and bold stripes of rich chestnut, green, steel-blue, ochraceous, and buffy; marked with the hues of the rainbow. Brilliant, with large elongated, drooping, greenish and purple crest hanging across back of head; cheeks and crown green; throat and cheek-lines (line over eye, and to ear and nape) white; breast chestnut; belly white; feet yellowish. Female, yellowish-gray or quaker-gray, with large white spectacles and white throat; crown purplish-brown, crested; steel-blue speculum like male. L. 19. W. 9. B. 1.35 (narrow, higher than wide at base).

Field Marks.—Beautiful; rainbow colors; conspicuous drooping crest across back of head; medium size; and woodland habitat. Male, green-crested, white-striped head; chestnut breast; white chin and belly; blue speculum. Female, crested head, white spectacles.

Popular Names.—Summer Duck; Painted Duck; Acorn Duck; Bridal Duck; Rainbow Duck; Squealer.

REDHEAD

Nyroca americana[49] (Eyton)

Moderately common, sometimes abundant, fall migrant, scarce spring migrant, and scarce winter resident; in migrations, second week in October to early December, and March and early April. In fall, October 15, 1916, abundant (B); October 22, 1914, 1 shot (B); November 6, 1917, thousands (B). In spring, April 7, 1919, 3 (A). *Recorded:* ABCDLOW.

Geographical Distribution.—Northern North America, breeding from Canada south to California, Missouri, and Maine. Winters from north-central United States south through Texas to central Mexico.

Habitat.—Open waters of streams, lakes, and prairie sloughs; when it alights on inland waters it prefers the wider, deeper stretches of larger streams. Preferable, salt water of bays and the Gulf.

Local Haunts.—Colorado River, especially along Lake Austin, Deep Eddy, and about the mouth of Barton Creek.

General Habits.—Rarely alights on inland waters, being a true bay or sea duck, which, together with several other species occurring in the Region, possesses a small flap on its hind-toe to aid in swimming in the surf. Generally observed in flocks flying high in the air, wings whistling as they move along, commonly in wide, V-shaped formation. Occasionally seen by twos and threes, or in small companies of from 6 to 10 or 15. When common or abundant, flocks often alight. One flock will attract more flocks to the open water; the birds will drop or fall like zigzagging thunderbolts, the flock apparently in utter confusion until it nears the surface of the water, when each bird will straighten its wings and settle quietly beside the others. Occasionally in composite flocks with the Canvasback. Easily decoyed and shot.

Feeding Habits.—Expert at diving, and, although usually classed with bay and sea ducks, usually feeds in fresh-water lakes and open streams, where it keeps well away from shore and dives down to pull up its food, which it seeks both in daytime and at night: acorns, insects, nuts, submerged rootstocks and buds, and wild celery grass, the latter giving it the same delicious flavor that makes the Canvasback so attractive to the epicure, thus adding to the confusion which exists between these two very similar species. Occasionally molluscs, crustaceans, and small frogs are taken.

Flight.—V-shaped speeding flocks, with loud whistling and roaring of wings, are able to travel for many hours without rest. Rises from the water in hurried confused flight.

Voice.—Female quacks like a hoarse and half-choked Black Duck. Male accompanies his peculiar *qua-quaa* with a flirt of his head back toward his tail; also, a hollow, rapid croaking, and a hoarse, rolling, gutteral sound.

Description.—Grayish; with front parts, including neck and breast, black. Head and upper neck, brick red; forehead high, full, rounded; bill of ordinary duck-shape, pale grayish-blue, with narrow black tip. Back grayish-canvas. Eye yellow. Tail and feathers about base, black. Female, dark grayish-brown above, paler below, whitish on throat and belly; chocolate-brown head; indistinct bluish-gray band across end of bill. L. 20. W. 8.90. B. 2.

Field Marks.—Large size. Eye yellow, instead of red as in Canvasback. Ordinary broadly-flattened duck-bill, with high forehead rising abruptly from it. Male, head and upper neck brick-red, lower neck black; grayish dirty-canvas back. Female, no barring on back-feathers as in Canvasback female; distinguished from female Scaup by gray on speculum-patch in wing and less white on face; larger than Ring-necked Duck; and without white wing-patch of Golden-eye.

Popular Names.—Red-head Mallard; Poachard; Fiddler Duck; Red-headed Duck; Pug-nosed Canvasback.

CANVASBACK

Aristonetta valisineria[50] (Wilson)

Rare migrant and winter resident; not uncommon one winter when unusual numbers of water-fowl were present. Late October to the end of March; migrating through toward coast in late October and November, and returning in February and March. *Recorded:* ACDF-GHKLNW.

Geographical Distribution.—North America, breeding from Canada south to Colorado and Minnesota. Winters from northern United States south to central Mexico, particularly along coasts.

Habitat.—Open water of shallow ponds, lakes, and estuaries; bays.

Local Haunts.—Larger bodies of water along the Colorado River, particularly along Lake Austin, Deep Eddy, and quieter water from Barton Creek to the Montopolis Bridge.

General Habits.—Generally observed singly or in pairs, rarely in the larger flocks in which it is often found in the north and along the coasts. Expert diver, thus easily procuring, from several feet under the water, the ribbon-like wild celery grass stems and bulbs of which it and many other ducks are very fond; dives as much as 25 feet for food.

Voice.—Males, peeping or growling when together. Females, a *quack* resembling that of the Black Duck, or a startled, screaming *curr-row*.

Description.—Head and neck dark reddish-brown, much darker than that of the Redhead and blackish on chin and crown. Broad band of black encircling breast and upper back; remainder of plumage very pale silvery gray, much lighter in general color than that of the Redhead, and with belly white and sides whitish. Upper and under tail-coverts black. Black bill gradually slopes up to the top of the head, which is long and narrow and slants gradually back from the high bill; the head of the Redhead rises abruptly with high forehead from the base of an ordinary duck bill. Iris red. Female, reddish-brown replacing black on breast-band. L. 21. W. 9. B. 2.40.

Field Marks.—Rufous-brown head and neck, blackish about chin and crown; shining white canvas back; and bill running in straight line from top of forehead to bill tip, so that "the Canvasback has a Roman nose, the Redhead a pug nose." Profile of bill and forehead best mark for all ages and both sexes. Female, back finely barred with wavy white lines.

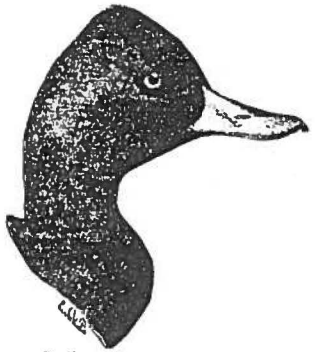
Popular Names.—Horse Duck (from shape of head).

Remarks.—The most highly prized of all the water-fowl shot by the local hunters for the table.

LESSER SCAUP DUCK

Fulix affinis[31] (Eyton)

Scarce migrant and very rare winter resident. Middle October to early April; migrating, late October and November, March and early April. October 15, 1917, abundant (B); November 6, 1917, thousands (B); November 11, 1915, 2 shot (B). April 18, 1915, last seen (A). *Recorded:* ABCNO.



Bailey
SCAUP DUCK

Geographical Distribution.—North America, breeding mainly north of the United States, south to the Dakotas, Colorado, Indiana, and rarely the Louisiana marshes. Winters from northern United States south to Panama.

Habitat.—Open water of lakes, ponds, and estuaries; bays.

Local Haunts.—Colorado River and small, cattle tank ponds and pastureland water holes.

General Habits.—In flocks, usually with other species. Usually observed only when flying along the river in migrations, though occasionally resting on the open waters. Rarely, in immense flocks, closely packed when resting on the water, and giving the appearance of a raft. Decoys easily. Good diver; fond of wild rice, and hence esteemed for the table.

Voice.—A harsh *scaup* or *quauck.* A soft, purring note or whistle.

Description.—Rather small duck, with black head, neck, and breast having purplish reflections; back and sides grayish with fine wavy lines, the flanks more strongly marked with wavy black bars; belly white. White speculum patch in wing. Broad, pale bluish bill. Female, more drab or brownish, with breast and flanks brownish; white about base of bill. L. 16. W. 8. B. 1.90 or less.

Field Marks.—Blackish head, neck, and breast; grayish body, and white speculum wing-patch. Short, wide, bluish bill. Small size.

Popular Names.—Bluebill; Blackhead; Little Bluebill; Raft Duck; Little Gray-back; Flocking Duck; Flocking Fowl; Butterball (by a few people).

BUFFLE-HEAD

Charitonetta albeola (Linnæus)

Rare migrant and winter resident. November to March; migrating, November, and late February and early March. November 8, 1915, 1 shot (B). *Recorded:* ABLNW.

Geographical Distribution.—Northern North America, breeding south to Maine and Iowa. Winters from Canada to Florida and central Mexico.

Habitat.—Open water of lakes and rivers; less commonly along grassy banks of small creeks and pools.

Local Haunts.—Quiet waters of Colorado River (particularly Lake Austin and Deep Eddy) and the larger creeks; larger ponds.

General Habits.—Occurs singly and in very small flocks. By preference, a fresh-water species. Expert diver, quick and skillful, and often mistaken for a grebe; feeds on small fish and other animal matter secured by diving. Decoys easily.

Voice.—A short *quack.*

Description.—Conspicuous, handsome, plump little duck, about the size of a teal. Puffy, round, crested head purplish, greenish, and bluish, dark, with distinct large white band passing across back and top of head from eye to eye. Neck and under-parts white; back black; rump and tail ashy; wing whitish, with long feathers black. Short, pointed bill. Female grayish, darker on head, with ear-patch and wing-patch white. L. 14.50. W. 6.50. B. 1.10.

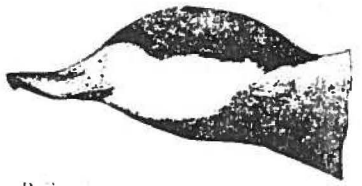
Field Marks.—Small size, white sides and breast, and white triangle behind eyes contrasting sharply with glossy green-black forehead. Plump, with round, crested head. White flanks and white in wings. Female, head smaller and with smaller white ear-patch.

Popular Names.—Butterball; Dipper; Dipper Duck; Spirit Duck; Hell-diver.

RUDDY DUCK

Erismatura jamaicensis (Gmelin)

Common migrant, very irregular; probably occurs in winter and summer. Migrations, middle October to early December; late March and early April. October 15, 1917, abundant (B); November 6, 1917, thousands (B); November 12, 1915, thousands (B). April 6, 1919, small flock (A). *Recorded:* ABN.



Bailey LAF
RUDDY DUCK

Geographical Distribution.—North America, from northern Canada southward, breeding locally throughout the United States, rarely south to Guatamala; a few pairs breed at Mitchell's Lake, near San Antonio, Texas. Winters in the United States, northern Mexico, and the West Indies.

Habitat.—Tule or grass-fringed lakes; open water of larger lakes, streams, and ponds.

Local Haunts.—Colorado River, especially on Lake Austin at the base of Mt. Bonnell, but occasionally on smaller streams and ponds.

General Habits.—Sociable, usually observed in compact flocks of from 10 to 12, less commonly larger flocks and composite flocks. In early November, flocks of thousands observed; November 12, 1915, the main flock rested on the water in nearly a solid mass, fifty yards wide and a quarter of a mile long, with several smaller bunches of from 25 to 100 a short distance upstream (B). Swims in close formation, and sinks to neck like a grebe; expert diver, and prefers escape from pursuit by diving. Rests in water with tail cocked up at right angles to body.

Feeding Habits.—Feeds at deep or shallow bottom of lake on seeds, plant stems, roots, and aquatic animal life.

Flight.—Flight low, straight, and strong, with a rapid whirring or

buzzing of its short wings. Patters over the water in taking to the air.

Breeding.—Possibly. Nest and eggs should be looked for in June.

Nest Location.—On or in the water's edge of some deep, sluggish, reed-lined stream, pond, or lake.

Nest Construction.—An old Coot's nest, or one of its own construction, of reeds, dry rushes, and grass, on the water or just over the water in reeds, tules, and rushes.

Eggs.—4 to 11, ovoid to oval, finely granulated, grayish-white or light buffy, 2.43×1.75.

Voice.—A throaty, pumping *ip-ip-ip-ip-ip-cluck, ip-ip-ip-ip-ip-cluck.*

Description.—Rather small, plump, squat duck, with short wings. Tail feathers very stiff and pointed; in bird at rest, tail up-tilted, often spread like fan. Large, bright sky-blue bill, very stout and broad at end. Summer, general color glossy chestnut to gray; throat, neck, and back chestnut; lower back blackish; under-parts silvery-white; crown glossy blackish, with large white patch covering cheeks, sides of head, and chin. Female, grayish, without black crown or white cheeks. Winter, dusky grayish-brown; under-parts white; crown and nape reddish-brown, streaked with black, with sides of head and chin white, and throat gray. L. 15. W. 5.90. T. 3.50. B. 1.55.

Field Marks.—In breeding plumage, bright sky-blue bill. Stiff, pointed tail feathers and short upper tail-coverts. When swimming, round, plump body and uplifted spike tail.

Popular Names.—Brown Coot; Bumblebee Coot; Bristle-tail; Butterball; Pintail; Spine-tailed Duck; Acorn Duck; Sprig-tail; Dipper Duck; Deaf Duck; Fool Duck; Bull-neck; Dumb Bird; Stiff-tail; Rook Duck; Rooky; Rookie.

LESSER SNOW GOOSE

Chen hyperborea hyperborea[52] (Pallas)

Not uncommon migrant, third week in October to latter November; and second week in March to middle of April, very common in late March. October 19, 1914 (A); November 24, 1914 (A); November 25, 1919 (A). March 10, 1915 (A); April 4, 1915 (A); April 18, 1915, 35 (A). *Recorded:* ACDNW.

Geographical Distribution.—Western North America, breeding in the far Northwest, and wintering in the western part of the United States, east to Louisiana and the western Gulf Coast, and southward into central Mexico.

Habitat.—Wider stretches of water, marshes, margins of ponds, and sloughs.

Local Haunts.—Valley of the Colorado River, rarely the prairie ponds in sparsely-settled farming country.

General Habits.—Large, glistening white flocks move northward in spring, flying at a great height, in long-extended or gently-curving line instead of the V-shaped formation of the majority of wild geese. The flight is usually line broadside, practically never V-shaped. Rarely

settle in the Region, passing on to their winter home in the coastal marshes. At rare intervals exhausted birds alight on the open stretches of the river or the prairie ponds to rest. Flies low in foggy weather, when it is sometimes killed. Migrates during both day and night.

Feeding Habits.—Alight on extensive marshes, prairies, grain fields, and stubble fields, where they feed on grain, waste corn, mast, or sprouts.

Voice.—High-pitched, shrill, falsetto, noisy cackling; higher, noisier than, and on the whole quite different from the clanking call of the White-fronted Goose and the mellow honk of the Canada Goose.

Description.—A large white goose with black wing tips or primaries and ashy coverts. Bill pinkish, with black along edges. Immatures washed with gray; blackish feet and bill. Adult feet and legs pinkish or red. L. 25. W. 16. T. 6.5. B. 2.10.

Field Marks.—Large size, pure white except for entirely black long wing-feathers. Call. Flight formation.

Popular Names.—Brant; White Brant; White Goose; Snow Goose; Small Snow Goose.

AMERICAN WHITE-FRONTED GOOSE

Anser albifrons gambelli[53] Hartlaub

Scarce migrant, formerly extremely abundant; middle October to late November, and early March to middle April. Occasionally shot while flying low (C). *Recorded:* CDIW.

Geographical Distribution.—Central and western North America and Greenland, breeding south to Vancouver, Canada. Winters from Canada south to Mexico, the Gulf Coast, and Cuba. Essentially a species of the far West.

Habitat.—Low, wet ground near timber; low, bush-dotted prairies; and, occasionally, bottomland grain fields.

Local Haunts.—Rarely, the Colorado River flood plains; usually passes through without alighting.

General Habits.—Large flocks of these gray-headed, gray-bodied geese, the noisiest of their kind, are observed in migrations, especially in spring, flying over generally in V-shaped formation. Probably the bird, migrating through at night, occurs much more commonly than is supposed. Years ago visited grain fields in hordes, damaging crops.

Feeding Habits.—Feeds on vegetable matter and small aquatic animal life.

Voice.—Loud, harsh, clear, clanging cackle, rapidly repeated, *wah, wah, wah, wah,* often heard at night during migrations.

Description.—Mottled grayish-brown (upper-parts, head, neck, chest, and sides), with dark or blackish bars across its belly; lower belly pure white. White forehead patch over its bill at the front of its dark head. Yellowish or orange-pink bill; orange-reddish or dusky-yellowish feet and legs. Immature without white forehead or black belly-mark. L. 28.50. W. 16. T. 6. B. 2.10.

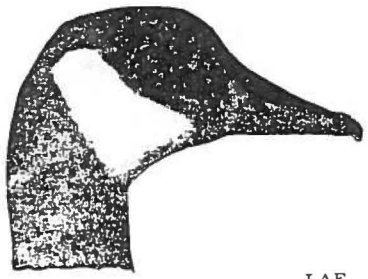
Field Marks.—Gray-headed, gray-bodied goose (mixed black and white plumage), with white about base of upper mandible and whitish edge at base of tail. Orange or pinkish bill, and yellowish or orange feet. Slightly over 2 feet long.

Popular Names.—Gray Brant; Speckled Brant; Laughing Goose; Speckle-belly; Speckle-bill; Yellow-legged Goose; Pied-Brant; Barnyard Goose.

CANADA GOOSE

Branta canadensis canadensis (Linnæus)

Fairly common migrant, formerly a few remaining in winter; in migrations, early or middle October to early December, and late February to middle April, though more commonly March 10 to 20. In fall, October 8 to 11, 1914, numerous flocks sweeping southward late in evening and at night (A); December 5, 1915, small flock (A). In spring, February 23, 1916, 9 flying northwestward along Lake Austin (D. A. Simmons); April 14, 1919, common (A); April 18, 1915, abundant (A). *Recorded:* ABCDEFGIJKLMNPQWY.



Bailey CANADA GOOSE LAF

Geographical Distribution.—North America, breeding from Arctic Circle south to Oregon, Colorado, and Indana. Winters from southern Canada south to Florida, the Gulf Coast, Texas, and California.

Habitat.—Stubble fields; low marshes and broad stretches along rivers and about lakes; open lowland fields.

Local Haunts.—Rarely alights since the country has become moderately thickly settled, generally passing over on cool days and at nights, honking over the city and the University campus. Corn and grain stubble fields of the Blackland Prairie Area and the lowlands of the Colorado River flood plains, particularly near larger stretches of water.

General Habits.—The familiar spring honker which passes rapidly overhead in large or small flocks of wedge- or V-shaped formation, an old gander leading the point of the V. Very wary on account of hunters. Occasionally, in foggy or drizzly weather, it flies so low as to be killed in flight.

Feeding Habits.—In water it feeds by tipping, with its head and neck immersed and tail in the air, searching for roots and seeds of aquatic plants. Frequently visits land, like other geese, to feed on vegetation and seeds, cutting a clean swath because of its fondness for roots. Wary; usually several sentinels are on guard while a flock feeds.

Flight.—Firm, steady, protracted, rapid, though with slow, measured wing-strokes. Usually runs a few steps on outspread wings before taking to air. Doubtless flies in wedge-shaped formation instead of Indian-file because the more powerful wings of the old gander leading the flock break the air and make less difficult the passage of those immediately behind, and in order to enable each member of the flock to see better. Sometimes, instead of the usual V-shaped flock, a single small file speeds overhead in rapid flight.

Migration.—These birds appear in waves in spring and fall migrations. They arrive late in fall, just in advance of a norther, not uncommonly alighting on the Colorado River from Lake Austin downstream, and are then common during the norther. When the norther lets up, they take wing and resume their long migration flight. During these cold spells they are rather plentiful for a few days, numerous flocks passing over the city. Then they become rare and are not seen for perhaps several weeks, when another norther strikes and the are again common. In spring, their waves of northward migration depend on the occurrence of warm spells of weather in late winter and early spring in sections to the south and southeast, where they winter.

History.—Prior to thirty years ago this goose was a very common migrant and winter resident (L); but in recent years, since the country has become more settled, it is scarcer. Now it is seen only during migrations, flying high, rarely stopping to feed, as in former years, when it was occasionally a very destructive species on account of its abundance, flocks alighting on the flood-plains fields near Hornsby's Bend and below the mouth of Walnut Creek, especially in fields of corn, where often in a day the birds destroyed an entire season's crop.

Voice.—A mellow, melodious *honk-honka-honka, honk-er honk-er honk-er*, varying to *honk, honk, ha wank, honk* or *honk, honk, k'wonk*, frequently uttered, like a pack of hounds baying on the chase, often heard long before the flock is seen. Less commonly, a short *huhnk* or *huh-huh;* gabblings.

Description.—A large, dark-grayish, light-breasted goose having black head and long black neck with a distinct white cravat-patch on throat and lower sides of head; tail black, with whitish upper and lower coverts; belly whitish. Bill and feet dark, blackish. L. 35 to 43. W. 18. T. 7.50. B. 2.

Subspecific Characters.—Largest race of Canada Geese; bill measures 1.88 to 2.31 instead of 1.37 to 1.80 as in the Hutchins Goose (Grinnell, Bryant, Storer), with which it intergrades.

Field Marks.—Largest sized goose, 3 feet or longer, with uniform gray body, abruptly black head and neck, white patch on throat and cheeks, and blackish bill and feet. Characteristic voice.

Popular Names.—Wild Goose; Brant; Black-headed Brant; Honker; Canada Goose; White-throated Goose; Black-necked Goose; White-cheeked Goose; Ring-neck; Canadian Goose; French Goose; Mexican Goose; Big Mexican Goose; Hunter; Canadian Honker; Bay Goose.

Remarks.—Famous table bird of fine flavor, weighing from 7 to 14 pounds. Very wary, but decoys to tame birds or imitations of its calls; shot from pits or brush blinds, from covered wagons, or from behind trained browsing oxen.

HUTCHINS' GOOSE

Branta canadensis hutchinsii[54] (Richardson)

Scarce migrant; formerly very common, although never as common as the Greater Canada Goose. *Recorded:* AO.

Geographical Distribution.—Arctic regions of western North America, breeding from Alaska to northwestern Hudson Bay; winters from southern Canada southward to Lower California, Texas, and Louisiana.

Habitat.—Mud banks along the river margin, and corn and grain fields of the blackland prairies and river lowlands.

General Habits.—Associates with and has the same habits as the Greater Canada Goose. Occasionally alights along the river, but never in the water.

Feeding Habits.—Formerly, when large flocks were passing over, the birds did considerable damage to farm crops.

Description.—Similar to the Greater Canada Goose, but smaller, and with tail normally having only 16 feathers instead of the 18 or 20 of its larger relative. L. 24 to 34. W. 16. B. less than 1.90, average 1.55.

Field Marks.—Gray-bodied, black-necked, white-cheeked goose. Small size, less than 3, usually only 2, feet long.

Popular Names.—Little Wild Goose; Lesser Canada Goose; Little Honker; China Goose; Gray Brant; Prairie Goose.

Remarks.—Named in honor of Mr. Hutchins, an authority on the birds of Hudson Bay.

WHITE-FACED GLOSSY IBIS

Plegadis guarauna (Linnæus)

Very rare summer visitor and postnuptial migrant; April to September, usually seen late in summer. July 12, 1916, 2 (F). *Recorded:* CF.

Geographical Distribution.—Broken or discontinuous range. Breeds from central Mexico northward to Oregon and Utah, rarely to Minnesota, and east along the Texas Coast to Louisiana and occasionally Florida; found breeding at Waco, Mitchell's Lake near San Antonio, Brownsville, and along the Texas Coast. Winters from the Mexico-United States border and southern Louisiana southward.

Habitat.—Marshes, overflowed muddy flats, and the shallow water and grassy or muddy banks of streams, sloughs, sluggish water courses, irrigated fields, and shallow grassy pools; brackish-water lagoons.

Local Haunts.—Sandbars along northeastern shore of Lake Austin below mouth of Bull Creek, and along Bull Creek 3 or 4 miles above its mouth.

General Habits.—Observed in pairs, not at all shy, standing motionless on bank or beach 6 or 8 feet from the water's edge, or wading crane-like in shallow water. These birds probably wander inland from their coastal breeding grounds at the close of their nesting season. In some localities they occur in flocks of from 5 to 50.

Feeding Habits.—Fishes in the shallows for minnows, frogs, crawfish, snails, and insects.

Flight.—Quite crane-like. Alternately flaps and sails. When several are together, they fly one behind the other.

Breeding.—Possibly. April to early July.

Nest Location.—Among tall tules or rushes in secluded places along swampy stream margins.

Nest Construction.—Quite different from the flat, stick platform of the herons. A substantial, well-built, comparatively deep-cupped structure of rushes and reeds, woven about upright canes or in bushes over water.

Eggs.—3 or 4, deep greenish-blue, elongate and decidedly pointed at smaller end, about 2.00×1.40.

Voice.—*Ooh-ick-ooh-ick.*

Description.—Dull brownish chestnut, with glistening bronze reflections on the back and purplish reflections on the head. Tail and wings greenish-black. Bare skin about base of bill red. Face white or whitish. Long, cylindrical, decurved, sickle bill, red. Legs red. L. 23. W. 10. B. 5.

Field Marks.—Large size (2 feet long); long, decurved bill; crane-like appearance. Seeming blackish at a distance, glossy brownish near at hand. Flight.

Popular Names.—Black Curlew.

JABIRU

Jabiru mycteria (Lichtenstein)

Accidental. "The sole claim of the Jabiru to a place in the list of United States birds rests on a specimen donated to the museum of the Philadelphia Academy of Sciences and claimed to have been taken near Austin, Texas."[55] Dr. Witmer Stone of the Philadelphia Acamedy states that at the present time he can find no trace of this old specimen, which may have been destroyed years ago or packed away with dismounted material of questionable value. These birds never bore any detailed data; and this Texas specimen was probably marked "Austin, Texas," on the base of the stand, without date or name of collector.

Geographical Distribution.—South America, rare in Central America, and accidental northward into Mexico and at Austin, Texas.

General Habits.—Generally, same as those of the White Stork of Europe, of which it is the New World representative. A true stork from the tropics.

Description.—A huge white stork, with long, black legs; bare, black head; and enormous, up-curved, black bill. Hair-like crest on occiput. Skin of lower neck red. L. 54. W. 26. B. 11.50.

Field Marks.—Size of a large crane, 4½ feet high. White, long-legged, with long, up-curving black bill.

Popular Names.—Stork; White Stork; American Stork.

LEAST BITTERN

Ixobrychus exilis exilis (Gmelin)

Very rare migrant and summer resident, middle of April to late September and early October; more frequently observed in fall, during the post-nuptial wandering of the species. October, 1907, 1 shot (E). *Recorded:* ABCEHN.

Geographical Distribution.—United States, rare in the Great Plains and the mountainous West; southwest as far as Mitchell's Lake, near San Antonio, Texas. Winters from Florida and Mexico southward to South America.

Habitat.—Reed-grown marshes along hollows and water courses; reed-margined lakes and ponds.

Local Haunts.—East of the limestone hills. Marshy, boggy spots along streams (Shoal, Waller, and Boggy creeks) of the blackland prairies. Wet, reedy and grassy marshes or stream edges in the bottomlands of the river flood plains, particularly in the open bottoms at the mouth of Waller Creek, on the edge of town. Marshy draw south of The Oaks.

General Habits.—Quiet, very shy, slender and dainty marsh bird that usually sits with its head pulled down between its shoulders. If approached before it can glide away through the jungle of reeds and stalks with compressed body and outstretched head and neck, it stands still and holds its head erect and motionless, and may easily be mistaken for the yellow and dry tules and cat-tails. Creeps about like a rail, wades in shallow water, and passes over deeper water by grasping protruding stems, which it often climbs up to survey the surroundings.

Flight.—Weak. Avoids flight wherever possible. When flushed from the marsh, it progresses for a short distance with fluttering wings and dangling legs, dropping back into the marsh grass.

Breeding.—Probably. Late April to early June.

Nest Location.—Along marshy edges of water courses or ponds, usually 2 or 3 feet above the water, rarely floating.

Nest Construction.—Tops of water grass, tules, and cat-tails bent and broken down and plaited together, with the addition of pieces of flags and rushes, and made into a perfectly circular, cone- or saucer-shaped, snug little nest. Sometimes a handful of dead grasses and a twig or two are added. Woven to and hidden by surrounding grasses. Rarely a floating platform of tiny twigs and rushes among the marsh growth.

Nest Measurements.—Outside, diameter 6.50; height 1.30 to 5. Inside, diameter 5, depth .30.

Eggs.—3 to 5, whitish or very pale bluish-white, elliptical, 1.20×.90.

Voice.—A harsh, croaking *qua*, uttered when flushed from the marsh. During the breeding season, the male utters a spirit-like, soft, slowly repeated, dove-like *coo, coo, coo, coo.*

Description.—Crown, back, primaries, patch at each side of breast, and tail largely glossy greenish-black; back of neck chestnut-rufous; remainder of plumage buffy, paler in front. Legs greenish-yellow; bill pale. Female, buffy and brown. L. 13. W. 4.75. B. 1.75.

Field Marks.—Small size, slender appearance. Plumage pale yellowish-brown and black, not striped. Female, buffy and brown.

Popular Names.—Little Pale Marsh Hen; Little Sun-gazer; Common Least Bittern; Pale Least Bittern.

WARD'S HERON

Ardea herodias wardi Ridgway

Uncommon migrant and winter resident, and rare summer resident. During severe winters, in January and February, all seem to move southward or southeastward to the coast; post-nuptial wanderers or migrants, first appearing in late July or early August, flying up the river, make the species more common in early fall. *Recorded:* ABCDEFGHIJKLMNOPQW.

Geographical Distribution.—Austroriparian species: Florida and the Gulf Coast to South Carolina, up the Mississippi Valley to Indiana and Iowa, and west to central and southern Texas (Austin, Kerrville, and Brownsville).

Habitat.—Shallow water of coasts, inlets, bays, marshes, lakes, and river banks. Sandbars and banks along rivers, and smaller water holes along half-dried creeks and lagoons.

Local Haunts.—Shallows along edges of the Colorado River (Lake Austin, backwater sloughs, the rapids, and sandbars near town), the larger creeks (Barton, Bull, and Shoal; and, in migrations, Onion), and rarely the prairie ponds. More common in spring and summer among the hills, along Lake Austin above Mt. Bonnell and Barton Canyon above Campbell Hole; regular in summer about water holes in the half-dried creek along Barton Canyon.

General Habits.—Occurs singly or in pairs, and usually breeds in small colonies. Shy and suspicious. Very dignified, and stands motionless on edge of stream or slough or wades slowly about in the shallows.

Feeding Habits.—Slowly wades about in the open, shallow water or poses stilt-like along stream margin, waiting for passing fish, tadpoles, and small frogs, which it captures with a lightening-like thrust of its dagger bill. Occasionally reptiles and small mice are eaten. In wading for food, the heron is extremely cautious, slowly and carefully lifting and placing one foot after the other.

Flight.—Flies solemnly along, with slow, silent, measured flapping of its great wings, head and neck crooked and drawn in close to the body, and long legs trailing behind.

Breeding.—Probably, but no definite record. Late February to early April.

Nest Location.—15 to 40 feet up in high trees, particularly cottonwoods, along stream-ways and hill canyons; or on shorter cedar, oak, and elm trees on steep slopes of mountain streams; rarely on cliffs along canyons.

Nest Construction.—Large, wide, rude, well-hollowed platform of sticks, with little lining.

Eggs.—3 to 5, greenish-blue or pale, dull blue, 2.60×1.75.

Voice.—A harsh, rasping croak or *squawk*, sometimes prolonged into a series of *squawks*.

Description.—Large, slaty-bluish or bluish-gray bird, lighter on the neck and lower parts, black crest, and whitish crown and cheeks, and having a long neck and stilt-like legs. Darker on primaries. Dark legs. Yellowish or greenish-yellow bill. Immature, dark crown, and brownish plumage. L. 52. W. 20. B. 6.50.

Subspecific Characters.—Large size (tarsus of male usually more than 7.87; wing of male averages over 19.29); lighter (mantle lighter ... instead of slate-gray, but neck moderately dark).

Investigation.—Typical summer specimen should be collected from far back in the Limestone Hill Area for careful subspecific identification on the chance that some southwestern or Sonoran form, probably *A. h. treganzai* Court (smaller; wing of male averaging less than 18.90), might occur in that section of the Region.

Field Marks.—Large size, bluish color, and long neck and stilt-like legs. Flying, head pulled in to shoulders, with neck curved below (true cranes fly with neck outstretched).

Popular Names.—Blue Crane; Big Blue Crane; Great Blue Heron; Poor Joe; Blue John; Florida Great Blue Heron; Gulf Great Blue Heron.

Remarks.—Named in honor of Charles W. Ward, who discovered it at Oyster Bay, Florida, March, 1881.

AMERICAN EGRET

Casmerodius albus egretta[36] (Gmelin)

Rare and irregular straggler and post-nuptial migrant, in late summer and early fall, most commonly during August and September. Formerly not uncommon; but it has gradually grown scarcer, and none have been observed in 10 years (L). *Recorded:* DL.

Geographical Distribution.—Gulf States and Mexico; formerly along the Atlantic Coast to Washington, D. C., along the Mississippi Valley to Indiana, and in the West to Utah and Oregon. Winters from Florida, Louisiana, the Texas Coast, and southern California southward.

Habitat.—Bushy islands along coasts; buttonbush lakes, ponds, and inlets; and the shallows along streams and lagoons.

Local Haunts.—Shallows along the Colorado River near the city.

General Habits.—Usually observed flying slowly up or down the broad valley of the Colorado River, following its breeding season, when it has wandered inland from its swampy breeding grounds in the Gulf Coast region along the Texas Coast. Sits on perch with neck erect instead of S-shaped after the manner of the Snowy Egret. Breeds in small colonies, rarely a pair by itself.

Flight.—Typically heron-like, rather slow wing-beats, its head and neck forming an S.

Breeding.—Possibly, though not probably. April and May.

Nest Location.—In trees or bushes near or over water.

Nest Construction.—A platform of sticks.

Eggs.—2 to 4, plain bluish-green, elliptical to oval, 2.28×1.53. Usually of a deeper shade of blue than the Ward's Heron eggs.

Voice.—A frightened *squawk*, when surprised into flight.

Description.—Entirely purest white. During the breeding season, magnificent straight, silky-white plumes from the back over the wings and tail, and even beyond the latter; but no head plumes. Bill, face skin, and iris of eye, yellow. Feet and legs, black. L. 36 to 41. W. 15. B. 4.50.

Field Marks.—White, with yellow bill and black legs and feet. Smooth, slender appearance, large size (apparently twice as large as the Snowy Egret). Erect perching position. Neck S-shaped in flight.

Popular Names.—Egret; American Egret; White Crane; White Heron; Great White Egret; Straight-plumed Egret; Great White Heron.

LITTLE BLUE HERON

Florida caerulea caerulea[37] (Linnæus)

Uncommon summer resident, but very common post-nuptial migrant; middle March to early October, post-nuptial migrants arriving in late July or early August. In spring, arrived March 25, 1915 (A); March 26, 1916 (F); and March 16, 1919 (A). *Recorded:* ABCDEFGHIJKLMNOPQWY.

Geographical Distribution.—Southeastern United States, north to South Carolina and Arkansas; west to the limestone hills of central Texas; southward into Mexico. Winters from Gulf States, and occasionally South Carolina, to the Texas Coast, and southward.

Habitat.—Swamps, bottomland lakes and ponds, cattle tank ponds in pastures, back-water sloughs, and water holes along half-dried creeks and stream-ways.

Local Haunts.—Colorado River and the larger creeks (Shoal, Onion, Waller, Bull, and Barton); seeks food in pastureland ponds. In fall, Colorado River, particularly along Lake Austin from Mt. Bonnell upstream, back-water sloughs, eddies below Dam, and rapids below Deep Eddy. Mouth of Barton Creek, and Pease Park on Shoal Creek.

General Habits.—Shy, usually taking flight when approached within a hundred yards. Observed singly or in pairs, except in late summer and early fall, when it occurs in family groups and flocks. Breeds singly or in small colonies; incubating bird sits length-wise of slightly oblong nest.

Post-nuptial Migration.—That the numbers of birds which wander up-stream along the river from the breeding grounds along the Texas Coast, to stay until the northers of late fall, are largely family groups, is easily seen by the prevailing white plumage in groups of the birds and the size of the groups themselves. Earliest post-nuptial migrants, July 10, 1915, 1 blue and 6 whites (B); July 13, 1919, 2 blues and 4 whites (A); August 6, 1915, 2 whites (B); August 7, 1915, 6 blues and 25 whites (B).

Feeding Habits.—Stands during the day on some old log or in shallows along stream margins, waiting for minnows, crawfish, and small frogs to come within striking distance.

Breeding.—April and May. *Breeding recorded:* EHN.

Nest Location.—Generally 6 or 7 feet up in horizontal, triple, or multiple fork or crotch in buckhorn or buttonbush overhanging water; less commonly, high in tall cypress or sycamore trees along creek valleys.

Nest Construction.—Oblong, rather deeply cupped for a heron: a frail, rude platform of willow, buttonbush, buckthorn, and other slender twigs and a few straws, rather roughly constructed, with occasional long twigs extending out 8 to 10 inches from the nest. Usually in rather thick growth, concealed among foliage.

Nest Measurements.—Outside, long diameter, 10 to 11.75; short diameter 5 to 7; height 3 to 4.75. Inside, long diameter of saucer, 6.50 to 6.75; short diameter 4.25 to 5.25; depth 1 to 2.50.

Eggs.—2 to 4, moderately pale greenish-blue or darkened Nile blue, 1.75×1.33, considerable size variation.

Voice.—Usually silent when feeding, and, other than a short flight-call or *ket* or *ket-ket*, uttered when flying over, the notes are rarely heard except about a nest or rookery. A rather rapid, very harsh *ker-oo-wack, ker-oo-wack* or *ker-huh-rack, ker-huh-rack:* a low, rather explosive series of exceedingly short, grunting notes; *huh-wak-kah, huh-wak-kah-kah-kah-kah-kah-kah-kah-kah:* a very rapid *ka-ka-ka-ka-ka-ka-ka-ka-ka* (short *a*).

Description.—Slaty-blue, with purplish-red or maroon-chestnut head and neck, a color difference scarcely noticeable except at close range. Bare skin of face, blue. Legs and feet black. Immature, white, touched in spots with slaty, and with tips of primaries always bluish-slate; young in changing plumage, spotted or mottled with slaty-blue and white. L. 25. W. 10.25. B. 3.

Plumage Peculiarities.—Some of the birds retain the immature white plumage through life and may be found nesting either with other blond birds or with typical blue adults; these blond adults appear at first solidly white, but closer inspection shows blue tips to some of the primaries, usually a bluish wash on wing-coverts, and black feet instead of yellow as in the Snowy Egret.

Field Marks.—Medium size (slender and 2 feet tall) for heron, dark slaty-blue appearance, and black or greenish-black legs and feet, absence of yellow feet distinguishing this species in any plumage from the Snowy Egret. Immatures in white plumage, legs and feet more greenish than adults.

Popular Names.—Little Blue Crane; Little White Crane; Calico; Spotted Crane.

GREEN HERON

Butorides virescens virescens (Linnæus)

Rare migrant and summer resident; middle April to middle October. In spring, arrived April 13, 1905 (B); April 13, 1919 (A); and April 18, 1915 (A). In fall, last seen, October 15, 1916 (G). *Recorded:* ABCDGH[38]JKLNOW.

Geographical Distribution.—Eastern North America, from southeastern Canada and the Dakotas south to the West Indies and Mexico; winters in Mexico and Central America.

Habitat.—Willows and willow thickets along the edges of streams and ponds; wooded borders of small streams; small, muddy water holes along half-dried water courses; edges of forest ponds; wooded swamps, bogs, and marshes; and, less commonly, small cattle tank ponds in prairie pastures.

Local Haunts.—Rarely the Colorado River and pasture ponds through the eastern half of the Region; commonly, back-water sloughs, and the edges of Bull, Barton, Dry, Shoal, Walnut, Williamson, and Onion creeks.

General Habits.—Usually solitary; rarely, two or three pairs nest within a short distance of each other. During the daytime it roosts on a dark and sheltered perch beside a stream, and becomes active at dusk and at dawn; usually found roosting in a willow tree or willow thicket. Rarely seen except when frightened from the muddy edge of the water or from its perch on a low bush. It jerks its tail when suspicious.

Feeding Habits.—Stands for hours on one leg in the edge of the water or among rushes and reeds, where, in the shallows, it spears frogs, small fish, larvae, and grasshoppers.

Flight.—Awkward. When flushed, it flaps noisily away in slow, heavy, rather straight-away flight.

Breeding.—Middle May to early June. Records: April 27, 1893, 4 slightly incubated eggs (L); May 9, 1894, 4 fresh eggs (L). *Breeding recorded:* LN.

Nest Location.—1 to 20, usually 2 to 6, feet up in inconspicuous situations in low trees, low thick bushes over water, or thick clumps of grass along stream-ways; generally placed in willows, buttonbushes, or Spanish oaks; if in a tree or bush, sometimes on bluff overhanging the creek valley instead of over the water itself.

Nest Construction.—A flattened, saucer-shaped platform of long, dry, wire-like twigs and slender sticks, generally of a lead-brown color; rim quite round, with a shallow cup usually rather deeper in proportion than other heron nests. Lined with twigs sticking or radiating from the center toward the sides. Occasionally small bits of Spanish moss are used in the nest.

Nest Measurements.—Outside, diameter 10.50 by 8, to tips of longest twigs 15; height 5.50 to 6. Inside, saucer-diameter 7 by 7 to 10.50 by 8, saucer-depth 1.75 to 3.50, usually nearer latter.

Eggs.—3 to 6, commonly 4, light greenish-blue, elliptical, 1.50 by 1.15, considerable size variation.

Voice.—Guttural squawks, grunts, and croakings. When startled, it utters an explosive whistle or *skeow*. When flushed from nest, female makes off with a rapid *kek-kek-kek-kek-kek* or *kak-kak-kak-kak-kak-kak*. The ordinary call-note, which may be heard for a distance of about 70 feet, sounds as if it were coming up from the depths of the bird's stomach, *skah-ooow* (long *o*). Nuptial call, extremely peculiar, carrying only about 20 feet, like the sound made by pumping air into water with a small syringe: *wah-oh-h-h*, uttered as the bird's head is pointed upward and its body twisted slowly from side to side.

Description.—Smallest of the herons: flat crown and crest of deep bluish-green; throat, sides of neck, and upper breast, purplish-brown; pale, delicate greenish-blue on wings; yellow pop-eyes; bright reddish-salmon to orange-yellow legs and feet. Immature, streaked brownish, with dark crown, and pale yellowish-green legs. L. 18. W. 7.50. B. 2.50.

Field Marks.—Usually sits with head almost between shoulders, giving an appearance of a small, short-necked, chunky heron about 10 inches long. Brilliant flickering sheen of colors, particularly the large, pale bluish patch on each wing, the bluish-green of the crown, and the purplish-brown of the breast.

Popular Names.—Schytepoke; Chuckle-head; Cop-cop; Fly-up-the-creek; Hell's Flyer.

Remarks.—One pair of these small herons nested regularly on a small tree-and-brush-covered flat in the Bull Creek valley, about a mile above the mouth of the creek and just below the road crossing.

BLACK-CROWNED NIGHT HERON

Nycticorax nycticorax naevius (Boddært)

Very rare migrant and summer visitor; migrating, March and April, and early September to midd'e October; should be looked for in winter. More common in fall, when migrants breeding further north and post-nuptial wanderers from the Gulf Coast are present. Male collected, April 27, 1912 (B). *Recorded:* ABCD.

Geographical Distribution.—United States and southeastern Canada, south to South America; found breeding at Mitchell's Lake, near San Antonio, Texas, and breeds commonly along Texas Coast. Winters from southeastern United States, the Gulf Coast, and California, southward.

Habitat.—Wooded margins of streams; edges of ditches, ponds, and marshy streams; buttonbush thickets; small lakes and ponds with considerable bushy growth.

Local Haunts.—Cypress trees along south bank of Colorado River above mouth of Barton Creek; trees along Fiset's mill-pond on Shoal Creek; sloughs back from Lake Austin; rarely along other muddy, slowly-flowing, stagnant streams.

General Habits.—Occurs usually singly, rarely in small companies. Seldom seen in the daytime; more or less nocturnal, moving about at night. Roosts in tall cypress, sycamore, and cedar or elm trees along river and creek margins. Sociable, nesting in small colonies or composite colonies with other herons.

Flight.—In flying, the head is drawn in close, neck S-shaped, top of head and back making continuous line.

Breeding.—Probably from April to early June.

Nest Location.—Along banks of streams, upper parts of cypress and similar trees, rarely in bushes or on lower limbs.

Nest Construction.—Roughly made of sticks, sometimes intermingled with reeds and rushes.

Eggs.—3 to 5, rarely 6, pale bluish-green, elliptical to oval, 2.00×1.45, with considerable variation.

Voice.—A hoarse *quawk* or *quawk-quawk*, uttered as the bird passes overhead at night. When flushed, it arises with a loud, startled *qwok* or *squawk*. In vicinity of nest, it frequently clucks like barnyard hen.

Description.—Stout body and bill, with neck and legs decidedly shorter than in most herons. Under-parts white; dark or blackish on upper back; wings, lower back, and tail, ashy; forehead, sides of neck, and throat, whitish; crown black, with three white crown-feathers hanging down back; bill black; eyes well forward, pupil large, iris red; blackish legs and yellow feet. Immature, streaked grayish-brown, or mottled brown and black, with greenish-yellow bill. L. 25. W. 12. B. 3.

Field Marks.—Stocky, chunky appearance for heron, heavier body, stouter bill, and stouter neck and legs. Sharply contrasting black crown-patch and black back-patch against creamy-whitish forehead and chin and white neck and under-parts distinguish it from its near-realative, the Yellow-crowned Night Heron.

Popular Names.—Squawk; Quawk; Qua-bird; Big-bill; Thick Crane.

YELLOW-CROWNED NIGHT HERON

Nyctanassa violacea (Linnæus)

Rare migrant, though formerly common, and very rare summer visitor; in migrations, fourth week in March to late April, and late July to September. *Recorded:* CD.

Geographical Distribution.—Southeastern United States, north in Mississippi Valley to Indiana and Kansas, west to east central and southern Texas, and southward into Mexico. Winters from West Indies and Mexico southward; rarely north to Florida Keys and to Brownsville, Texas.

Habitat.—Borders of wooded streams; woodland ponds.

Local Haunts.—Shoal Creek, north of Fiset's dam and mill-pond.

General Habits.—Since it is commonest in late summer and early fall, the majority of Austin Region records are for post-nuptial migrants from the swamps of the Gulf Coast and the Mississippi Valley. Nests in isolated pairs, or by twos and threes; sometimes in composite colonies with the Snowy Egret and the Louisiana Heron

Breeding.—Possibly, though not probably, in April and May.

Nest Location.—Alongside stream, on lower branch of cypress or other marginal tree overhanging water.

Nest Construction.—Rude platform of sticks.

Eggs.—3 to 6, usually 4, pale dull bluish, 1.95×1.43.

Voice.—A loud, weird *auwark*.

Description.—Whole of body, including under-parts, blue-gray; head black, with crown and ear-coverts distinctly tawny-white; two or three black and white plumes from back of head; skin of face greenish-yellow; legs greenish. L. 24. W. 12. B. 2.90.

Field Marks.—Rather similar to the Black-crowned Night Heron, but slightly smaller. Also, crown white and under-parts blue-gray. Very stocky for heron, with thick bill and short legs.

Popular Names.—Preacher Crane; Bald-headed Crane; White-crowned Crane.

WHOOPING CRANE

Zimnogeranus americanus[39] (Linnæus)

Formerly a common migrant; middle March to third week in April, and second week in October to third week in November. Now practically extinct. *Recorded:* CDHI.

Geographical Distribution.—Central northern North America, from central Canada south to Iowa. Migrates across eastern and central Texas. Winters from Florida, the Gulf Coast, and southern Texas southward to central Mexico.

Habitat.—Moist, grassy prairies.

Local Haunts.—In migrations, passes over eastern half of Region, rarely alighting on prairies near the city.

General Habits.—Occurs in small companies and flocks, usually two or three birds together. When on the ground, it stalks majestically about; very pugnacious, and if one of a flock is wounded, the other birds will frequently attack the hunter. Heard passing over the city of Austin at nights, frequently bewildered, though not stunned, by the city tower-lights high in the air.

Flight.—Usually flies in wavering single-file behind an old leader, moving with slow wing-beats, long neck stretched out in front and stilt-like legs straight out behind; progress slow, but strong and steady.

Voice.—A short whoop, high-pitched, repeated by other birds in the flock. A croaking in flight.

Description.—Pure white, with black primaries; forehead and cheeks naked, red, warty, and slightly hairy; remainder of head and all of long neck feathered; stilt-like black legs. L. 52. W. 24. B. 5.50.

Field Marks.—Largest of cranes, height about 4 feet, wing-spread about 8 feet. Bare cheeks. White plumage. In flight, long neck extending straight out in front; rather heavy bill.

Popular Names.—Great White Crane; Big White Crane.

SANDHILL CRANE

Megalornis canadensis mexicana[m] (Müller)

Rather scarce, formerly abundant, migrant; early March to second week in April, rarely moving northward in late January and February; last of September to middle November. Most frequently observed in March and early April and again in October. Earliest, September 24, 1914; September 26, 1919; February 24, 1915 (A). Latest, April 12, 1919 (A). *Recorded:* ACDEHIJKLMNWY.

Geographical Distribution.—Two distinct, widely separated breeding areas: southwestern Canada and northern United States, south to Ohio, Colorado, and California; the Gulf Coast, from Florida to Louisiana. Winters from Florida, Mississippi, the Texas Coast, and southern Texas and California southward.

Habitat.—Big, open, low, wet, desolate prairies and treeless marshes; open fields where grass is rather tall; open, grassy sloughs; and about prairie ponds and marshes or about grazing cattle.

Local Haunts.—Eastern half of the Region, particularly the big prairies 10 to 12 miles south of Austin; never known to alight on the rocky, western country.

General Habits.—In noisy flocks, upward to 500 birds, flying just ahead of northers, passing overhead during both day and night, sometimes low over the University campus. Rather shy, rarely alighting since the country has been closely settled up, though formerly somewhat common on the wet prairies east of Austin during migrations.

Feeding Habits.—Stalks and struts majestically about on the marshy prairies, feeding on grasshoppers, frogs, minnows, and worms.

Flight.—Ponderous in the air, moving along with slow, measured beats of its broad wings, long neck stretched out in front and stilt-like legs trailing out behind. Slides rapidly across the sky in Indian file.

Voice.—A loud, harsh, croaking, penetrating, bugle-like *Grrrrrrrrrr-oooooo*, uttered by the leader of a flock and repeated by his followers until an almost continuous racket is heard. The alarm cry is also a deep, powerful, prolonged, bugle-like call.

Description.—Brownish-gray, with blackish bill and legs; short, drooping tail hidden by tail-coverts. Top of head and forehead without feathers, rough and red, thinly grown with short black hairs. Cheeks feathered. L. 44. W. 21.50. B. 5.50.

Field Marks.—Dark plumage, feathered cheeks, bare top of head. In flight, long neck outstretched in front and stilt-like legs trailing behind.

Popular Names.—Brown Crane; Common Brown Crane; Big Brown Crane; Sam Hill Crane; Southern Sandhill Crane.

VIRGINIA RAIL

Rallus virginianus Linnæus

Very rare migrant, middle September to middle November, and middle March to second week in April, rarely to middle May. In fall, September 20, 1914 (A); November 5, 1920 (A). In spring, latest, May 15, 1917 (B). *Recorded:* AB.

Geographical Distribution.—Southern Canada and northern United States, south to New Jersey, eastern North Carolina, Kansas, Colorado, and central California; and valleys of inland Mexico, near the City of Mexico. Winters on South Atlantic, Pacific, Gulf coasts, and in lower Mississippi Valley, from North Carolina, Arkansas, Colorado, and Oregon, southward to Central America and Lower California. Migrates across eastern, central, and west-central Texas.

Habitat.—Extensive fresh or brackish marshes, particularly those with beds of cat-tail flags or with scattered thickets and low briers; lowland meadows; moist, tall grass stretches around ponds and along slowly-flowing streams; very rarely near salt water.

Local Haunts.—Among water-lilies in pond in Insane Asylum grounds; marshy ditches along I. & G. N. Railroad west of town; bits of marshy growth in Colorado River valley.

General Habits.—Reclusive in habits, keeping well to cover of the closely-growing marsh vegetation, where it is more often heard than seen. Observed singly. At least partly nocturnal, particularly in its feeding. On account of shyness and dislike to taking to laborious flight on its short wings, a rail is generally overlooked by most hunters and even by a great many nature students. Peeks forth from dense marshy growth and peers from the depths and shelter of grassy jungles; glides swiftly and noiselessly through reeds and grasses; skulks under bushes and behind tufts of grass; and darts swiftly into cover at first signs of danger. Runs nimbly over floating leaves of water plants, and swims easily when open water bars its path in the marsh.

Migration.—In spite of its laborious flight, the bird moves southward in winter. It migrates by night, flying low, close to the ground; and many are killed, as with the other rails, by flying into unseen fence and telegraph wires.

Feeding Habits.—Walks slowly about the edges of marsh pools, cocking its bob-tail at each deliberate step, and plunges its long bill deep in the ooze in search of food, which it seeks both at night and during the daytime. Its food is largely made up of insects—especially beetles, of which it is very fond—caterpillars, earthworms, and snails; some vegetable matter, such as weed seeds, is taken when insect food runs low.

Flight.—Seemingly poor: slow, wavering, and laborious. Flies for a short distance in a straight line, legs dangling, wings heavily flapping and feebly fluttering; then drops suddenly back into the marsh grass or among rank sedges.

Voice.—A rapid series of low, penetrating, grunting sounds, like the voice of a hungry pig; a short, explosive *kep* or *kik*, uttered when startled into flight from feeding grounds. In breeding season, in lowering weather and at night, male utters a peculiar, vibrating, almost

unearthly *cùt, cùt, cùtta-cùtta-cùtta*, frequently repeated, often for hours in succession. Female, a clucking when disturbed on the nest; a low-toned *ki-ki-ki* when anxious about eggs or young; a *kiu*, very much like that of the Flicker. A laughing cackle.

Description.—Olive-brown above, streaked broadly with blackish on back; crown and hind-neck blackish; cheeks uniform lead-grayish; space from eye to bill, black, with brownish-white line over eye running down to bill; wings and tail dark grayish-brown or olive-brown, the tail broadly striped with black; under wing-surface dusky, axillars barred dusky-brown and white. Chin and throat white, blending into bright cinnamon-reddish-brown of foreneck and breast; belly and flanks blackish, separated into wavy bars or zones on flanks and in anal region by narrow whitish lines. Eyes blood-red, deep-sunk into long, slender head. Bill dark brown, rather long and slender, and slightly decurved. Legs and feet yellowish-brown. Downy young, glossy black. L. 9.90. W. 4.15. Tar. 1.40. B. along Exp. C. 1.55.

Field Marks.—Small size (about that of Wilson Snipe or Killdeer) distinguishes this species from King Rail, of which it is an almost exact miniature, about one-third its bulk. Long, slender, brownish bill. Thin, wedge-shaped body; generally slender form. Olive-brown back, widely streaked with black; *bright cinnamon breast*. Short tail, usually held in vertical position. Bright red eye. *Large chestnut wing-patch* always distinguishes it in any plumage. From the Sora Rail it may be known by its longer, slenderer bill; its bright cinnamon breast; and the absence of black on its face. From the Yellow Rail, by its much larger size and longer bill; and absence of white bars on back and shoulders.

Popular Names.—Marsh Hen; Fresh-water Rail; Little Red Rail; Rail; Sweet-water Rail.

Remarks.—Clumsy flight makes it easy to kill, but few hunt it for sport or pot; scarcity in Texas, and the small size of its body, make it unimportant as a game bird, although its flesh is said to be delicious.

SORA RAIL

Porzana carolina (Linnæus)

Very scarce migrant, second week in September to late November, and first of April to early May. In fall, September 17, 1914 (A); October 14, 1919 (A). In spring, April 22, 1921 (A); May 6, 1920 (A). *Recorded:* ABCW.

Geographical Distribution.—Southern half of Canada and northern half of United States, south to New Jersey, Kansas, Colorado, and southern California. Winters from South Carolina, Illinois, and northern California, southward along the Gulf Coast, through the West Indies and Central America, and into South America.

Habitat.—Fresh-water marshes, thick with cat-tails or with reeds and grasses; wet, open, grassy meadows; flooded fields or marshes of wild oats or wild rice; grassy, reedy marshes, and the grassy margins of ponds, ditches, and sloughs; less commonly, fresh-water swamps; rarely, salt marshes.

Local Haunts.—Small grassy marsh near head of Boggy Creek, two miles northeast of University campus; bits of marsh along I. & G. N. Railroad west of Austin; ponds in the Insane Asylum grounds; bits of small marsh along the Colorado River and along the more prominent creeks throughout the Region.

General Habits.—Usually observed singly, rarely in pairs. Shy and elusive; reluctant to escape danger by flight, preferring to run swiftly through the rushes and grasses of its marshy habitat, and escape made easy even through the narrowest passages because of its strongly-compressed head and body, whence the expression, "as thin as a rail." Sits motionless, and calls from the edge of the marshy jungle, from

which it ventures forth, darting back to cover at least alarm. Swims where it cannot wade or walk over submerged stems, often crossing the open water of small streams or pools; an expert diver.

Feeding Habits.—Ventures from the marshes to feed along the muddy margins of streams and pools, stepping daintily along with tail erect. The food which it seeks is mainly insects, although some snails, small crustaceans, and other aquatic animals are eaten, along with some vegetable matter, largely wild rice and wild oats.

Flight.—Slow and labored, on feeble wing. Usually low, close to the tops of the marsh vegetation, into which it may drop at an instants danger. Occasionally it rises for a considerable height and flies for a mile or more across marshes, lagoons, or streams, its legs trailing behind. Because of its reluctance at taking wing and its preference to relying on its strong capable legs for moving its thin body away from danger, it has been supposed that the bird could not fly long distances and that its migration consisted of many short flights during the night; many, however, leave the United States at Florida and fly over the water 100 miles to Cuba and not infrequently the 500 miles to Yucatan; many fly across the Caribbean Sea, from the West Indies to South America; the northernmost breeders must fly 2500 miles to reach the northern limit of their winter home, while the birds south of the equator winter 3000 miles from the nearest breeding grounds.

Voice.—A frog-like *kuk, kuk, k-k-k-kuk;* a protesting *kuk* or *peep* when disturbed; a mocking, cackling laugh; a low, clear, whistled *ker-wee* or *ker-wee, ker-wee, peep, peep*, begun at dusk and kept up by numbers of birds until long after nightfall; a high-voiced, rolling whinny, consisting of from twelve to fifteen short, sweet, clear-toned, silver-bell whistles, the first eight or ten uttered rapidly in an even descending scale, the last few uniform and deliberate, occasionally followed by slow, drawling notes; this whinny is taken up and repeated by all the birds in the vicinity; female, anxious about eggs or young, a low whining and a low *cut-cut-cutta*, the latter not unlike a faint murmur of the noisy, vibrant call of the Virginia Rail. Nuptial call of the male, near at hand, seems a harsh, strident *ká-e;* at several hundred yards, a sweet, pleasant *er-e;* at a quarter mile or more, resembles the peep of a small frog; this call is repeated at short, regular intervals, many times in succession, each with a rising inflection that gives it considerable carrying qualities; uttered at sunrise, sunset, on cloudy days, and occasionally throughout the night.

Description.—Dark olive-brownish above and on wings and tail, the back and wings spotted and streaked with black and sparingly lined longitudinally with white; crown olive-brown, with middle stripe of black. Breast, sides of head, and sides of neck, lead color; forehead, face, and throat-patch, black. Belly whitish; sides and flanks distinctly, and upper tail-coverts narrowly, barred with blackish-slate and white. Short, thick, high, compressed, chicken-like, greenish-yellow bill. Legs greenish-yellow; toes without webs or lobes. Immature without black face or the ashy blue-gray breast. L. 8.65. W. 4.10. Tar. 1.30. B. .80.

Field Marks.—Small, dull-colored, brown-backed, lead-breasted bird, with a short, high, chicken-like bill and stubby tail. Marshy habitat. Slow, labored flight. Characteristic calls at dusk. Smaller than Virginia Rail, larger than Yellow Rail.

Popular Names.—Sora; Common Rail; Carolina Rail; Crake; Ortolan.

Remarks.—Easy to shoot, and, though decidedly small, considered attractive for the table. Formerly thousands were killed each fall in the coastal marshes of the Northeast by "sports" and pot or market hunters. Mowing of wet fields destroys many nests, birds continually rising in flight from the very teeth of the sickle; reclamation of marsh lands also decreases its numbers and narrows its distribution.

YELLOW RAIL

Coturnicops noveboracensis (Gmelin)

Extremely rare winter visitor, probably from second week in November to middle March. One killed December 25, 1889 (D). *Recorded:* D

Geographical Distribution.—Central and southern Canada and northeastern United States, south to Maine, Illinois, Minnesota, and North Dakota. Winters locally along the Gulf Coast and in California, straggling during migrations along the Atlantic Coast, in Arizona, and in Oregon. Migrant across the eastern half of Texas, more usually wintering along the coast.

Habitat.—Wet grassy marshes and meadows along the edges of ponds and lakes and the margins of ditches, swampy bayous, and slowly-flowing streams.

General Habits.—Observed singly; very much like the Sora Rail in habits. Shy, secretive, skulking, and elusive; quite difficult to find and flush, since it rarely takes wing, preferring to hide in the tangled grasses of the marsh, where it is practically invisible. Occasionally so unsuspicious that it will allow approach to within a few yards. Decoys easily to imitations of its notes, for it is pugnacious and will appear in the open at once in answer to a challenge.

Feeding Habits.—Picks up bits of food along the edge of the marsh: bits of vegetation, clover seeds, and probably many kinds of small insects.

Flight.—Swift and more protracted than that of most rails, although the bird is fully as reluctant to take wing.

Voice.—An abrupt, cackling cry; a scolding *kik-kik-kik-kik-queah;* a tree-toad-like croaking. *krek, krek, krek, krek, kuk, kuk* or *'krèk, 'krèk, 'krèk, 'krèk, 'kuk, 'k'kh.*

Description.—Entire upper-parts, including tail and top of head, dark buff to quite blackish, streaked with brownish-yellow and distinctly marked with small, wavy white bars or cross-lines, most distinct on the lower back, practically wanting on the crown. Sides of head and neck, and all of breast, continuously yellowish-brown or buffy-yellow; dusky from eye to bill and immediately below eye. Chin and middle of belly, white; sides and lower belly, brownish to black, barred with white. White patch in wing, formed by white ends of secondaries. Axillars and wing-lining white to mixed white and dusky. Under tail-coverts chestnut-brown. Rather short, heavy, chicken-like bill, buffy-yellow. Legs and feet buffy-yellow to light brown. L. 7. W. 3.35. Tar. .92. B. .60.

Field Marks.—Diminutive size, considerably smaller than Virginia or Sora Rails. *General appearance, buffy-brownish-yellow:* buffy-yellow breast, blackish upper-parts, latter conspicuously marked on back with sharp narrow transverse bars of pure white, not in longitudinal streaks as on the back of the Sora. In flight, *white wing-patch* nearer body than tip of wing.

Popular Names.—Yellow-breasted Rail; Tiny Rail; Little Crake.

PURPLE GALLINULE

Ionornis martinicus (Linnæus)

Rare and irregular migrant, and uncommon post-nuptial summer visitor; in migrations, September and October, and late April. In spring, April 19, 1919 (A). *Recorded:* AB.

Geographical Distribution.—South and Middle America, the West Indies, and Mexico, north to the Gulf Coast of southeastern United States from Florida to Texas, and inland as far as South Carolina and Tennessee; in Texas, through eastern half of state, west to Mitchell's Lake at San Antonio. Wanders to southeastern Canada, Nebraska, Colorado, and Arizona. Winters in the tropics, rarely north to Florida, Louisiana, and the Texas Coast.

Habitat.—Grassy marshes; small prairie ponds densely covered with reeds, rushes, and other water plants, and having from 15 to 30 feet of open water near the center; tall grasses along the edges of water courses; ponds densely grown with bonnets, or yellow pond lilies, and similar aquatic plants.

Local Haunts.—Muddy flats and stretches of soft silt along the shores of the Colorado River, west to the hills; ponds in the Insane Asylum grounds.

General Habits.—A tropical and subtropical bird, usually observed singly, rarely in pairs, which runs nimbly and with exceeding grace and ease over roots, reclining limbs, and broad-leaved pond lilies and other floating water plants that sparsely cover the open water at the center of marshy ponds. Swims and dives well, though usually only when forced to do so, rarely being seen to swim about after the manner of the Florida Slaty Gallinule.

Feeding Habits.—Walks about lightly over silt and soft mud of flats near the water's margin, picking up bits of food after the manner of a domestic chicken.

Flight.—When flushed from a clump of rushes or cat-tail flags, it flies awkwardly to another clump but a short distance away and soon disappears once more in the marshy jungle.

Voice.—A peculiar, harsh, shrill, rapid, laughing *hiddy-hiddy-hiddy-hit-up, hit-up, hit-up,* the latter part of slow delivery.

Description.—Olive-green back and light-blue wings, with shiny greenish reflections; head, neck, and under-parts, bright purplish or rich dark purplish-blue. Under tail-coverts white. Immature, white-spotted below; no red on bill. Downy young, glossy black; numerous white, hair-like feathers on head; black-tipped yellow bill. Scaly, bare, bluish crown-plate on forehead or fore-crown; bill carmine to reddish-orange, tipped with pale greenish to yellow. Legs and feet yellow; toes with neither webs nor lobes. L. 13. W. 7.10. Tar. 2.40. B., from rear margin of N., .80.

Field Marks.—Bright colors, particularly the purple of foreparts and underparts. Conspicuous large white patch under tail, particularly evident when bird takes wing. Slightly smaller and slenderer than the Florida Slaty Gallinule.

Popular Names.—Blue Peter; Marsh Guinea; Moonshine; Martinico Gallinule.

Remarks.—May possibly be found nesting between middle April and middle July, 2 to 5 feet up over water, in tufts of tall grasses, reeds, and rushes, rarely in thickets and matted boughs of willows, along the marshy edges of streams and ponds. Nest, a saucer-shaped platform composed of dry rushes and grasses, bent and broken down and woven into a mat, is much better built than that of the Florida Slaty Gallinule, and stands at a greater elevation from the water; other than its true nest, the bird often builds four or five shams. Eggs, usually 4 or 5, less commonly 6, rarely to as many as 10, are pale buffy or cream color, lighter and smaller than eggs of the other Gallinule, finely and sparingly speckled with chestnut; 1.60 × 1.10.

FLORIDA GALLINULE

Gallinula chloropus cachinnans[61] (Bangs)

Not uncommon migrant, rare and irregular summer resident, and possibly may occasionally be present in winter, though at that season all local birds doubtless move southeastward to the coast; the more common of the two Gallinules in the Austin Region. *Recorded:* ABCEW.

Geographical Distribution.—The most universally distributed and common of the Gallinules, found throughout Central and South America, northward into the eastern United States as far as Vermont and Nebraska, less common to the west, in Arizona and central-western California; straggles into southeastern Canada and to Colorado. Breeds throughout eastern Texas and at Mitchell's Lake, near San Antonio. Winters from the Gulf States (Georgia to Texas) and the Mexican border (Arizona to southern California) southward over Central and South America.

Habitat.—Dense tule thickets of fresh-water marshes; tule-bordered ponds and streams; tangles of vegetation around the borders of ponds; small grassy marshes and marshy ponds; edges of ponds and meadow brooks; vegetation edging backwaters and small marshy sloughs; larger valleys of the interior; muddy banks of sloughs and streams; swampy woods along still waters.

Local Haunts.—Backwater sloughs on Lake Austin; mouth of Barton Creek; muddy north bank of the Colorado River, just above the railroad bridge; ponds in the Insane Asylum grounds.

General Habits.—Usually observed singly and in pairs; partly gregarious, especially in sections where it is common. Wild, shy, timid, seldom venturing into the open. During the day it keeps well concealed in the tangles of tules, rushes, grasses, and bushes growing in water, coming forth usually after dusk, and swimming about on the open stretches of water, where it paddles about, runs over the surface, and coasts, much after the manner of the Coot; an expert swimmer, even though it has no webs or lobes on its toes; it sits high on the water, accompanying the alternate strokes of its feet with forward-backward bobs or nods of its head and neck; spasmodically flips or jerks its tail upward, not infrequently. Runs lightly over flat-leaved water plants; sometimes walks gracefully about over stems and semi-submerged branches in tangled growth, or swims about, carefully picking unobstructed water-ways among the roots; and wades along the marshy edges. Afoot, it steps daintily along very much like a rail or a guinea hen, the body held low and crouching, lifting and putting down each foot slowly. Bathes in small ditches and in shallow open spots in ponds, scattering water in a tiny shower over back and trembling wings with a quick plunge and upward flirt of the head; after plumage has been thoroughly soaked in this manner, the bird dresses it by running each feather through its bill. Dry-preening and ruffling of feathers makes the bird look quite thick and awkward, its attitude at such times being stiff and wooden.

Feeding Habits.—Feeds less in the open than the Coot, preferring to forage along shores and in vegetation; occasionally comes forth and feeds along with the Coots, which at such times it resembles very much in manner of swimming and feeding from the surface. Feeds on aquatic insects, grasshoppers, seeds, and bits of various water plants.

Flight.—Rises with legs hanging, wings beating feebly and laboriously; flies awkwardly, heavily, and slowly along for a short distance, as if nearly exhausted; and then drops abruptly, recklessly, back into the marsh.

Breeding.—Probably; no authentic record. Late April to early July. Incubation frequently begins with the deposition of the first egg.

Nest Location.—Usually a foot or two up over the water, in thick clump or tussock of saw-grass or a tule thicket standing in shallow water of a marshy place, on edge of swampy lake, pond, or lagoon; placed on bent and broken stems of saw-grass and tules, and well concealed by the surrounding grasses and reeds.

Nest Construction.—A thick platform, usually piled up from 5 to 10 inches or more; saucer-shaped on top, the saucer rather deep, and the edges of the nest rising rather abruptly about the eggs. Composed of dead saw-grass blades, dead tules, and occasionally a few green flags and rushes, matted together; and lined with smaller bits of dead grass blades.

Nest Measurements.—Outside, base diameter 13 to 20; top diameter 9.75 by 10; height 7 to 8. Inside, diameter 6.25 by 6.50 to 7; depth 2.35 to 4.10.

Eggs.—8 to 13, shaped like the egg of a domestic hen; dull-colored, pale brownish or drab-buff, marked irregularly over the entire surface with specks and spots of chocolate, walnut-brown, burnt-umber, and prune-purple, a faint color-wash around each spot as if such spot were "running"; and a few under-shell markings of grayish-lavender; darker, and with darker and more profuse markings, than the light-colored eggs of the Purple Gallinule; 1.75×1.26, with considerable variation down to 1.65×1.20.

Voice.—Notes loud, varied, and complex; particularly noisy during the breeding season. Calls and squawks like a barnyard fowl, screams loudly, utters complaining cries, clucks in a subdued manner, and *cuh-taws* like a hen disturbed at her brooding; usually utters its loud, discordant, harsh, curiously hen-like notes in the early morning and about dusk, noise usually dying down altogether with the falling of darkness, since the bird is much less nocturnal than the rails. Let one bird call, and the other birds in the near vicinity will take it up and repeat it as if an echo, spreading out, farther and farther across the marsh. Calls at intervals with many strange, weird noises, like those of a pasteboard, carnival trumpet-horn or a Jew's-harp; *you-ur; hee-ur; you-ee;* and one sounding as if the bird were in pain, *eee-e-er;* a very croupy, ventriloquistic *yew'-r-r-r-r-k, yew'-r-r-r-r-k,* deep and throaty, after the manner of the clucking utterance of a domestic hen; a low *ku ku ku;* a creak; conversational notes; a single abrupt, explosive *kup;* a low *kloc-kloc* or *kloc-kloc-kloc;* an explosive *chuck;* a slow, connected series of loud, discordant, hoarse, hen-like *clucks.* A much louder series, one variation being *hit-up, hit-up* or *hiddy-up, hiddy-up;* a slower *kuh-hy, kuh-hy, kuh-hy;* a very fast *hih-hih-hih-hih-hih-huh-heh,* gradually slowing up; and a loud *kr-r-r-r-r. kruc-kruc, krar-r, kh-kh-kh-kh-kea-kea,* uttered rapidly, falling toward the end. Several calls by the female, *kr-r-r-r-k;* a short *cah';* and a shorter *krup'.* Various calls by the male, particularly explosive low-bass notes: a wooing note, *ticket, ticket,* repeated six to eight times in a series.

Description.—Dark-blue slate-color, washed on back with olive-brown, darker to blackish or dull fuscous on head and neck; tail edged with white in such a way as to form a white line along its border; under tail-coverts white, and a few conspicuous white streaks on flanks. Scaly, bright scarlet-red shield or crown-plate on forehead, growing wider on head. In winter, more whitish on belly; forehead-plate smaller. Immature, more grayish with below; bill brownish; no red on legs. Downy young, glossy black; silvery-white hairs mixed in on throat and cheeks; sooty on median line of under-parts. Bill slender, sharp, nearly as long as head; bright red, tipped with yellow or greenish-yellow. Feet greenish, with ashy-blue joints, and bright red ring around "heel"; neither webs nor lobes on long toes. L. 14.50. W. 7. Tar. 2.18. B., from rear edge of N., .80; B., including shield, 1.70.

Field Marks.—Dark, dull colors: grayish, slaty-colored bird, more brownish on back, resembling in action both rails and coots; more sturdy, fuller, and slightly larger than the Purple Gallinule. Bright, *flaming-red shield-patch on forehead, red bill with yellow tip;* either mark distinct as far as the bird can be clearly seen. Greenish to greenish-yellow legs, with reddish ring just above "heel" joint. White patch under tail, and white stripes on flanks. No webs or lobes on toes. Skulking, wading, and swimming habits.

Popular Names.—Red-billed Mud Hen; Indian Hen; Mud-chicken; Water-chicken; Red-billed Water Hen; Common Gallinule; Chicken-of-the-Marsh; Gray-blue Gallinule; Florida Gallinule.

Remarks.—'Gallinule' means 'small hen.' The term 'Florida' Gallinule, is misleading since the bird is found throughout the temperate portions of both North and South America, and, for our concerns, is not uncommon in eastern, central, and western United States. In some localities it is considered a fine bird for the table, but is more frequently shot because of its curious appearance.

AMERICAN COOT

Fulica americana americana[62] Gmelin

Common migrant, at times abundant; less common winter resident, a few remaining throughout the season in mild winters; very rare summer resident, formerly not uncommon. In migrations, first of October to last of November, and early March to last of April; more noticeable in spring. A young Coot of the year shot October 19, 1914 (B); April 18, 1915, 48 (A); last spring migrants seen, April 27, 1919 (B). *Recorded:* ABCDEHIJKLMNOPQWY.

Geographical Distribution.—Southern Canada, casually in Alaska and Greenland; entire United States, except the Gulf States from eastern Texas eastward to Tennessee and New Jersey, more common in the western regions; the West Indies, Mexico, and Guatemala. Breeds in western Texas, east to Decatur and through the Lower Rio Grande valley to Brownsville; breeds plentifully at Mitchell's Lake, near San Antonio. Winters in lowlands from southwestern Canada, Utah, Virginia, and the southern United States southward to northern South America.

Habitat.—Margins of shallow creeks, ponds, and water holes; ponds bordered with tall grasses or tules; lakes covered with bonnets, or yellow water lilies; marshy, reed-grown shores of slowly flowing streams or large shallow rivers, near the banks on still water, particularly near tules and other marshy growth.

Local Haunts.—Quiet portions of the Colorado River, particularly the quiet, open water of Lake Austin off the foot of Mt. Bonnell; the backwater sloughs in the hills; Deep Eddy; Onion, Shoal, and Barton creeks. In summer, Onion and Shoal creeks, Deep Eddy, and the Colorado River near town.

General Habits.—Observed singly or in pairs in summer; and in flocks during migrations, usually numbering 5 to 25 birds, with flocks of much larger numbers at times during the spring migrations. Quite social in its instincts, nesting in scattered colonies, sometimes of large numbers in favorable regions. Usually quite shy except when in large flocks during spring, at which time it may be approached at close range without disturbing it.

Swimming and Diving Habits.—Generally to be seen floating lightly, quietly, on still, smooth, open water, well out from the bank. Swims frequently with its long neck craned forward; though usually, when swimming on the surface (or walking on shore), it nods or bobs its head in a peculiar manner, keeping time with the strokes of its lobate feet set so far back to the rear. Good, easy, graceful swimmer and diver, swimming skillfully under water with both wings and feet. When disturbed, it patters along the surface of the water for a score of rods, flapping its wings, and beating, slapping, and pushing the water rapidly with its widely-spread, lobed feet, making considerable noise, before its short wings can bear the weight of its heavy body and the bird can take-off in flight. Brings itself to a stop on the water by shoving its heels down and skidding along. Young take to water a few hours after leaving the egg, swimming, diving, and hiding expertly, frequently clinging to vegetation under the water to escape their enemies.

Feeding Habits.—Splendid diver, obtaining much of its food from under the water. Omnivorous; feeds largely on grain and other seed, wild celery, pondweed, and other tender water plants, buds, blossoms, and green grass; also aquatic insects, tadpoles, and snails.

Flight.—Usually quite low, birds frequently striking barbed wire fences in the open country. Leaves the surface of the water laboriously, its large feet clumsily extending well beyond its tail.

Breeding.—Probably. Early May to middle July. Incubation frequently begins after the first 2 or 3 eggs have been deposited.

Nest Location.—In shallow, exposed water, or in clumps of reeds or tule stems over water, in fresh-water marshes, marshy ponds, edges of tule thickets, and grassy margins of sluggish streams; less commonly, built up in tules, placed on small island near water, or well concealed in thick growth. Two or three nests or a small colony of nesting birds usually found in nesting locality.

Nest Construction.—A floating pile of vegetation, built of green tule stems, reeds, sedges, and grasses, with smaller stems making a semblance of lining; the green stems die rapidly, and the nest is soon dry, dead, buff-colored.

Eggs.—6 to 16, pointed ovate, pale creamy clay or grayish white, finely and uniformly speckled and small-spotted with dark brown and blackish; 1.83×1.35, considerable variation.

Voice.—Very noisy, occasionally breaking out into a chorus of shrill, high-pitched cacklings, which may be heard for a half mile: an explosive, cackling, hollow-intoned *pulque, pulque, pulque; a sharp cuck;* a short *plop;* at intervals, a very short, very low note, *fhoo*, like the sound made by blowing through a tissue-covered comb.

Description.—Slaty, or dark sooty bluish-gray, darker to blackish about head and neck, paler below; distinct white patch under tail, and tips of middle wing-feathers white, showing as rear edge on extended wing. Immature, browner above, whiter below. Crown-plate, brownish, narrow, ending in point on head; stout bill, waxy whitish (2 small brown spots near tip). Iris reddish. Legs and feet plain pale greenish to greenish-yellow, each toe having on each side flat, scalloped lobes or webs not connected with those of the other toes. Downy young, blackish; white below; lores red; bill red, tipped with black; numerous bright orange, hair-like feathers on throat and upperparts. L. 15. W. 7.50. Tar. 2.25. B., from rear edge of N., .80; B., including shield, 1.60.

Field Marks.—A large, slate-colored bird, size of a small duck, with plain black velvety head and slaty neck. Distinct bright waxy *ivory-white bill; distinct white V-shaped spot* at rear end *under stubby tail;* no white streaking on flanks. *White spot on hind edge of each wing, conspicuous in flight.* Distinct flat lobes of skin alongside joints of toes. Diving and swimming habits. Pied-billed Grebe has distinct dark chin-mask and dark area around bill, but its head is lighter; Coot's white bill appears knife-like when seen from front, as contrasted to Grebe's bill with dark band on tip, giving it the effect of an amputated tip. Young Coots have plain pale gray necks, while downy young Pied-billed Grebes have many black-and-white stripes down their necks. By these and the characteristic white wing and tail patches of the Coot, that bird and the Pied-billed Grebe should be easily distinguished, even though they are about of a size and appear very nearly the same a short distance across the water.

Popular Names.—Mud-hen; Pull-doo; Pool-doo; Blue Peter; Crow Duck; Water Hen; Poule d'Eau (chicken of the water); White-billed Coot; White-billed Mud-hen; Ivory-bill; Chinese Mallard.

Remarks.—Flesh unpalatable, and classed by most people along with that of the Crow; young birds, skinned and broiled, or old birds, after being parboiled, are said to be tender and have good flavor. Plumage of no value. Tame, and easily shot; not considered a game bird.

WILSON'S PHALAROPE

Steganopus tricolor Vieillot

Very rare and irregular migrant, more common in spring than in fall; last of March to last of April, and September. In spring, March 27, 1920, 3 (A); April 19, 1919, 1 (A); in fall, September 27, 1919, 2 (A). *Recorded:* AC.

Geographical Distribution.—Southern and southeastern Canada and northern and northwestern parts of the United States, southward to Indiana, Kansas, and California. Winters from central South America southward. Wanders extensively after breeding season. Migrates mainly down central North America; casual on Atlantic Coast during migrations, Maine to North Carolina, and on Pacific Coast, southwestern Canada to Lower California; apparently migrates more commonly across western than central or eastern Texas.

Habitat.—Sparsely settled country, particularly near interior prairie sloughs; shores of streams and banks of pools and small pastureland ponds; marshes and flooded lands; mud flats along alluvial river lowlands; occasionally cultivated fields; margins of fresh, rather than brackish, waters.

Local Haunts.—Typical habitats near the city, particularly along edges of sloughs back from Lake Austin, mud flats margining the water's edge in the broad valley of the Colorado River, and pastureland ponds.

General Habits.—Usually observed singly, in pairs, or in small family groups; practically never in large flocks as in the other two species, the maritime phalaropes. Not shy, and may be rather closely approached. Wades, sandpiper-like, in the edge of the water or walks along a muddy beach. Occasionally swims gracefully, buoyantly, like a tiny duck, nodding its head with the strokes of its feet; rarely dives, and then only at great fright; in either case, it is seldom found far from shore. Dainty and trim, with soft, yet exquisite colors. In its more northern summer home, where the birds nest in scattered loose colonies, the male builds the nest, incubates the eggs, and is in a general way subservient to the female, which, though keenly interested in the nest, gathers with others of her sex and stays some little distance away.

Feeding Habits.—Feeds along shores and edges of water, where it secures its food by resting in one place, and whirling around in one spot by alternately waving its lobed feet and then bobbling up and down, this rotary movement bringing to the surface many minute aquatic forms which are picked up with quick darts of its slender bill and devoured. Food is also secured after the manner of other shorebirds, by wading along shore or walking on muddy flats, where many insects, such as tiny beetles, mosquitos, and crane-fly larvae, as well as small snails and tiny crustaceans are picked up.

Flight.—Long flights are steady, direct, and powerful; short flights, slow (rapid when alarmed), jerky, halting, zig-zag, and uncertain, with a peculiar sinuous stretching of the neck.

Voice.—A soft *quok* or *qua;* a nasal, toad-like *oit, oit, oit;* a soft, trumpeted *yña, yña.*

Description.—General colors, gray and white: brownish above; crown, foreneck, and hindneck, whitish to pale grayish; nape, line over eye, rump, and underparts white; broad black stripe through eye, changing into rich chestnut stripe down side of neck and alongside a similar stripe on the brownish-gray back. Female larger and brighter than the quiet-plumaged male, a pale brownish-red wash over the white of her neck and upper breast. In fall and winter, largely whitish, mottled with grayish above, darker on wings and tail; sides of head whitish, with grayish stripe back from eye. Slender bill, longer than head. Plover-like, with lobate feet like grebes and coots; legs and bill greenish-slate (legs yellowish in fall and winter). L. 8.60 (female 9.70). W. 4.75 (5.25). Tars. 1.25 (1.32). B. 1.25 (1.32).

Field Marks.—Moderately small, quietly-plumaged shorebird, with straight, slender, *needle-like bill over an inch long.* Lobate feet (toes with straightened membranes along their sides). *Whitish rump.* No white on back; no white bar or patch in wing; no spots or barrings below. Swims. In spring, broad black stripe through eye, changing to chestnut stripe running down side of slender, light-colored neck, and out onto grayish back alongside a similar stripe.

Popular Names.—Needle-billed Snipe; Swimming Sandpiper; Lobe-footed Sandpiper.

Remarks.—Named in honor of Alexander Wilson, famous ornithologist, the discoverer.

AMERICAN AVOCET

Recurvirostra americana Gmelin

Very rare migrant; March and occasionally April, and from early or middle August to first of November. In spring, March 8, 1920 (A); April 3, 1920 (A); April 18, 1915, 1 (A); in fall, August 9, 1919, 3 (A); occasionally observed well up into cold weather in December (L). *Recorded:* ACDLNO.

Geographical Distribution.—Interior: South-central Canada and the northwestern part of the United States, south to Illinois and southern New Mexico and California; formerly in west-central and western Texas south into the Lower Rio Grande Valley. Winters along Gulf Coast of the United States, and in marshy lands from southern Texas and California southward to Central America; rare east of the Mississippi River.

Habitat.—More arid inland country, on the shores of shallow alkaline lakes, ponds, and depressions in the Plains Country and along river valleys; uncultivated lands; shallow ditches, mud flats, and stagnant shallow waters of ponds and pools on prairie and in pasture; irrigated meadows and marshes; moist upland prairies; river sandbars.

Local Haunts.—Sandbars and pools along flat valley of the Colorado River below town; moist upland prairies north of the city.

General Habits.—Solitary, occasionally observed in flocks of from 6 to 25 or 30, rarely larger. An inland species. Wades along in the shallows, with water frequently nearly up to its feathers, its head bobbing up and down; swims easily when it gets beyond its depth, but never wanders far from the shore.

Feeding Habits.—Moves along at a swinging half-run, sometimes with the wings half spread or raised over back; swings its bill from side to side in an arc of about forty-five degrees, just beneath the surface of the water, as a farmer moves a scythe, skimming and feeling along on the muddy ooze of bottoms with the convex lower side of its bill touching, and even the whole head and neck occasionally under the water, in search of small crustacea, larvae, small beetles, dragon-fly larvae, other insects, tiny fish, and other aquatic life which it cannot see in the muddy water. Steps about in shallow pools with surface scum, bowing and dipping its up-curving bill into the water, occasionally probing for choice morsels, or, with wings half spread, running after and capturing insects.

Flight.—Trails or dangles long legs behind as it rises in flight, and dangles them when ready to alight. Flaps leisurely with wings that seem rather too short when compared to the long legs stretched stiffly backward and the long neck extended at full length forward. On alighting, it totters on its long legs, holds its wings upright for a moment over its back, and then deliberately folds wings in place. Occasionally, but rarely, alights upon deep water.

Voice.—Vociferous, particularly during the nesting season. A loud, rather sharp *plee-eek, plee-eek;* a sharp, plaintive *click, click, click;* a subdued, whistled cry.

Description.—Body, including back, large wing-patches, tail, and belly, pale whitish; face and eye-ring whitish: head, neck, shoulders, and chest, light cinnamon or cinnamon-rufous; wings, blackish (primaries and base of wing) and white. Long, slender, up-curving, black, needle-pointed bill. Long slender blue legs with partly webbed feet. Iris of eye bright carmine. In winter, duller white below, and with head and neck white to pearl-gray. L. 17.60. W. 8.90. Tar. 3.80. B. 3.60.

Field Marks.—Most showy and striking of shore-birds, conspicuous at quite a distance. *White body;* black-and-white striped wings spreading 20 inches; *blackish, white-margined V on back and shoulders;* large, tall, slender, with *long bluish legs* and with *long, slender, upward-curving, needle-like, black bill.* No black on its head or long neck; no streaks below. Webbed toes. Vociferous. Reddish on head, neck, and breast in spring and summer.

Popular Names.—Blue-stocking; Scooper; White Curlew; Irish Snipe; Yellow Snipe; Lawyer Bird (because of loud and insistent voice, and its long bill).

Remarks.—Occasionally shot by local hunters, but flesh bluish and of rather poor eating quality.

BLACK-NECKED STILT

Himantopus mexicanus (Müller)

Very rare migrant, more common as a postnuptial visitor; middle March to middle April, and middle July to early December. In spring, March 17, 1 shot by small boys (A); April 17, 1920. 2 (A). In fall, July 18, 1919, 3 (A); July 24, 1915, 2 (A); December 4, 1921, 1 (A). *Recorded:* A.

Geographical Distribution.—Formerly all over North and Central America; now breeds from Oregon, Colorado, southern New Mexico, Atlantic Coast of South Carolina, and the Gulf Coast (central Florida and the southern parts of Louisiana and Texas) southward into South America. Winters from southern border of the United States, from southern Florida, Louisiana, Texas, and Lower California, southward, only a few remaining on the coast of Texas. Breeds in the coast counties, more usually from Corpus Christi to Brownsville, and in the southern plains of western Texas.

Habitat.—Inland bodies of water; grassy, muddy margins of shallow ponds and shallow little pools where it can wade; shallow sloughs; grassy fresh- and salt-water marshes; wet prairies and plowed fields.

General Habits.—Usually observed by twos and threes, particularly in fall, after heavy rains, when it alights on the wet prairies and plowed fields. Alert, and graceful in spite of its ludicrously long legs. Occasionally lifts its black pointed wings as it walks about. An excellent wader; but a poor swimmer, since its toes are free and its foot practically without webbing, hence swims only when it steps into water beyond its depth.

Feeding Habits.—Wades sedately, deliberately, but somewhat jerkily, its sharply bent heel raised high behind at each step, as it moves along shallow edges of grassy ponds or across submerged meadows, gleaning its food from the surface of the water and from plant stems rising above the water. Its food thus secured consists largely of grasshoppers, water beetles, bill-bugs, and similar insects; the marsh plants furnish a greater abundance of minute insect life than can be found in the open pond. Frequently drives bill into mud in search of a choice morsel, or runs swiftly with wings outspread. Jerks head up abruptly now and then as it feeds.

Flight.—Swift, darting, erratic; or, swift, straight, and steady, with slow flapping of its wings, its head drawn back and its long legs trailing straight out behind. As flock wheels, the birds show alternating black and white of back and lower parts, respectively.

Voice.—Noisy, especially so during the nesting season; a sharp *ip-ip-ip;* yelping; a sharp, *click*-like note; a nasal, courtship *quank.* When disturbed, it flies about with loud cries, scaring everything in the neighborhood.

Description.—Upper-parts, back of head, and back of neck, black; forehead, semi-circle over eye and spot below it, front of neck, lower back and rump and upper tail-coverts, and entire lower-parts, white; tail grayish. Female, more rusty above. Immature, paler, and more mottled. Long, delicately pointed, almost straight black bill. Unusually long, slender red legs. L. 15. W. 8.75. Tar. 4.15. B. 2.55.

Field Marks.—Large-sized, striking, slender, black-and-white wader. Black above (crown and shoulders), white below. White rump patch showing distinctly in flight. Long, *straight,* delicately-pointed black *bill.* Exceedingly long, slender, *stilt-like pink legs. Black wings* contrasting sharply with slender *white body,* long neck in front and long legs behind.

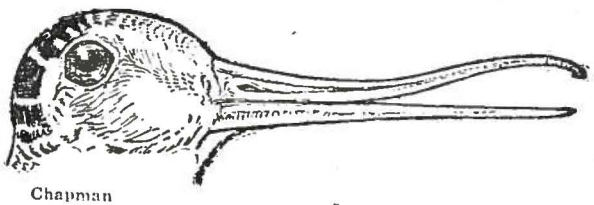
Popular Names.—Longshanks; Lawyer; Tilt; Giant Snipe.

Remarks.—Sometimes shot by hunters; but, like that of the Avocet, the flesh is poor, and sportsmen pay little attention to it while hunting. May possibly be found nesting in April, May, or early June, in little communities of from four to six pairs, among bunches of grass on semi-barren ground along margin of lake or river, nests being scantily constructed of small sticks and roots, and filled with 3 or 4, rarely 5, pear-shaped eggs, buff or olive-brown to greenish-yellow, thickly spotted, blotched, and irregularly lined with brownish-black, 1.72×1.20.

AMERICAN WOODCOCK

Rubicola minor[63] (Gmelin)

Rare and irregular winter visitor, observed only in the coldest winter weather between January and early March. In spring, latest, March 5, 1916 (F). *Recorded:* BCEFGH.



Chapman

WOODCOCK

Probe-like bill, showing extent to which upper mandible can be moved.

Geographical Distribution.—Southeastern Canada and eastern United States, south to northern Florida the coast of southern Louisiana, and northeastern Texas (near Sour Lake), and west to North Dakota, Kansas, and the Rockies in Colorado, and southwestward into eastern Texas, west to Austin, rarely to San Angelo.

Habitat.—Boggy and swampy places along streams; low, swampy bottomlands; low, gentle hillsides with soft earth; wet woodlands, soft

muddy places in wooded tracts, and occasionally dense thickets of wooded upland near streams; fall, corn-fields near woods. In any case, a locality where the ground is soft and moist, the earth nearly or thickly hidden by decayed leaves.

Local Haunts.—Shoal Creek bottoms at Seider Springs; thick bottom woods along the lower part of Onion Creek.

General Habits.—Solitary, migrating by night and staying close to its feeding ground by day, at which times it is usually seen only when accidently flushed. This is another species which, in its summer home, on being flushed from eggs or young, generally feigns a broken wing to lead intruder astray.

Feeding Habits.—Among dead leaves on the soft earth it punches clear, round, clean-cut holes in boring down, probing, and feeling for earthworms and grubs. Moves tip of upper mandible independently of lower one, and is thus able to feel about and grip food at bottom of its holes.

Flight.—Very fast and erratic when flushed, and accompanied by characteristic peculiar, high, shrill, whistling sound, caused by rapid motion of its narrow, stiffened primaries beating the air.

Description.—Thick, chunky head and neck and chunky body; very large eyes set so far back as almost to seem at back of head; small nostril at edge of feathers. A rather light reddish-brown, mottled richly with slaty, reddish, yellowish-buff, and black; under-parts, an even reddish yellowish-buff. Forehead and fore-crown plain slaty-buff, without distinct bars or stripes; back of crown black, with 3 or 4 bars of yellowish-buff from side to side. Outer 3 flight feathers very abruptly narrowed and much stiffened. Tip of tail, ashy-gray above, silvery below. Long, slender, flesh-colored bill, the mandibles grooved and roughened toward the tip, the end of the upper mandible slightly overlapping the lower. Very short legs. L. 11. W. 5.30. Tar. 1.25. B. 2.75.

Field Marks.—Stocky appearance, apparent absence of neck; stumpy legs; long bill. Whistling of wings as it rises from ground. Mottled, rich russet-colored, much lighter and more reddish-brown than Wilson Snipe, and mingling with russet-colored leaves so that it is difficult to see. Back of crown with 3 or 4 broad bars from side to side. 'Borings,' usually in little groups, on feeding grounds.

Popular Names.—Bog-sucker; Bog-bird; Thick-necked Snipe; Timber Doodle; Bog-borer; Wall-eyed Snipe; Big-headed Snipe; Cane Snipe; Owl Snipe; Whistling Snipe; Bar-capped Snipe.

Remarks.—A famous game bird, well on the way to extermination until protection was given it during spring and summer, just before and during the mating and nesting seasons, when many formerly were killed.

WILSON'S SNIPE

Capella gallinago delicata[64] (Ord)

Rather scarce migrant and winter resident, most usually observed during migrations and severe winters; rarely late September, usually middle of October, to middle of March, rarely early April; begins moving northward in late February, and is common by the middle of March. Records: September 30, 1921, 2 (A); October 8, 1916 (F); not uncommon 20 years ago (C); spring, 1917, common (B). *Recorded:* ABCEFGJNOW.

Geographical Distribution.—From northern limit of trees in the Far North, southward over Alaska and the whole of Canada, and over northern United States south to New Jersey, Illinois, Colorado, and south-central California. Winters from North Carolina, Arkansas, New Mexico, and California southward to South America; local in winter in the northern United States.

Habitat.—Open places; water-soaked, boggy gound, swamp, and fresh-water grassy meadows; margins of ditches; level marshes; wet upland meadows; soft mud silt and rich loam soil deposits along water's edge or in corn-field; small stretches of soft, water-soaked ground, near river or creek bank, where small, scattered bushes and tussocks of grass offer shelter from observation; soft mud along water-line bordering river flats or edging pond in pasture or woodland; low-lying swales in meadows and mowed fields; shaded places under bridges; practically never on shores, rarely on salt marshes, and ventures on the bare, open mud-flats only at night, preferring localities where hillocks, tussocks, and clumps of long grass offer concealment.

Local Haunts.—Low muddy flats and marshy places throughout the flood plain of the Colorado River valley; water's edge of the larger creeks, such as Onion, Shoal, and Barton; margins of drain ditches among cultivated fields, where bits of pastureland occupy the dips of the rolling upland prairies north of Austin; boggy ground near Manchaca.

General Habits.—Of solitary habits, usually observed singly, though occasionally at rare intervals during actual migration two or three to a dozen occur in loose company. Difficult to find, but their presence is always indicated by clusters of round drill-holes in soft mud, usually long before the first bird for the season is seen. Difficult to flush on warm, quiet days; active on cold, rainy, windy days, flushing easily.

Migration.—Very erratic, irregular, in its migratory movements; abundant in a locality one day, entirely absent the next; so sporadic in local appearance that its migration is difficult to explain. Migrates chiefly at night, flying low down.

Feeding Habits.—Pokes about quietly on the edges of muddy ditches and streams, walking nimbly along, head and body erect, bill down, probing the soft, water-soaked bottom or moist earth for its food. Feeds chiefly at night or on dark days. Its long bill and short legs indicate at once that the bird is a prober and not a wader; the long bill is thrust down perpendicularly into soft mud and worked about for food, the tip of the bill being very sensitive in nerve endings located in tiny pits, making it possible for the choicest morsels to be selected; the tip of the upper mandible is very flexible and capable of being moved independently of the lower mandible, so that the bird may feel around and grasp its food without having to see it. Food consists largely of worms, grasshoppers, mosquitos, cutworms, leeches, water beetles, click-beetles, larvae, and smartweed seeds. Rarely gleans bits of food from the surface.

Flight.—When approached, it crouches or squats close against the ground, motionless; then springs suddenly from under the observer's very feet to a height of about 2 yards; then indulging in the customary rapid, strong, erratic, zigzag flight for about 20 yards—a habit that makes it extremely difficult to hit—and finally flying straight away on a dead level. Practically always flies up *against* the wind, the wings making no sound as it arises in flight; the swift, irregular flight in sharp zigzags is produced by a rapid jerking or swinging of its fan-spread tail from side to side. When safely away, the bird circles widely, mounts high in the air, and then dives down again.

Voice.—Hoarse, rasping, nasal, but not loud *'scaipe, 'scaipe*, sharply whistled and rather grating, uttered as the bird zigzags away on being flushed from its feeding. Sometimes this call resembles a startling *squa-aik, squank*, or *skeaack*. A harsh *cache-cache*. A far-reaching, breeding-season call of *yak-yak-yak-yak-yak* or *ka-ka-ka-ka-ka*.

Description.—Grayish-brown or brownish—not rich russet—with several distinct, light buff streaks down back, which is dark, mottled and barred with cream-buff; breast and neck rather heavily but indistinctly streaked and spotted blackish on dusky and yellow-buff; sides barred black and white, and belly white; neck like breast; under tail-coverts

barred with black; outer tail-feathers barred black and white, with rich chestnut zone across tail near end. Crown and top of head light creamy or pale buff, cut into stripes by blackish-brown side-crown stripes, which separate a light cream stripe down middle of crown from a similar stripe over each eye. Long, slender, black-ended brown bill, the upper tip slightly longer and pitted with nerve-endings; small nostril at edge of feathers. Short legs. Bill widened, roughened, grooved near end. L. 11. W. 5.10. Tar. 1.25. B. 2.60.

Field Marks.—Moderately small size, short legs, and long bill. Grayish-brown instead of rich russet colors, with longitudinally striped head and back; mottled rump, *mottled breast without reddish color*, and *conspicuous white belly*. About as long as, but smaller, slenderer, and more trim than the Woodcock. Stripes running from bill up forehead and back across the crown, *blackish stripes separating creamy stripe over each eye from that along middle of crown*. Crouching attitude, *noiseless flight in erratic zigzags*, and harsh grating voice.

Popular Names.—Jack Snipe; Common Snipe; English Snipe; Stripe-headed Snipe; Big-eye; Pop-eye; American Snipe.

Remarks.—Named in honor of Alexander Wilson, famous ornithologist, who first showed the difference between this and the common snipe of Europe. Its delicacy of flesh makes its hunting fine sport; its habits of living about fresh, clean water are probably responsible for the fine flavor of its flesh. The bird should be given protection as much as possible, since in recent years there has been a marked decrease in its numbers. Sportsmen have long since learned that in hunting the Wilson Snipe it is best to move against the wind, for the birds fly across the wind on being flushed or else try to struggle against it; on alighting, the bird usually remains in the same spot, and it can thus be located for shooting the next time it is flushed.

PECTORAL SANDPIPER

Pisobia maculata[65] (Vieillot)

Rather rare migrant; middle of March to last of April, and rarely late July, usually August, to October or occasionally November. In fall, July 27, 1919, 5 (A); November 6, 1920, 3 (A). In spring, earliest, March 11, 1920, 4 (A); latest, April 27, 1919, 6 (2, 1, 3) (B), and April 29, 1920, 3 (B). *Recorded:* ABG.

Geographical Distribution.—From the Arctics south into northern Canada. Winters in central South America. Rare on the Pacific Coast in migrations, at which times it is more common in the Mississippi Valley.

Habitat.—Marshy borders of streams, pools, small ponds, and water holes; fresh-water meadows near ponds; marshes and mud-flats rather than open beaches, higher stubble salt marsh rather than thicker marshes, and meadows rather than open flats; wet corn-fields; on moist, short-grass prairies, pastures, and meadows after rains; edges of rain pools.

Local Haunts.—Low places and flats along the Colorado River valley; low meadows along creeks north and northwest of Austin.

General Habits.—Arrives during the night in large flocks of from 10 to 30, which break at once into small, loose flocks or small bunches, usually of 4 or 5 birds, which scatter to feed and which take flight one at a time. Half squats, half crouches, when startled. Rather snipe-like in feeding and flying habits. Runs along, stops erect with neck lengthened, then runs.

Feeding Habits.—Walks deliberately along, with bill pointed down. Probes in soft mud. Stops now and then to assume erect, watchful attitude before moving on to continue its feeding. Food consists largely of cutworms, small beetles, horse-flies and their larvae, worms, mosquitos, wire-worms, bill-bugs, tiny shell-fish, and occasionally roots and buds.

Flight.—Flocks move in close-packed formation, members of the flock leaving the ground together in rapid, erratic, zigzag flight, leading to the supposition that they are Wilson Snipe, particularly when unexpectedly flushed; then mount high in several rapid circles overhead, and dive back to earth; on alighting, which the flock does in unison, the wings are held above the back for an instant and then folded. They are more easily mistaken for Wilson Snipe when the birds have scattered to feed and are flushed into zigzag flight one at a time. For short flights, wings are held deeply incurved.

Voice.—Usually quiet. Call quite similar to that of the Spotted Sandpiper, but not so quick and sharp, and more of a whistle: a single, harsh, rasping *tweet* or *kreek*, occasionally repeated in a series of shrill cries when the bird is flushed: a soft, low, *pweet, pweet;* a hoarse, rolling, squeaky, grating whistle, *k-r-r-r-u, k-r-r-r-u*. A short *kuk* or *chup*. During mating season, male inflates and more than doubles size of his throat and breast, and utters a deep, hollow, liquid, resonant, musical sound: *tōō'-û, tōō'-û, tōō'-û*

Description.—Upper-parts brownish, yellowish-buff and black, and streaked, darker on crown and rump, the latter blackish; broad whitish line along side of head over eye. Wings dark, with white shaft to outer quill-feather. Middle tail-feathers blackish, the inner feathers longest, pointed; outer tail-feathers pale brownish-gray, margined with white. Under-parts, including chin, throat, and belly, white; distinct dark band of heavy, fine, black-brownish-buffy streaks across upper breast, rather sharp against white of throat and white of belly. Distinct white patches on each side of rump. In fall and winter, upper-parts more distinctly reddish, which replaces the yellowish-buff; and breast-band heavily washed with buff. Bill about as long as head. Legs dark. L. 9. W. 5.30. Tar. 1.05. B. 1.15.

Field Marks.—Medium small and medium stocky, with bill about as long as head. Quite inconspicuously, protectively marked. Upper tail-coverts and *rump blackish. Broad pectoral band of finely-streaked dark brownish across upper breast, rather sharply outlined against white throat and pure white of belly.* Erratic flight. Smaller than Killdeer, but two or three times larger than Least or Western Sandpipers; more slow in wing action than Spotted Sandpiper, and not so uneasy when on ground; about size of Western Solitary Sandpiper, but heavier, and with slightly heavier bill.

Popular Names.—Grass Snipe; Grass-bird; Meadow Snipe; Krieker; Jack Snipe (rarely).

Remarks.—Flesh juicy and well-flavored, particularly in fall, and highly prized as food, the bird being quite a favorite, though it is the smallest of real game birds.

WHITE-RUMPED SANDPIPER

Pisobia fuscicollis[66] (Vieillot)

Fairly common but irregular migrant, more common in spring and less common in fall; early August to middle October, and May. In fall, earliest, August 10, 1919, 7 (A); latest, October 15, 1916, 8 (F) In spring, latest, May 27, 1920, 10 (A). *Recorded:* ABEF.

Geographical Distribution.—Arctic Coast and extreme northern Canada. Winters in South America. Moves across the United States in migrations, more commonly up and down the Mississippi Valley.

Habitat.—Sandy beaches, mud flats, and marshy shores; inland, prefers edges of ponds, pools, and small lakes on uplands; low wet prairies, and wet spots on stubble fields.

Local Haunts.—Eastern half of the Region, particularly on sandy beaches of the Colorado River valley; shallows of Little Walnut Creek, below Six-mile Park; pasture ponds and wet meadows northwest of Austin.

General Habits.—Social, moving about in small flocks containing rarely as many as 30 birds, and composite flocks with Least and Western Sandpipers. Rather inconspicuous and unsuspicious; not usually shy, and rarely flying more than a few rods on being startled, resuming its feeding in quite an unconcerned manner. Sometimes crouches back on its heels (tarsi) when startled.

Feeding Habits.—Feeds in shallows and on dampened, wave-washed beaches, running nimbly along and picking up the abundant minute forms of animal life which its sharp little eyes are quick to see.

Flight.—Usually swift and well sustained; sometimes direct and leisurely, sometimes swift and darting. Flocks arise, wheel and circle, and alight in unison; as they whir by, veering and wheeling, flash of white bellies alternates with the sudden appearance of distinct small white rump patches, the dark of upper-parts and breast fading into background.

Voice.—A sharp, squeaky, mouse-like piping *jeet* or *weet, weet,* uttered on the wing.

Description.—Upper-parts and breast brownish-gray, indistinctly streaked with blackish and rufous; cheeks and sides streaked; throat and belly, white; white upper-tail-coverts forming distinct pure white rump-patch at base of tail. In fall, less conspicuously streaked than in spring, grayish to brownish in color, and with distinct whitish line over eye; markings otherwise similar. L. 7.50. W. 4.95. Tar. .95. B. .95.

Field Marks.—Tiny sandpiper, with *distinct white rump patch* showing clearly as it takes flight, the whiteness of the patch emphasized by the dark tail, which is much darker than in other members of the group. Breast and *sides streaked* with black, less distinct in fall, the *dark breast* conspicuous against *white throat and white belly.* Call-note.

Popular Names.—Pin Snipe; Peep; Big Ox-eye; Bonaparte's Ox-eye; Bonaparte's Sandpiper.

LEAST SANDPIPER

Pisobia minutilla[67] (Vieillot)

Fairly common migrant, the most abundant of the small sandpipers; rarely early March, usually second week in April to end of May, and late July to second week in October. In fall, July 20, 1919, 3 (A); September 12, 1906, 1 (B); October 13, 1916 (F). In spring, March 5, 1916 (G); April 10, 1920, 6 (A); April 18, 1915, 1 (F); April 27, 1919, 9 (B); April 30, 1919, 13 (B); May 28, 1920, 3 (A). *Recorded:* ABCEFGI.

Geographical Distribution.—Arctic Coast and northern and northeastern Canada. Winters from North Carolina, Georgia, southern Texas, southern Arizona, and central California southward over South America, Central America, Mexico, and the West Indies. In migrations, over the whole United States.

Habitat.—Wet grassy meadows and shores of water courses; shallow edges of pools and ponds in pastures; sand beaches, river bars, and the sand of river and creek bottoms; mud flats; inland ponds; in winter, coastal prairies.

Local Haunts.—Sand beaches along Waller Creek northeast of town; Colorado River valley, along Deep Eddy, the gravel beds, and sand beaches and sandbars east of the hills, particularly near Montopolis.

General Habits.—Occurs singly and in small, scattered or close, flocks or composite flocks of from 6 or 7 to 13 with the two larger Semipalmated Sandpipers (the Eastern and the Western), and occasionally with even larger shorebirds. The smallest and one of the most abundant of shorebirds; confiding, unobtrusive, and generally allowing close approach, except if it has been hunted or when it is alone, at which time it is more shy. Does not trot, but runs rapidly and directly as it continually moves along on the soft mud, silt, or sand at the water's edge, nervous, active, flitting on for a short distance as it is alarmed.

Feeding Habits.—Feeds on shallows and on flats of mud or silt, picking up or probing for minute animal life, actively feeding through the day and through a good part of the night. Bill thrust in and out of mud and silt with extreme rapidity for several seconds; then the bird probes, its tail going up as its bill goes down. Mosquitos, grasshoppers, and flies feature prominently on the Least Sandpiper's bill of fare.

Flight.—Takes wing suddenly when frightened, and goes top speed at once. At times, flight is swift, erratic, zigzag. Wheels and circles in compact flock, evolutions in perfect accord, moving on fast buzzing wings, alternately showing brown backs and flashing white of under surfaces, the birds seeming to appear and disappear at intervals.

Voice.—A cheery, shrill, emphatic *peep, peep* when on the wing; a short, abbreviated *cher;* a soft, rolling *k-r-r-r-r;* a plaintive, sometimes quavering *wheet, wheet* or *pe-et, pe-et;* faint conversational *peeps* while feeding; a series *wheet, wheet, wheet-whrr-terr-wheet;* most characteristic, a grating *k-r-r-e-e-p,* as the bird takes wing or darts along.

Description.—Back rather definitely streaked reddish-brown and blackish; rump and central tail-feathers plain black or fuscous, the outer tail-feathers ashy-gray; throat, belly, sides, axillars and wing-lining, white; breast pinkish-buffy, lightly streaked with fuscous. Narrow light line over eye to base of upper mandible. Narrow white bar across wing. In fall, without buffy, tawny markings; brownish-gray to ashy-brown above, with a few black streaks; breast, ashy to white, indistinctly streaked. Immature, colors more blended. Females slightly larger than males. Bill black, fading to yellowish at lower base. Legs, greenish in fall, yellowish or olive-green in spring. No webbing between toes. Iris brown. L. 5.85. W. 3.40. Tar. .75. B. .75 (rarely to .92).

Field Marks.—Diminutive size and extremely slender build. *Slender toes cleft to base,* without the small webbing which characterizes the Eastern and Western Semipalmated Sandpipers. Ashy-drab breast-band narrowly streaked brownish, more heavily than the other small sandpipers with which it might be confused. *Slender, short bill slightly decurved, shorter than head,* that of the other two being straight or longer than head. Least, Semipalmated, and Western Semipalmated Sandpipers are rather difficult to distinguish, but the Least is smaller, with weaker note, more slender bill, paler legs, and more reddish plumage (that of the Eastern Semipalmated tending toward gray).

Popular Names.—Peep; Pin Snipe; Little Oxeye; Meadow Oxeye; Pigmy; Bumblebee Peep; Little Sandpiper.

WESTERN SANDPIPER

Ereunetes mauri Cabanis

Uncommon migrant, doubtless more common than generally supposed; early August to middle October, and last of March to early April. In fall, August 10, 1919, 3 (A); October 15, 1916 (G). In Spring, March 26, 1919, 2 (A). *Recorded:* ACGI.

Geographical Distribution.—Alaska Coast. Winters from North Carolina to Florida, and along the Gulf Coast to Texas; and from southern California to South America. In migrations, most common west of the Rocky Mountains, but also the eastern United States, from Massachusetts southward; extremely rare in central United States.

Habitat.—Open shores, tide flats, and beaches; mud flats, edges of rain pools, marshes, and soggy inland meadows.

Local Haunts.—Waller Creek, on bits of sand beach; sandbars and bits of sand beach along the Colorado River valley.

General Habits.—Occurs in small flocks and composite flocks, usually of from 3 to 7 birds, feeding and associating with the Least and Eastern Semipalmated Sandpipers. Runs nimbly up and down the beaches.

Feeding Habits.—Flocks alight and scatter out in open formation to feed, searching diligently for fresh-water worms and insects.

Flight.—Swift, the compact flock of tiny forms off together as at a signal, and on the wing moving as a bird, swerving, swinging, and twisting this way and that, left and right, almost swallow-like, one moment appearing dark as their backs are seen, the next moment appearing almost white as a turn brings their breasts in view.

Voice.—A quick *ch-r-r-uk, kuk,* or *kip; a soft, whinnying trill, eh-heh-heh-heh-heh-heh-heh-heh;* a soft *wet-wet* or *wut-wut,* or *to-whet.* No *ee* sound, such as is characteristic of the call-note of the Least Sandpiper.

Description.—Very similar to the Eastern Semipalmated Sandpiper, but upper-parts brighter and more distinctly, conspicuously tawny chestnut-red, with mottlings of black and buffy-gray; breast more heavily streaked and more thickly spotted; and bill slightly longer. Tail-feathers drab, shading to blackish-brown on the inner web of the inner pair. Rump dull dark brown. White bar across expanded wing. Back more mottled than streaked. In fall and winter, differences in color less noticeable, at which seasons this species is dull gray above, obscurely streaked, the under-parts nearly pure white, only a few dusky, triangular spots on breast and sides. Male smaller than female. In common with the Eastern Semipalmated Sandpiper, this species has a small web between the outer toes. L. 6.35. W. 3.75. Tar. .90. B. along C. .83 to 1.20.

Field Marks.—Small size; no buffy ground-color in breast-band; voice. Distinct small web between bases of front toes. Bill turns slightly, but pronouncedly, downward, where that of the Eastern Semipalmated Sandpiper is straight or turns slightly upward; bears stronger resemblance to Least than to Eastern Semipalmated Sandpiper; *bill slightly longer than head,* and as long as or longer than tarsus, measuring usually more than .85, that of the Least and the Eastern Semipalmated usually less than .80.

Popular Names.—Peep; Sand-peep; Half-webbed Sandpiper; Pigmy; Long-billed Least Sandpiper.

GREATER YELLOW-LEGS

Totanus melanoleucus (Gmelin)

Very scarce migrant, formerly comparatively common, rarely mid-July, usually early August, to late October and middle of March to early May. Common years ago (IJ). In fall, July 18, 1919, 3 (A); October 22, 1919, 4 (A). In spring, May 1, 1919, 1 (AB). *Recorded:* ABFIJ.

Geographical Distribution.—Alaska and northern and western parts of Canada, southward into Nebraska and northern Illinois. Winters from Georgia, Louisiana, Texas, and central California southward over South America.

Habitat.—Salt and fresh-water marshes; grassy-edged inland ponds; near water of rivers, creeks, lagoons, and lakes; edges of cattle tank-ponds and muddy pools in pastures; wet prairies after rains.

Local Haunts.—Pastureland ponds near Austin, particularly to north and northwest; Pease north pasture; small, rank sloughs, pools, and water-holes in the broad valley of the Colorado River; edges of Lake Austin and its sloughs.

General Habits.—A conspicuous migrant, occurring singly, in pairs, or in small companies or loose flocks of from 4 to 6, rarely 12. Rather solitary, rarely seen in company with other shorebirds. Shy and suspicious, though easily decoyed; takes alarm easily, and rises to wing with much noise. Stately, graceful wader in the shallow water along the edges of pools, dipping and bobbing as it walks about with a slight hitch in its gait, a hitch or catch due to its excessively long legs. At intervals it stops and stands motionless except for an occasional upward bob. Leaves in fall with the cold northers of October.

Feeding Habits.—Flocks, on alighting, scatter to feed. Searches along the shallows for adults and larvae of insects, beetles, and crickets; worms, crustaceans, and snails; and tiny minnows. Occasionally wades to the depth of its long legs, or plunges its head beneath the surface of the water.

Flight.—Flock swiftly approaching to alight appears to be made up of whitish birds with long, thin, yellow legs, and angular, tern-like wings. Before alighting on the feeding grounds, the flock circles high in the air, almost out of sight; as they come nearer, they look downward first by leaning over, then set their wings, and come down, large and graceful, with curving wings and dangling legs. For a moment after alighting, each bird raises its wings and touches them high over its back before folding them deliberately in place. The actions of birds in a flock are usually quite harmonious. Usual flight, steady and direct, with rather slow beating of wing.

Voice.—A curious, discordant cackle or yelp, *kaouw, kaouw,* uttered with a vigorous bob of the head. Call, a clear, musical *tu-weep* or *too-whee,* oft-repeated; calls are frequently heard long before the birds appear in the distant sky. Alarm notes, loud shrill, insistent, mellow, penetrating, or soft and flute-like, whistle, *wheu, wheu-wheu-wheu-wheu, wheu, wheu-wheu,* all of an even pitch. When disturbed, *wheu-wheu-wheu,* louder than similar calls of the Lesser Yellow-legs; or a mellow, but harsher, *pew-pew-pew;* usually a series of three or more, uttered by twos and threes, in rapid succession. Often by its noisy calls the bird warns other birds of the presence of hunters.

Description.—Blackish or grayish-brown above, finely streaked on head and neck and speckled or spotted on back with white or ashy; white line from base of upper mandible passing over eye; dark brown rump, white upper tail-coverts; underparts white, throat grayish, breast heavily streaked or spotted with black, and lower breast, sides and under tail-coverts barred with brownish-black; dusky streaks on throat, and almost imperceptible scanty black bars on white of upper tail-coverts. Wing lining and axillars white, with irregular brown bars. Tail feathers white, barred or ashy-brown above, faintly marked and almost whitish below; sides of upper feathers with blackish and whitish spots. Bill slaty-black, fading to brownish at lower base. Legs, long and slender, chrome or straw-yellow, with greenish tinge. L. 13.50. W. 7.50. Tar. 2.35. B. along C. 2.15.

Field Marks.—Medium-sized bird, one of the largest and most conspicuous of shorebirds. Slender gray body, dark primaries, whitish breast, and narrow whitish eye-ring. Peculiar, shrill, unmistakable call-notes; triple or multiple *wheus.* Dark *upper-parts conspicuously mottled; whitish rump-patch showing in flight,* at which times the whole tail and rump appear conspicuously light; long, slender, straight bill and neck; *extremely long, slender, yellow legs.* No large, unmixed, contrasting patches of clear black or pure white side by side on body or wing. In hand, from Lesser Yellow-legs, less extensively barred below, lighter pattern on top of head; larger size; fine pale marblings on inner surface of flight feathers.

Popular Names.—Yelper; Big Yellow-leg; Winter Yellow-leg; Big Tattle-tale (warns ducks of hunter's approach); Tattler; Tell-tale; Long-legs; Big Yellow-shanks; Greater Yellow-shanks; Stone Snipe.

Remarks.—Easily decoyed by imitations of its whistles or by the cries of birds already wounded. Meat second-class, though inland birds are frequently esteemed as a delicacy, especially in fall when they are exceedingly fat.

LESSER YELLOW-LEGS

Totanus flavipes[68] (Gmelin)

Uncommon migrant; late July to October, and late March to second week in May. In fall, July 25, 1919, 7 (A); October 8, 1916 (F). In spring, March 23, 1915, 7 (A); April 27, 1919, 5 (B); May 1, 1919, 2 (AB). *Recorded:* ABEF.

Geographical Distribution.—Alaska and northern Canada. Winters chiefly in the southern half of South America, casually north into Mexico and Florida. In migrations, mainly east of the Rocky Mountains, principally in the Mississippi Valley.

Habitat.—Marshes, mud flats, and brackish meadows; wet prairies after heavy rains; grassy-edged ponds and shallow pools; sand-bars; small rank sloughs or water-holes in river lowlands.

Local Haunts.—Flood plains of the Colorado River valley; prairies and pasture meadows north and northeast of Austin.

General Habits.—Usually occurs in flocks of larger numbers than the Greater Yellow-legs, with which it is sometimes found and to which it is very similar in habits. Graceful, runs rapidly and hides easily in the grass. Very shy and wary, but decoys more easily than the Greater Yellow-legs. Occurs in composite flocks with other species of shore-birds. Hides in grass when winged by shot. Flies up at a distance with loud cries which frighten other birds.

Feeding Habits.—Skillfully picks up small bits of food from surface of mud or sand or from shallow water; wades about, picking up from or probing beneath the surface for insects, crustacea, worms, small mollusks, and tiny fish.

Voice.—A slow, mellow *pe-yew'* or *pew-pewk'*; a clear, whistled *wheu-wheu* or a single *wheu*, commonly uttered singly or in pairs, rarely three or more at once, a mellow *pew-pew-pew* or a *wheu, wheu-wheu-wheu-wheu, wheu-wheu, wheu;* usually when disturbed, the bird utters a single *wheu;* a short *wip*, sometimes repeated in a series; summons call, a repeated *too-whee*. The calls are clearer than, but none so loud as, similar calls of the Greater Yellow-legs.

Description.—Similar to Greater Yellow-legs, but smaller, and with finer markings. Upper-parts mottled sooty-brown to grayish or light brownish-gray, paler to white below, faintly streaked with grayish across breast; incomplete whitish eye-ring; rump whitish; more black than white on top of head. In fall and winter, more brownish-gray above, paler below, and tail-bars paler to grayish; sides of upper feathers with whitish spots. Long slender bill. Long yellowish legs. L. 10.50. W. 6.40. Tar. 2.05. B. 1.45.

Field Marks.—Slender of body and bill, with extremely long, slender, stilt-like, yellow legs showing prominently; in flight, curved slender wings without white band, and distinct white rump-patch; back mottled, particularly in spring. Always distinguished from Greater Yellow-legs by smaller size, in bulk only about half as large; not more than 11 in length, the Greater always over 12; more extensive white below, darker crown, and no pale markings on under surface of flight feathers; bill decidedly shorter than tarsus, instead of nearly as long; nasal groove extending nearly half the distance to the tip of upper bill, instead of only about two-fifths.

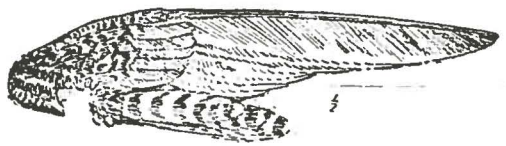
Popular Names.—Little Yellow-leg; Summer Yellow-leg; Yellow-legs; Yellow-shanks; Lesser Tell-tale; Lesser Tattler.

Remarks.—Flesh only second-class in flavor.

WESTERN SOLITARY SANDPIPER

Tringa solitaria cinnamomea[69] (Brewster)

Not uncommon migrant; middle March to early May, and middle of July to October, commonest during last two-thirds of April and through September. In fall, July 1, 1915, 1 (AB); September 27, 1914, 1 (AB); October 8, 1916, 1 (F). In spring, March 23, 1920, 1 (A); April 4, 1915, 1 (A); April 18, 1915, pair (A); April 13, 1919, 1 (AB); latest, April 25, 1915, 1 (A); April 27, 1919, 3 (B); May 6, 1892, 1 (C).[70] *Recorded:* ABCDEFGIN.



Chapman

SOLITARY SANDPIPER

Inner surface of wing, showing barred axillars.

Geographical Distribution.—Western Canada and western United States, south to Washington and Colorado, breeding more commonly northward. Winters in northwestern South America. Migrates across the western and southwestern parts of the United States, east to central Texas.

Habitat.—Well sheltered places inland: soft mud silt along edges of streams and sloughs; cattle tank-ponds and water holes in open upland pastures; muddy borders of shallow pools, ponds, ditches, and small wooded streams; grassy mud flats; small bits of open mud flat; wet meadows and meadow creeks; wayside puddles; woodland streams; fresh-water pools and streams; tiny turf-margined ponds in brushy pasturelands; rarely on salt-marshes or beaches near the sea.

Local Haunts.—Borders of back-water sloughs along Lake Austin, particularly Buzzard Slough; small sluggish streams and pastureland ponds near the city; Pease north pasture; borders of Barton, Williamson, Onion, and Bee creeks.

General Habits.—Occurs singly and in pairs; occasionaly, but rarely, very small flocks in fall, probably family groups. Quiet and shy, and more dignified than the Spotted Sandpiper; not difficult to approach, however, if care is taken not to arouse its suspicions, the birds moving ever ahead along the small streams in short flights. Particularly fond of wading in water up to its belly, but rarely swims, and then usually only when it gets beyond its depth. When wounded, dives beneath the water, and swims with both wings and feet.

Feeding Habits.—Feeds in shallow water along the edge of streams and pools, stepping slowly and gracefully along, its forward foot quivering slightly as it is set down, stirring up a cloud of sediment from the bottom. The bird picks up its food from the surface and the shallows with quick and graceful motions, first in front and then from side to side as it strolls along. Wades in water of stagnant ditches in search of food; and occasionally, in pursuit, runs about, bobbing head and tail jerkily and abruptly, balancing by bending its knees, jerking its tail, and bending its head. Food consists largely of tiny minnows, minute young crayfish and other fresh-water crustaceans, aquatic insects and their larvae, small mollusks, worms, spiders, beetles, caterpillars, grasshoppers, and many more minute forms of animal life.

Flight.—With a wing-spread of about 16 inches, it is a quick, graceful, easy flier. Rises swiftly from ground, moving rapidly away at a sharp upward angle; does not fly low in half-circles, skimming the surface, as does the Spotted Sandpiper. Often runs several steps on alighting, and then, with beautiful precision, it elevates wings high over back and folds them carefully in place, showing the beautiful black-and-

white barred lining of wings, a landing habit which this species practices even more commonly than do the two Yellow-legs.

Voice.—A soft, whistled *swee-sweet, sreet-sreet,* or *tweet-tweet,* usually uttered only when flushed; a low, musical, penetrating, whistled *pieue-pieue, qieu-pieu,* or *quey-pew;* a few sharp *peeps.*

Description.—Dark olive-brown above, with tiny buffy white spots on feather edges; under-parts white, streaked dusky on throat and chest; eyelids and chin white; primaries brownish, the outer ones and edge of wing deep black; axillars and under wing-surfaces barred blackish and white; central tail-feathers dark, the outer ones distinctly barred white and brownish. In winter, less olive, more dusky above, more buffy on sides.

Subspecific Characters.—Averages slightly larger htan the Eastern Solitary Sandpiper, *Tringa solitaria solitaria* Wilson; sides of head lighter; spots on back typically cinnamon-brown instead of white or creamy. L. 8.75. W. 5.10-5.49 (instead of 4.83-5.19). T. 2.18-2.30. Tar. 1.30. B. 1.15-1.30 (instead of 1.03-1.20). Less distinctly spotted with whitish; middle pair of tail feathers often wholly deep grayish-brown.

Field Marks.—Moderately small; general unstreaked brownish color above; brownish streaked throat and breast, without rounded dark spots; very slender bill; no light bar on wing. Tail appears nearly white when fan-spread, particularly when the bird rises or alights; *outer tail-feathers* are *strikingly,* heavily *barred with white and brownish* (reminding one of the tail of the Meadowlark), and stand out sharply against the *dark body colors.* Habit of elevating wings high above body on alighting. *Blackish (barred black and white) under wing-surfaces,* seen in flight or as the bird folds its wings in place, form a conspicuous recognition mark for the species. Characteristic call as the bird takes wing.

Popular Names.—Whew-whew Snipe; Pond Snipe; Swee-sweet; Solitary Tatler; Larger Solitary Sandpiper; Cinnamon-dotted Solitary Sandpiper.

UPLAND PLOVER

Bartramia longicauda (Bechstein)

Very common migrant, quite abundant in former years; third week in April to early May, and second week in July to end of September; commonest, second and third weeks of April, and the last half of August. In fall, July 10, 1915 (A); July 12, 1919 (A); July 12, 1920 (A); August 4, 1921 (A); August 12, 1916 (F). In spring, March 2 (O); March 27, 1915, common (A); March 30, 1914 (G); March 31, 1922 (A); April 5, 1919 (A); April 10, 1913 (B); April 10, 1905 (B); April 19, 1915, 47 (A); latest May 10 (O). *Recorded:* ABCDEFGHIJKLMNOPQWY.

Geographical Distribution.—Alaska, Canada, and the northern United States, southward to northern Virginia, southern Oklahoma, Utah, and Oregon; and said to have bred in former years in the northern edge of Texas at Gainesville. Winters on the Argentine pampas of South America. The greater part of its range is regulated by the extension of prairies and plains east of the Rocky Mountains.

Habitat.—Not seashore, as with most shorebirds, but grassy plains, prairies, and pastures, generally on uplands far from stream or pond; upland stubble fields; plowed fields on uplands; drier ground of meadows, old fields, and prairies away from water; preeminently a bird of the high open country though occasionally found on flat, damp meadows and rarely near ponds and streams of water.

Local Haunts.—Grassy upland prairies and plowed fields near Austin, particularly east of the city and to the north of Hyde Park and of the

Insane Asylum grounds; a few on the sand beaches along the broad valley of the Colorado River. Open country east of the hills, and bare crests of a few of the hills.

General Habits.—Occurs singly, in pairs, and in rather loose flocks of from three to ten or fifteen; individual birds, passing over during the night, are the first to arrive, then small flocks. From its habitat, together with its voice and its plover-like habits, this large buffy-colored sandpiper is generally known as Upland Plover. Lulls between showers are conducive to the abundance of flocks of these birds on the upland prairies, plowed fields, and stubble uplands. Graceful, running swiftly through the stubble, where occasionally they crouch motionless on being alarmed. The characteristic call is heard long before a flock of birds appear as tiny specks in the distance; the birds grow more and more distinct, until their long wings on the down stroke show the characteristic, peculiar wishbone effect; the birds circle wide, high in the air, and then drop down to the big open prairie.

Feeding Habits.—Migrants drop to the upland plowed or stubble fields, and move about in squads, rising and settling at intervals in rather scattered formation, feeding on seeds; picking up worms, cutworms, cotton worms, cotton cutworms, and insect larvae; catching the more common insects, such as locusts, grasshoppers, weevils, and similar pests; and following the plow to glean from the upturned sod. Run about swiftly in pursuit of insects.

Migration.—Apparently more common in spring than in fall, because it alights commonly during the spring and spends the larger part of the day on or near the ground of the wet, grassy prairies and plowed fields. In fall, on the contrary, the birds alight usually only for a few moments after daybreak, when the morning fog or mists are still rolling and the dew yet upon the ground; rarely seen by day, except when flying high overhead. Generally migrates high over the city. In dry years, particularly in summer and fall, the birds pass over, rarely alighting; however, when the ground is wet in fall, Upland Sandpipers are as familiar on feeding grounds as in spring.

Flight.—Swift and high, usually appearing tiny against the leaden sky, when only its oft-repeated, mellow, whistled call will identify it. On the open country, in a lull between spring showers, the wind will bring the faint call of the Upland Sandpiper when no birds are to be seen; a group of tiny specks forms on the southern horizon; they grow larger, and finally drift across the leaden sky low overhead, to come to ground a short distance away.

Voice.—A rapid, high-pitched, though soft and mellow bubbling whistle, *quey-youey-yip; kewey-yewey-yip; kewey-yew-yip; quip-ip-ip; quitty-quit-it-it; quip-ip-ip-ip, quip-ip-ip-ip;* said by the French of Louisiana to be *pa-pa-bot;* close at hand resembling a rapid *quit-oo-loot-a-loo.* Any of these variations are but interpretations of its common call, usually whistled, 3 short notes, the first high, the second and third alike, lower and shorter, uttered as the bird rises in flight or passes overhead; a common night-migration sound. Song, a weird, prolonged, mournful, mellow whistle, *chr-r-r-r-r-ec-e-e-e-e-e-oo-o-o-o-o-o-o-o-oo* or *wh-o-e-e-e-et-et-e-e-e-e-e-o-o-o-o-o,* uttered from ground, fence, or tree.

Description.—Upper-parts, mixed very dark brown and yellowish-brown, or yellowish-buff barred on blackish; streaked on crown; chin white; throat, breast, and sides, washed with buffy and barred and streaked lightly with black; belly white or whitish. Darker to fuscous or black on wings, the outer primary fuscous barred with white. Light face with dark crown, the latter with a central line of light buff. Tail long, graduated, extending well beyond tips of folded wings; inner feathers brownish-gray; outer ones ochraceous-buff to white, all more or less barred with black. Axillars and under-wing surfaces sharply barred dark brown on white. Slight web between outer and middle

toe, at base of toes. L. 11.75. W. 6.75. T. 3.45. Tar. 1.95. B. 1.12.

Field Marks.—Considerably larger than Killdeer, with a fairly long, but not particularly slender, bill; round head; neck and legs rather long for a sandpiper; trim body, of a general buffy-brownish-yellow color, streaked darker above and lighter below. Blackish rump; outer tail-feathers lighter than central ones, and broadly tipped with white. Outer primary blackish, marked conspicuously with white bars. Yellowish legs. Dried-grass colors, and characteristic call. No conspicuous contrasting white areas.

Popular Names.—Plover; Field Plover; Upland Sandpiper; Grass Plover; Prairie Pigeon; Papabotte; Bartramian Sandpiper; Bartram's Sandpiper.

Remarks.—Considered game and slaughtered by the thousands in the years before protection; also less common now because of extensive cultivation of its habitat, the big open prairies. Shy and wary, and rarely approached on foot; a man on horseback or in a vehicle can approach within a few yards of a flock without alarming the birds.

SPOTTED SANDPIPER

Actitis macularia (Linnæus)

Tolerably common migrant for several months in spring and fall, rare winter resident (ABO), and rare summer resident (ABCHO). In migrations, middle of March to third week in May, and first of August to end of October. Migrating, April 27, 1919, 10(B); April 30, 1919, 6 (B); August 1, 1915, 1, first fall migrant (A); August 6, 1915 (B). Wintering, January, 1915, one present during cold norther and snowstorm on 17th and seen again on 19th (B). Commonest of the smaller sandpipers more regularly observed; more common during last half of April and first half of October. *Recorded:* ABCDEFGHIJKLMNOQW.

Geographical Distribution.—From northern limit of trees in Alaska and northern Canada southward to South Carolina, southern Louisiana, central Texas, southern New Mexico, central Arizona, and California. Winters from South Carolina, Louisiana, central Texas, and south-central California southward into South America.

Habitat.—Mountain streams; gravel beds and beaches; inland sand and gravel bars and bits of sandy beach along rivers and larger creeks; fresh and salt-water shores; inland ponds, lakes, and rivers; edges of shallow water along river margins; rarely, tanks or cattle-ponds.

Local Haunts.—Migrant along Colorado River, and along Barton, Shoal, Waller, and Walnut creeks, particularly the gravel beds and sandy bits of beach; backwater sloughs of Lake Austin. Winter, about the mouth of Barton Creek. Summer, along Barton Creek canyon, well upstream; Bee Creek; shores of Lake Austin; all summer localities within Limestone Hill Area.

General Habits.—Occurs singly and in pairs in summer; usually singly and in pairs during migrations, although sometimes associating in family flocks of from 4 to 6 in fall; in winter, observed singly. The best known of the sandpipers. It stops at intervals as it moves along, standing on the shore or on a stone, and constantly teeters by tipping or hoisting its tail up with a peculiar jerk and bowing or bobbing its head in a most energetic, clock-like manner; when excited, teeters quite rapidly. Swims, and occasionally dives, when forced to do so, using wings as in flight. Somewhat nocturnal in habits. Both birds incubate; a bird flushed from nest flutters away as if wounded, uttering feeble peeps. Young just out of shell run swiftly about, squatting and remaining immovable at sign of danger, their protective colors—drab body with a black streak down back—rendering them invisible when they flatten and remain still.

Feeding Habits.—Walks rapidly for a few steps, then stops to pick up bits of food from among pebbles of the gravel or glean tiny morsels from the water's margin. Feeds on various small insects, such as grasshoppers, cutworms, army worms, ants, spiders, wasps, and beetles, particularly the aquatic species; also feeds on other small animals and bits of plants.

Flight.—Never flies up and down stream, but in rapid, semi-circular curve, skimming close over the water and back to bank some distance along the stream; after several flights, the bird returns in wide circles to the starting point. Skims the water with wings seemingly always pointed downward, well below the level of the back, their shortness making them disappear in the rapid trembling of the wing-beats, which alternate with short, regular periods of firm gliding. Nothing undulating or zigzag in its flight.

Courtship.—May 20, 1915, paired (A).

Breeding.—Probably; May and June. Twice nests have been found by local fishermen and twice by local amateur bird students, the descriptions of parents, nests, and eggs fitting this species; none were collected, however, and no verified record has been established.

Nest Location.—Slight saucer-shaped hollow or surface depression on dry, gravelly ground, among weeds and grasses or beneath bush, on rocky or gravelly shore on foothill or mountain stream or near brook, not far from edge of fresh or salt water, a few yards back from the water or in adjacent meadow. Eggs usually sheltered by high weed or two or by tuft of grass.

Nest Construction.—Occasionally no special lining, though usually hollow lined with a few weeds, and bits of leaves, plant stems, and grasses.

Eggs.—3 to 5, usually 4, pear-shaped, grayish-buff or creamy-clay to white, thickly spotted, blotched, and speckled with blackish, chocolate, and brown, chiefly at the larger end, and with pin-point markings and very small under-shell marks of lavender and pale gray, 1.27×.94.

Voice.—A sharp *peet-weet, peet-weet,* or *weet-weet weet-weet;* less commonly, *weet-weet-weet* or *wheet, wheet, wheet,* sometimes repeated x or seven times at half-second intervals, often given with a descending inflection, so loud that the first note of the short, repeated whistle may be heard for a mile; uttered as the bird flies up, down, or across streams, or as it teeters for a moment on a bit of beach. Song, a sweet *per'r'r weet, per'r'r weet; pr-r-r-r-r-ret,* or *ter-r-r-r-ret;* a loud, musical, piping by the female as she cuddles her young, a song uttered after the manner of a domestic hen, *tr-tr-tr weet, tr-tr-tr weet, tweet, tweet, tweet, tr-tr-tr.*

Description.—Upper-parts, brownish-gray, more or less streaked on head and neck, spotted or barred on back with black; distinct white line along side of head over eye. Characteristic conspicuous narrow white line running from body out along center of extended wing. Under-parts, white; breast and flanks in spring and summer, spotted with round grayish or blackish spots. In fall and winter, without black bars on back and without dark round spots on breast. Blackish-tipped bill. Light grayish or yellowish legs. L. 7.50. W. 4.25. Tar. .98. B. .98.

Field Marks.—Small size; smaller than Western Solitary Sandpiper, but larger than the Least and the Eastern and Western Semipalmated Sandpipers. *Plain Quaker-gray,* or uniform brown, *upper-parts,* including rump. White under-parts, with sharp rounded blackish spots in spring and summer. Runs and teeters almost constantly on its slender legs. In flight, skims water, executes semicircles from bank back to bank; low, narrow wings downcurved, rarely raised above level of back, with *conspicuous white line running from body out along spread wing.* Shrill *peet-weet.* White axillars and sides.

Popular Names.—Sand Snipe; Teeter-tail; River Snipe; Piper; Peet-weet; Teeter; River Sand-peep; Sandpiper; Tip-up; River Tilt-up; Steelyard Bird.

LONG-BILLED CURLEW

Numenius americanus americanus Bechstein
Numenius americanus occidentalis Woodhouse[71]

Comparatively rare migrant and very rare winter resident, though never remaining during severe winters; not uncommon 20 years ago. In migrations, second week in August to middle October, and March and April. In fall, August 3, 1914 (G); August 20, 1916 (F); August 27, 1915 (O). In spring, March 15, 1919, 3 (A); April 6 to 29, 1922, passing over fairly commonly every night (AB). *Recorded:* ABC[70]DEFGHIJKLMNOW.

Geographical Distribution.—(*a*) Middle and midwestern United States (except northernmost part) and Mexico, breeding from southern Idaho and southeastern Kansas south to central Mexico and northwestern Texas, and an isolated few on the coast of Texas; migrating over the eastern United States; and wintering from southern Arizona, southern and coastal Texas, and Georgia southward to Guatemala. (*b*) Southwestern Canada and northwestern United States, breeding along the Canadian border and south to northeastern South Dakota, northern Idaho, and northern California; migrating throughout the West, rarely east of the Atlantic Coast; and wintering from southern parts of Florida, Louisiana, and Texas, and from central California, southward into Mexico.

Habitat.—Upland prairie stubble fields and pastures; wet prairies after heavy rains; moist grassy flats and plains; muddy shores and grassy meadows; plowed fields; fields covered with shallow rain-water; sandy ocean beaches; salt and fresh-water marshes; sandy flats left bare by receding tides; sand plains and salt-water ponds.

Local Haunts.—Dry upland prairies north and south of town; flat country toward Pilot Knob; gravel and sand bars and beaches along the Colorado River, along which the bird flies.

General Habits.—A typical shorebird. Occurs in small flocks, usually of from 3 to 5 birds, rarely as many as 10 or 15, once 30 (O). Rarely alighting, except after heavy rains; but usually heard calling as they pass over the city in drizzly weather and at night. During night migrations it is attracted by the tower-lights of the city of Austin, and flies about them as if bewildered. Occasionally observed flying up and down the river valley during migrations. Even when alighting on the rain-moistened upland prairies, the bird is wild, shy, and wary, and is always so alert that it is difficult to approach; on the approach of an observer, it turns body sidewise as if ready to fly away at an instant. Sleeps at night standing on one leg, its head tucked under one neatly-folded wing.

Feeding Habits.—Moves about easily, often in several inches of water, where its long legs and long bill give it a decided advantage over the other species of shorebirds with which it mingles at feeding-time; occasionally bobs up and down as it feeds; picks up crickets, beetles, grasshoppers, crabs, small snails, flies, spiders, caterpillars, and toads; reaches into crawfish holes and pulls out the luckless occupants; probes in soft earth and ooze for worms and for other animals, particularly insect larvae, living in the shallow substrata, locating such animals by means of the sensitive tip of its long bill and pulling them out of the ground.

Flight.—Not rapid, but well-sustained, easy, and graceful, with slow, regular wing-strokes. When on extended flight, a flock usually moves in triangular formation, high above the earth, the lines continually shifting and reshifting, forming and dissolving. On alighting, the birds suddenly drop nearly to the ground; gather for an instant; and, legs trailing, with a rising sweep gracefully alight, raising their wings high over their backs for a moment before beginning to feed or preen.

Voice.—A loud, rather harsh, startling, prolonged, flute-like melodious whistle, *cur-lew* or *ker-loo*, not unlike the squeaking of brakes on a freight train; often repeated, *cur-lew', cur-lew', cur-lew'*; wild cries, and shrill laughter; continually utters its insistent call-notes as it rises on the wing.

Description.—Upper-parts, light buffy to pale cinnamon-brown, marked with black and white barrings and marblings; under-parts ochraceous-buff or pinkish-cinnamon, breast faintly streaked and sides more or less barred with black; side of head, line over eye, throat, and neck, light; axillars, or arm-pit feathers, rufous-brown, generally unbarred; crown dark; chin whitish; outer web of outer primaries wholly black, the shaft to the outer one wholly white ivory in color. Very long, down-curving bill. Light olive-gray legs and feet. Females average larger than males. L. 24. W. 10.50. Tar. 3.25. B. 6- (from 2.50 in yearlings to 8.50 in old birds).

Subspecific Characters.—(*a*) A large southern race which migrates southward across the whole of Texas; particularly larger in wing (male, 10.55-11.05*; female, 10.57-11.73), averaging .75 inch longer; and bill (Exp. C., male, 5.47-6.10; female, 6.54-8.74†), averaging 1.50 inch longer. (*b*) A small northern race which migrates southeastward across the whole of Texas; similar to *N. a. americanus* Bechstein, but particularly smaller in wing (male, 9.98-10.28*; female, 9.92-10.83) and bill (Exp. C., male, 4.17-5.71; female, 4.65-6.38†). (*ab*) The best character to distinguish members of the two races seems to be in the female, difference in length of bill (†); and, in the male, difference in length of wing (*), with difference in length of bill second.

Field Marks.—Largest of the shorebirds, 2 feet long; *with a 6-inch bill, long and down-curving.* Distinctly pinkish cinnamon-brown color, buffy and mottled appearance, with darker crown and faintly-streaked breast; axillars and under wing-surfaces unbarred. No contrasting black and white areas. Big, round-backed, dignified brownish shorebird.

Popular Names.—Sickle-bill; Big Curlew; Brown Curlew; Curve-bill; Spanish Curlew; Daddy-long-legs; Greater Long-billed Curlew; Lesser Long-billed Curlew; Sickle-billed Curlew.

Remarks.—Conspicuous, and an easy mark because of size and because wounded birds attract others of a flock, which hover near and make all sorts of racket. In size, about like a small duck; flesh tough and dry, though highly prized by many; not palatable on the seashore, but fattened, with fine taste and flavor, inland.

AMERICAN GOLDEN PLOVER

Pluvialis dominica dominica (Müller)

Rare migrant, more common in spring, very rare and irregular in fall; late September to middle November, and second week in March to middle April. Shot in spring of 1913 (B). *Recorded:* BCIW.

Geographical Distribution.—Arctic Coast and the Hudson Bay country of far northern Canada. Winter on the pampas of South America, from Brazil to Argentina. In migrations, common east of the Rocky Mountains, less common and less frequently seen on the Pacific Coast.

Habitat.—Treeless regions: open, wet, grassy, treeless prairies and marshes; bare tide-flats; old stubble-fields and plowed fields; corn fields; extensive marshes; low sand-flats along rivers; muddy banks and margin of pools, ponds, and water-holes; burnt tracts.

Local Haunts.—Sand-flats and bars along the broad open valley of the Colorado River, particularly near Montopolis bridge; moist, loamy surface of the sand beach near the city; low-tide sand-flats along the river; marshes; plowed fields; open burned tracts; sandy hills; treeless prairies north of town.

General Habits.—Occurs in flocks of from 5 to 15 which scatter on alighting. Runs rapidly, nimbly, and gracefully hither and thither, almost continually on the move; runs a few yards, stops quickly with head erect, and looks around for sign of danger; all movements unusually quick and sudden, whether running along, striking at prey, or stopping to raise their heads and look about them. When driven away, it soon returns to a favorite feeding or resting ground. Younger birds are shyer, wilder, and more wary and more difficult to decoy than old birds.

Migration.—In fall, it leaves its summer tundras of the Arctic Coast, and begins the first lap of an 18,000-mile annual journey that takes it to its winter home and back to its breeding grounds. In deserting its tundras at the end of summer, it heads for the enormous supply of tempting, palatable food to be found in Labrador and Nova Scotia; then, having fattened exceedingly on crowberries, and thus having stored up enough energy for a protracted flight, it leaves the Atlantic Coast of North America at Labrador, and heads straight south down the open Atlantic Ocean, striking land again at South America, and touching the shores of North America only in case of unusually severe stormy weather at sea; once in South America, it moves leisurely southward to the pampas of the southern part of that continent. In spring it travels northward, alights on the coast of Texas, and travels leisurely up the Mississippi Valley, where there is an abundant food supply (Labrador at that season having scarcely any food), and on to its breeding grounds on the tundras of the frozen North. Only a few pass down the Mississippi Valley and fewer still down the Pacific Coast, in fall; in the Austin Region the birds are occasionally heard passing over, moving southward, but they rarely stop during that season.

Feeding Habits.—Feed almost entirely on crowberries in Labrador in fall. At other seasons and in other localities, it feeds on cutworms, beetles, crickets, grasshoppers, and some vegetable matter. Quick in striking at and capturing insect-food.

Flight.—Swift and strong; migrates in compact, wavy flocks, the shape of a flock continually changing, the birds sometimes clustered, sometimes broadside in long straight lines after the manner of geese; in an ever-changing, circling course, now skimming the ground, now high in the air, whistling as they go. Stop suddenly; on alighting, raise wings above back until tips almost touch, and slowly fold them neatly in place. At a signal whistle, scattered birds rise to a common center, and move away in a compact flock.

Voice.—A distinct, clear, soft, unmistakable, mellow, melodious, bubbling whistled *coodle, coodle, coodle* or *whootle-whootle-whootle*, uttered usually as the bird takes wing or as it flies overhead, the whole flock frequently calling at once.

Description.—Upper-parts, including crown and back of head, mottled, golden-yellow spots predominating amid greenish and black ground-color, with a few small spots of white; sides of breast and side of neck, white; zone over eye and across forehead, white, forming conspicuous white band around head; side of head, and *all* under-parts, from chin to lower tail-coverts, black, frequently with some little white mixed in; tail, dusky and yellowish, indistinctly streaked. Female, browner below, and with more white. Fall, duller, dusky, brownish-gray and olivaceous, streaked. Winter, less spotted above; less streaked, and more mottled with dusky gray, drab, and white below. Small, slender bill. L. 10.30. W. 7. Tar. 1.68. B. .88.

Field Marks.—Slightly larger than Killdeer. Plump-bodied, short-necked, thick-round-headed species, with short, slender black bill. No white patches on rump or wings. In spring, black below, yellow-spotted above, white band around head. In fall, black and white breasts; immatures with pale breasts. No distinct black collar as in many other plovers. This species has *no hind* (fourth) *toe*, while the Black-bellied Plover has a distinct, though small, hind toe. In any plumage underwing-surface and *axillars* (long feathers lining under side of wing at arm-pit) are *ashy-gray*, whereas they are black in the Black-bellied Plover: good distinguishing marks, observable in flight.

Popular Names.—Greenback; Green Plover; Lowland Plover; Bullhead (sometimes); Eastern Golden Plover; Common Golden Plover.

Remarks.—Famous gamebird, formerly common, now very rare because of persistent hunting by "sports" and market hunters. Decoys readily, but soon becomes suspicious and wary. Flesh highly-prized and palatable.

KILLDEER

Oxyechus vociferus vociferus[73] (Linnæus)

Fairly common resident, most common during migrations; common from third week in July to October, when family groups assemble, and from October to March, when wintering birds from the North are present; winter birds arrive in early October and move northward during the first half of March. In fall, winter birds arriving, October 8, 1916, 48 (F). *Recorded:* ABCDEFGH[74]IJKLMNOPQWY.

Geographical Distribution.—Southern Canada southward across the whole of the United States to the Gulf Coast and central Mexico. Winters from New Jersey, Indiana, Texas, Arizona, and central California southward into South America.

Habitat.—Vicinity of fresh and brackish water: bits of sandy, gravelly shore; tiny plowed fields along water-courses in stream valleys; moist, level meadows; roadside puddles; and, back from the creeks and hollows, in pastures, in cultivated cotton and corn fields, and about barnyards. In hottest summer, shores of inland ponds and streams, particularly creeks with rock bottoms and many shallows; cultivated meadows, and newly plowed ground; and, occasionally, dry arroyos or creek beds. In winter, river sand-bars; wet prairies, upland pastures, and plowed fields; deserted-looking pools in the half-dried hollows and valleys of creeks and rivers.

Local Haunts.—Gravel beds and the gravel island in the valley of the Colorado River at Austin; pebbly beach on the south side of the river, west of the Congress Avenue bridge; truck gardens on second bottoms of the river; level cotton fields and gravelly tops of rises in the open, rolling country which sweeps across the eastern half of the Region; bare, gravelly, rocky tops among the hills, with only a blade of grass or a thorny bush here and there. In hot summer, particularly common along Little Walnut Creek.

General Habits.—Usually observed singly or in pairs; in late summer, families gather in loose flocks of from 3 to 8 birds and wander along water-courses; occurs in flocks, sometimes of considerable size, in fall, winter, and early spring. Rather noisy and restless; not generally shy, but easily alarmed into loud cries. Nimble, spending a large part of the time on the ground, running gracefully, actively about, on the ground or in the shallow water, head drawn in and held low, wings sometimes outspread; occasionally stops, poses rigidly, head erect, body tilted forward, as it looks about. Plays on lake margin or river sand-bar, where it goes for food and water at dusk and at dawn.

Home Life.—Parent frequently leaves the nest when the intruder is still far away; when flushed at close range, which occasionally happens, the bird attempts to lead the observer away from eggs or young by running ahead, dragging and fluttering spread wings and tail and crying as if in pain. Especially noisy when the little downy, striped young—which run about and hide by squatting and remaining motionless, which they do almost as soon as they leave the shell—are trotting about in the short grass.

Feeding Habits.—Flocks scatter to feed, uniting on taking wing. The birds move about, searching for beetles, which form about a third of their food; for crustaceans, centipedes, spiders, and ticks, which form about a fifth; and for grasshoppers, weevils, army worms, small snails, worms, insects and their larvae, and a few weed seeds. Particularly fond of water beetles.

Flight.—Usually high, almost beyond vision; swift, sometimes straight away, sometimes erratic and pursuing an irregular course. Frequently heard flying over at night, high in the air, calling. Flocks do not move in compact formation, but in rather loose, irregular company. A faint call comes from a distance, a speck appears against the sky and we soon see the flying bird, high overhead; just as it reaches a point above the moist flat, it pulls its wings slightly downward, tips forward, and coasts down to earth in a long, volplaning glide of terrific speed, occasionally dipping and diving in a bewildering manner; yet, just when we think the bird will be dashed to pieces, it manipulates its wings as a well-trained aviator handles his plane, and comes to rest beside a small puddle where food is to be found. When flushed from its feeding ground, it darts lightly away on powerful wings, and then usually circles back and forth.

Breeding.—Middle of March to June. Earliest: April 30, 1919, 4 hatching eggs (AB). Latest: June 4, 1908, 4 slightly incubated eggs (Y); June 6, 1915, 1 small downy young (A). Sometimes two broods. *Breeding recorded:* ABCEGH[75]IJLMNOWY.

Nest Location.—On ground, a mere saucer-shaped surface depression in dried earth or fine gravel on small islands, gravel beds, and bits of beach near stream or ponds; in middle, on edge, or at turn-row of cotton and corn fields. Usually shaded by a cotton plant, a broomweed, or a few tall weeds.

Nest Construction.—The small-saucer depression is usually lined with about a handful of uniform, small, white pebbles about the size of peas; sometimes lined with bits of pebbles, mixed in with a sparse lining of weed stalks or short, dry grass blades; rarely, unlined.

Eggs.—4, rarely 3, almost pear-shaped and quite pointed at the smaller end; drab, light clay-colored, creamy, buffy-white, or dull greenish-buff; handsomely, boldly, and profusely spotted, blotched, and scrawled with black, dark chocolate, and lavender, chiefly at the larger end; 1.50×1.10. Eggs placed small points together in center of saucer, their shapes making their position firm and rendering rolling of eggs from the shallow depression impossible.

Voice.—A low, slow, sweet, musical, half-petulant, half-plaintive whistled *kil-deé* or *till-deé, till-deé*, commonly heard on rainy and drizzly days as the bird passes overhead, but also quite common at all times of the day and on moonlight nights; noisier in fall and winter. When the bird is disturbed, its call becomes a loud, rapid, high, harsh, excited, screaming *kill-dee, kill-dee* or *til-deé-o, tel-deé-o;* when flushed, and rising into flight from feeding ground, a rapid *kittle, kittle, kittle*, at first very loud and emphatic, but growing less distinct; or, a more surprised *twittlety-tit-tit-tit-tit-tit-tit*, growing slower toward the end. A softer *de-e-e-e-e-eet*, as the bird runs ahead of the observer; and a variety of other calls, prominent among which are a quavering *til-de-de-o;* a slow, plaintive, soothing *dee-e-e*, dropping in the scale; a faint *q-eee* or *tieu-ee;* a slow *pieu;* a short *dee;* and a two-syllabled *pew-eee*. Another alarm call is a loud *kill-dee, dee, dee, dee-ey*. The commoner call, from which the bird obtains its name, is usually uttered on the wing.

Description.—Crown and back grayish-brown with reddish-brown edgings; front-crown, eye to bill, cheek, ear-patch, neck-ring, and breast-band, black; big rump-patch, light, bright yellowish-cinnamon-brown. Tail, grayish-brown in center to reddish and white on sides, all tipped with black and white. Forehead, chin, throat, neck-ring, breast-band, patch-line over and behind each eye, and belly, white.

Sexes alike, with practically no seasonal changes. Young birds, browner above, with brown replacing black of head and neck. Bill black. Toes three, hind-toe missing; legs and feet greenish-yellow. Wing-lining and axillars white. L. 10.50. W. 6.36. Tar. 1.40. B. .80.

Field Marks.—Moderate-sized, brown-backed, white-bellied plover, with two black bands across its white breast, the upper one extending like a necktie around the lower part of the bird's white collar. Conspicuous white bar on extended wing. Tail black-banded, white-tipped. Large bright cinnamon-orange rump-patch. *Only shorebird having two black chest bands.* Characteristic calls.

Popular Names.—Killdee; Killdeer; Ring-neck; Mainland Plover; Vociferous Plover.

Remarks.—Although a plover, its flesh is little esteemed and not very palatable, for it has a fishy, musky flavor; it is however, shot by many foreigners for the pot. Shot by hunters as a nuisance, for it flies to meet them, circling and calling noisily, warning other birds. Its wide range has saved it from diminution.

MOUNTAIN PLOVER

Podasocys montanus[75] (J.K.Townsend)

Rare and irregular migrant and winter resident, probably migrating during August and September and again in March. Records, August 27, 1921, 2 (A); February 6, 1919, 1 (A); March 8, 1922, 3 (A). *Recorded:* A.

Geographical Distribution.—Western United States, from Montana and western Nebraska south to northern New Mexico and the Staked Plains of northwestern Texas. Winters from California, southern Arizona, and central-western and southern Texas (east to Austin and San Antonio) southward to central Mexico.

Habitat.—High plateaus of the West, on flat country, the barren prairies, the open plains, and the dry uplands, preferring the more barren to the grassy parts; usually dry country, particularly near roads; low, rolling, gravelly hills; dry, half-barren plains; newly-plowed fields; rarely found in short-grass pastures, lowland meadows, and near ponds.

Local Haunts.—Open pasturelands near the city, and small bits of prairie on flat plateaus west of the city.

General Habits.—Generally observed singly and by twos and threes, usually only after very severe cold spells of weather, or following a freeze, a blizzard, or a snowstorm; rarely observed in small loose flocks, although in other wintering sections farther west it has been observed in flocks of as many as 300 birds. Water seems to make little difference in its occurrence, which is quite unusual for a shorebird, so-called. A very quiet bird, difficult to flush from the ground; rather than to take wing, it prefers to run and dodge among vegetation with its head held low, stopping now and then with head erect to look about.

Migration.—Nests on the highlands and plateaus of the Rocky Mountain section, in winter migrating to the lowlands southeast and southwest of its breeding grounds.

Feeding Habits.—Feeds on the short-grass prairies and the open pasturelands, where it picks up its food from among the short grasses, a diet consisting almost entirely of insects, such as grasshoppers, crickets, beetles, flies, cattle ticks, and many smaller kinds.

Flight.—Flocks fly low, and are difficult to see except when they wheel, when the silvery-white under surfaces of their wings flash for an instant. Birds usually run for some distance after alighting, and are hence very difficult to locate, even among the short grasses which sparsely cover their haunts.

Voice.—A rather low, plaintive, pleasing whistle; in spring and early summer, a short, shrill whistle, which, at intervals, drops to a harsher note.

Description.—Pale ashy-grayish-brown or yellowish-brown above; under-parts white, broadly tinged with buffy on breast. Broad, high forehead-band to base of bill and extending back into line over eye, white. Broad front of crown (over white forehead) and space from eye to bill, black. No rings on pale buffy neck. Tail, less than half as long as wing, drab, shading to blackish-brown near tips, which are white; outer web of outer feather white. In winter, more buffy, without pure black and white markings. Immatures, buffy replacing black. Slender black bill. Pale brown legs with black feet; no basal web between middle and inner toe. L. 9.15. W. 5.75. Tar. 1.58. B. .85.

Field Marks.—Broad white forehead and white line over each eye, contrasting sharply against distinctly dark cap. About size of Killdeer, but chunkier. Uniform, grayish-brown above, buffy below; no breast-bands, and no conspicuous white on rump or wings. Wing-lining and axillars white.

Popular Names.—Prairie Plover; Mountain Plover; Arid Plains Plover; High Plains Plover; Bullhead (sometimes).

Remarks.—Not common enough in Texas to be of importance as a game bird. Its body is of moderate size and quite fat in winter, but the flesh has an unpleasant taste which is not at first apparent.

RUDDY TURNSTONE

Arenaria interpres morinella (Linnæus)

Rare migrant, probably occurring from late August to early October, and during March. One record, September 2, 1917, 3 shot (B). *Recorded:* B.

Geographical Distribution.—Summers on the Arctic shores and, strangely, along the Texas Coast and on the Lower Rio Grande at Brownsville. Winters from South Carolina, Louisiana, Texas, and central California southward over most of South America. In migrations, rare on the Pacific Coast and in the interior; chiefly down the Atlantic Coast, less commonly, the Mississippi Valley.

Habitat.—Maritime: usually the outer beaches along seashores; sandy beaches along the pounding surf; wind-swept, stony beaches and tide-bared sandbars; bases of rocky cliffs. During migrations, wide sand and gravel beaches and flats along the larger rivers.

Local Haunts.—South bank of the Colorado River, directly across from the Deep Eddy swimming pool at Austin.

General Habits.—Most attractive and striking of the shore-birds, occurring singly and in small flocks. Swims well when forced to do so; and, on seashores, bathes in the little rolling waves which sweep up the sands, shaking itself free of water after the manner of a little dog.

Feeding Habits.—Pries under stones, shells, pebbles, and bits of drift. Its name comes from its ruddy colors and from its habit of turning over stones, often of considerable size and frequently partly imbedded in the sand, laboring and pushing with its breast, heaving, digging beneath to undermine them, prodding the sand with its beak, and raising them from their cavities in search of choice morsels. Works usually along the edge of the water, diligently earning its name, though frequently it probes the sand and searches for food like a sandpiper. Feeds on insects and their larvae, small crustaceans, worms, crab spawn, small and thin-shelled mollusks, and low-tide oysters killed by the heat of the sun's rays.

Flight.—Low and swift, alternately flapping and sailing.

Voice.—Usually silent. A deep, melodious whistle of two or three notes; a chuckling whistle; a curious, rapid, rattling, chattering note, *kuk-kuk-kuk;* a loud, twittering note.

Description.—Rich chestnut above; sides of face, throat, neck, and part of back, black; hind-head, lower back, base of tail, sides of neck, hind-neck, spot at side of bill, chin and throat, and belly, white. Breast with broad black band. Wing-lining and axillars wholly white. White band around head, across fore-crown, over eye, and onto ear-patch. Rump-band brownish. Tail white, banded near end with blackish-brown, and tipped with white. Female, duller, white faintly dusky, black faded with brown. In winter, more gray above; rusty-brown of back less conspicuous; white edgings partly hiding black feathers; more white below. Bill quite short, stout, pointed, the perfectly straight top of the upper mandible giving it an up-turned appearance. Short, stocky, dull orange legs. L. 9.50. W. 5.95. Tar. 1. B. .90.

Field Marks.—Handsome, compact, stocky shore-bird, strikingly marked with mixed coarse pattern of white, chestnut, and black on head, neck, and back. Short, orange-red legs. Short, "up-turned" bill. Moderately small, about the size of a Killdeer, but considerably chunkier. Conspicuous white band across expanded wing, and striking large white patch on lower back, identify it even in winter plumage. Heavy area on black chest and fore-neck. Black on forehead; white band around head. Black rump-patch set in white. Tail white at base, then brownish-black, tipped with white. The markings of its upper-parts present a double alternation of black and white from its lower back to the end of its tail.

TEXAS BOB-WHITE

Colinus virginianus texanus (Lawrence)

Common permanent resident, though gradually becoming scarcer year by year. *Recorded:* ABCDEF[a]GH[a]IJKLMNOPQRSWY.

Geographical Distribution.—Southern and southwestern Texas, northeastward to the Brazos River, where it intergrades with and passes into the Eastern Bob-white, *C. v. virginianus* (Linnæus); north into western Kansas, and southward into northern Mexico.

Habitat.—More or less open country, particularly in mesquite-chaparral-cactus pastures; old plantations, clearings, and cultivated fields; open, semi-arid, tree-dotted, bushy pastures in farming country, particularly where such pastures are interspersed with small bodies of woodland; hay, grain, brown stubble, corn, cotton, and open weedy fields; clearings and brushy edges of woodlands; thickets, brush, and briar patches along edges of meadows and creeks; weedy roadsides and fencerows; wooded hillsides; cedar brakes; cultivated fields. Never in bottom woods or open prairies. In fall and winter, among dead stalks in cotton and corn fields.

Local Haunts.—Zilker's south river-pasture; Pease north pasture; slopes of Mt. Barker; pastures along Onion Creek, between Austin and Mt. Bonnell, and between the Dam Boulevard and the Colorado River; occasionally on the University campus. Whole of the Region, in suitable localities, particularly immediately west, southwest, and south of the city.

General Habits.—Observed singly, in pairs in summer, or by threes and fours; in winter, from middle fall to early spring, in covies or bevies of from 10 to 30, breaking up for the breeding season and reassembling as soon as it is over. Rather shy and difficult to find after the hunting season has opened. During summer days the birds seek shelter under the bushes which dot the pastures; winter days, in scattered brush heaps and tiny hollows. On spring and summer

nights they generally roost in the open fields; on fall and winter nights, roost under cover, usually in lowlands. When frightened, or when preparing to sleep and keep warm, a covey arranges itself in a close-huddled circle, heads out from center; when approach is too close, the birds burst in all directions, making it very difficult to shoot more than one at a time; were they to follow each other, as most gregarious birds do, the hunter would have a better opportunity to exterminate the whole covey. Occasionally, but rarely, takes to the trees when flushed, and remains squatting close to limb and practically invisible.

Feeding Habits.—Feeds after the manner of a barnyard hen by scratching on the ground for its food, chiefly seeds, particularly weed seeds and waste grain; also fond of wild berries, Mexican and pink cotton boll weevils, cutworms, army worms, and other insects; about fifteen per cent of the food is insect in character, the bird feeding freely on many pests to agriculture.

Flight.—When a bird is flushed into sudden flight, it goes off as if shot from a spring, and its wings make a loud whirring noise, *r-r-r-r-r-r-r-r-r*. Takes wing only as a last resort, usually preferring to depend on its protective coloration to escape danger. Birds of a covey run for some distance the moment they alight on the ground in open country.

Courtship.—Pair in early April. Males fight for females much after the manner of game-cocks.

Breeding.—First week in May to second week in August. Earliest: May 30, 1915, 13 downy young (A); June 7, 1908, 15 slightly incubated eggs (E). Latest: June 12, 1915, 14 slightly incubated eggs (B); October 1, young birds just from the egg (H). Two, rarely three, broods. *Breeding recorded:* ABCEFHIJLNOW.

Nest Location.—Nest on ground along fencerows, in small dewberry thickets, in prickly-pear beds, in brushy mesquite lands or bushy, grassy pastures, in thick tussocks or clumps of big grass, along weedy fence lines or roadsides, or in the middle of cotton or corn fields on the rolling prairies; usually well hidden by a small bush or by weeds and prairie grasses; occasionally placed in a fencerow with overhanging vines or beside a stone wall or a log.

Nest Construction.—A domed, neatly-walled nest of grasses, with entrance on one side. A saucer-shaped surface depression or cavity is lined with dead grasses, and the depression is concealed by a grass arch, the bird pulling the thick grass tops together and weaving them with other dead grasses.

Nest Measurements.—Inside, greatest diameter, top to bottom 5, side to side 5.50.

Eggs.—8 to 18, rarely 25, usually 12, ovate to sub-pear-shaped, usually quite pointed at one end, dull white, with slight gloss, and partially stained a buffy-yellow by contact with the grass on which they rest. 1.18×.94.

Voice.—During the breeding season, a clear, vigorous, mellow, whistled *Bob-white*, measured in rendition and uttered at slow intervals. Sometimes another, and lower, syllable is added in front: *(Bob)-bob-white* or *Bob-white! ah, Bob-white!*, heard from the middle of April to September. On hot summer days there drifts across the pasture a slow, peaceful call, *quoi-hee, quoi-hee* or *ka-loi-kee, ka-loi-kee;* a clear, vibrant *whoil-kee;* a peaceful *quoit, quoit, quoit*, said to be the assembling call; conversational *quits, quirks*, and *queets;* low twittering notes when excited; scatter calls, *Where are you? Where are you?*, the *Where* emphasized most strongly, uttered by members of a scattered covey; another summer call, a querulous *toó-ie, toó-ie* or *toó-ee, toó-ee, toó-ee*. Calls from fence rail or post, stump, fallen log, thicket, or furrow in plowed field.

Description.—Upper-parts reddish-brown and black, with a considerable amount of striking black blotching on lower back and shoulders; buffy to brownish below, more reddish on sides, under-parts narrowly barred with black; white line through eye; throat white, bordered with black. Female, black and white replaced by brown and buff. L. 9.50. W. 4.40. T. 2.44. B. .59.

Subspecific Characters.—Similar to the Eastern or Virginia Bob-white, *Colinus virginianus virginianus* (Linnæus), but much paler and slightly smaller, the eastern form measuring L. 10.10, W. 4.55, and T. 2.70. Upper-parts, mainly brown instead of cinnamon-brown, less black blotchings, and with *distinct white barrings;* under-parts, broader and more conspicuous pinkish-brown band below black collar, and generally more heavily and thickly-barred with brown. Female, paler, less distinctly barred, and with tawny throat-patch.

Field Marks.—Small-headed, heavily-bodied, round-breasted bird, streaked dull brown and tawny, flecked with black and white. Forehead and stripe over eye to back of neck, white; throat-patch white, bordered with black, and then with pinkish-brown band. Female, head markings largely buffy instead of distinct black and white. *No white feathers in tail in flight.*

Popular Names.—Bob-white; Quail; Patridge; Partridge; Patritch; Virginia Partridge.

Remarks.—Highly-esteemed game bird, best hunted with a pointer dog.

BUFF-BELLIED SCALED QUAIL

Callipepla squamata pallida[78] Brewster.

Very rare winter visitor; probably a rare resident in suitable localities in the extreme western portion of the Region. Two records, separated by a period of two years. *Recorded:* J.

Geographical Distribution.—Central Arizona and southern Colorado, southward into Mexico, and eastward over most of the Texas Panhandle and most of western Texas, northeastward locally to Austin; rare east of northwestern Kerr and southern Bexar counties, Texas.

Habitat.—Parched desert country of Upper and Lower Sonoran subzones. Shuns timbered country, but characteristic of the barren plateaus in the mountainous districts of western Texas, usually where the soil is fine, loose, and sandy; broad, dry, arid washes, gulches, and semi-barren plateaus of the hills where hard ground is covered with a few thorny bushes, scattered scrub oak, chaparral, mesquite, sage brush, and different species of cactus; chaparral and mesquite country, generally in the vicinity of water but sometimes miles from any stream or pond.

Local Haunts.—Nearly bare slopes of Bull Creek valley in wild, mountainous, limestone hill country 20 miles northwest of Austin. A bush and scrub-oak patch, surrounded on every hand at a hundred yards by dense cedar brakes.

General Habits.—Occur in flocks of from 6 to 10, sometimes more. Trim, delicately-tinted birds, more often heard than seen. Very shy in places, trustful in others. Scatter easily, difficult to find; their bluish-gray colors make them almost invisible against the gray ground. When frightened, birds scatter from the covey, run with outstretched neck and spread erected crest, and dart like rabbits through the chaparral and brush and among rocks, hiding cleverly among the almost impenetrable cactus and rarely taking wing.

Feeding Habits.—Scratches on the ground and searches for small seeds, grain, berries, plant tops, small beetles, ants, and grasshoppers.

Breeding.—Possibly. Fourth week in April to middle of May. Probably only one brood.

Nest Location.—A surface depression or slight hollow in the ground under shelter of small low brush, cactus, yucca, or other shelter. Rarely placed in meadow or grain field; more commonly in desert country.

Nest Construction.—Depression generally unlined; sometimes scantily lined with leaves and dry grasses.

Eggs.—8 to 16, buffy-white or creamy-white, finely speckled all over with pale brownish; extremely thin-shelled; 1.25×.95.

Voice.—A single low, long-drawn whistle; a nasal, musical, friendly *pe-cos'*, *pe-cos'*.

Description.—Pale bluish-gray, darker on sides, changing to buffy on belly; paler to fawn color on head, which has a short, full, white-tipped crest. Upper neck, upper back, and under-parts, conspicuously scaled in appearance. Conspicuous white stripe on each side of back; sides streaked with white. Young, black-barred upper-parts with white streaks, brown breast with triangular white streaks, and brown-barred sides. L. 10.50. W. 4.75. T. 4.30.

Field Marks.—Distinct pale blue-gray color. Scaly appearance to feathers of neck and under-parts. Conspicuous small whitish or buffy-whitish crest or tuft of feathers on top of head.

Popular Names.—Blue Quail; Mexican Quail; Cottontop; Gray Quail; Desert Quail; Scaled Quail.

ATTWATER'S PRAIRIE CHICKEN

Tympanuchus americanus attwateri Bendire

Extirpated in the Austin Region; formerly common resident, non-migratory; observed as late as forty-four years ago. Now rather scarce in all sections of its range. *Recorded:* DO.

Geographical Distribution.—Coastal regions of southwestern Louisiana and of Texas, inland west to Austin and northwestward to Williamson County.

Habitat.—Low prairie lands near coast. Rolling, open, grassy, fertile upland prairies, where the grass is from 1 to 3 feet tall, old and thick and mixed with weeds; wheat and corn fields; takes to timber only during snow and sleety storms.

Local Haunts.—Eastern half of the Region, west to the line of the hills, beyond which it never extended. More common in the northeastern corner of the Region, particularly on the extensive praries near Pflugerville.

General Habits.—Observed singly and in pairs in spring; in fall and winter, roamed about in flocks of from 10 to 12 up to a 100 or more, moving about over the prairies and grain fields, generally keeping among bushes and tall grass inland, the open prairies and grassy knolls along the coast. Stately of bearing, but otherwise very much like the domestic fowl in its actions. In spring, a 'scratching-ground' or smooth, open courtship ground is selected, where pairing takes place.

Feeding Habits.—Sometimes flies to treetops to inspect corn fields before alighting in them to feed; frequently feeds in the open in plain sight of observers several hundred yards away. During early breeding season, feeds largely on insects, such as grasshoppers, crickets, potato bugs, and other beetles; in fall and winter, tops and seeds of leguminous plants, tender buds and green leaves of late winter, fruits, berries, and waste grain of stubble and corn fields.

Flight.—Quick, swift, moderately easy, low, and in a straight line, with short stretches of sailing; rather slower and with much less whirring than the flight of the Bob-white. Flights usually short, but occasionally flap and sail along, hardy and strong, for a mile or more.

History.—Formerly abundant on the open prairies, these wonderful game-fowl became extirpated in the Austin Region through two agencies: civilization and hunting. They disappeared rapidly as the country was settled up and as cultivated fields took the place of the extensive, wild, unfenced prairies; and hunters quickly killed the few remaining birds. The last were seen in the spring of 1878 on the extensive prairies near Pflugerville (O).

Courtship.—In spring, from late February to May, for hours in the morning after sunrise, the low courtship booming of the male is heard for a mile or more over the rolling prairies. Males fight on an open space; the females hearing the love-call, appear and sit on one side as quiet spectators until they are claimed by a victorious male. The cock struts back and forth across a small hilltop, showing off with wide-spread tail, drooping wings, and erected neck-tufts, before the female, who looks at a distance like an ordinary hen. The bright orange sacs under the neck-tufts of the male can be inflated during the nuptial season to the size of a small orange, whence the hollow booming sound as contained air is released.

Breeding.—Late March to late May. Nest and eggs found, spring of 1878 (O). *Breeding recorded:* O.

Nest Location.—A slight hollow or surface depression in ground, in thick hummock of prairie grass, among grasses and weeds, or under small bushes, on the wild, open, unfenced prairie, far from houses.

Nest Construction.—Hollow usually lined with a few matted grasses and feathers.

Eggs.—8 to 12, usually 9, olive-buff or cream to light brown, with a few pin-point specks of reddish-brown, 1.68×1.25.

Voice.—Nondescript calls; strange cackles, with a muffled booming love-call, *uck-ah-umb-boo-oo-oo-oo-oo-oo;* and a loud beating *boom-ah-boom*, perhaps produced by a beating of the wings; when alarmed, a rapidly repeated *cluk-cluk-cluk-cluk;* female, when flushed, utters a low *kuk-kuk-kuk-kuk-kuk-kuk-kuk-kuk.*

Description.—Upper-parts barred rufous-brown, yellowish-brown, and white, and spotted and barred with black, the black bars single; tail fuscous or blackish, tipped with white, the inner feathers somewhat mottled ochraceous-buff; throat buffy; white breast and belly evenly barred with black. Bare skin on each side of neck hidden by tufts of buffy-and-rufous-marked black feathers, usually 10 or more, generally 2.50 or longer, narrow and stiffened and broadly-rounded at ends. Female, much smaller neck-tufts, and with ochraceous-buff barrings on tail.

Subspecific Characters.—Considerably smaller (L. 16.50, W. 8.34, T. 3.42; female smaller) than its more northern plains relative, the Great Plains Prairie Chicken. *T. a. americanus* (Reichenbach), larger (L. 17.50-19, W. 8.60-9.40, T. 3.80-4.30) form of wider range; full-grown birds average only 25 to 31 ounces. Darker, more tawny above; more chestnut on neck; tarsus never feathered down to base of toes, even in front, and generally much naked in summer, with stripe down back of tarsus naked even in winter.

Field Marks.—Large size; with *tail rounded* or nearly square, *not pointed.* Brownish above, grayish below, *barred* all over with brownish-black; not with V-shaped marks on breast and belly. Long tuft of feathers on each side of neck.

Popular Names.—Prairie Hen; Chicken; Prairie Chicken; Prairie Grouse; Southern Prairie Hen; Southern Prairie Chicken; Texas Prairie Chicken; Louisiana Prairie Chicken; Pinnated Grouse; Attwater's Prairie Hen.

Remarks.—More usually shot for sport, since its flesh is dark and not particularly esteemed.

RIO GRANDE WILD TURKEY

Meleagris gallopavo intermedia Sennett

Very scarce permanent resident; comparatively common 30 years ago, but gradually decreasing in numbers, and almost extinct now where formerly it was plentiful. *Recorded:* CDH[79]JL.

Geographical Distribution.—Middle northern Texas, southward over southern and southwestern Texas into northeastern and eastern Mexico.

Habitat.—Wild, rough, brushy country; dry, big-timbered arroyos running back from watered creeks; hill and valley country; shin oak clumps on hillsides; creek bottoms and lower slopes; wild, less-frequented, thinly-settled country, particularly in the mountains and notches in the hills.

Local Haunts.—Hilly, northwestern corner of the Region; Bull Creek valley, eighteen miles northwest of Austin, where some of the wildest country in Texas is located; southwestern part of the Region, particularly along the broader, wooded ravines of the upper parts of Barton Creek. The big, unmolested stock ranches. Once, a generation ago, found commonly through all heavily timbered bottomlands along water courses, side draws, and ravines of the hills, west to the Pedernales River.

General Habits.—Observed singly or in pairs during the breeding season, at other times in flocks of from 12 to 15 or more; flocks are usually practically all of one sex or the other. Very wary; when in danger, it usually sneaks away or runs through the underbrush and into thickets, preferring to trust to its stout legs rather than taking wing. Usually roost each night in the same locality, birds returning singly and by twos and threes at dusk, until all the birds have assembled in their favorite places in the tops of larger, taller trees, generally over water and frequently in partially submerged trees, possibly for protection against prowling coyotes and bob-cats; big pecan trees along wooded creek valleys, in washes, and in bottomlands are generally selected. Birds make their way back to the higher ridges before daylight has half arrived. Males flock together during the period in which females are kept busy with eggs or care of young.

Feeding Habits.—When pecans are ripe, the birds feed under the pecan trees along the valleys. At other seasons, they wander about wooded slopes in the daytime, feeding among the cedars and scrub oaks which cover the hillsides and ridges of the land that was once prairie; at night, they return to the valleys to roost. Feed on nuts, acorns, seeds, grain, berries, plant tops, insects, crickets, and grasshoppers.

Courtship.—In late February and early March the males, which are polygamists, strut before the females, show off their charms, and do battle for the hens.

Flight.—Strong, rapid, powerful, its great wings making considerable noise as they beat a heavy *whish, whish.* Usually flies very low.

Breeding.—Last of March to last of May. Nest found (C), and others reported frequently by the hill people (H), who say that two or three broods are reared each season. *Breeding recorded:* C.

Nest Location.—Slight depression in the ground among low bushes, in dense woods along streams, in tangles of briar vines, and in thick weedy places. Very difficult to find, particularly when placed in tangled growths of underbrush.

Nest Construction.—Slight hollow, scraped out by the bird, is lined with grasses and leaves.

Eggs.—8 to 15, rich buff or cream colored, speckled and dotted over the entire surface with brownish-red, 2.46×1.86.

Voice.—Usually at the opening of the mating season, at first signs of day in the early morning, *gil-obble-obble-obble,* clearer and much shriller in early spring than the call of the barnyard turkey, but becoming deeper later in the season; answered by birds in other parts of the bottoms. Also, a *chuck.* Female, during nesting season, a plaintive piping.

Description.—Very much like domestic turkey. Bare, dull bluish head and neck, with strip of skin hanging from forehead above bill; long, bristly tuft of beard hanging from chest. Back dark to blackish; feathers of under-parts metallic bronze green and reddish, tipped with velvety-black. Female much smaller and duller. L. 48-50. W. 21. T. 18.50.

Subspecific Characters.—Lower back and rump jet black (in certain lights, steel-gray bars), instead of the rich dark chestnut of the Eastern Wild Turkey, *M. g. silvestris* Vieillot; tail and lower tail-coverts tipped with cinnamon or cinnamon-buff.

Field Marks.—Largest of our game birds, length 4 feet. Very similar to the domestic turkey—which is one of its descendents—with metallic bronze reflections to its plumage, but with chestnut instead of white tips to tail and its coverts.

Popular Names.—Wild Turkey; Bronze Turkey; Texas Wild Turkey; Intermediate Wild Turkey.

Remarks.—The Wild Turkey of southern Mexico, *M. g. gallopavo* Linnæus, with white tips to tail and upper tail-coverts, was introduced and established in Europe as early as 1530, and was later brought over by settlers to the eastern United States, where it interbreeds quite freely with the native Eastern Wild Turkeys when given a chance. Males weigh from 14 to 40 pounds.

PASSENGER PIGEON

Ectopistes canadensis[80] (Linnæus)

Extirpated in the Austin Region. Formerly abundant migrant, several weeks in both spring and fall, though commonest in September and October. Forty years ago the species was not uncommon. A Kentucky flock seen by Alexander Wilson in 1808 was estimated by him to contain well over two and a quarter billion birds; the race is now probably extinct; no unquestionable record of its actual capture in the United States since 1898, when specimens were taken in New York and Michigan; the sole surviving Passenger Pigeon, a captive, died on September 1, 1914. *Recorded:* DO.

Geographical Distribution.—Formerly southeastern Canada, from Hudson Bay southward, and the northeastern part of the United States, west to the Great Plains, southward to New York, Pennsylvania, Mississippi, and Kansas. Wintered principally in southeastern United States, from North Carolina and Arkansas south to Florida, Louisiana, and the post-oak country of central Texas. Migrant across eastern Texas, west to Austin.

Habitat.—Deciduous woodlands, particularly those of post oak; shin oak woodlands; marginal timber along streams.

Local Haunts.—Whole of the Region: post oak woodlands near the city; post oak woods in extreme eastern part of Region; trees along banks of Barton Creek near its mouth, and trees along south bank of the Colorado River just above Barton Creek; shin oak woods on hilltops. More common in extreme eastern part of Region, on edge of the post-oak-blackjack area, where numbers wintered; fewer west to Austin, where oaks were not so common.

General Habits.—In its more northern breeding grounds the birds bred in colonies nearly solidly covering patches of woods, 3 to 4 miles wide and 8 to 28 miles long, where it was persecuted, netted, captured, and destroyed, where it was beaten and clubbed to death by the thousands in the dead of night and its nest, eggs, and young destroyed wantonly. During migrations, especially in the earlier days, they

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were myriad; flocks of millions and millions passed overhead, flying between winter and summer homes, their immense numbers frequently darkening the sun.

Feeding Habits.—Fed largely on acorns in oak woodlands.

Flight.—Said to be noiseless. instead of whistling as that of the Western Mourning Dove.

History.—Prior to forty years ago they were common in the Region, particularly in the extreme eastern part of Travis County where greater crops of acorns could be found. Then in the fall of 1878 a large migration took place over the city, moving from the southeast toward the northwest, in the general direction of the western post-oak timbers. String after string of many thousands of birds passed over; many lit in the tall trees along Barton Creek just above its mouth and in the trees along the south side of the river just above the creek, literally loading down the limbs. This was particularly true of the trees within a few hundred yards of the mouth of the creek. A number of the birds were shot and their "craws" were found to be literally packed with huge acorns, each about an inch in diameter, so large that it seemed impossible the birds could have swallowed them. Not a single bird has been seen in the Austin Region since that year (O), although the species has been recorded later in Lee County (1886, J. A. Singley) and at Houston (1883, and 3 birds in 1896, by market hunters).

Voice.—An explosive squawk.

Description.—Back and head rich slaty-bluish, with metallic reflections on back and sides of neck; flight feathers (primaries) brownish to black; tail long, graduated, slaty-blue, darker at base, with broad white border, the tail-feathers being narrow and pointed at tip; tail nearly as long as wing. Throat bluish-slate; breast and under-parts reddish-salmon or deep rich vinaceous, shading to white on the belly. No black spot on side of neck. Olive-brown wash on middle of back. Female, more olive-brown above, more plain grayish-brown below; slightly smaller. Young more mottled; whitish in front. Iris red. Short tarsus partly feathered down in front. L. 16.30. W. 8. T. 8.25. B. .71.

Field Marks.—A rather large woodland pigeon, with a very long, graduated, pointed tail. Distinctly larger than the Western Mourning Dove (about 5 inches longer), from which it may also be distinguished by its bluish-slaty rump (brownish in the dove), and its darker, slaty-bluish head.

Popular Names.—Wild Pigeon.

WESTERN MOURNING DOVE

Zenaidura macroura marginella[81] (Woodhouse)

Very common resident; more or less local and migratory in winter, its abundance at that season depending on the severity of the weather; moves southward during October and early November, returning during the latter part of February. *Recorded:* ABCDEF[82]GH[83]IJKLMNOPQRTWY.

Geographical Distribution.—Pacific Coast and western North America, from southern Canada south into western Mexico, and east to the Mississippi Valley. Winters from Oregon and Colorado southward over Middle America.

Habitat.—Open and semi-open country, always within easy flight of drinking places; slopes of creek valleys; edges of timber; pastures, waste fields, cut-over timber, and open, second-growth timber; mesquite and chaparral country; cedar-clad hills; bushy slopes; wayside fencerows; tree-bordered fields. More often about civilization than in the distant mountains and deserts. In fall, stubble grain and corn fields; weedy patches about water holes.

Local Haunts.—Edges of town; pasturelands throughout the Region; slopes of Waller, Shoal, Barton, Bee, Bull, Onion, Williamson, and Dry creeks; Pease Park; University campus; semi-wooded pastures along the Dam Boulevard and between Austin and the Dam.

General Habits.—Evenly scattered in spring, from April to early summer; moves about in family groups in summer. and in larger flocks in fall; arrives in late winter and early spring in wintering flocks, which feed and roost together for a short while before dispersing on approach of the nesting season; however, never assembles in vast flocks, as did the Passenger Pigeon. Female, which incubates the eggs for about two weeks, either slips quietly away or tries to lead the intruder away from the nest by means of the broken-wing ruse. In desert country, from Austin westward, water holes and the cool shade of the narrowly-timbered prairie creeks can be located by watching during mid-day the direct lines of flight of the swiftly-moving doves, which come from miles across the prairie, since they frequently nest a long distance from water. Hunters make use of this water-seeking habit of the doves by hiding near a water hole at dawn or dusk and shooting the birds as they drop in to water preparatory to leaving or roosting in the nearby trees where they spend the night.

Fall Migration.—Begins to gather in small flocks early in September; commonly observed in flocks in late September and during October, though commonest about middle October, when birds summering further north begin to arrive; moves southward in bunches in late October and early November, and after the middle of November they are found only in irregular, isolated, wintering groups.

Feeding Habits.—Feeds on the ground on weed and vine seeds, particularly seeds of the yellow oxalis or wood sorrel, spurge, sunflower, ragweed, pigeon-grass, and other pest weed seeds about weedy patches; waste grains gleaned from stubble fields; plant tops; acorns; rarely snails, thousand-legs, and locusts and a few other insects; particularly fond of sunflower seeds in fall and of ragweed seeds in October; three stomachs were examined by the United States Bureau of Biological Survey to determine how many seeds a dove would eat at a meal, one containing 6400 seeds, a second 7500, and a third 9200. Visits gravel beds during day, and eats large quantities of fine gravel to aid its muscular gizzard in grinding seeds to small fragments, aiding digestion and at the same time killing germination powers, of such weed seeds. The young squabs in the nest are fed on "pigeon's milk," a partially-digested substance regurgitated by the parents.

Flight.—Free, swift, and darting, cutting the air overhead with the hiss of a bullet, its long, powerful wings whistling with the power it applies to each shove, and its long tail narrowed to prevent friction, a saving of energy assisted by its smooth and compact plumage. Exceedingly, wonderfully, skilled in flight, swerving without lessening speed, many birds thus being saved from the less-skillful hunters and many natural enemies.

Courtship.—Peculiar aerial evolutions are performed during the mating season by one or both birds, which leave perch, ascend for about 30 feet, fly about in a peculiar manner, then sail for a short distance, and finally return to the perch. A number, however, appear to remain mated throughout the year.

Breeding.—February to October. Earliest: March 18, 1916, 2 fresh eggs (B). Latest: September 20, 1901, 2 fresh eggs (H); September 14, 1916, 2 partly incubated eggs (FG). Nests in late February (B); and young in nest in October (O). A day intervenes between the laying of the eggs. Two or three broods each season; usually (1) second week in April (2) third week in May, and (3) late June to September. *Breeding recorded:* ABCEFGHIJKLMNOPQWY.

Nest Location.—3 to 20, usually 9, feet from the ground on low, flat, horizontal limb of small mesquite, cedar, elm, hackberry, mountain rock-cedar, eastern and mountain live oaks, post oak, shin oak, and black willow trees or small bushes, usually in pastureland, on vacant lot in town, or residential shade tree. On account of egg-loving snakes, rarely placed on ground in gravel beds or cotton and corn fields, a slight surface depression in the shelter of a weed or other plant. Rarely on leaning corn-stalks, rail fences, tops of rock fences, or ledges in cliffs.

Nest Construction.—A slight, frail, loosely-built, crude, rude, almost flat platform or saucer-shaped structure of small twigs, straws, dried grasses, rootlets, or weed-stems, carelessly arranged; usually without lining, and so flimsy that eggs can frequently be seen through from below; occasionally lined with small weed stems. If on ground, slight depression is lined with weed-stems and grass.

Nest Building.—Nest generally new, constructed by the birds. Occasionally, however, old nests of the Gray-tailed Cardinal or the Western Mockingbird are repaired and used; one bird with eggs was found occupying an old nest of the Audubon Caracara.[54]

Nest Measurements.—Outside, diameter 5 to 6; height 1.5 to 3, averaging 2. Inside, diameter 3 to 4, depth .50 to 1.

Eggs.—2, rarely 1 or 3, elliptical-ovate, more equal-ended than an average egg, pure white, rarely creamy, smooth and somewhat glossy, 1.06×.80. One unusually small egg measured .71×.58.

Voice.—Love-song of male, a soft, sweet, slow, mellow, mournful, musical *coo-weé-oo-o-o, coo-o-o, coo-o-o, coo-o-o,* the first three syllables uttered rapidly and as one continuous note, with a distinct stress and accent on the higher-pitched *wee;* the other notes are of an even, lower pitch, uttered much slower; also interpreted as *coo-o-o, ah-coo-o-o—coo-o-o—coo-o-o* or *coo, coo, roo; moo, oa, ooo, ooo, ooo.* Often merely a soft *coo-o-o,* repeated several times. Under favorable conditions, the call may be heard for a half mile. First heard late in February, and then common through spring and summer months.

Description.—Crown bluish-slate; upper-parts and wings olive-grayish-brown; sides of neck with metallic reflections, and blue-black spot on side of neck below ear. Bare space around eye. Long, slender tail of 14 feathers pointed at tips; graduated, more than two-thirds as long as wing; edged or broadly tipped with white, with a series of black marks in almost a band between the white and the darker center of the tail, slaty-gray to grayish-brown in color. Under-parts brownish or cream-buff, tinged with pinkish on breast and forehead. Female duller, grayish-brown on forehead and breast. L. 12. W. 5.80. T. 5.75. Tar. (naked) .82. B. .53.

Field Marks.—Large size, though smaller than domestic pigeons or the wild Passenger Pigeon; rump olive-grayish-brown instead of bluish-slate; black spot below ear. Wings plain brownish, without white. In its free, swift, whistling flight, long and pointed wings and *long, narrowly-compressed, conspicuously-pointed tail* margined with white. Soft, mournful cooing.

Popular Names.—Dove; Wild Dove; Turtle Dove; Common Dove; Carolina Dove; Cooing Dove; Carolina Turtle Dove.

Remarks.—Common game bird, now classed as a non-game bird in many eastern states because of its great value as a weed-seed destroyer. In many parts of Texas nesting has been found under way during every month of the year, which makes difficult the selection of a proper hunting season to prevent jeopardizing the hatching of eggs and the rearing of young squabs; there are different times of bulk-nesting and periods of migration in different sections of the state (southern and coastal, central, central-north and Panhandle), which would make a single season unsatisfactory; then, too, because of weather conditions and the arrival of northers in fall, many birds (as in northern Texas) nest to within a few days of their departure. So slaughtered during the first few days of open season—an incredible number of dove hunters taking the field with automobiles and pump shotguns—that they quickly become wary and move into the hills and sparsely-settled sections.

MEXICAN GROUND DOVE

Chaemepelia passerina pallescens Baird

Rare resident, becoming commoner year by year. January 7, 1922, 6 (A); February 14, 1921, 3 (A); February 29, 1920, 9 (A); April 4, 1915, 3 (A); June 19, 1919, 5 (I); August 27, 1921 (A); October 27, 1915 (F). *Recorded:* AFHI.

Geographical Distribution.—Extreme southeastern California, occasionally western California north to San Francisco, Lower California, southern Arizona, and south-central Texas southward over Middle America. In middle southern Texas ranges north to Corpus Christi, San Antonio, New Braunfels, Austin, Medina River, and Eagle Pass.

Habitat.—Quiet town streets and horse corrals; camp-yards and ranches; about cultivated fields along rivers in edge of town; cactus and mesquite growth or moist river bottom willows near town; window sills and dooryards of quieter residential sections.

Local Haunts.—University campus; residence district of Austin north and northwest of University campus, particularly between Twenty-fourth and Twenty-seventh streets and between Speedway and Guadalupe; lowlands in southeast part of Austin in winter.

General Habits.—Usually observed singly or in pairs, since the bird is not very gregarious; occasionally in small flocks of from 5 to 12 in fall, rarely in large flocks of as many as 35 birds, assembling when weed seeds are especially abundant. Not particularly shy, if shy at all; but appears shyer than the Inca Dove, though both are more friendly than most birds. Roosts in densely foliaged trees; usually seen at sunrise, when it is more active. Runs along with quick short steps and with graceful movements of its head. Its habit of holding its tail upright gives it quite a bantamlike appearance. Both sexes engage in incubating the eggs, a duty which occupies about two weeks; wild near nest, though rarely using broken-wing tactics to mislead intruder.

Feeding Habits.—Feeds on small seeds, refuse grain, and various small berries; gravel eaten by the bird helps to grind up the food. Young birds feed on small seeds, berries, and grain, as do the adults.

Flight.—Instead of being a straight-line flyer like the longer-tailed doves, this species gets away in a hurry, much faster than the Inca Dove, its wings whirring as it moves in its short flight; about as erratic on the wing as a Wilson Snipe.

History.—Has appeared in the Region within the last decade, gradually moving its range northward, as did the Inca Dove. First birds appeared in fall. Then two adults and four grown young appeared in the backyard of the Batts home at Twenty-fourth Street and Speedway in late summer and stayed into winter (I). Then fall and winter records became more frequent, and finally spring and summer records.

Courtship.—Birds are said to mate for life.

Breeding.—Probably. Late March and April, and possibly later from May to early October; birds in the Southeast nest in early spring, those in the Southwest in late spring and summer. Two, possibly three or even four, broods.

Nest Location.—2 to 6, rarely more to 20, feet from ground on horizontal limb of low tree or stout bush, particularly in cottonwood, pear, mesquite, and willow; occasionally merely a surface depression in the ground.

Nest Construction.—Small, frail, flat, but compact and, for a dove, fairly well-constructed platform of twigs, plant stalks, weeds, and rootlets; sometimes lined with a few straws or horsehairs. If on ground, the slight depression in the center is sparingly lined with grasses and hairs—and rarely a few feathers.

Nest Measurements.—Outside, diameter up to 4.5. Inside, rim to rim 2, depth 1.

Eggs.—2. elliptical-oval to ovate, pure white. .86×.65.

Voice.—Not often heard; bird usually quiet. Intense cooing; mellow, soft, crooning, floating *coos;* a single, long-drawn-out, ventriloquistic, misleading *woo,* uttered at short intervals. Begins its moaning about mid-afternoon.

Description.—Upper-parts, brownish-gray, pale cinnamon, or grayish-brown, with top and back of head bluish-slaty-gray; shading to vinaceous or pale pinkish-brown on under-parts and forehead. Only back of head and whole of throat and neck suggesting scales, but breast-feathers with blackish centers. Pale but distinct cinnamon-brown, bright reddish-brown, or brick red on inner webs of wing feathers and under surface of short, broad wings. Blackish tail, short and nearly even at end, with 12 broad feathers wide at end; considerable white, principally on corners or outer feathers. Female, duller, more grayish-brown; more brownish-gray on top of head and neck; breast more drab. Immature, paler; more mottled whitish above. Coral-red or yellow bill tipped with brownish-black. Tarsus as long as middle toe without claw, hence very short legs. L. 6.75. W. 3.45. T. 2.65. Tar. .63. B. .50; Exp. C. .46.

Field Marks.—Very small; the tiniest of pigeons in the world, scarcely associated with them because of its small size. *Sparrow-like* (and but a trifle larger than the English Sparrow). Wings distinctly pinkish, brick red, or rich, vivid, rusty brown in flight, the edges of the wing-lining frequently showing when bird is sitting. *Very short, practically square tail,* wide at end, much shorter than wing. Scaly only on head and neck. Ground-haunting. General pale brownness, with *no contrasting white areas* (only tiny bit of white at ends of outer pair of tail-feathers); colors frequently as pale as weathered limestone.

Popular Names.—Mexican Dove; Ground Dove; Little Dove; Short-tailed Little Dove; Square-tailed Little Dove.

INCA DOVE

Scardafella inca (Lesson)

Common regular permanent resident; a few birds move southward in colder winter weather. *Recorded:* ABCDEFGH[85]IJKLMNOPQY.

Geographical Distribution.—From Lower California, southern Arizona, and central Texas southward into Central America. Formerly unknown in southern Texas, but has gradually extended its range northward over arid and semi-arid portions of south and southwest Texas.

Habitat.—Quieter streets, walks, and dooryards of cities and towns, nesting in vacant lots and on the outskirts of villages and camps; corrals, barnyards, vacant lots, lawns, and shade-trees; a bird of the town, rarely met with in thinly-settled country.

Local Haunts.—University campus; lines of hackberry shade-trees along quieter streets of the residential sections of Austin; edges of town.

General Habits.—Usually observed singly or in pairs, rarely in family groups in summer; occasionally in small flocks, numbering sometimes as many as 30 or 40 birds, in fall and winter. A familiar, dainty little bird, rarely, if ever, found very far away from civilization. Perches on telegraph, telephone, and fence wires and on clothes-lines, its long tail hanging perfectly straight down. Arboreal and semi-terrestrial; trusting and gentle, walking gracefully about among the barnyard fowl or pattering swiftly along with bobbing head. Rather unusual, a small flock of seven birds seen together as early as June 28 in 1915 (A).

Feeding Habits.—Familiar on lawns and in backyards where it rushes about, feeding greedily among the pigeons and chickens on chicken-feed, corn chops, wheat, oats, sugar-cane seed, and kaffir corn. Gathers weed seeds along roadsides. Feeds with quick motions of head and neck as it rushes about. Perches on hydrants to catch water, or drinks from the drinking-pan put out for the chickens.

Flight.—Usually noiseless, straight away, though quick, lively, and rather jerky.

History.—The bird is said by Ridgway to range into "Southern Texas, casual or occasionally at . . . Austin."[86] Formerly it was little known in southern Texas, but it has gradually moved northward until it is rather common over the southern and central parts of the State. On October 23, 1889, one was shot from a flock of thre at Austin (D);[87] this was the first record for the Region. Then in the winter of 1891-1892 it was seen by other observers, who thought it the young of the Western Mourning Dove. In 1894 another was shot (O); and in the winter of 1896 a flock of 30 was noted on top of a low shed in town, protected from the cold by a wall on one side and a hackberry tree on another (O). Year after year they kept appearing in late fall and winter, but none were seen in summer until 1900 (O). The first nests were found in 1905 (B) in the southwestern and southern parts of the city, where the first birds had appeared. In 1909 they became common and were found nesting in numbers; but, as before, they were restricted to the semi-arid, southwestern parts of the city. In 1910 they began spreading over the entire city, and since that time have become rather evenly distributed; the equal spreading resulted in the bird's appearing to be less common for a number of years, but at the present time it is common everywhere in the city.

Courtship.—Male marches about in combative manner, tail at angle to body, even more dignified than its usual erect marching attitude. Two males will fight each other like tiny game-cocks, pecking with bills and buffeting with partly-spread wings.

Breeding.—Earliest: March 12, 1909, 2 eggs, incubated 3 days (B). Latest: July 21, 1909, 2 fresh eggs (B). Two, rarely three, broods. *Breeding recorded:* ABCEGHIKOQY.

Nest Location.—6 to 20, average 10, feet from ground, saddled on horizontal fork or flattened limb of low shade tree or large bush, usually in cedar elm, occasionally in winged elm, eastern live oak, Mississippi and rough-leaved hackberries, sycamore, or prickly ash. One nest was on a trolley wire (June 22, 1915, 1 egg, AB) at a switch in eastern part of Austin, where about every seven minutes street-cars raised it from 6 to 12 inches above its normal position.

Nest Construction.—Small, rather compact, firmly matted, almost flat platform or shallow saucer of weed stems, tiny twigs, dried grasses, rootlets, a few straws, grass seed stems, bits of Indian tobacco weed, and sometimes bits of Bermuda grass, Spanish and ball moss, mesquite leaves, and a few feathers from the birds; occasionally nests contain string, horse-hair, or strips of cedar bark. Commonly unlined; rarely lined with fine grass stems, Spanish moss, or a few small Inca Dove feathers.

Nest Building.—Frequently old nests of the Inca and Western Mourning Doves and the Western Mockingbird are used after being only slightly repaired or relined.

Nest Measurements.—Outside, diameter 1.80 to 3.40 by 3.60, average 2; height 1.15. Inside depth .50. One nest was about the size of a silver dollar (A); unfortunately, measurements were not made.

Eggs.—2, oval or elliptical-oval, nearly equal-ended, pure white, .83 ×.65.

Voice.—Monotonous, tiresome, extremely mournful, rather short two-syllabled, hard little *coo*, quite different from the soft, soothing murmur of the Western Mourning Dove: a slowly uttered *cōe-coo* or *co-o-o-h coo-o-o*, the first slightly shorter, higher-pitched, coarser, and with the *o* as in *go;* the second lower, with a typical *oo* sound, as in *moon.* Uttered from perch in tree or on telephone wire. Heard calling as early as February 15, 1915 (A); heard constantly during the breeding season, from earliest daylight into the hottest part of midday; fearfully monotonous on hot July and August days, when nervous people complain of their calling. An animated, gutteral *cut-cut-ca-doo-ca-doo* of anger, one male to another.

Description.—Brownish above; under-parts pale grayish-pink, shading to buff on belly; inner webs of flight feathers mainly reddish-brown, with under-coverts partly black; tail brown and black, with two outer feathers largely white, composed of 12 narrow tapering feathers, double-rounded, shorter in middle and on sides. Whole body appears scaled. Young duller, more mottled with white above. Bill black. Feet flesh-color or pink, the very short tarsus slightly feathered above. L. 8. W. 3.75. T. 4.20.

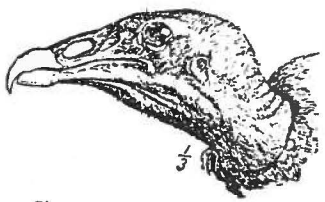
Field Marks.—Very small, about half of its length being tail. General appearance cinnamon or rich light brown, *scaly all over*, with conspicuous fine crescent bars of black. Dainty, diminutive, neat, trim dove. *Tail long, slender*, graduated or slightly rounded, *with conspicuous white margins* or edges, the outer feathers being largely white; longer than wing. Monotonous, two-syllabled call.

Popular Names.—Mexican Dove; Little Dove; Ground Dove; Long-tailed Little Dove; Long-tailed Ground Dove; Scaled Dove; Mexican Flicker.

TURKEY VULTURE

Cathartes aura septentrionalis[84] Wied

Common and regular permanent resident, about one-fourth as common as the Black Vulture. Some are said to move southward in winter, departing in early October, returning in early March, but their absence is not noticeable. *Recorded:* ABCDEFGHIJKLMNOPQRSTWY.



Chapman
TURKEY VULTURE

Geographical Distribution.—North America, from southern Canada and northern United States south to the Gulf of Mexico, wintering from middle United States southward.

Habitat.—Sails the sky across the whole of the Region. Feeds on carrion in pasturelands, and on refuse meat and viscera about stockyards of the city. Nests generally in thickets in pasturelands, Blackland Prairie Area, and in underbrush of the gravelly terrace upland oak woods; in the Limestone Hill Area, in caves in the limestone cliffs or under slanting boulders on the canyon slopes.

General Habits.—Beats over the open country and pasturelands searching for animal carcasses. After locating a body, it stands near by waiting for it to ripen; then it carefully and systematically picks the bones, ridding the earth of much putrid flesh. Feeds on refuse viscera about the city slaughter pens, in company with Black Vultures.

Flight.—Circles, soars, and sails majestically, often for hours without flapping, high over the country.

Breeding.—Earliest: April 22, 1890, 2 eggs (O); May 3, 1908, 2 fresh eggs (E). Latest: May 14, 1892, 2 fresh eggs (L); May 20, 1901, 1 slightly incubated egg (B) May 25, 1902, 2 fresh eggs (H). Much later in season than Black Vulture. Probably only one brood. *Breeding recorded:* BEHIJL.

Nest Location.—In dense underbrush and bushes of thickets, under fallen dead trees covered with tangles of vines, and in dense patches of prickly pear cactus, generally on black-jack and live oak slopes, ridges, and terraces of the Blackland Prairie Area, particularly the wooded pastures along the eastern edge of Austin. In caves and beneath overturned boulders on slopes along Barton Creek and the Colorado River, in the Limestone Hill Area, from Deep Eddy cliffs westward.

Nest Construction.—None. Eggs laid on a few sticks and leaves lying at random in slight hollow in ground, well concealed and shadowed by bushes or vines, often alongside a fallen log in woodland.

Eggs.—2, rarely only 1, light creamy, marked rather regularly over entire surface with small blotches and spots of reddish-brown and burnt-brown, with none of the large, strikingly handsome, bold egg markings of the Black Vulture. Elongate ovate, not so pointed as Black Vulture eggs, 2.81×1.96, generally slightly smaller.

Voice.—Quiet, except for a low, hissing grunt, made by blowing through nostrils, uttered in displeasure as another of its kind comes too close. A somewhat similar asthmatic wheeze or hiss is uttered by the suspicious watching male to warn female of too close approach of an observer, following which alarm she slips off her eggs and away.

Description.—Glossy brownish-black body, with bright red skin on naked head and neck. L. 30. W. 22. T. 12. B. 2.30. Downy young, snowy white for several weeks, with black bill and iris.

Field Marks.—At rest, the naked bright red head. In flight, long tail and wings, the latter with longer, up-curving primaries, distinctly spread at the tips like the fingers of a hand; even, soaring, sailing flight.

Popular Names.—Turkey Buzzard; Red-headed Buzzard.

BLACK VULTURE

Coragyps[89] *urubu urubu*[90] (Vieillot)

Very common, permanent resident, less common in winter, December to February, when numbers move further south to milder climate. *Recorded:* ABCDEFGH[91]IJKLMNOPQRSTWXY.

Geographical Distribution.—Southeastern United States, from Virginia and Kansas southward and westward through Texas to Mexico, etc. More southern in range than the Turkey Vulture. Very common in eastern and central Texas; rare in western Texas.

Habitat.—The sky across the whole of the Region. Slaughter pens on the southeastern edge of Austin. Breeding, in cave-riddled cliffs and boulder-strewn slopes along canyons of the Limestone Hill Area; and in thick, brush bottom woods and along rocky bluffs of streams in the Blackland Prairie Area.

Roosts.—Large numbers roost together at night in a favorite small clump of tall, dead trees, generally in some valley in the hills; roosts have fearful stench, and limbs of dead trees and ground underneath generally almost whitewashed with excreta. One roost on east bank of Lake Austin, just below mouth of Bull Creek. Another roost in Devil's Gorge.

General Habits.—Just before daybreak, when a reddish glow begins to show in the eastern sky, Black Vultures begin to leave their roosts in the mountainous country, passing over in a continuous long string

by ones and twos, or as many as half a dozen at a time, moving eastward toward the slaughter pens or to spread out over the open country and begin their tireless vigil for carcasses. A roost of about 200 birds will form a procession almost ten miles long, each bird or group of birds following the same air line set by the leader. All day long they wheel and sail in broad circles over the farming country, the pastures, the hills, and the city, or sit in companies atop posts or walk on ground near putrid carcasses, on which they feed. Just after sundown, as dusk foretells night, they strike westward for the roost in the hills, often trailing out in single file, one behind another. More gregarious than the Turkey Vulture, with which it is found feeding on carrion and discarded slaughter-house viscera. Disgorges when frightened. Feeds its young on disgorged carrion.

Flight.—Alternates five or six quick, strong flaps with short stretches of sailing. In flight, it seems smaller than the Turkey Vulture, with abbreviated tail as short as or shorter than the head, and with wings shorter and broader and more abruptly slender at tip, seeming to curve forward; a light colored grayish patch at extremity of wings shows in flight either from above or below. The flying contour of the Turkey Vulture presents a decided contrast to that of the Black Vulture. The Turkey Vulture appears larger, with longer tail, longer wings seeming to curve upward and backward at tip, longer primaries wide-spread like fingers, and light colored patch on outer, under side of secondaries and not near wing tips.

Courtship.—Birds are usually paired by February 1, and throughout the day hunt together. During February and to the middle of March, the love-flight or courtship flight of the two birds may often be seen at the breeding grounds, lasting from two to ten minutes, in rapid, prolonged, wide-spreading circles. In the air over a thickly-populated nesting area, such as a honey-combed cliff or canyon wall in the hills, as many as 25 or 50 pairs may be seen going through these nuptial ceremonies during early March, presenting a slowly-moving, gyrating maelstrom, circling and sailing in close spirals, one of a pair continually following the other; out of this maelstrom a female occasionally drops, the male a few feet behind, and then a chase ensues, dropping, darting, wheeling with incredible speed, wing tips of one touching the wing tips of the other in the twists and turns of the play. A male performing before a female perched high on a dead tree overlooking the chasm often circles high in front of her, half folds his wings and dives straight for the earth, his wings shrilling and whistling until he zooms upward again to resume his circling.

Breeding.—Earliest: January 28, 1889, 2 fresh eggs (O); February 22, 1906, 2 nestlings fully 15 days old, eggs probably laid first week in January (E). Latest: June 4, 1915, 2 fresh eggs (B); May 20, 1901, 1 incubated egg (B). One brood (E), or possibly two, a season, unless eggs are destroyed or collected each time, and then three or four sets laid. Incubation period about 30 days (E), and young remain at nesting site for about 60 days more (E). Nest commonly, last week in February to first week in April, fresh eggs. *Breeding recorded:* ABCEHIJLMNOW.

Nest Location.—Commonly in cliffs and along boulder-strewn slopes of canyons and stream valleys: Colorado River (Deep Eddy cliffs and Lake Austin), Barton Creek above Campbell Hole, Dry Creek, Devil's Gorge (Burnt Hollow Box Canyon), Williamson Creek just below San Antonio road crossing, Onion Creek just below McKinney Falls, usually at a bend in the stream, where the cliffs are high and honey-combed with caves, and where there are sufficient trees for roosting places. Return year after year to same site.

Nest Construction.—None. Eggs usually deposited on soft bare earth, rarely on dead leaves, in slight hollow worn by parent among

scattered rubbish, in dark places in caves in cliffs, under huge boulders, under over-hanging ledges, under great heaps of boulders in dry gorge bottoms, and rarely in hollow logs, beside decayed logs in bottomland thickets, or among dense bushes on sloping, mountain-side pastures.

Eggs.—2, rarely 1 or 3, elongate ovate to ovate pyriform, pale bluish-white, handsomely but irregularly spotted, blotched, and specked with rich chocolate, reddish-brown, lilac, and lavender. One egg usually boldly, heavily marked, blotches often half an inch or more across, the other and second egg much plainer and usually decidedly smaller. Eggs much more pointed than those of the Turkey Vulture, and never with their creamy tint. 2.61 to 3.12 long, and 1.87 to 2.04 wide, averaging 3.00×1.96.

Voice.—A hiss. When disturbed and frightened, a squeal like that of a stuck pig. When flushed from nest into sudden flight, female hisses and squawks, her wings beating a loud, booming, whistling *ker-WOP-WOP-Wop-wop-wop.*

Description.—Uniform dull glossy black. Bare skin of naked head and neck, black. Under wing surface silvery-white. L. 24. W. 17. T. 8. B. 2.20.

Field Marks.—At rest, the naked black head. In flight, climbing, bat-like appearance; short, square-cut bob-tail; quicker flap of wing; and different tone of black to plumage.

Popular Names.—Buzzard; Black Buzzard; Carrion Crow; Black-headed Buzzard.

Remarks.—Nesting caves can easiest be located by firing shotgun in front of secluded, cave-riddled cliffs in Limestone Hill Area during the nesting season, and marking the spots from which the sitting females dart forth.

SWALLOW-TAILED KITE

Elanoides forficatus forficatus[92] (Linnæus)

Irregular and very scarce migrant and summer resident, now of only occasional occurrence. Moves northward late March to early May; earliest March 22, 1919 (A). Moves southward in August and September; latest, November 14, 1915, pair flying southward in teeth of norther (G). *Recorded:* ADGH[92]LW.

Geographical Distribution.—Very local distribution in North and South America, breeding from southern Canada south through central and southern United States, through Mexico to South America; accidental in western United States. Winters wholly south of United States. Formerly abundant, now rare, summer resident across eastern half of Texas, west to Limestone Hill Area.

Habitat.—Creek and river bottom woodlands near prairies, fields, and meadows, in more uninhabited portions of the Blackland Prairie Area.

General Habits.—Skims the prairies and cotton fields which its lofty nest overlooks, searching carefully for and swooping down to catch small snakes, lizards, chameleons, field mice, young Western Mockingbirds and Texas Painted Buntings which it takes on the wing from nests in mesquite growth, bugs, flies, and young wasps which it secures from wasp nests plucked and broken on the wing. In late summer and early fall it spends most of its time about the cotton fields. Generally seen singly, rarely in pairs, and in eastern Texas sometimes in huge flocks in migrations, sailing rapidly high overhead on motionless wings. Rarely alights. Very pugnacious and vicious in defense of its nest.

Flight.—This beautiful bird floats lazily along, tail generally widely spread, wings almost closed when sailing in circles, sailing and sweeping the tops of the towering bottomland trees in matchless graceful,

smooth, rapid, gliding curves, seemingly without the least effort whatever. Often makes swift dives at observer climbing to nest, sometimes plunging down a thousand feet, sweeping the back of his head with its wings.

Breeding.—Probably, though no nest found in Austin Region; it has been found breeding in counties immediately to the north, east, and southeast, and years ago doubtless nested along wilder water-ways in the Blackland Prairie Area of the Region, in localities similar to those where it nested in Williamson, Lee, and Bastrop counties. Eggs laid last of April to second week in May.

Nest Location.—Usually 100 to 155, rarely as low as 60, feet from ground in tops of tallest giant trees (sycamore, cottonwood, cypress, pecan, or elm) in marginal timber or groves along stream-ways, in crotch among smaller branches and twigs, at top extremity of nearly vertical limb, well hidden by thick foliage.

Nest Construction.—Very beautiful, symmetrical, compact yet bulky affair of small sticks and Spanish moss, lined and festooned with streamers of the moss.

Nest Measurements.—Outside, diameter 18 to 24, height 12. Inside, depth 3.

Eggs.—2, rarely 3, pale bluish-white, one usually boldly, handsomely splashed about the larger end with rich brown, from chestnut and vandyke to almost black, the other more sparingly specked, blotched, and marked over entire surface with lighter shades of brown, 1.82× 1.47.

Voice.—A few faint whistles, rather shrill and penetrating, uttered several times, *wee-wee-wee*.

Description.—Pure white head, neck, under-parts, under-wing feathers, and band across rump. Glossy black back, wings, and tail. Wings very long, narrow, and acute. Tail long, very deeply forked for half its length. L. 24. W. 18. T. 14.5 (forked 8 or 9). B. .80.

Field Marks.—Long, deeply-forked tail; white under-parts, head, and neck; glossy black back, wings, and tail. Large size. Flight.

Popular Names.—Grasshopper Hawk; Snake Hawk; Fish-tailed Hawk; Swallow-tailed Hawk; Fork-tailed Hawk; Scissor-tailed Hawk; Snake-bird; Fish Hawk.

Remarks.—Thirty years ago rather common, but scarce for past twenty-five years, and now extremely rare. Killed by hunters to show their fine marksmanship and to secure beautiful plumage. The late Henry Eeles Dresser, famous European ornithologist, passing by wagon from San Antonio through Austin to Houston in 1864, observed as many as 40 or 50 of these beautiful birds at one time on the Colorado River at Bastrop.

MISSISSIPPI KITE

Ictinia misisippiensis[94] (Wilson)

Very rare migrant and summer resident, moving northward in March and April, earliest March 15, 1915 (A), and southward in August. *Recorded:* AC[95]DH[96]KW.

Geographical Distribution.—Southeastern United States, from Kansas and Illinois southward to Florida and Texas, wintering from the southern border of the United States south to Central America. Across Texas, west to Tom Green County and the Panhandle; rather local distribution.

Habitat.—Monotonous post oak woodlands, fairly open, generally scrubby timber, averaging about 20 feet tall, with here and there a small patch of larger post oaks, 30 to 35 feet tall, in which the kite places its nest; this timber, typical of the East Texas Timber Belt on the eastern edge of the Austin Region, and further east toward Giddings and Elgin, was its favorite haunt.

Local Haunts.—Oak woodlands along Onion and Shoal creeks, and north of Austin.

General Habits.—Perches on dead trees in half-cleared ground on borders of woods in vicinity of water, sailing slowly away when approached. Generally observed only when sailing steadily and swiftly overhead. Usually one at a time, rarely a pair, or, during migrations, flocks of from three to fifty individuals. Feeds on small reptiles, and on grasshoppers and other insects, which it catches on the wing. Rarely seen to flap its wings.

Breeding.—Probably, though no record for the Austin Region; nested not uncommonly in Lee County years ago. Eggs should be looked for in May to middle of June.

Nest Location.—21 to 30 feet up in slender fork of small live oak, post oak, or soapberry, rarely in young blackjack, elm, cypress, cottonwood, or sycamore.

Nest Construction.—Usually remodels its old nest, or nest of some other bird, rarely building a new nest of its own. Composed of small twigs, leaves, and Spanish moss, with thick, bulky walls, lined with oak, pecan, willow, mesquite, and soapberry twigs bearing green leaves.

Nest Measurements.—Outside, diameter 13 to 17, height 7. Inside, diameter 5, depth 1.50.

Eggs.—2, rarely 3, dull bluish-white, unmarked, sometimes with a few faint brownish stains, size varying considerably, 1.64×1.34.

Description.—Chiefly lead blue, lighter on head, darker on wings and tail, the latter almost black; chestnut streaks and spots in primaries. L. 14. W. 11. T. 6.50. B. .60.

Field Marks.—Bluish-gray. Blackish tail without bars.

Popular Names.—Blue Darter.

MARSH HAWK

Circus cyaneus[97] *hudsonius* (Linnæus)

Uncommon, formerly common, winter resident, last of September or early October to first week in April; most common, November to February. Earliest: September 15, 1906 (B); September 15, 1916 (G). Latest: April 18, 1915 (A). *Recorded:* ABCDFGHIJKNOPW.

Geographical Distribution.—North America, breeding from Alaska and Canada south to southern border of United States, breeding locally in Texas (northern parts and at Mitchell's Lake, near San Antonio); winters from Canada and northern United States south to South America, across whole of Texas at that season.

Habitat.—Flat wet prairies, broad open fields, open flat grassland meadows, lowland prairie marshes, and weedy pastures of the Blackland Prairie Area, west to the hills. Rather common in fields and open country near Austin.

General Habits.—Beats slowly back and forth, sweeping and skimming close to the grass tops, on the open bottomlands and wide grassy meadows and fields, with slow, easy, regular flight, occasionally hovering to watch for pray. Slow and deliberate. Captures small rodents and snakes, and occasionally may capture poultry; has been known to eat carrion; generally flies off with its prey, but alights and stands on ground to eat it.

Description.—Male, uniform light bluish-gray, streaked with white, tips of wings blackish, tail barred with six to eight bands, the one nearest the end being darker and broader. Female and immature, streaked dusky or rusty brown, more frequently observed than the blue male plumage. Conspicuous large white patch on rump at base of its very long tail. L. 19. W. 14. T. 9. B. 60.

Field Marks.—In any plumage, easily recognized by low, sailing flight and conspicuous large white rump patch. Male, light bluish-gray above, whitish below. Female and immature, reddish-brown above, brown-streaked buff below.

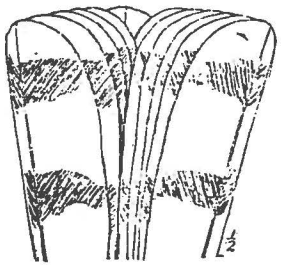
Popular Names.—Prairie Hawk, White-rumped Hawk, Lowland Hawk, Blue Hawk, Marsh Harrier.

Remarks.—A few stragglers have been found to breed in the immense marshy stretches of Mitchell's Lake near San Antonio, during March and April, by Mr. Roy Quillin, a field naturalist of decided ability who has done much in recent years to work out the breeding ranges of birds in Texas. Nests of this species are placed on ground in marshes, and the 4 to 6 pale bluish-white eggs measure 1.75×1.40.

SHARP-SHINNED HAWK

Accipiter velox (Wilson)

Irregular migrant and winter resident, generally rather uncommon, but sometimes common all winter. More common during migrations, October and November, March and April. Earliest: October 10, 1915 (F), and October 13, 1916 (F). Latest: April 18, 1915 (F). *Recorded:* ACDEFGISW.



Chapman
SHARP-SHINNED HAWK
Tip of tail is square.

Geographical Distribution.—Breeds throughout Canada and United States to Oklahoma, wintering from southern Canada and northern United States southward, across Texas, to Panama.

Habitat.—Narrow marginal timber and groves along streams, wooded draws, and elm woods, particularly second growth timber and semi-wooded country.

Local Haunts.—University campus and the city of Austin, and patches of woodlands about the edges of town.

General Habits.—Flight marvelously swift and noisless as it dashes across clearings and into thickets and brush piles in search of birds and small mammals on which to feed. Bold chicken thief, visiting poultry yards in town, frequently dragging away a pullet as large as itself.

Voice.—Quiet until about the time of its departure in spring, when it is rarely heard to utter a *cha, cha, cha, cha,* or *cac, cac, cac.*

Description.—Generally uniform bluish-gray, darker on head; whitish below, in adults barred with reddish-brown on breast and sides, streaked below with reddish-brown in immatures. Tail very long, more than two-thirds as long as its short rounded wings, crossed by several blackish bands, and square at tip instead of being rounded like the tail of the somewhat similar but larger Cooper Hawk. L. 12. W. 7. T. 6. B. .40.

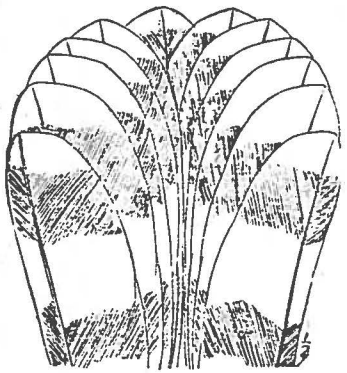
Field Marks.—A small, slender, swift-flying hawk, larger than Sparrow Hawk or Pigeon Hawk, and longer and slimmer, with short, rounded wings, which, when flying low, gives a good view of its very long, rather heavily barred, decidedly square-ended tail. See Field Marks of Cooper Hawk.

Popular Names.—Little Chicken Hawk; Pigeon Hawk.

COOPER'S HAWK

Accipiter cooperii[93] (Bonaparte)

Scarce and irregular resident, more common in winter, late September to early April, when their numbers are increased by the arrival of more northern breeding individuals. *Recorded:* ABCDFGHIRW.



Chapman
COOPER HAWK
Tip of tail is rounded.

Geographical Distribution.—North America, breeding from Canada south to the southern United States, wintering commonly from middle northern United States south to Ceneral America. Breeds in northern and northeastern Texas, southwestward through the Limestone Hill Area.

Habitat.—Resident in the Limestone Hill Area, east to the edge of the hills. In winter, semi-open woodlands of the Blackland Prarie Area, about the city of Austin, and even observed flying over the University campus. Marginal timber along the river and creeks east of hills.

General Habits.—Very harmful, and with the Sharp-shinned Hawk, forms the real "Association of Chicken-house Thieves," for it is one of the few hawks which eat poultry, pigeons, and birds. Usual flight is slow and easy, but is bold and as swift as an arrow when pursuing its prey, diving into timber in pursuit of a bird, or darting out from forest patches. As mountain streams dry up and leave broken pools, the hawk is found feeding on minnows.

Breeding.—One new nest, and one nest which 3 young were leaving (B). Eggs should be looked for in March, April, and early May. *Breeding recorded:* B.

Nest Location.—20 to 50 feet up in medium-sized cedar elm or cottonwood trees in brushy marginal bottom woods standing on bank of a stream in the canyons of the hills. Generally placed in crotch near top of tree.

Nest Construction.—Quite bulky, composed of large sticks, twigs, and sometimes weeds, often lined with bark and leaves. Sometimes remodels the old nest of another hawk, the Southern Crow, or a squirrel.

Eggs.—3 or 4, bluish-white, unmarked or faintly spotted with pale brown, 1.90×1.50.

Description.—Similar to Sharp-shinned Hawk, larger, more bluish, with darker crown, and tail, bluish-gray crossed by about three bands of blackish, more plainly tipped with white. L. 17. W. 10. T. 8. B. .55. Female slightly larger.

Field Marks.—Medium-sized hawk, with short wings and long tail, bluish above with sharply contrasting black crown, which may be distinguished from the Sharp-shinned Hawk by its decidedly rounded tail and black cap, and from the Marsh Hawk by its lack of white rump patch.

Popular Names.—Chicken Hawk; Blue Darter; Pullet Hawk; Small Chicken Hawk; Cooper's Sparrow Hawk.

Remarks.—Named in 1828 in honor of William Cooper, a New York scientist.

HARRIS' HAWK

Parabuteo unicinctus harrisi (Audubon)

Extremely scarce permanent resident in the southern portion of the region, where it reaches its northern limit in Texas. Formerly very common, but disappeared rapidly as country was settled up, and is now seen only at rare intervals as far north as Austin, more frequently in spring and fall. *Recorded:* ACH[99]W.

Geographical Distribution.—Mexico-United States borderland, from southeastern California, south-central Texas, and Mississippi, south to Central America, rarely straggling northward into north-central United States.

Habitat.—Prairies, mesquite lands, and oak-dotted pastures of the southern part of the Blackland Prairie Area, west to the edge of the hills, where the northwestward tip of the Rio Grande Coastal Plains extended into the Austin Region. Generally in rather open country intersected by small, tree-margined streams. Breeding resident in Comal, Caldwell, and Hays counties, and the southern tip of Travis County.

General Habits.—Sluggish, heavy, slow-flying bird, seldom on the wing, associating with the Black and Turkey Vultures and the Audubon Caracara. At times, however, its flight is swift and clear-cut. Feeds on lizards, small snakes, cottontail rabbits, cotton rats, and field mice, which it catches on the wing, generally in mesquite thickets and chaparral, which form its favorite hunting ground. Rather tame except during nesting season, when it becomes shy and is easily alarmed, leaving the nest at even a distant approach, circling overhead and screaming.

Breeding.—April 18, 1902, 4 incubated eggs (H). Begins nesting in February, with eggs from March to early May, and occasionally with a second brood up into July (H). *Breeding recorded:* H.

Nest Location.—15 to 30, generally 22, feet up, in top limbs of chaparral bush or low tree (mesquite, elm, hackberry, or blackjack) on prairie.

Nest Construction.—Compactly constructed platform of sticks, twigs, weeds, and roots, and lined with green mesquite and elm shoots and leaves, small twigs, small bird nests, grass, and other rubbish.

Eggs.—2 to 4, commonly 2, dull white, generally unmarked, or faintly marked with traces of pale light brown spots, with considerable variation in size, 2.05×1.65.

Voice.—A long, harsh scream, like many other hawks.

Description.—Blackish, with white rump and tail base, and broad white band at tip of tail; rich reddish-brown or chestnut shoulders and thighs; space between eyes and base of upper mandible nearly naked. L. 21. W. 14. T. 10.50. B. 1. Male smaller, female larger.

Field Marks.—Large, handsome, dark chocolate or blackish hawk, with distinct white rump and rich rufous shoulder patches.

Popular Names.—Buzzard Hawk; White-rumped Buzzard; White-tailed Hawk.

Remarks.—Named by Audubon in 1837 in honor of his friend, Edward Harris.

RED-TAILED HAWK

Buteo borealis borealis (Gmelin)

Rather rare resident, comparatively common years ago. *Recorded:* ABCDEFGHIJKLMOPQRW.

Geographical Distribution.—Eastern North America, from Newfoundland and Saskatchewan, Canada, south to the Gulf Coast, eastern and central Texas, and northeastern Mexico.

Habitat.—Blackland Prairie Area, in post oak woodlands on gravel uplands along the Colorado River and Onion Creek, well back from the stream valleys, generally in large timber tracts, particularly south of the Colorado River, southeast of Austin and southwest of Hornsby's Bend, toward Pilot Knob. Limestone Hill Area, in hilly, mountainous country along Lake Austin, Barton Creek canyon, and Bull Creek, east to the Deep Eddy and Mt. Barker cliffs and Campbell Hole. Generally distributed over the whole Region, but more common in the wild hill country. In winter, sparsely wooded country and tall timber along water courses.

General Habits.—Sits motionless on top of some prominent limb in the open, on the tallest dead trees in woodlands and along stream-ways. Circles in slow flight over the hills and among the clouds, sailing smoothly on its four-foot spread of wings; though a larger bird, it generally sails lower in hunting than does the Red-shouldered Hawk.

Feeding Habits.—Feeds on cottontails and jack rabbits, gophers, prairie dogs, lizards, snakes, frogs, grasshoppers, crickets, and large beetles; occasionally carrion; and rarely poultry, game birds, and smaller birds. Because of its comparatively sluggish flight it cannot capture active prey except in the brushy shin-oak country; generally frequents open ground when hunting.

Breeding.—Earliest: March 19, 1896, 2 sets of 2 heavily incubated eggs each (J). Latest: March 20, 1896, 3 heavily incubated eggs. Breeds through March and first half of April, perhaps into early May. One brood, incubation period about 28 days, young remaining in nest about 40 days more. Small set: Spring, 1890, female laid 1 egg, which she incubated (B). *Breeding recorded:* BCHJL.

Nest Location.—In Limestone Hill Area, 55 to 150 feet up on shelves of rock in canyon cliffs, rarely in tallest cottonwood and sycamore trees growing on stream banks in canyons. In upland post oak woods of Blackland Prairie Area, 40 to 80, generally 45, feet from ground in large triple fork or crotch of post oak trees standing in small clearing in the timberland, and well concealed among smaller branches, usually against main trunk. In mesquite and prairie country of the southern part of the Blackland Prairie Area, 10 to 30 feet up in old mesquite of mesquite forest growth or in oak or hackberry in small motte or along edge of arroyo.

Nest Construction.—Sometimes a great, loose structure, with but a shallow cavity loosely lined; sometimes well made and compactly lined. Composed externally of large oak sticks and twigs and mesquite sticks, rarely with some weeds, leaves, Spanish moss, grass, feathers, and trash. Lined with green oak twigs, fibrous cedar bark, green oak buds, and rarely with feathers, Spanish moss, green leaves, and hay; nests sometimes contain corn cobs. An old nest is sometimes relined and used again.

Nest Measurements.—Outside, diameter 20 to 33, height 12 to 18. Inside, diameter 9 to 12, depth 3 to 5. Generally considerably larger than nests of the Southern Red-shouldered Hawk.

Eggs.—2 or 3, usually 2, white, generally scantily marked with small blotches and spots of brown, 2.35×1.90.

Voice.—A shrill, long-drawn, squealing whistle or whistling, cat-like scream, *kee-aah* or *pee-yare*, like a pig squealing or the sound of escaping steam.

Description.—Large, dark brown hawk, sooty or buffy-white below, heavily and darkly streaked with brown on breast, sides, and belly. Tail above, deep rusty rufous with thin black band near tip, which is narrowly white. L. 21. W. 16. T. 9.50. B. .95. Male smaller, female larger.

Field Marks.—Large size, general dark reddish-brown coloration, bright brick-red tail without white bars. Call.

Popular Names.—Chicken Hawk; Hen Hawk; Big Hen Hawk; Red-tailed Buzzard.

WESTERN RED-TAILED HAWK

Buteo borealis calurus Cassin

Rare winter visitor. Male shot February 1, 1902 (B). *Recorded:* B.

Geographical Distribution.—Western North America, from northwestern Canada south to Guatemala, resident east to the Great Plains and across the western half of Texas.

Habitat.—Tall timber bordering banks of streams. Limestone Hill Area, east to the eastern shore of Lake Austin, midway between Austin Dam and Mt. Bonnell.

General Habits.—Similar to those of the Eastern Red-tail.

Description.—Similar to Eastern Red-tailed Hawk in size, but plumage often chiefly blackish, sometimes entirely sooty, except tail and upper tail-coverts, which are bright pale rufous or rich red instead of dark rufous as in the eastern race, always with black subterminal bar near end of tail, and frequently with several more or less complete additional bars.

Remarks.—Specimen No. 15666, Ornithological Collections of Dr. Jonathan Dwight, Jr., forms the basis for this record.

FLORIDA RED-SHOULDERED HAWK

Buteo lineatus alleni Ridgway[100]

Moderately uncommon resident, but the commonest of the larger breeding hawks. *Recorded:* ABCDEFGH[101]JKLMNOPQWY.

Geographical Distribution.—Southern United States and eastern Texas west as far as the Austin Region.

Chapman
RED-SHOULDERED HAWK

Habitat.—In Blackland Prairie Area, thick and heavily-wooded bottom lands near water, strips of tall timber which fringe the larger water courses, and blackjack and post oak woodlands on upland gravel terraces. In Limestone Hill Area, tall timber along the river, and larger streamways.

Local Haunts.—Especially partial to bottom woods in the broad valley of Onion, Shoal, Williamson, Walnut, Barton, Waller and Bouldin Creeks, rarely wandering from such localities.

Habits.—Soars, sweeps, and sails in wide circles over the woods, in which it hunts for frogs, snakes, and small mammals, not once in a hundred times visiting a poultry yard, the habit of near relatives, for which it is often blamed. Occasionally observed flying over Austin's residence districts.

Breeding.—Earliest: March 15, 1903, 3 fresh eggs (E). Latest: April 27, 1919, 2 slightly incubated eggs (J). Large set: March 26, 1905, 4 eggs, one-third incubated (E). Said to begin nesting late in February, sometimes rearing two or three broods in a season (H), thus probably breeding well into May. *Breeding Recorded:* ABCEHJOY.

Nest Location.—30 to 55, rarely 75, feet up in tallest bottomland trees, in topmost crotch where several limbs branch out from main trunk to form a heavy fork, generally in cedar elm, since its early foliage offers concealment for the nest, but often in tall pecan, cottonwood, or live oak trees on creek bank. A few pairs prefer tall oaks or pecans near little ravines or hollows draining the wooded slopes and flattened post oak upland woods back from the bottoms.

Nest Construction.—Large platform of heavy sticks, built over with smaller sticks and Spanish moss, with sometimes dead leaves, ball moss, and old-man's-beard moss. Well-cupped, and lined with smaller twigs, fibrous cedar bark, leaves, lichens, and moss; nest lined with green leaves, renewed from time to time until eggs are hatched. Nest usually beautifully festooned with Spanish moss streamers. Generally a pair uses the same nest year after year, repairing it early in the nesting season, but often they may have two or three nests within a radius of several hundred yards, in which case the occupied nest may be identified from the ground by the fluttering bits of snowy down feathers that always cover the top of the nest and cling in profusion to nearby twigs.

Nest Building.—Nests built and repaired in late February and early March, in course of construction and ready for eggs March 5 and 7.

Nest Measurements.—Outside, diamater 20 to 28 (average 22), height 10 to 24 (average 14). Inside, diameter 8 or 9, depth 2 to 4. About 7 inches usually added to height of rebuilt nests.

Eggs.—2 to 4, usually 3, dull-white, blotched, spotted, stained, and clouded irregularly with brown, shading from cinnamon to chestnut and seal brown, 2.07×1.69.

Call.—A loud, vigorous, long-drawn, nasal, screaming *kay'-yer, kay-yer, kay-yer,* varying toward a *kee-yer,* more frequently heard in spring and summer. Often during spring, particularly in mating season, calls are weak and scarcely to be heard; sometimes a short *you-you,* a single *kee,* or a shrill *whee-e-e* with an occasional *ca-ac* added, as it soars high over the woods.

Description.—Dark reddish-brown, ruddy about head, neck, and under-parts, the latter barred with white in adults, streaked in immature birds. Conspicuous shoulder patch of rufous or orange-brown. Tail blackish-brown, crossed by 4 or 5 bands of white and tipped with white. L. 20. W. 13. T. 8.50. B. .85. Male smaller, female larger.

Subspecific Characters.—Much more richly colored than Northeastern Red-shouldered Hawk; smaller than and not so brownish as Texas Red-shouldered Hawk of southern Texas and northeastern Mexico; similar to Red-bellied Hawk of the West, but head and back more rufous, breast more spotted with buffy, and dark shaft lines of chest more conspicuous. Chest and breast uniform bright cinnamon-rufous, under-parts bright buff barred heavily with cinnamon-rufous.

Field Marks.—Large, though smaller than Red-tail. General reddish-brown color, with rich rufous shoulder patch. Tail conspicuously banded with alternating bars of white (4 or 5 in number) and dark (grayish from below, black-brown from above).

Popular Names.—Chicken Hawk; Bottom Hawk; Red-shouldered Buzzard.

SWAINSON'S HAWK

Buteo swainsoni Bonaparte

Not uncommon migrant, last of August to early October, last of March and first half of May. Fall, earliest August 20, 1916 (FG), latest October 17, 1915 (F). Spring, earliest March 28, 1915 (A), latest April 18, 1915 (F). *Recorded:* ADFGIR.

Geographical Distribution.—North and South America, from Alaska to Chile, resident east to South Dakota, the Texas Panhandle, and the Davis Mountains in Texas, wintering locally in southern United States, and migrating across eastern and central Texas.

Habitat.—A bird of the western prairies which, even during its migration, prefers open country, lowlands and cultivated fields, where it frequents marginal timber in the vicinity of streams.

General Habits.—A migrant hawk, observed singly, sometimes in large flocks, in spring and fall, slow of flight and, as a rule, not shy, sweeping in graceful circles over the open country, or occupying a lofty perch from which it can watch the surrounding fields. At times it can sail rapidly for more than a mile without flapping its wings.

Description.—Grayish-brown above, with dusky wings. White forehead and under-parts, with a distinct large bright, rich chestnut breast-patch. Grayish-brown tail, crossed by 9 or 10 narrow blackish bands, less distinct near base of tail. L. 20. W. 15. T. 9. B. .90. Male smaller than female.

Field Marks.—Large size. Reddish-brown chest band sharply contrasting with white throat and white belly and thighs. Numerous tail bands, usually 9 or 10.

Popular Names.—Grasshopper Hawk.

Remarks.—Breeding in the plains country in the Panhandle and Tom Green and Concho counties, March to middle May, nesting in low trees in ravines and on bluffs, laying 2 or 3 greenish or yellowish-white eggs, inconspicuously spotted with various shades of brown, 2.30×1.75.

BROAD-WINGED HAWK

Buteo platypterus platypterus[102] (Vieillot)

Uncommon, occasionally very common, spring and fall migrant, and very rare winter resident. Migrations, September to early November, middle March to middle April. Earliest, September 3, 1914 (A). Latest, April 18, 1915 (A). *Recorded:* ABCDX.

Geographical Distribution.—Eastern North America, breeding south to the Gulf States and northeastern Texas, wintering locally from southern United States south to Peru.

Habitat.—During migrations, wooded stream valleys and marginal timber of water courses, and patches of second-growth timber near city; west to edge of hills. In winter, heavily timbered bottoms.

General Habits.—Sits for hours at a time on the dead top limbs of large forest trees in heavy woodlands—from which it rarely strays, even in migrations—or on smaller trees in marginal timber. When disturbed from its perch, flight slow, heavy, and sluggish. However, at times, as during migration, it is an easy, graceful flier, sailing in wide, spiral circles without apparently moving its wings, and carried along by the wind.

Migration.—Occasionally immense flocks pass over during migrations. April 12, 1915, flock of 50 (A). November 10, 1918, 2000 in three connected flocks, moving southward in teeth of norther, a steady stream passing over western edge of Austin for about 20 minutes, sailing and circling in peculiar gyrating motion, flying low, ever circling and circling, but always leisurely along with the forward movement of the stream, the sky seeming full of hawks (B).

Voice.—A high, sharp, somewhat squeaking, mellow whistle, likened to a barn door swinging on rusty hinges and reminding one of the call of the Wood Pewee: *chee-e-e-e; chee-a-a-a; zigee-e-e;* or *kwee-e-e-e-e-e,* diminishing in force, plaintively uttered as the bird circles high overhead.

Description.—Dark brownish above (gray-brownish in spring) rusty under-parts broken by white barring. Broad rounded wings; short tail, blackish, crossed by 2 to 4 (5 to 7 in immature birds) grayish-white bands. Conspicuous dark cheek patches. Smaller than Swainson and Sennett White-tailed Hawks, fewer and more distinct tail bars, and shorter wings, primary tips reaching only to middle of tail; from all other hawks a specimen may be identified by notched inner web of three outer primaries. L. 16. W. 11. T. 7. B. .70. Male smaller, female larger.

Field Marks.—Comparatively small, dark hawk, with broad rounded wings and short blackish tail with broad, distinct bands of white, and barred under-parts.

Popular Names.—Short-tail Hawk; Stumpy Hawk; Zone-tailed Hawk (erroneously mistaken for southwestern species, *Buteo abbreviatus* Cabanis, which has blackish tail crossed by three white zones, but which has black under-parts).

Remarks.—Seen in spring and supposed to breed on outskirts of Austin (X).[103] Published breeding record (H)[104] based on small nest and eggs of Southern Red-shouldered Hawk. Broad-wings nest somewhat similarly to Southern Red-shouldered Hawks, laying 2 or 3, rarely 4, grayish or yellowish-white eggs, marked with spots and blotches of fawn color, umber-brown, and chestnut, quite mottled or clouded, 1.90×1.54.

AMERICAN ROUGH-LEGGED HAWK

Buteo[105] *lagopus sanctijohannis* (Gmelin)

Very rare winter visitor, shot October 21, 1916 (FG). *Recorded:* FG.

Geographical Distribution.—North America, breeding through Canada, and wintering across the United States.

Habitat.—Western edge of Austin. Wooded water courses, hunting where groves and fields alternate.

General Habits.—Solitary, sluggish, with slow, heavy flight, hunting principally at twilight, frequently hovering over meadows.

Description.—Large, blackish, with legs (tarsi) feathered to base of toes[106]; sometimes whitish, rusty streaked, with white tail barred on end with black, under-parts heavily marked. L. 24. W. 17. T. 10.

Field Marks.—One of the largest of American hawks, heavy, striking, blackish in appearance, or lighter, with white rump and whitish tail, and dark belly. Known in any plumage by legs heavily feathered to toes.

Popular Names.—Black Hawk; Rough-leg; Hair-footed Hawk.

BALD EAGLE

Haliaeetus leucocephalus leucocephalus (Linnæus)

Rare straggler from the Texas Gulf Coast. *Recorded:* D.

Geographical Distribution.—United States, both east and west, south to the Gulf and northern Mexico. Breeding resident in wilder portions of the coastal region of Texas, formerly resident along rivers of south-central and southwestern Texas.

Habitat.—Larger bodies of water.

Local Haunts.—Colorado River, and Lake Austin.

General Habits.—Never seen to alight, observed singly, flying majestically up from the coast, soaring over the water of the river and Lake Austin. Subsists on fish, which it usually steals from the Fish Hawk.

Voice.—A harsh, noisy, screaming, maniacal *cac-cac-cac.*

Description.—Dark brown, with snowy head and tail and yellow bill; lower third of leg naked. Immature birds wholly dark brown, with brown bills, may be distinguished by only partially feathered tarsus, which is generally bare, that of the Golden Eagle being feathered down to the toes. White head and tail gained about fourth year. L. 34. W. 23. T. 12.

Field Marks.—Huge brown bird, with snowy head and tail, and wing expanse of 7 feet, identified in any plumage by naked lower third of leg.

Popular Names.—Bald-headed Eagle; White-headed Eagle; Bald Sea Eagle; American Eagle; Washington Eagle; Black Eagle (first year immatures).

Remarks.—Name given because of white feathers of head and not because of absence of feathers. In the coast country builds huge nests in towering bottomland trees or low trees near prairie ponds; in low mesquites, in tall pecans, and on ledges in cliffs along rivers of southwestern Texas; breeds in November and December in coast country, March to May in west-southwest Texas.

PRAIRIE FALCON

Hierofalco[107] *mexicanus* (Schlegel)[108]

Accidental visitor from the West, a post-nuptial wanderer observed July 17, 1915. *Recorded:* A.

Geographical Distribution.—Western North America, from Canada to southern Mexico, east to Great Plains, the Texas Panhandle, and the plains of western Texas and the trans-Pecos country.

Habitat.—Canyons, cliffs and escarpments of the west, where on ledges it lays its 2 to 5 creamy, heavily-cinnamon-clouded and spotted eggs. Observed flying about over the city of Austin, and perching on high light towers.

General Habits.—A bird of great strength and daring, feeding on birds up to the size of a Western Meadowlark, and rarely on small mammals. Makes swift, dashing descent for prey. The only bird observed in the Region flew slowly and heavily along, worried by a beautiful male Scissor-tailed Flycatcher which darted lightly about just in front of it; suddenly the falcon darted swiftly forward and upward, stopped suddenly in midair, and dropped, turning somersault after somersault, about four or five in rapid succession, enfolding or rolling around the luckless Scissor-tail in its downward plunge, and when it straightened out and rose lightly on easy wings it bore its prey in its talons.

Flight.—Strong, easy, straight-away, very graceful and powerful, several quick wing beats followed by a stretch of sailing. Frequently rises, folds its wings, and drops headlong for great distances.

Voice.—A peculiar scream, varying from *kay* or *kaye* to *kee*, and a sort of cackle.

Description.—Grayish-brown above, indistinctly but broadly marked with bluish-gray, top of head sooty to deep black, distinctly darker than back; whitish or creamy below, distinctly but not heavily marked with blackish, heavier on flanks. L. 19. W. 13. T. 8. B. .80. Male smaller, female larger.

Field Marks.—Gray-brown back instead of slaty-blue as of the Duck Hawk. Blackish moustache patch on side of throat just below eye. Distinctly streaked under-parts. Strong, quick, dashing flight.

Popular Names.—Bullet Hawk; Lanner Falcon; American Lanner.

DUCK HAWK

Rhynchodon[109] *peregrinus anatum* (Bonaparte)

Rare winter visitor. Earliest, October 24, 1915 (FG). Latest, April 4, 1915 (A). *Recorded:* ACFG.

Geographical Distribution.—North America, breeding locally from Alaska south to middle United States, and wintering from Canada to Panama.

Habitat.—Usually found near water, as it feeds principally on ducks and other water-fowl.

Local Haunts.—Colorado River, particularly where the escarpment edge of the hills presents prominent perching places overlooking Deep Eddy and Lake Austin.

General Habits.—Usually perches until its prey is sighted, following and overtaking it, and choking it to death in a flash. Bold, fearless, and daring. Following migrating flocks of water-fowl (ducks and shore-birds), it chooses its prey at will. Also feeds on doves, meadowlarks, bob-whites, and small mammals.

Flight.—Speed on the wing tremendous, almost incredible, and other swift birds, such as ducks, seem to be standing still in midair when pursued by this famous old Peregrine Falcon. A teal, one of the swiftest of birds, whistling its way along the river, will be suddenly and swiftly overtaken and killed. It is graceful, sometimes soaring high in air, and is the swiftest of all the falcons, wheeling, circling, and sailing with incredible rapidity. Fleet and sure-footed.

Voice.—A cackling *kay-yak, kay-yak, kea-kea.*

Description.—Top of head deep black, decidedly darker than its bluish-ash back. Under-parts, creamy forward, buffy backward, sometimes immaculate, but generally faintly marked with tear-shaped spots and streaks. Flanks distinctly barred with blackish. Cere bright yellow, bill black. L. 17.50. W. 13. T. 7. B. .68. Male considerably smaller, female larger.

Field Marks.—Its shapely body, its dark-colored, pointed wings, short squat head and neck, constant flapping of its wings, and its great speed identify it in flight. At rest, slaty blue back and its prominent black moustaches.

Popular Names.—Peregrine Falcon; Bullet Hawk; Mountain Falcon; Great-footed Hawk; Eagle Hawk; Noble Peregrine.

PIGEON HAWK

Tinnunculus[110] *columbarius columbarius* (Linnæus)

Not uncommon migrant and winter visitor. Earliest, August 26, 1919 (A). Latest, April 18, 1915 (A). *Recorded:* ABFGIQW.

Geographical Distribution.—North America, breeding in Canada and the northern United States, wintering from southern United States to South America. Chiefly east of Rocky Mountains.

Habitat.—Lofty perches overlooking gorges and stream valleys. In and about the city, perching on housetops in winter, and occasionally topmost twigs of tall shade trees.

Local Haunts.—Buildings on University campus, and house-tops in town. Lake Austin, Colorado River, Shoal Creek, and Pease Gorge.

General Habits.—Swiftest of the small hawks, very speedy on the wing, and dauntless, attacking birds of its own or greater size, frequently visiting poultry yards where it catches small chickens; also feeds on small mammals. In general appearance looks like a pigeon, sitting erect and alert; although not shy, on too close approach it darts speedily away in pigeon-like flight.

Description.—Bluish-gray above; cream-buffy below, streaked with brownish. White throat patch. Tail brownish, with four narrow white bands and white tip. L. 12. W. 8. T. 5.50. B. .45.

Field Marks.—Pigeon-like appearance, swift flight, erect position on perching. In flight, pointed wings seem to reach forward. Small, dark, heavily streaked below with umber-brown. Sometimes confused with young Sharp-shinned Hawk, but its darker, stouter, and shorter tail is brown with quarter inch whitish bands, the tail of the Sharp-shin being grayish-brown with half inch black bands.

Voice.—An often repeated *ke-ah, ke-ah, ke-ah.*

Popular Names.—Merlin; Small Falcon; American Merlin.

Remarks.—General resemblance to do[illegible]

AMERICAN SPARROW HAWK

Cerchneis sparveria sparveria[111] (Linnæus)[113].

Moderately common, sometimes very common, winter resident, and very rare and irregular during summer. Winter birds appear late in August; earliest August 22, 1911 (B), August 15, 1914 (A), and August 16, 1919 (A); not common until about ten days later. Majority leave during March, but a few winter birds remain to early May, latest May 23, 1915 (A). *Recorded:* ABCDEFGH[112]IJKLMNOPOQRTW:.

Geographical Distribution.—North America east of the Rocky Mountains, breeding from Canada to the Gulf States (northeastern and northern Texas), and winters from middle northern United States south to Central America.

Habitat.—Open country, edges of woodlands, marginal timber along streams of the Blackland Prairie Area, meadows and fields on the outskirts of town, and in and about town and the University campus. The broad, open bottoms of the Colorado River flood plains, and occasionally along stream-ways into the hills. In summer, edges of marginal stream timber in open country north and northeast of Austin.

General Habits.—Observed singly or in pairs, though occasionally in small flocks in migrations. Perches conspicuously on a telegraph pole, high on wires or crossbars, high dead limbs, old stubs, fence posts, and even on ramparts and flagpoles of buildings in town. Moves forth from its perch, falcon-fashion, to hunt for its food, grasshoppers, field mice, and rarely sparrows or other small birds, which it often secures from the prairie grasses which it skims or the country roads along which it reconnoiters.

Flight.—Alternates short stretches of sailing with a few rapid wing beats. Sails and soars over the open country, at intervals hanging or hovering in midair on rapidly quivering wings. Catches its prey with a smooth and flashing dive.

Breeding.—Middle April, 2 fresh eggs, data lost (J). May, 1905, female shot, contained fully formed egg (E). Eggs probably in nests from April to June. *Breeding recorded:* J.

Nest Location.—Natural pocket cavity or old woodpecker hollow, 9 to 25 feet up in tree, usually sycamore, occasionally mesquite and live oak, standing on edge of marginal timber of water course crossing pastures and fields. Rarely about buildings.

Nest Construction.—Usually none; eggs deposited on soft, punky, rotten wood and a few feathers of the parent. Rarely, considerable nest lining.

Nest Measurements.—Hollow, depth 7 to 10, bottom diameter 8, entrance diameter 6.

Eggs.—3 to 5, rounded ovate or oval, buffy to cream or cinnamon, heavily spotted, sprinkled, marbled, mottled, and blotched with walnut, cinnamon, chocolate, ochre, and lavender, considerable size variation. 1.35 × 1.12.

Voice.—A rapid, shrill, tinkling *kill-ee, kill-ee, kill-ee,* uttered so rapidly that at a short distance sounds like *kle kle kle kle kle* or *cleek-cleek-cleek-cleek-cleek,* usually sounded on the wing.

Description.—Above, reddish-brown, with slaty-blue cap, shoulders, and inner wing quills. Below, whitish or rusty. Tail bright reddish-brown, ending with broad black band narrowly tipped with white. Ear patch and moustache patch black. Bluish cap of male usually centered with reddish spot. Sometimes marked above, below, and on wings with black. L. 10. W. 7. T. 5. B. .45.

Field Marks.—Small size, hovering on quivering wings. Call. Reddish upper-parts with bluish cap, and black markings on sides of head and neck. Narrow, pointed wings.

Popular Names.—Mouse Hawk; Killy Hawk; Kestrel; Rusty-crowned Falcon.

Remarks.—Found nesting on northwestern edge of city (J), and one pair said to nest in eaves of house at Seventh Street and West Avenue years ago.

AUDUBON'S CARACARA

Polyborus cheriway audubonii[114] Cassin

Very rare, formerly common, resident, now more frequently seen in fall. One shot December 10, 1914, on southeastern edge of Austin by local hunter. *Recorded:* ABCDEFH[115]JKLNOQWY.

Bailey LAF
AUDUBON CARACARA

Geographical Distribution.—North America from Cuba, Florida, central Texas, Arizona, and northern Lower California, south to Panama.

Habitat.—Open pasturelands and prairies, generally where dotted by oak mottes or crossed by creeks and arroyos narrowly skirted with trees. Mesquite forests typical of the Rio Grande Coastal Plain from Austin southward. Open divides in the wooded mountainous country. Prefers prairies to wooded country, never breeding in tall trees in wooded bottoms. Wanders along streams into the wooded hills.

Local Haunts.—Head of Walnut Creek; Pilot Knob; divides of Cedar Valley plateau, southwest of Austin; mottes on tops of knolls or rises in the open country north and northeast of Austin, usually where surface begins to break down toward a creek bed; Del Valle For several years a pair nested in Noton's mesquite pasture, 12 miles east of Austin and 3 miles north of Hornsby's Bend; grazing pasture for cattle, dotted with a few post oaks, in moderately settled farming country and surrounded on every side by cultivated fields; birds nested in the oaks.

General Habits.—Usually observed singly or in pairs, occasionally in company with feeding or circling Black and Turkey Vultures. Nest usually placed so that the birds may obtain unobstructed view of surrounding country, over which they roam. Guarding parent, driven from nest, disappears for a short time, and reappears in company with mate, both birds staying close at hand, not infrequently perching in tree in which nest and intruder examining it are located.

Feeding Habits.—Feeds on carrion with Black and Turkey Vultures, and captures gophers, cottontail rabbits, field mice, lizards, and small snakes, hawk-fashion, two birds usually hunting together.

Flight.—Straight-away, usually sluggish, flying with the Black and Turkey Vultures, sailing and flapping alternately, often low, skimming tops of mesquite and chaparral, or circling high in the sky. At times flight is rapid, and its speed on the wing is shown by its ability, after making vultures disgorge carrion in midair, to catch falling masses before they reach the ground.

Breeding.—Earliest, March 20, 1896, 3 slightly incubated eggs (L). Begins nesting late in February, and nests into April. Two or three broods (H). *Breeding recorded:* CEHJLWY.

Nest Location.—10 to 35 feet up near top of post oak, elm, blackjack, live oak, or hackberry tree, standing in small motte or along narrowly-timbered stream crossing the open country, sometimes in large mesquites in mesquite pasture growth. Once on top of haystack in clearing (J).

Nest Construction.—Compact or bulky, according to number of seasons it has been used. Generally composed entirely of slender broomweed stems, rarely with base of coarser twigs or containing grass. Sometimes built on old hawk nest.

Nest Building.—New nest seldom built; old nest usually remodeled and relined. Birds carrying nesting material in early March, 1900 (E); others observed carrying material as early as December or January (H).

Nest Measurements.—Outside, diameter 18 to 40, height 8 to 36, according to age of nest. Inside, depth 2 to 4.

Eggs.—2 or 3, very beautiful, reddish-buff, spotted, mottled, and clouded with chestnut and reddish to purplish-brown, length varying, 2.37×1.75.

Voice.—Practically always silent, rarely heard to utter its prolonged cackling note or a loud guttural cry.

Description.—Generally black, breast and upper back barred with whitish or buffy. Throat buffy; face bare. Low, black crest. Tail white, narrowly barred and broadly tipped with black. L. 22. W. 16. T. 9. B. 1.25.

Field Marks.—Black and white "buzzard," with black crested crown on its whitish head.

Popular Names.—Mexican Eagle; Mexican Buzzard; Totache; Caracara Eagle.

AMERICAN OSPREY; FISH HAWK

Pandion haliaëtus carolinensis (Gmelin)

Rare and irregular summer visitor, April to early November. Earliest, February 21, 1915 (P); next, April 18, 1915 (A). Latest, November 20, 1914 (B). *Recorded:* ABCDEGH[116]PRW.

Geographical Distribution.—Breeds from Alaska across Canada and the United States to the Gulf Coast and western Mexico; winters locally from southern United States to Central America.

Habitat.—Large streams and lakes.

Local Haunts.—Colorado River, along at Austin, Deep Eddy, Lake Austin, mouth of Bull Creek, and up Barton Creek canyon.

General Habits.—Occurs singly, circling and sailing high over the water, which it carefully watches for the fish on which it feeds. Seeing a fish, it suddenly closes its wings, diving in a lightening-like drop, hitting the water with a splash, disappearing beneath the surface, and reappearing a moment later, mounting up into the air with the fish in its talons.

Voice.—A thin, high-pitched whistle.

Description.—Plain dusky brown above. Head, neck, and underparts white, with chest sometimes brown-marked very faintly. Sides of head with dark stripe, and top of head sometimes slightly streaked. L. 23. W. 19. T. 9. B. 1.35.

Field Marks.—Great size, brown above, white below, with dark stripe over eye. Proximity to water.

Popular Names.—Fish Eagle.

Remarks.—Resident along the Gulf Coast of Texas, wandering irregularly up the rivers in summer to central Texas. Theodore Haschke reports that a pair spent the summer of 1896 on Barton Creek. Watch should be kept along the water courses for its huge platform of sticks in tall, dead trees, and its 2 or 3 bright creamy, heavily chestnut-blotched, handsome eggs, 2.40×1.80.

AMERICAN BARN OWL

Tyto alba pratincola[117] (Bonaparte)

Rather uncommon permanent resident. *Recorded:* ABCDEFGH[118]IJLMNOPWYZ.

Geographical Distribution.—North America, from New York, Illinois, and California south to the Gulf States and Mexico.

Chapman
BARN OWL

Habitat.—In Blackland Prairie Area, churches and steeples in town, old pigeon lofts and gables of old barns in the farming country, thick trees along water courses, and burrows in the face of clay and sand bluffs along the river and larger creeks. In the Limestone Hill Area, caves and cliffs, boulder-strewn bluffs, and thick timber along canyons.

Local Haunts.—Methodist and Catholic church towers in Austin; caves in bluffs below McKinney Falls on Onion Creek; caves in cliffs along Barton Creek canyon; thick trees along Shoal Creek. Irregularly, one pair in tunneled burrow at mouth of Barton Creek, and three or four pairs in similar burrows at mouth of Walnut Creek, overhanging the water.

General Habits.—Seldom seen in the daytime unless aroused from its hiding place in thick trees along creeks or in pastures, in caves, belfries, or in nooks or burrows in bluffs. Hunts during the evening and through the night. During rain in winter, February 15, 1915, one sat in shelter on ground under tree, backed up against the tree trunk, on slope nearly at top of Mt. Bonnell (F).

Feeding Habits.—Feeds on gophers, rats, mice, squirrels, bats, frogs, and rarely small birds, grasping its prey with one foot and beginning with the head. Swallows its mammalian prey whole—bones, fur, and all—the indigestible parts forming a thick pellet in its stomach, later vomited up before new supply of food is taken.

Flight.—Considerable flapping, but entirely noiseless.

Breeding.—Earliest: April 13, 1904, 6 fresh eggs (Z). Latest: April 16, 1905, 1 slightly incubated egg (B). Eggs during March and April, and perhaps as early as late January. Incubation usually begins with laying of first egg. *Breeding recorded:* BEHNOZ.

Nest Location.—Old church belfries, attics, pigeon lofts, gables of old barns, and burrows or old kingfisher tunnels in perpendicular clay or sand bluffs on streams.

Nest Construction.—Slightly cleared space among rubbish of old food pellets, owl feathers, sticks, straw, bones, and fur.

Nest Measurements.—Burrows in banks, entrance diameter 4 to 6; length of burrow, 16 to 48; diameter of chamber at end of burrow, 10 to 20, sometimes L-shaped.

Eggs.—3 to 6, ovate, more pointed than most owl eggs, plain dead white, 1.65×1.32.

Voice.—An unearthly, rasping, witchy, quavering scream or screech, *kar-r-r-r-ick* or *kr-r-r-r-r-ik*. A feeble, querulous *quaek-quaek*. An unpleasant, escaping-steam hissing. Popping or clicking of mandibles when disturbed.

Description.—Pale amber, marbled above with pale gold and yellow and sprinkled with tiny black specks, tinged tawny whitish below faintly dotted with black. No ear tufts. Facial disk of feathers heart-shaped, giving the face a long, peculiarly-hooded appearance. Black eyes and yellow bill. L. 18. W. 13. T. 5.50. B. 1.30.

Field Marks.—Pale amber owl, without ears or horns, but with heart-shaped facial disk surrounding its black eyes and yellow bill.

Popular Names.—Monkey-faced Owl; Monkey Owl; Church Owl; Steeple Owl; Golden Owl.

AMERICAN LONG-EARED OWL

Asio otus wilsonianus[119] (Lesson)

Very rare migrant, October, late March and early April. Latest, April 14, 1919 (A). *Recorded:* A.

Geographical Distribution.—Canada and the United States, south to Virginia, northern Texas, and California; wintering through its breeding range, southward to central Mexico.

Habitat.—Thick trees along stream-ways, and shady undergrowth on dry slopes of stream valleys.

General Habits.—Hides in daytime in dense shade of trees and underbrush, hunting at night.

Voice.—Prolonged, catlike *me-ow-ow-ow.* Less commonly, a low, soft-toned, slowly repeated *wu-hunk, wu-hunk.*

Description.—Dark grayish-brown or blackish, brownish face with white cross. Two long, conspicuous, well-developed ear tufts of 8 to 12 feathers, rising from top of head. L. 15. W. 12. T. 6. B. 1.05.

Field Marks.—Dusky brown color. Feathered ears or horns on top of head.

Popular Names.—Cat Owl (from call).

Remarks.—Probably occurs in winter, and possibly in summer. Description of bird, nest, and eggs found years ago (N) but not collected, were undoubtedly this species. Old crow, hawk, and squirrel nests in the Limestone Hill Area should be examined for this owl's grass-and-feathers lining and 3 to 6 white eggs, 1.65×1.30.

SHORT-EARED OWL

Asio flammeus flammeus[120] (Pontoppidan)

Rare migrant, and very rare winter resident. In migrations, November, and late February to middle April. Earliest: November 7, 1914 (A), and November 23, 1915 (F). Latest: April 18, 1915 (A). *Recorded:* ABDFG.

Geographical Distribution.—Breeds locally from Alaska and Greenland south to California, Kansas, and Massachusetts; winters from southern edge of its breeding range south to Guatemala.

Habitat.—Thickets and marshes, thick trees along stream valleys, and heaps of boulders and boulder-strewn cliffs and bluffs along the river.

General Habits.—Shy and retiring, generally observed singly, spending the day in retirement in thick trees along streams or under great boulders. Forages and hunts over lowland meadows and fields at dusk, at night, and in cloudy weather.

Voice.—Generally silent, rarely a low, quavering, mouse-like squeak.

Description.—Tawny, varying from bright to whitish, conspicuously striped with brown below, on breast, belly, and sides. Ear tufts present, but inconspicuous. L. 15.50. W. 13. T. 6.50. B. 1.20.

Field Marks.—Large size, striped upper-parts and absence of bars, fairly light color, and apparent absence of ear tufts.

Popular Names.—Marsh Owl; Meadow Owl; Flat-faced Owl.

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HEADS OF OWLS

Long-eared Owl
Barn Owl
Saw-whet Owl

Hawk Owl
Great Horned Owl
Snowy Owl
Screech Owl

Short-eared Owl
Barred Owl
Richardson Owl

TEXAS BARRED OWL

Strix varia helveola[121] (Bangs)

Tolerably common resident, the most common of the larger owls. *Recorded:* ABCDEFGHIJLMOPRW.

Geographical Distribution.—Middle southern Texas.

Chapman
BARRED OWL

Habitat.—Blackland Prairie Area, heavy swampy wooded bottoms, the deep timber bordering streams, rarely wandering into city shade trees in Austin. Limestone Hill Area, along the main streams, not in the usual scanty forest growth, but in heavily wooded draws; heavily wooded, boulder-strewn slopes; and cave-riddled cliffs. Rarely, mesquite forests.

Local Haunts.—Colorado River bottoms, Barton, Willliamson, Onion, Shoal, and Bull creeks; Deep Eddy cliffs and the slopes of Mt. Bonnell and Mt. Barker. Most commonly along Williamson and Onion creeks east of the hills, and along Barton Creek, above Campbell Hole and along Horseshoe Bend, in the hills.

General Habits.—Roosts in daytime in deep woods or in nooks and crevices in cliffs; more often heard than seen. Feeds on mice and other small mammals, frogs, crawfish, insects, fish, and small birds, hunting at night; occasionally may be seen hunting on dark winter days. Flight quick, noiseless.

Breeding.—Late February and early March. April 13, 1919, 2 slightly incubated eggs, broken by wind storm a few days before (AB); May 25, 1921, 1 young ready to leave nest (B). *Breeding recorded:* ABHJ.

Nest Location.—Generally in rather lofty hollows, from 15 feet up, in large trees in low, deep, thick woods bordering a stream; possibly also in old hawk or crow nests.

Nest Construction.—Bottom of natural cavity generally lined with a small handful of tiny twigs, dead Spanish moss hairs, and dead leaves, browned through long decay.

Eggs.—2, rarely 3, globular or sub-spherical to rounded oval, dull white, 2.00×1.63.

Voice.—A wild mixture of hoots and blood-curdling shrieks, screams, and loud, terrible, mocking, maniacal laughter. A moderately high-pitched *who-who-who, to-who-ah* or *whoo-whoo-whoo, who-hoo, to-whoo-ah,* uttered with rising inflection and seeming to come from a distance through deep woods; admirably rendered by Mr. Stanley Clisby Arthur as *"Oo-hoo-hoo-hoo—You cook for me—I'll cook for you—Oh-hoo-hoo!"* Sometimes a few *wha-whas,* a *haw-haw, hoo-hoo,* or a single, long-drawn *whoo-ah.*

Description.—General color dark gray or grayish-brown and buffy-white, barred everywhere except on belly, which is distinctly streaked. Distinct ring of feathers around each eye. No ear tufts. Toes bare. L. 20. W. 14. T. 9. B. 1.50.

Field Marks.—Large size, great round head without ears or horns, upper-parts and breast distinctly barred gray and white, somewhat after manner of Plymouth Rock poultry; belly and sides distinctly streaked.

Popular Names.—Hoot Owl; Crazy Owl; Bottom Owl; Woods Owl; Chuckle-head Owl; Old-folks Owl; Round-headed Owl.

HASBROUCK'S SCREECH OWL

Otus asio hasbroucki[122] Ridgway.

Moderately common permanent resident. *Recorded:* ABCDEFGHIJKLMNOPQWY.

Geographical Distribution.—Central Texas, from Dallas and Travis counties west and southwest to Palo Pinto and Kerr counties; range nearly coincident with limits of Limestone Hill Area.

Habitat.—More abundant in central and western parts of the Austin Region, along wooded bottoms and marginal timber skirting streams, on wooded valley slopes, timber along canyons in the hills, and in and about the residence districts and outskirts of Austin. Never in thick woods or open regions, but generally in rather open mixed woods, where scattered oaks and elms and dead stubs contain numerous hollows.

Local Haunts.—Shoal and Barton Creek valleys, Colorado River Valley slopes along the Barton Road, Deep Eddy, slopes of Lake Austin, and gorges in the hills.

General Habits.—Although it can see perfectly well in the daytime, it usually spends the daylight hours in dense foliage in thickets and trees or in a hollow tree or stump, remaining closely concealed, and coming forth at dusk to begin its hunt for mice, insects, and rarely small birds. Moderately sociable, frequently seen and heard in town, throughout the residence districts and on the University campus. Female during incubation period appears torpid and sleepy and may be lifted from her eggs without a struggle.

Breeding.—Earliest: March 15, 1907, 4 fresh eggs (B). Latest: May 21, 1905, 3 heavily incubated eggs (B). Most commonly late March to middle April. *Breeding Recorded:* ABCEFH[123]IJLNQWY.

Nest Location.—6 to 25, usually 16, feet up in natural hollow in cedar elm, live oak, post oak, or sycamore tree or stump, generally standing on creek bank; once in old woodpecker hollow in telephone pole in town.

Nest Construction.—Hollow, sometimes bare, generally scantily carpeted with small decayed wood chips, a few feathers, or debris of dead leaves, twigs, straw, grass, Spanish moss, or crawfish crusts.

Nest Measurements.—Hollow; entrance about 4; depth, 4 to 84, usually 18; inside diameter, 4 to 10, usually 7.

Eggs.—3 or 4, sometimes 5, rarely 6, globular oval, pure white, with moderately smooth, finely granulated shell, 1.34 1.17.

Voice.—Weird, blood-curdling, quavering tremulo; high-pitched, long-drawn, wailing, whistled hooting *w-w-whi-i-er-r-r o o o o o o o o o o,* or a *whe-e r r r r o o o* of more sudden, hushed stop; lonesome, sad, and creepy, heard most frequently during fall, less commonly during winter and early spring, and rarely during the breeding season or in summer. There are two short notes, often uttered alone, occasionally used to begin the tremulous screech, a very low, short hoot, *proot,* and a puttering, beating *put t t t,* again, a low *goop-goop.* Screech usually crescendo and then diminuendo.

Description.—Two different phases of plumage, independent of sex, age, or season, often appearing in the same brood: Grayish, streaked and barred, almost exclusively in the Austin Region; bright rufous to rust-red reddish, streaked and barred, rarely seen in the Region. Bill pale. Ear tufts conspicuous. Toes feathered and bristled. L. 9. W. 6.50. T. 3.20. B. .60.

Sub-Specific Characters.—Dichromatic (a grayish and a clear cinnamon-rufous phase), closely related to *O.a.mccallii* of Check-List, but darker and more thickly pencilled below; darker, larger, and more heavily pencilled below than Northeastern Screech Owl, *O.a.naevius*

(Gmelin); larger than Florida Screech Owl, *O.a.asio* (Linnæus) of the Gulf Coast.

Field Marks.—Small size. Ear tufts. Tremulous hooting whistle.

Popular Names.—Squinch Owl; Death Owl; Little Gray Owl; Little Red Owl; Little Horned Owl; Mottled Owl; Scritch Owl; Scritch.

WESTERN GREAT HORNED OWL

Bubo virginianus pallescens Stone[124]

Rather rare permanent resident. *Recorded:* ABCDEH[125]IJKPW

Geographical Distribution.—Western North America, across the Plains but not in the higher mountains, from Canada across western and southern Texas to northeastern Mexico.

Habitat.—Heavily forested and unsettled regions, rarely heard or seen in thickly populated areas. More common in Limestone Hill Area, in wilder sections, in dark trees and caves along the canyons, central and western parts of the Region. Less common in Blackland Prairie Area, in deep bottom woods, and, less commonly, in mesquite forest growth and in timbered mottes on the prairie.

Local Haunts.—Face of cliffs and bluffs at Deep Eddy, Mt. Bonnell, Mt. Barker, and well up Bull creek and Barton creek canyons. In thick trees along Lake Austin, near Chautauqua.

General Habits.—Awakens echoes in the canyons at night. During the still hours of the night, just before day begins to break, as many as 15 or 20 have been heard calling at one time on the wooded slopes of Mt. Barker and Mt. Bonnell. Feeds on small mammals, poultry and small birds, fish, and insects, and, since its eye-sight is better than most owls, often hunts during the daytime as well as at night, especially when it has young to feed; particularly fond of hunting about deeper ravines, where wood rats nest among shelving rock slopes. Sits close to eggs during incubation.

Breeding.—January to March, eggs usually February and early March. *Breeding recorded:* C.

Nest Location.—In Limestone Hill Area, in small caves and on ledges high up in overhanging cliffs, in box canyons or along main streams. In Blackland Prairie Area, 20 to 100 feet up in large trees in bottom woods; or 12 to 35 feet up in mesquite, oak, or hackberry, in mesquite forest or prairie motte; using the old nest of hawks, crow, Audubon Caracara, or squirrels.

Nest Construction.—If an old nest of another bird, they place a thick lining of their own soft breast and belly feathers, with sometimes a little Spanish moss. In cliffs or hollows in trees, sticks, leaves, bark, and other rubbish.

Eggs.—2 or 3, pure white, 2.25×1.85.

Voice.—A loud, deeply-bayed, booming, ghostly bass *whoo, hoo-hoo-hoo, whoo-whoo* or *whoo, hoo-hoo, whoo, hoo-hoo-hoo,* all uttered at the same low pitch, much louder and deeper than the voice of the Texas Barred Owl, and awakening canyon echoes at night. Less commonly, a loud, blood-curdling scream.

Description.—Finely marked all over with dark dusky and whitish, tawny, brown, and buff. White semi-circular collar around neck. Very large, conspicuous ear tufts. L. 22. W. 16. T. 9. B. 1.60.

Field Marks.—Great size, heavy appearance. Large ear tufts or horns.

Popular Names.—Giant Hoot Owl; Pale Horned Owl; Pallid Horned Owl; Eagle Owl; Virginia Eagle Owl; Cat Owl.

WESTERN BURROWING OWL

Speotyto cunicularia hypugaea[126] (Bonaparate)

Very rare resident, more common in fall and spring. February 22, 1920 (AB.) *Recorded:* ABCFGH[127]JLMNOPW.

Geographical Distribution.—Western United States, east to Minnesota and Louisiana, and from Canada to Panama; winters from Kansas southward.

Habitat.—Driven out by the breaking of the prairies into cultivated fields, and now confined mainly to the uncultivated hillsides of the Blackland Prairie Area. Parched, sterile, treeless or very scantily forested parts of the Great Plains and rolling prairies, breeding in the prairie dog villages of northwestern and western Texas. Generally in mesquite-grown, rather weedy, rocky, semi-arid pastures on slopes; crumbly limestone pastures with little vegetation other than scattered mesquite and cedar bushes; waste fields, gentle mesquite slopes, and higher prairies. In winter, sometimes in corn fields.

Local Haunts.—Old fields one mile north and northwest of Hyde Park, Austin. Sand beach, rocky waste stretches, and catsclaw-gravel habitat on the Colorado River flood plains. Arid mesquite slopes and rises, gentle arroyo slopes, and bare, creek-side, sloping pastures northeast of town; along the Manor and Sprinkle roads. Arid mesquite uplands south of Austin.

General Habits.—Usually observed singly or in pairs, sometimes associated in small colonies. Sits calmly on fence-posts, or stands sentinel on ground at entrance to burrow. When flushed from hole in ground, it half flies, half bounces away. Usually retire into burrows for the winter the end of November, hibernating through severest winter until it comes forth again in early March.

Breeding.—Late March to early June. *Breeding recorded:* CJM.

Nest Location.—In old burrows in ground, generally at the base of bush or small tree, formerly occupied by prairie dog, gopher, ground squirrel, skunk, or other large rodent; rarely, an old kingfisher hole.

Nest Construction.—Burrow scantily carpeted with grass and feathers or crumbled cattle dung.

Nest Measurements.—Burrows 2 to 12 feet deep, usually 4 or 5.

Eggs.—2 to 9, usually 7, rounded oval, glossy white, rather badly soiled and nest-stained, 1.25×1.05.

Voice.—A mellow, cackling *kook-ka-wah,* uttered after dark in the evenings. Alarm note, a shrill *zip-zip.*

Description.—Above, earthy-brown with buffy spots. Below, ground color, or buffy barred with brown. Legs extra long, slender, and scantily feathered. Eyes yellow. L. 10. W. 7. T. 3.50. B. .60.

Field Marks.—Quaint, brown, long-legged, ground owl.

Popular Names.—Dog Owl; Ground Owl; Prairie Owl; Billy Owl; Long-legged Owl.

ROADRUNNER

Geococcyx californianus (Lesson)

Uncommon permanent resident, formerly quite common, but rapidly becoming scarcer; popularly supposed to be practically extinct in the Region, but much more common in suitable localities than generally supposed; more frequently seen during summer. *Recorded:* ABCDEFGH[128] IJKLMNOPQWY.

Bailey LAF

ROADRUNNER

Geographical Distribution.—Northern Mexico and southwestern United States, north to California and Colorado, and east to Kansas and Corpus Christi, Texas.

Habitat.—Drier regions, particularly on deserts; in mesquite thickets and patches of cactus; in the dry, rocky hills and mountains; flattened pastures dotted with winged elm and cedar elm bushes, cactus, chaparral, and mesquite; chaparral growth in the foothills; rough, brush-covered hills; cedar brakes and hardscrabble-shinnery country. Generally, Lower Sonoran and lower part of Upper Sonoran subzones

Local Haunts.—Limestone Hill Area, and adjacent semi-arid strip along its eastern edge; small rocky arroyos or washes east to the eastern edge of the Region. More commonly between Austin and Driftwood, in southwestern part of the Region; rocky ledges and slopes, west side of Deep Eddy; hills along Barton Creek; cedar-clad chalktops near St. Edward's College, south of Austin; country between Austin and the Dam.

General Habits.—Observed singly or in pairs, except after the nesting season, when family groups of from four to eight may be seen. Somewhat suspicious, half friendly and half shy; and hence difficult of approach and rarely seen. Ground-haunting. When one meets it on a trail or desert, it will linger, speeding up as its pursuer speeds up—even to racing speed—and slowing down when its pursuer slows down, ever watching him curiously. Noted for swiftness of foot; seldom uses its wings, except when hard-pressed; prefers to escape by swift running and by skillfully darting and dodging in among thickets and into roadside bushes, where it disappears with a quick dash; when scared, it appears nothing but a brown streak, low against the ground. Races ahead of the horses, or trots gently ahead; darts in and out of the brush; loves to dust itself like a hen in well-beaten paths or trails. When surprised, it raises and lowers its crest and flirts its tail. When running and desiring to stop quickly, it suddenly throws its brakes on, it erects its ludicrously long tail and skids to a stop, or

stops short and lifts its tail until at right angles to its body in order t keep its perfect balance; cocks its tail to turn quickly.

Feeding Habits.—Runs with astonishingly great speed, which en ables it to pursue and capture its prey: small snakes; lizards; mice grasshoppers, crickets, beetles, and centipedes; and the much-slowe snails; occasionally fruit of the various cacti; family of adults an young observed at large ant hill, feed on the Texas agricultural ant Occasionally appears in the door-yards of homes on the outskirts o towns and feeds and drinks with the fowl. Many thrilling tales ar told of its encounters with deadly rattlesnakes.

Flight.—Very short and sailing, rarely indulged in. Short wing and long tail make its flight peculiarly pheasant-like.

Breeding.—Earliest, April 6, 1902, 7 eggs, 3 fresh and 4 almos hatching (H); April 10, 1904, 4 young of various ages and 2 well incubated eggs (H). Latest, June 3, 1916, 4 slightly incubated egg (B). Two broods. Incubation almost always begins with the lay ing of the first egg, and frequently young of different sizes and egg not yet hatched are found in the same nest. *Breeding recorded* ABCEHJLMNOWY.

Nest Location.—2 to 10, usually 5, feet up, well concealed in cente of bush or tree, generally thick cedar elm, winged elm, mountain roc cedar, mountain live oak, hackberry, Texas black-fruited persimmon mesquite, or beds of prickly-pear cactus, in thickets or dry ravines

Nest Construction.—A rather coarse, flat, shallow platform, compactly built of sticks from 5 to 11 inches long, intermixed with a large percentage of cedar bark; lined with smaller sticks and numerous strips of cedar bark, some roots, moss, cedar and oak twigs, weed stems, Indian tobacco weed; mesquite pods, manure chips, and sometimes cast-off snake skin, chicken feathers, and Bermuda grass; occasionally unlined nests are found. Frequently old nests of the Western Mockingbird are rebuilt, or even old Roadrunner nests rebuilt and reused.

Nest Building.—March 2, 1919, bird observed securing chicken feathers from poultry-yard and carrying them 200 yards to nesting site (AB).

Nest Measurements.—Outside, diameter 10 to 12, height 3 to 6. Inside, diameter 6 to 7, depth 1.50 to 2.

Eggs.—2 to 8, commonly 5 or 6, rather short ovate, plain white or buffy-white, unspotted, without gloss, occasionally partly or completely covered with a chalky, dirty coat, 1.50×1.20.

Voice.—A low, soft, dove-like cooing noise; a low, gargling *wher-r-r-r-r-t*, with a distinct rolling of the *r*'s; a low, muffled cry, very difficult to locate as to direction and distance; a low, moaning *coo;* a low *deck, deck, deck, deck*, reminding one of the barnyard hen calling her chicks; a purring *perrp perrp perrp.* A chattering noise, produced by a rapid snapping or popping together of its stout mandibles. Alarm-note, a low *kr-r-r-rt.*

Description.—Mainly bronze to glossy blue-black on crest and brown on lower back; coarse, harsh plumage conspicuously streaked with brownish-white above, particularly on wings. Whitish on throat and belly, to brownish-white on chest, where the bird is streaked with black. Short, rounded wings, secondaries covering quills when wing is folded. Tail, plain bronzy blue-black and green, very long, the lateral feathers much shortest, all except middle feathers tipped with white thumb-marks. An erectile crest on head; iris of eye brown and yellow; bare space around eye colored orange and blue. Eye-lids with eye-lashes. Bill comparatively long. Stout black feet, 2 toes in front and 2 behind. L. 23. W. 6.50. T. 12.

Specific Characters.—Larger (W. 6.38 to 7.72) than the Lesser Roadrunner (W. 5.37 to 6.38) of southern Mexico.

Field Marks.—Curious, streaked-brown, long-tailed, sprinting, chicken-like bird with frizzled head and strongly-pointed bill. Crest and tail erectile.

Popular Names.—Chaparral Cock; Chaparral; Paisano; Lizard-bird; War-bird; Snake-killer; Medicine Bird; Running Cuckoo; Ground Cuckoo; Large Roadrunner; el Paisano (compatriot, or fellow-countryman); el Correo del Camino (from fondness for running in roads or paths); la Churrea, pronounced Choor-ray-ah (in imitation of its cry).

YELLOW-BILLED CUCKOO

Coccyzus americanus americanus (Linnæus)

Fairly common summer resident; last of April to middle September, rarely early October. Spring arrivals, April 18, 1915 (A); April 21, 1914 (F); April 26, 1916 (G); April 27, 1919 (B); April 28, 1920 (A); April 30, 1921 (A). In fall, last seen, October 7, 1921 (A); September 14, 1916 (F). *Recorded:* ABCDEFGH[129]IJKLMNOPQWY.

Geographical Distribution.—Southeastern Canada and eastern United States, south to the Gulf Coast and northeastern Mexico; west to wooded valleys of streams crossing the Great Plains, to South Dakota and central Texas. Winters in Central and South America.

Habitat.—Never in deep woods or prairie country; usually trees along rivers and creeks; slopes of wooded stream valleys and ravines; and thickets of saplings in the neighborhood of streams. Rather commonly, edges of woodlands, tree-dotted pastures, mottes in the open, semi-open woods, and shrubbery along roads; parks, orchards, and the dense foliage of shade trees in town.

Local Haunts.—Suitable localities throughout the country east of the hills, and along the wooded valleys into the hills; slopes of Shoal and Barton creeks; Pease pasturelands, west of Austin; edges of the Colorado River valley below Austin; University campus.

General Habits.—Usually observed singly, rarely in pairs; more often heard than seen, for it is shy, furtive, retiring, usually keeping well-hidden in the thick foliage of the trees, or flitting from tree to tree and hiding as much as possible. Moves about in the tree-tops, from which its call is frequently heard; perches motionless in the trees; flies about mostly on dark days or late in the afternoon about dusk.

Feeding Habits.—Feeds on insects in general, especially grasshoppers and potato-bugs, and particularly the tent-caterpillar, its favorite food, as many as 43 having been eaten by a single bird in the early morning. The bird punches many holes through the web-tents in the trees, searching for these caterpillars. Feeds commonly on Cicada locusts when they are abundant.

Flight.—Rarely makes long flights, usually slipping from tree to tree; passes in straight line from one leafy cover to another in swift and noiseless flight, its slender brownish body and long tail making it exceedingly graceful.

Breeding.—Earliest, May 21, 1915, 3 fresh eggs (B); May 22, 1897, 5 slightly incubated eggs (L); possibly may be found breeding much earlier in the month. Latest, June 14, 1895, 4 fresh eggs (M). Two broods. *Breeding recorded:* ABCEHJLMNOWY.

Nest Location.—4 to 25, usually 12, feet from ground on horizontal fork, well hidden in thick foliage or vines, in mountain rock cedar, red cedar, cedar elm, eastern live oak, hackberry, post oak, and small mountain live oak trees or bushes, usually along slopes of water courses; in semi-open pasturelands; in mottes or clumps of trees on the open, sparsely-treed prairie; and in city shade trees; never in deep woods or in isolated trees in extremely open country.

Nest Construction.—A frail, flimsy, ragged platform of about 20 to 50 coarse twigs, rootlets, and small sticks, grasses, catkins, or straws, poorly put together; and generally lined with mesquite or willow leaves or oak blossoms. The shallow saucer is very slight, barely curved enough to keep eggs from rolling off; and the structure is so loose that the eggs may frequently be seen through the bottom of the nest.

Nest Measurements.—Outside, diameter 5 to 7.50, height 3.50. Inside, diameter 3.50, depth 1 to 1.50.

Eggs.—2 to 6, usually 4, elliptical-oval, equally rounded at either end, thin-shelled, close-grained, without gloss; pale bluish or greenish-blue, unspotted, though sometimes rather mottled in appearance on account of the color varying slightly in shade on different parts of the egg; 1.19×.90.

Voice.—Song, varies considerably, rarely heard all at once; a loud *cluck-a-cluck-a-cluck-a-cluck-a-cluck-a-cluck-a-klook, klook, klook, klook,* uttered slowly at first, but continually picking up speed until it reaches the *klook's,* which are uttered at a slow and measured beat; sometimes it commences with a *tut-tut, tut-tut, tut-tut, tut-tut, cluck-ut, cluck-ut,* or *cl-uck-cl-uck-cl-uck, cl-uck-cl-uck-cl-uck;* and frequently its slow ending varies from a *cow, cow, cow, cow, cow,* or *keow, keow, keow, keow,* to *kyow, kyow, kyow, kyow* or *cowlp, cowlp, cowlp, cowlp.* Frequently the call consists of nothing but a very slow, cooing *cow-cow-cow* or *coo-k, coo-k, coo-k;* a slow *kloop-kloop-kloop-kloop-kloop-kloop-kloop,* 7 to 9 times and then a rest; a somewhat liquid *coo, coo, coo, coo* or *noo-coo-coo-coo;* a steady *pulook', pulook', pulook'. pulook';* a slow, regular *skcoo, skcoo;* or a harsh, grating *kuk, k-kuk, k-kuk, k-kuk';* often but a note or two or a half-subdued rendition of a call. Uttered more frequently before falling weather, hence considered an infallible foreteller of rain or approaching storms; often heard at night; frequently uttered from the nest.

Description.—Plain brownish-gray above, whitish below. Distinct large patch of cinnamon on primaries of opened wing, the rufous coloring on the inner webs. Upper-parts glossed with green. Tail long, rounded at tip, all but middle feathers black, broadly tipped with white thumb-nail marks or spots. Bill long and curved, basal two-thirds of lower mandible plainly, conspicuously bright yellow. Toes, 2 point forwards, 2 backwards. L. 12.10. W. 5.65 (female 5.76). T. 6.20. Bill, Exp. C. 1; from N. .76; depth at base .33.

Subspecific Characters. — Smaller size and smaller, weaker bill distinguishes this form from the California Cuckoo, *C. a. occidentalis* Ridgway, which ranges throughout the western United States from Canada to northern Mexico and from the Pacific eastward to the eastern slopes of the Rocky Mountains and to western Texas, the latter form being characterized by longer wings (male 5.89, female 5.91) and larger, stouter bill (length 1.02-1.08, depth at base .37-.40).

Field Marks.—Slender, with long tail half the length of the entire bird. Satiny-brown back and white breast. Slinking habits. *Large white thumb-marks on under side of blackish tail,* and *striking reddish cinnamon-brown color in wings,* both especially noticeable in flight; *yellow,* instead of black, *lower mandible,* plainly visible at quite a distance; and calls harsher and more varied than those of the Black-billed Cuckoo. Graceful, horizontal, noiseless flight.

Popular Names.—Rain-crow; Cow-cow; Chow-chow; Rain Dove; Cuckoo; Clucker.

BLACK-BILLED CUCKOO

Coccyzus erythropthalmus[130] (Wilson)

Uncommon migrant; last of April to last of May, and early September to middle October. In spring, April 28, 1919 (A); May 2, 1915

(F); May 13, 1919 (A); May 28, 1916 (G). In fall, September 4, 1921 (A); October 17, 1914 (A). *Recorded:* ACDEFG.

Geographical Distribution.—Southern part of eastern Canada and Labrador southward over northeastern United States to North Carolina, Georgia, Arkansas, and Kansas; west to the eastern foothills of the Rocky Mountains. Winters in Central and South Americas, to the valley of the Amazon.

Habitat.—Wooded bottomlands and slopes along streams; patches of trees in pasturelands and along fence-rows and roadsides; shade-trees in town.

Local Haunts.—Suitable localities throughout the Region; hillsides near Camp Mabry; wooded slopes of Shoal Creek valley; Pease Park; East Woods and Wheeler's Grove on Waller Creek; shade trees in Austin.

General Habits.—Observed singly. Habits quite similar to those of the Yellow-billed Cuckoo; also has a trace of the habits of the Old World Cuckoo, for it occasionally lays eggs in the nests of other birds, particularly those of its own species, a habit rarely met with in the Yellow-billed Cuckoo.

Feeding Habits.—Quite similar to those of the Yellow-billed Cuckoo, and, like that bird, feeding largely on caterpillars, particularly the destructive fuzzy tent-caterpillar, disliked by most other birds.

Flight.—Noiseless and lazy; glides through the foliage on short rounded wings and long tail.

Voice.—Softer than that of the Yellow-billed Cuckoo, its *tut* and *cluck* notes softer, and its *cow-cow* notes connected, and not disconnected as in its yellow-billed cousin. The long call is introduced by a bubbling or gurgling note: a soft, mellow, *k-k-k-k, kow-kow-ow-kow-ow!;* a soft, mellow, gurgling *k-k-koo, koo-koo, koo-koo;* a slow, regular *sk-coo, sk-coo* or a *cow-oo, cow-oo, cow-oo, cou-oo cou-oo, cou-oo;* a steady *cucucoo-oo, cucuoo-oo, cucuoo-oo;* a few deliberate, weird *kuk-kuk* notes. The most distinctive is a very monotonous, rhythmic series, *cou-coo, cou-coo, cou-coo* (.. .. ..) or *cou-cu-coo, cou-cu-coo, cou-cu-coo* (.. .. ..).

Description.—Upper-parts grayish-brown, with faint greenish-gloss; similarly-colored wings and tail. Under-parts grayish, to white on belly. No bright cinnamon feathers in wings. No black feathers in tail, lateral ones being brownish-gray, *narrowly* tipped with dull white, bordered on basal side with black bar. Naked eye-lids reddish and eye-ring reddish. Bill entirely black. L. 11.75. W. 5.40. T. 6.25. B. from N. .74.

Field Marks.—Long slim bird with drooping tail; reddish circles about eyes. Very similar to, but slightly smaller than, Yellow-Billed Cuckoo, from which it differs in having *bill entirely black* (no yellow); *no bright cinnamon color on primaries;* no distinct black or big white-thumbmarks in *tail,* which is *gray below* (instead of black), and *with white terminal spots very small and dull* instead of broad and clearly white.

Popular Names.—Rain-crow.

BELTED KINGFISHER

Streptoceryle alcyon alcyon (Linnæus)

Uncommon permanent resident; more common in fall, September to early November, when a westward-northwestward migration seems to take place from more eastern parts of Texas and the Gulf Coast; formerly moderately common. *Recorded:* ABCDEFGH[132]IJKLMNOPQRW.

Geographical Distribution.—Canada and the United States, from the Arctic Ocean to the southern border of the United States, exclusive of northwestern coast districts. Winters from southwestern Canada, Nebraska, Ohio, and Virginia southward to northern South America.

Habitat.—Clearer waters of rivers, larger creeks, and other watercourses; appears to dislike dirty waters, because of difficulty in seeing its food. Shores of woodland streams and ponds; smoother lakes; even along narrow canyons.

Local Haunts.—Whole of the Region: Colorado River; Barton, Shoal, Onion, Waller, and Walnut creeks; mouth of Barton Creek; wider parts of Barton canyon; Lake Austin and its backwater sloughs, particularly Buzzard Slough; along larger streams into the hill country.

General Habits.—Observed occasionally in isolated pairs; usually solitary. Usually sticks rather closely to a chosen territory, flying low along the water or perching over it; frequently seen and heard passing high overhead flying across country from one stream to another.

Feeding Habits.—Perches on partially submerged snags, twigs or stumps overhanging the water, or on some rock promontory, from which it watches for the glint of a fish's scales or fins; on sighting its prey, it flies forth, hovers on quick-moving wings, aims, and dives or plunges beneath the surface of the water to secure the fish which it has sighted, much after the manner of the Fish Hawk; rises from the water with its prey in its bill, shakes itself free of spray, utters a triumphant rattle, and flies away to its favorite perch, where it shakes the water from its fish, throws up its bill and swallows until even the tail-fin is gone. In looking into depths for fish, it occasionally hovers over the water on fluttering wings.

Breeding.—Last of April to early June; probably only one brood. Records: May 16, 1901, 5 young birds a few days old (B); incomplete sets excavated (BCW). *Breeding recorded:* ABCGW.

Nest Location.—A nearly circular tunnel excavated by the birds in perpendicular, water-cut, clay, sand, or gravel banks, generally directly over water of river, creek, slough, or railroad cut. Tunnel generally slightly curved, and enlarged at rear into small chamber. Commonly, in Austin Region, in bluffs and banks along Barton Creek between the springs and the mouth; mouth of Walnut Creek; and north bank of Lake Austin, 3 miles above Bull Creek.

Nest Construction.—A small amount of fish scales, fish bones, and other rubbish on floor of chamber at end of tunnel.

Nest Building.—Often takes as much as two weeks for a pair of birds to dig their burrow, even though their feet are especially adapted for digging: middle and outer of the front toes on each foot are joined for half their length, forming a tiny, efficient shovel.

Nest Measurements.—Tunnel, length 48 to 72, diameter 3.50. Nesting chamber, width 10, depth (front to rear) 10, height 6.

Eggs.—5 to 7, generally 6, rather short rounded ovate; pure, clear, shining white, smooth and rather glossy, 1.35×1.09.

Voice.—An unusually loud, harsh, vigorous, prolonged rattle or rattling scream, suggestive of a watchman's rattle; unmistakable, and not infrequently heard, carrying for half a mile or more on a clear, quiet day.

Description.—Bluish or bluish-gray upper-parts, head, and belt across breast; wings darker to blackish on quills, marked with white spots and feathers tipped with white; tail darker to blackish on outer feathers, with spots and broken bands of white. Throat, collar, spot in front of eye, and underparts, white. Head with ragged crest of erectile feathers; dull bluish bill, large, heavy, dagger-like. Tail short. Feet small and weak; middle and outer toes joined for half their length. Female, reddish belt across breast and in markings on flanks. L. 13. W. 6.20. T. 3.75. B. 2.

Field Marks.—Large, thickly built, short-tailed, *top-heavy* bird with a *ragged, frizzly crest* on head. *Shining white collar,* throat, *and belly.* Slaty-blue upperparts, and blue or rusty band across breast. Large, heavy, dagger-like bill. Rattling call.

Popular Names.—Kingfisher; Big Kingfisher; The Halcyon.
Remarks.—Marked decrease in the last two or three decades due to many being killed by hunters and small boys with guns.

TEXAS KINGFISHER

Chloroceryle[131] *americana septentrionalis* (Sharpe)

Post-nuptial migrant and fall straggler from the South; will probably become rare summer resident. Recorded: October 4, 1919 (A); October 8, 19, and 15, 1916 (FG); November 5, 1915 (B); November 12, 1915, several (B). *Recorded:* ABFGM.

Geographical Distribution.—Resident along clearer mountain streams of southwest-central Texas, from Comal County southward through southern Texas, Mexico, and Central America to Panama; particularly the Guadalupe, Comal, Llano, and Medina rivers, south and southwest of the Region; found in Nueces, Bexar, Mason, Kerr, Edwards, Maverick, Kinney, and Val Verde counties.

Habitat.—Occurrence depends largely on its habitat, the bird requiring the clearest of waters, particularly the crystal-clear rivers and brooks of the central Texas hill area; dislikes water the least bit muddy; larger, clearer streams and rarely smaller ones; shady little brooks.

Local Haunts.—Colorado River, near the mouths of Bull and Barton creeks, and on the southeastern edge of Austin, below the Congress Avenue bridge and near Travis Heights; Barton Creek, between the mouth and the springs, and 10 miles upstream. Should be looked for in summer up Barton canyon.

General Habits.—Quite similar to those of the Belted Kingfisher. Its rarity in all localities is doubtless due to the fact that many of its low tunnels and the eggs and young are destroyed in many cases by the annual spring cloud-burst floods of southern and southwestern Texas.

Feeding Habits.—Business-like little fisherman, perching atop a stick or stake in the water or on a low branch overhanging low water; frequently flies back and forth over the water, hunting for small fish. Often driven off feeding-grounds by the larger Belted Kingfisher, with which it is sometimes found.

History.—A small kingfisher seen several times about 1893 (C) was undoubtedly this species. A pair appeared in October, 1914, about 10 miles up Barton canyon, southwest of Austin (M). In November, 1915, several appeared along the Colorado River west of Austin and along the lower part of Barton Creek (B). In October, 1916, a single individual stayed on the river between Montopolis bridge and the mouth of Barton Creek, as well as along Barton Creek from the springs to the river (FG). In October, 1919, one was seen again on the river (A). The species seems to be gradually extending its range northward, after the manner of the Inca Dove, which appeared first in fall, then in fall and winter, and finally as a resident through the year. Will probably be found nesting along Barton canyon where suitable habitats may be found.

Breeding.—Possibly. Last week in April to early June.

Nest Location.—Small, bent tunnel or burrow in clay or sand bluff over water, enlarged at rear end into nesting burrow, large enough to allow the bird to turn around.

Nest Construction.—Mass of fish bones and scales scattered on floor of nesting chamber.

Nest Measurements.—Tunnel, length usually 24.

Eggs.—3 to 6, elliptical-oval and practically equal-ended, extremely thin-shelled; pure ivory to faint creamy white, usually dull. .96×.73.

Voice.—A rather sharp, rattling twitter, uttered on the wing; quite different from and shriller than the loud, harsh rattle of the Belted Kingfisher.

Description.—Upper-parts dark glossy green, head and wing-coverts sprinkled with small white dots. Wings dark green, almost black, crossed by three bands formed by white spots on the primaries. Tail dark glossy green; inner webs white, banded with dusky black spots. Under-parts and band on hind-neck, white. A broad band of dark rufous or chestnut across chest. Flanks, sides, and under-tail-coverts, spotted with green. A moustache of dark green from angle of lower mandible. Female, similar to male, but with less perfect breast-band, glossy green instead of rufous. L. 8. W. 3.45. T. 2.70. Exp. C. 1.75.

Field Marks.—Diminutive size (about a third or a half the size of the Belted Kingfisher). Beautiful little fellow, *without crest. Glossy bottle-green above,* speckled with white; *white below,* spotted greenish.

Popular Names.—Little Green Kingfisher; Texas Kingfisher.

HAIRY WOODPECKER

Dryobates villosus villosus (Linnæus)

Rather rare winter visitor, appearing usually during colder spells; October to March, though rarely seen after March 1. Earliest: October 3, 1915, 2 (F); October 6, 1921 (A). One shot, January 4, 1904 (H). Latest: March 25, 1920 (A). *Recorded:* AFGHI.

Geographical Distribution.—Northeastern United States, south to Virginia and to Mason in west-central Texas (about 100 miles west-northwest of Austin; west to central Dakotas, eastern Colorado, and through northern Texas as far west as Lipscomb in the Panhandle and San Angelo in west-central Texas. In fall and winter, moves southward.

Habitat.—Forests, indiscriminately on lowland and highland; timber along streams, particularly river and creek bottoms; outskirts of woodlands; occasionally city shade trees, though rarely observed outside woods.

Local Haunts.—Big trees in East Woods and Wheeler's Pecan Grove; heavily-wooded groves northeast and northwest of Austin, on edge of town; pecan grove at Barton Springs; University of Texas campus; rarely, shade trees in yards or along quiet streets.

General Habits.—Quiet, solitary, timberland bird, rarely observed in pairs in winter, usually occurring singly; not very friendly. Occasionally drums with its bill on a resonant branch, particularly in early spring.

Feeding Habits.—Moves with short hops up and around tree-trunks, or backs down them; never climbs upside down, as do the nuthatches. Feeds on the eggs and larvae of injurious wood-boring insects; also on ants, spiders, and moths; sometimes on small berries, seeds, and acorns, with occasionally some wild fruit.

Flight.—Deeply undulating, strong, but rarely protracted.

Voice.—A shrill, rattling *trriii, trriii.* When flying from one tree to another, a shrill, sharp *huip, huip.* Call-note, a sharp *peck.* Voice quite distinctly louder than that of the Downy Woodpecker. Rolling tattoo, shorter and louder, but with greater interval between each stroke of bill, than that of the Downy.

Description.—Upper-parts and central tail-feathers, black. Under-parts, large patch down middle back, outer tail-feathers, space about base of bill, and sides of head (wide stripe above and below eye), white.

Black band through eye to back of head; black line separating cheek from throat. Wing-coverts spotted with white. Bright red spot or band on nape or back of head. Female, slightly smaller, lacks red occipital band. Juveniles, similar to adults, but almost entire top of head red. L. 9:50. W. 4.75. T. 3.25. B. 1.25.

Specific Characters.—Size medium, about that of Robin or Red-headed Woodpecker, whereas Downy and Texas Woodpeckers are small, size of English Sparrow. Clear black and white plumage, with clear white belly. Back never barred with white, as in Red-bellied and Golden-fronted Woodpeckers, but *streaked* with white, and with large white patch or vertical stripe down back. Closest similarity between Downy Woodpecker and this species: Besides striking difference in size, there are other noticeable differences; outer tail-feathers of Hairy Woodpecker are pure white, while those of Downy are barred with black; the Hairy has a good-sized woodpecker-bill feathered only about the base and for not more than a fourth or a third of the way along it, while the Downy has a very small bill seemingly feathered half way to the tip.

Field Marks.—Clear black and white colors. *Large white vertical patch down middle of back.* Larger size (about like Red-headed Woodpecker), and prominent bill not half-feathered. *Outer tail-feathers pure white.*

Popular Names.—White-backed Woodpecker; Northern Hairy Woodpecker; Northeastern Hairy Woodpecker.

Remarks.—The Southern Hairy Woodpecker, *D. v. audubonii* (Swainson), similar to the common Hairy Woodpecker but smaller and shorter (L. 8.10. W. 4.60. T. 2.80. B. 1.15), under-parts less purely white, and with smaller and less numerous white spots on wing-coverts, breeds in the southeastern United States from Virginia to southeastern Illinois, southward to the Gulf Coast, and west to Giddings, Texas, and is much commoner in its range than the Common Hairy Woodpecker in its own woods further north. It has been said to range "west to Jefferson and Austin in eastern Texas,"[132] Austin being included on Schutze's[133] statement in his Austin and central Texas list that it was a "resident, not common," Schutze having merely included the species in his list because of J. A. Singley's summer records for Lee County, immediately east of the Austin Region. This form may possibly be found nesting in the Region, from early April to early May, in cavities 8 to 15 inches deep, dug 10 to 20 or rarely 30 feet from the ground in dead limbs or dead tree-trunks on the edges of woods; the 4, rarely 3 or 5, glossy white eggs, .97×.70, are laid on soft chips.

SOUTHERN DOWNY WOODPECKER

Dryobates pubescens pubescens (Linnæus)

Rare resident, occurring in every month of the year; more common in winter, October to late March, and very rare in summer. Unusual record, December 25, 1914, 4 (G). *Recorded:* ABCDEFGHW.

Geographical Distribution.—Southeastern United States, in South Atlantic States as far as North Carolina, through the Gulf States to central Texas, where it reaches at Austin its extreme southwestern limit; northwest into southeastern Kansas. Austroriparian.

Habitat.—Orchards and groves; sparsely wooded pastures near creeks; river and creek bottoms; occasionally upland woods; along streams in the foothills; open or cleared land and orchards rather than forests; shade trees in town.

Local Haunts.—In summer, city shade trees; Waller Creek towards Keasbey place; I. & G. N. railroad track three-quarters of a mile of Camp Mabry. In winter, University campus and city shade trees; Shoal Creek valley; mixed woods between Austin and Dam.

General Habits.—Usually observed singly, rarely 3 or 4 loosely associated together. Sociable, associating in winter with the Plumbeous Chickadee and the nuthatches; quiet and friendly, showing little fear of man. Works daintily about from tree to tree, industriously *tap-tapping* the bark and uttering its call, or climbing tree-trunks and branches. One of the smallest of woodpeckers, resembling the Hairy Woodpecker in appearance and habits, but less solitary and not so partial to forests.

Feeding Habits.—Searches for wood-borers which ruin trees, for grubs and other larvae beneath bark, and for scale insects, caterpillars, and ants.

Breeding.—Middle April to July. Records: Nest with 3 eggs; female, shot, contained two more eggs in course of development (B); September, 1914, 2 parents still feeding their 3 young (F); parents feeding 4 young in trees (G). *Breeding recorded:* ABFG.

Nest Location.—10 to 20 feet from ground in small dead deciduous trees, or in old stumps or telegraph poles.

Nest Construction.—Cavity, dug by the birds, goes in horizontally for a few inches, with sides of hole perfectly round and smooth, adapted to the size of the bird digging; then cavity turns downward and enlarges. No lining, the eggs being laid on fine chips in the bottom of the cavity.

Nest Measurements.—Entrance diameter, 1 to 1.50, average 1.25. Inside depth 6 to 8; average width 2.75; greatest width 3.25 by 3.50.

Eggs.—3 to 6, nearly elliptical, ovate or rounded ovate, pure glossy white, .74×.59.

Voice.—A sharp *queep, queep. queep* or *peek, peek,* sometimes prolonged into a long series, *cre-er er er er er er er er er er* or a rattling *cheek-cheek-cheek-cheek-cheek-cheek-cheek.* Its rolling tattoo, in spring, beaten with bill on a resonant limb, used as a 'song' during the breeding season, is *long and unbroken.*

Description.—Black above, with long white vertical spot or stripe down middle of back. Crown, back of head, and nape, black; side of head white, with broad black line from eye back to connect with black hind-head. Black wings sparingly spotted with white. Central tail-feathers black; outer ones white, marked with black bars, particularly near tip. Scarlet nape band in male, absent in female. L. 6.50. W. 3.50. T. 2.40. B. .60.

Subspecific Characters.—A smaller form of the Common Downy Woodpecker, *D. p. medianus* (Swainson), of southeastern Canada and the northeastern United States (L. 6.85. W. 3.70. T. 2.55. B. .68); also has browner under-parts and more restricted white markings.

Field Marks.—Clear black and white plumage. *Large white patch down middle of back* distinguishes it from other woodpeckers, including the similarly-small Texas Ladder-backed Woodpecker, except the much larger Hairy Woodpecker, from which it is told by the fewer white bars on the wings and by having its *white outer tail-feathers barred with black near ends. Pointed feathers on its short tail* distinguish it from nuthatches and other bark-climbing species.

Popular Names.—Little Gray Sapsucker; Gray-winged Woodpecker; Little White-backed Woodpecker.

TEXAS WOODPECKER

Dryobates scalaris symplectus[134] *Oberholser*

Formerly rather common, now rather scarce, permanent resident; more common in the western part of the Region than at Austin. *Recorded:* ABCDEFGH[135]IJKLMNOPQRWY.

Bailey
TEXAS WOODPECKER

Geographical Distribution.—Western and southwestern Texas, north and east irregularly into the Panhandle and to Waco, east regularly to Austin, San Antonio, and Corpus Christi; southward into northern Mexico.

Habitat.—Rather general in distribution and in choice of habitat; somewhat open post oak woods and oak upland gravel terraces; mesquite forests; hackberry shade trees in town; mesquite association pasturelands; open woods not far from water; marginal timber along streams. In the hills, cottonwoods and oaks along stream bottoms; wooded slopes of gorges. In winter, leafless city shade hackberry trees.

Local Haunts.—Limestone Hill Area, and the semi-arid strip east to the eastern edge of the city; southeastern part of the Region, toward Del Valle; mesquite trees and fence and telegraph poles along roadsides southwest of Austin; larger trees along Shoal Creek. More common in the hill country, particularly in uplands and rough country southwest of Barton Springs; Deep Eddy willows; Barton canyon; slopes of Mt. Bonnell.

General Habits.—Usually observed singly, occasionally in pairs; shy, generally keeping hidden behind tree-trunks or limbs and peeking forth. Jerks its way upward on the bark of trees, to which it clings closely, uttering its shrill call now and then.

Feeding Habits.—Searches high up on the knotty trunks of oak trees in open groves for larvae and eggs of injurious wood-boring insects, for the adults of similar as well as other insects, and for weevils and ants.

Breeding.—Late April to early June. Earliest: April 16, 1905, 3 fresh eggs (B); April 24, 1901, 4 slightly incubated eggs (B). Latest: June 6, 1919, 4 newly hatched young (A). Two or three broods (H). *Breeding recorded:* ABCEHLMPWY.

Nest Location.—4 to 25, average 12, feet from ground, in rotten stubs or dead and partly decayed branches of oak, mesquite, hackberry, and willow trees, usually alongside lake, river, creek, or ravine; when suitable trees are not to be found, nests in cedar fence posts or telegraph poles along roadsides; when in mesquite tree on mesquite-covered prairie, entrance of cavity on under side of low, drooping limb.

Nest Construction.—Cavity excavated by the birds. Eggs laid on a few soft, fine dead chips in bottom of cavity.

Nest Building.—Both sexes assist in nest-building, which is wholly work of excavation.

Nest Measurements.—Entrance diameter 1.50. Depth of cavity 7 to 8, rarely 10.

Eggs.—2 to 5, usually 4, oval, smooth, glossy white, fine-grained, .80×.62.

Voice.—Usually a thin, high-pitched, shrill *cheek; tcheck, queep* or *queep-queep,* uttered as the bird gives a hop in its progress up the tree-trunk. Sometimes an incredibly rapid, shrill, ringing, even, not-so-high-pitched *cheeky-cheeky-cheeky-cheeky-cheeky* or *tchee-dee-dee-dee-dee-dee-dee-dee-dee-deet;* less commonly, *chickp, chickp, chick-chick-chick-chick-chick-chick-chick-chick-chick.* Drums rapidly with its bill on dead limb of tree at any time of year.

Description.—Entire upper-parts, including back and wings and all parts of outer tail-feathers, barred with black and white. Forehead and under-parts smoky, lightly spotted below with black. Crown red, with a scattering of fine white specks. Middle tail-feathers plain black. Female, crown black. Young, like adult male, but less red on crown. L. 7.50. W. 4. T. 2.60. Exp. C. .88.

Field Marks.—Small size. Thin voice. Averages slightly larger than Downy Woodpecker. *Narrow but distinct black and white cross-bars on all of back.* Barred feathers along each side of tail. Wings spotted or barred with white. Forehead, breast, and *belly, smoky-brown.*

Popular Names.—Little Gray Woodpecker; Speck.e-check; Ladder-backed Woodpecker; Young Sapsucker; Texas Sapsucker; Baird's Woodpecker; Texas 'Downy' Woodpecker.

YELLOW-BELLIED SAPSUCKER

Sphyrapicus varius varius (Linnæus)

Rather uncommon winter resident; rarely middle October, usually last week in November, to last of March. Earliest: October 18, 1921 (A); November 7, 1915 (F). Latest: March 30, 1919 (A); March 29, 1921 (A). *Recorded:* ABCDEFGHJKLW.

Geographical Distribution.—Eastern Canada and eastern United States, south to Massachusetts, Ohio, and Missouri, and to the mountains of North Carolina. Winters from Pennsylvania and the Ohio Valley south to the Gulf Coast, the West Indies, and western Mexico; and west to the foothills of the Rocky Mountains.

Habitat.—Bottom woodlands; wooded slopes of creeks and ravines; cottonwoods margining streams; orchards and shade-trees; occasionally upland woods.

Local Haunts.—Eastern half of the Region, rarely straggling up the valleys of the hill country. Walker, Shoal, Williamson, and Onion creeks; Wheeler's Pecan Grove and East Woods; Barton canyon to a mile above Campbell Hole.

General Habits.—Observed singly. Very shy and difficult to discover, silent and suspicious, generally keeping a tree-trunk between itself and any chance observer; inconspicuous even during migrations, when it is concealed a large part of the time by foliage. Trunks of living trees along water-courses bear its squarish, sap-tapping marks drilled in even lines.

Feeding Habits.—Girdles trees by perforating bark, feeds on the juices of trees, or clings motionless to trunk while watching its sap-holes for insects attracted to them. Tongue is very slightly extensile, with a bushy tip used for a swab; quite different from the extremely long, extensile, barb-tipped, spear-tongues of the Hairy, Downy, and Texas Woodpeckers. Food about one-third ants; also feeds on many tiny insects, hosts of which are attracted by the sweet syrupy juices of its squarish sap-holes: flies, bugs, crickets, wasps, and other insects; also feeds on seeds, nuts, wild fruits, and the inner bark of trees.

Voice.—A peculiar, low, weak, snarling *mew,* between a creaking and the mewing of a kitten; a clear, ringing, penetrating, sweet *cleur,* often repeated several times in succession in summer home, where the birds are quite noisy, screaming and rollicking as they chase one another. Rolling tattoo beating on dead limb of tree, commences with short roll, and ends very emphatically with 5 or 6 disconnected taps.

Description.—Upper-parts blackish, thickly marked with white and yellow, with no distinct streaks or bars on back. Rump and sides of head, white; large white patch on wing, the coverts being mostly white; nape brownish-white. Under-parts dingy yellowish, with black patch on breast. Crown and throat red, bordered by black, separated by white cheek-stripe. Female, less red on crown; throat whitish instead of red. Colors vary much with age, sex, and season; duller in winter. L. 8.50. W. 4.80. T. 3.15. B. 1.

Field Marks.—Colors never clear, usually smutty black, gray, and white, generally with *a yellowish tinge* throughout. Back never barred or streaked. White rump. *Black chest-patch. Conspicuous wide white stripe down extended wing.* Black eye-line through whitish cheek.

Popular Names.—Sapsucker; Red-throated Supsucker; Sap-tapper; Tree-girdler; Yellow-bellied Woodpecker.

PILEATED WOODPECKER

Phlœotomus pileatus pileatus (Linnæus)

Very rare permanent resident for the last thirty years, previous to which it was somewhat common; now doubtless extirpated in the Austin Region. *Recorded:* DLNVW.

Geographical Distribution.—Southeastern United States, from North Carolina and western Oklahoma south to the Gulf Coast and middle Texas, reaching at Austin its western limit. Austroriparian.

Habitat.—Wilder country only; cypress swamps, and the most heavily timbered bottomlands, generally in very thinly settled sections; post oak woods on gravelly river terraces; edges of woodland meadows; along margins of both large and small streams; Austroriparian forests; in or near edges of timber, venturing out onto fields to feed.

Local Haunts.—Eastern half of the Region, west to the edge of the hills. Heavily timbered bottoms of the Colorado River and larger creeks east of the hills; big bottoms of Onion Creek a half mile from the river; creek woods 15 miles north of Austin; nesting cavities in marginal timber cottonwoods on Walnut Creek and Shoal Creek near Fiskville.

General Habits.—Observed singly, rarely in pairs; not particularly shy, except during nesting season, when it is very wary, leaving nest immediately on approach of observer and staying away until he departs. Usually winters in the same small patch of woods where it will nest the following spring. Perches atop a dead tree, where it hammers slowly and deliberately, and calls at intervals.

Feeding Habits.—Feeds on ants, particularly about decayed stumps; the eggs, larvae, and adults of wood-boring insects, particularly beetles; and on berries, acorns, nuts, and wild grapes. When digging for insects beneath the bark or in the wood of dead limbs or trunks of trees, it pounds steadily away, head swinging back in an impossible arc and driving straight down with the force of a blacksmith's sledge, chips flying every stroke or two; by employing a wrenching stroke with its chisel-bill, it knocks three-inch, four-inch, or even six-inch chips from the tree and causes them to fly for some distance.

Flight.—Usually rather slow, vigorous, straight-away, not undulating as is the flight of most woodpeckers; occasionally powerful and bounding. The bird has a wing-expanse of about 28 inches.

History.—The late H. E. Dresser, famous European ornithologist, in making a trip through Texas over fifty years ago, crossed the Colorado River at Austin and at Bastrop; he wrote that "On the Colorado * * * this bird was very common, and I found several nests in huge cottonwood trees," probably just below the city of Austin, "but had no means of getting up to them; besides which, I could not stop long enough to undertake such a task."[136]

Breeding.—Only record: May 3, 1896, 3 fresh eggs (V). Probably early April to middle May. *Breeding recorded:* V.

Nest Location.—Cavity in upper part, usually 30 to 60 feet from ground, in solid trunk of live, sound tree, less commonly in dead or partly dead limbs or trunks, generally tall cottonwood, cypress, elm, or oak, on the edge of woods or in marginal timber skirting stream, and usually easily located by the half-bushel of big fresh chips scattered about on the ground below; tree 10 or more inches in diameter at cavity.

Nest Construction.—Usual woodpecker hollow, the bottom of which is softly bedded with clean fresh chips.

Nest Building.—In late February or in early March the birds begin excavating their large burrow, which requires about a month for completion; same tree frequently used year after year, but never the same hole.

Nest Measurements.—Entrance diameter 3 to 4. Neck straight in for about 6, and then turns down into enlarged cavity, depth 18, diameter at bottom 6 or 7.

Eggs.—3 or 4, rarely 5; ovate, rounded ovate, or pyriform; pure white, glossy; 1.34×.94.

Voice.—Flicker-like, but much louder. A loud *cac, cac, cac* as it flies. A sonorous *cow-cow-cow,* repeated many times; a clear *wichew,* when two birds are together. A loud cackle, like loud, ringing, derisive laughter, *chuck-chuck; chuck, chuck-ah, chuck; chuck-ah, chuck, chuck, chuck, chuck;* or *chuck, chuck, chuck, chuck, chuck, chuck, chuck.*

Description.—Sooty black. Cap and brief flowing crest from back of head, scarlet, with narrow white border. Throat white; conspicuous white stripe running from nostril to cheek, down neck, and into each wing, basal half of which is white, the part in front of the eye frequently being pale yellowish. Whitish tips to sooty feathers of belly. Orange eye. Scarlet moustaches. Large nasal tufts concealing nostrils. Female, moustache stripe and front of head brown instead of red. Young, like female, but crest salmon. Heavily built, short-necked bird with powerful head; firmly-set, horn-colored chisel-bill, longer than head, broader than high at base, sides beveled, and tip wedge-like; feet peculiar, outer front toe longer than outer hind toe. L. 17. W. 8.90. T. 6.18. Exp. C. 1.80.

Subspecific Characters.—A smaller form of the Northern Pileated Woodpecker, *P. p. abieticola* (Bangs), of Canada, the Allegheny Mountains, and the Sierras and Rockies to northern New Mexico and California (L. 18. W. 9.10. T. 6.30), the latter having longer bill (Exp. C. 2.05), and more extensive white markings.

Field Marks.—Very large, about size of a Crow. *Black body;* white stripe down side of neck. Much *white, in big patch, in wing in flight. Bill straight and blackish.* Fourth toe not decidedly longest. *Head* conspicuously *crested with glowing, flaming red.*

Popular Names.—Log-cock; Woodchuck; Big Black Woodpecker; Great Black Woodpecker; Giant Woodpecker; Crow Woodpecker; Log God; Good-God; Cock-of-the-Woods; Lord God.

Remarks.—Named from its large, pointed, bright red crest, which resembles the *pileus,* or cap, of the Roman soldiers.

RED-HEADED WOODPECKER

Melanerpes erythrocephalus erythrocephalus[137] (Linnæus)

Fairly common summer resident, middle April to early October, moving northward in April and southward in September and early October; rare and local in winter; more common at the beginning of the nesting season. *Recorded:* ABCDEFGH[138]IJKLMNOPQWP.

Geographical Distribution.—Eastern North America, from southern Canada south through the United States to the Gulf Coast, and in Texas to San Antonio and the mouth of the Nueces River; west to the eastern slope of the Rocky Mountains, reaching at Austin its western limit of abundance in Texas. Of rather local distribution throughout its range.

Habitat.—Edges of woodlands; orchards, groves, and clearings in open woods; dead timber and solitary trees in fields; new grounds; telephone poles along quiet streets, railroad rights-of-way, and country roadsides; open oak woodlands. In winter, dead tops of tall trees in semi-open woods.

Local Haunts.—Only casually or irregularly west of the eastern edge of the hills; of local distribution throughout eastern half of the Region. Streets and roads towards St. Edward's College; the Dam Boulevard west of Austin; telephone poles along Austin streets, and in the University neighborhood; West Sixth Street; roads leading north, east, and south from the city. In winter, in sheltered localities in woods near town, particularly Wheeler's Grove and Barton Springs pecan grove, occasionally appearing on telephone poles and office-building flag-poles in town.

General Habits.—Active, usually observed singly or in pairs, or a half dozen males fighting or courting a female in early spring; in summer and early fall, in family groups. Quite active, and partial to telephone poles. Drums on poles and dead trees with heavy strokes of its bill, as do other woodpeckers.

Feeding Habits.—Abundance of food apparently largely determines the abundance and occurrence of this woodpecker, its migratory movements being very erratic; its presence in winter seems to depend on the acorn crop. Perches on stumps or clings to the sides of trees, sallying forth, flycatcher-wise, to capture insects on the wing in quite an expert manner. Digs in dead wood of limbs and trunks, and explores worm holes, in search of beetles, larvae, insect eggs, and bugs; feeds on grasshoppers, and on acorns, nuts, fruits, depending on the season. Acorns are frequently stored in cracks and crannies of limbs, trunks, and poles. Occasionally devours eggs and young of other birds.

Courtship.—Courtship flights and actions observed in the latter part of April (A).

Breeding.—Second week in May to middle June; two broods. Earliest, May 4, 1894, 5 fresh eggs (Pfannkuche); March 5, about 1902, eggs (H). Latest, June 25, 1916, 5 eggs (B); August 15, 1916, 4 large young in nest (G). *Breeding recorded:* ABCEGHIJLMNQWY.

Nest Location.—8 to 45, usually 18, feet from the ground, in telegraph or telephone poles along town streets and alleys, country roads, or railroad tracks; also the tops of dead trees and decayed tree-trunks and stumps, in clearings and on the edges of woods; less commonly telegraph poles in recent years, as the smaller, older poles, especially those of cedar, have been removed and replaced by larger, harder poles.

Nest Construction.—Eggs laid on soft chips in bottom of cavity excavated by the birds; sometimes old hollows are used for several times.

Nest Building.—Although the same old hollow is frequently used year after year, the destruction of dead trees and removal of old poles forces a great many birds to dig new hollows. Late record, June 27, 1915, birds digging new hollow (A).

Nest Measurements.—Entrance diameter 1.75 to 2. Cavity, depth 8 to 18, greatest diameter 3.50 by 4.50.

Eggs.—3 to 5, rarely 8 (H), average 4, short ovate, pure white, rather glossy; like all woodpecker eggs, yolk gives pinkish tinge to shell; 1.03×.75.

Voice.—Very noisy. A loud, harsh, rattling, rolling, tree-toad-like *ker-r-r-ruck, ker-r-r-ruck, ker-r-r-ruck* or *ktr-rr, ktr-rr;* a high-pitched *charr;* a harsh, squeaky *ske r r r r r r t;* a very mellow *creeow* or *creeoo,* with no rolling of the *r;* a ringing *cuhkk, cuhr-r-r* or *coor-r-r;* a clear *whah-p;* a rasping, whining *cher-cher-cher-cher;* a harsh *ker'r'r, char-r-r-r,* or *quarr' quarr' quarr';* a mellow, rasping *chiew* or *chweeu;* a loud, clear, harsh *chwuhr* or *chweehr;* a harsh, grating *chaew-cheeow-chacow* not with the soft *chuh-chuh* of the Red-bellied Woodpecker or the rolling of *r*'s of the Golden-fronted Woodpecker.

Description.—Head, neck, throat, and upper breast, deep crimson red; back, wings, and tail, glossy blue-black. Patch on wings, rump, breast, and under-parts, white; middle of belly generally tinged with reddish. Young, head brownish or blackish, changing to red by April; more black in wings; and sometimes streaked or spotted with dark brown on lower breast and belly. L. 9.60. W. 5.50. T. 3.50. B. 1.15.

Field Marks.—Three striking, bright colors in solid patches: brilliant red, snow white, and glossy black. *Red head and neck; blue-black upper-parts, and white rump.* Never spotted or streaked above or below. In flight, conspicuous broad white wing-patch. Immatures, with heads brownish or blackish, common in summer and early fall.

Popular Names.—Red-head; Peckerwood; German Woodpecker; Tricolor.

Remarks.—Female found nesting in old hollow in telegraph pole on June 6, 1901, allowed eggs to be removed as with the domestic hen: June 7, 1; June 10, 3; June 12, 1; June 21, 2; and June 24, 3; total eggs laid, 10 (B).

RED-BELLIED WOODPECKER

Centurus carolinus (Linnæus)

Fairly common permanent resident; more common in winter, when its numbers are reinforced by the arrival of more northern breeders in October. *Recorded:* ABCDEFGH[139]IJMNOP.

Geographical Distribution.—Eastern United States, from Delaware, western New York, the edge of Ontario, and southeastern South Dakota, southward to the Gulf Coast and west to the Austin Region in central Texas, its western and practically southwestern limit.

Habitat.—Commonly dead trees, preferably in heavily timbered bottom lands or swampy woods; open deciduous or mixed coniferous woodlands with very large trees; heavy woods of oak and elm along river and creek bottoms; shade trees and dead trees in town. In winter, heavily wooded creek bottoms; on dead trees and telegraph poles along alleys and about door-yards in town. Both Upper and Lower Austral subzones.

Local Haunts.—In hackberry and elm trees in town, where parts have died; Wheeler's Grove; Manchaca road-crossing on Williamson Creek; shore of Lake Austin, 18 miles from town; whole of the Region, although more common east of the hills. In winter, about town, and along Shoal, Waller, Walnut, Williamson, and Onion creeks.

General Habits.—Observed singly and in pairs; in family groups in summer and early fall; occasionally in early spring, several males fighting or courting a female. A very common Southern States woodpecker, shy and rather retiring, but noisy. Drums and calls in a challenging manner from dead trees and telegraph poles; ascends trees in peculiar, jerky fashion, accompanying its jerk upward with its peculiar call-note; raps on dead limbs at tops of tall pecan trees in pecan groves, and calls at intervals; prefers tops of tallest trees because of its shy and retiring habits. Frequently spends the winter about trees where it will nest the following spring; female sticks close to incubated eggs, and bold in defense of cavity, frequently brushing the intruder with her wings as she screams and dashes at him; if eggs are touched, female frequently throws them out of cavity to ground below.

Feeding Habits.—Subsists on insect larvae and eggs; beetles, ants, caterpillars, wasps, grasshoppers, weevils, and flies; and acorns, nuts, berries, seeds, and grain.

Courtship.—Observed already paired on March 21, 1915 (A).

Breeding.—Third week in April to early July; two, possibly three, broods. Earliest: April 19, 1901, 4 slightly incubated eggs (B). Latest: July 9, 1915, 3 fresh eggs (A); young flying about in August (A). *Breeding recorded:* ABCEFGHJN.

Nest Location.—5 to 60, higher in forests, about civilization usually less than 20, feet from the ground, usually where trunk or limb has about an 8-inch diameter; in dead limbs or stumps of hackberry, Chinaberry, cedar elm, pecan, and American water elm trees, particularly the rotten, shaky, skeleton upper-parts of living hackberry trees in backyards, or in telegraph poles along city streets and alleys

Nest Construction.—New or old hollow, excavated by the birds in soft dead wood; entrance perfectly circular; eggs laid on coarse, though soft, bits of wood, accumulated to a depth of about half an inch in the bottom of the cavity.

Nest Building.—New hollow completed on April 18, 1915 (A). Same cavity occasionally used from year to year.

Nest Measurements.—Entrance, diameter 1.75 to 1.96. Cavity, depth 10 to 12; widest diameter near bottom (3 above eggs), 5.25.

Eggs.—3 to 5, average 4, ovate or rarely subpyriform, dull white, finely grained, shining from incubation, and usually nest-stained, 1.01 ×.74.

Voice.—Calls noisily from dead trees. In fall and winter, a soft, scolding *chuh; chuh-chuh; chow-chow; cherr-cherr;* or *chawh-chawh.* At other seasons, a variety of calls: a slow, harsh *crer-r-r-r-r-r r r r r r* or *chur-r-r-r-r r r r r r r;* a noisy *charr-r-r* or *chawh-chawh;* a rather slow, regular *chuh-chuh-chuh-chuh-chuh,* sometimes uttered in a series of a dozen or more as rapidly as the syllables can be plainly pronounced; a very rapid *chuck-a-chuck-a-chuck-a-chuck-a-chuck-a-chuck-a-chuck-a-chuck-a;* a slow, harsh *sherr, cherr, cherr* or *crerr, crerr, crerr, crerr, crerr;* an alarmed *cha-cha-cha;* at intervals, a loud, bold, running, connected *koo er-r-r-r; qu er-r-r-r-r; qui er-r-r-r-r;* or *k-r-r-ring·* uttered with a distinct rolling of the *r*'s; in nesting season, an additional *whicker.*

Description.—Back, rump, wings, and tail, closely and regularly barred with black and white, the black on the rump running into arrowheads and streaks; wings mostly black near ends, spotted and barred with white near body. Cheeks and under-parts, grayish, often tinged with red on middle of belly, about base of bill, and less commonly on breast. Whole crown, back of head, and nape, bright scarlet red. Female, gray patch across red crown; back of head and nape reddish. Young, duller, markings obscure; buffy on belly, indistinct red on head. L. 9.50. W. 5. T. 3.60. B. 1.10.

Field Marks.—Medium size. Wings spotted or barred with white; belly tinged with pinkish-red. *Both back and rump barred with black and white.* Male, whole top of head red. Softer calls than Golden-fronted Woodpecker.

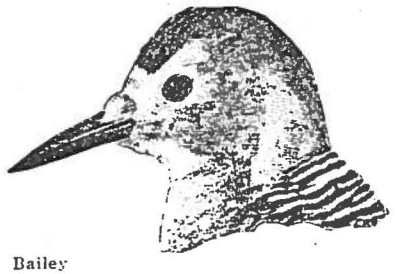
Popular Names.—Big Gray Woodpecker; Big Gray Sapsucker; Shab; Big Ladderback; Zebra Woodpecker; Zebra-bird; Zebra; Carolina Woodpecker.

GOLDEN-FRONTED WOODPECKER

Centurus aurifrons (Wagler)

Rather uncommon resident, slightly less common in winter. *Recorded:* ABCDEFGI.

Geographical Distribution.—Central Texas southward to the valley of Mexico; of local distribution northward to north-central Texas, and west to Llano and Kerr counties.



Bailey

GOLDEN-FRONTED WOODPECKER

Habitat.—Mesquite forests with large trees, and mesquite flats; partial to large timber near mesquite growth, particularly among post oak and mixed oaks on gravel uplands, and in pecan groves on open and semi-open bottoms.

Local Haunts.—Very local in distribution, found in suitable localities through southern and western parts of the Region; valleys of the Limestone Hill Area, rarely ascending into the hills; higher uplands with mesquite and post oak east of the city; Barton Springs pecan grove; Shelley home grounds on Windsor Road; elm and mesquite trees between Camp Mabry and the Mt. Bonnell road; pecan groves on the second bottom of the Colorado River, between Austin and Barton Springs; localities in city of Austin, such as the square between Nineteenth and Twenty-first streets, west of Rio Grande; University campus; post oaks on gravel terraces at Thirtieth and Guadalupe: Twenty-fourth Street just west of Rio Grande; northwest corner of Guadalupe and Twenty-first; alley between San Antonio and Nueces, north of Twenty-second; square east of Baylor, between Seventh and Eighth; section immediately southwest of Insane Asylum grounds.

General Habits.—Observed singly or in pairs; in early spring, several males fighting together or courting a female; in summer and early fall, small family groups. General habits and appearance similar to those of the Red-bellied Woodpecker, both being frequently found in the same locality or even in the same tree, although the Red-bellied Woodpecker sticks more to the creek bottoms, while the Golden-fronted Woodpecker is typical of mesquite prairies, roadsides with plenty of fence-posts and telegraph poles, and open pecan and oak groves where mesquite is near at hand. Shy about the nest, which is not deserted as easily as that of the Red-bellied; one cavity was sawed into and the hole immediately patched up, yet the female not only remained in the vicinity but completed her full set of eggs in the repaired cavity (B). Both parents feed the young.

Breeding.—Probably only one brood. Earliest: March 30, 1917, 5 fresh eggs(B). Latest: June 26, 1916, parents feeding young in nest(FG). *Breeding recorded:* ABFG.

Nest Location.—1 to 35 feet, usually quite close to ground, commonly about 9, rarely above 14, feet up; usually on under side of inclining dead limb or rotten stub or stump of pecan, live oak, mesquite, or hackberry, most frequently in those bending toward north or northeast; in fence posts or telegraph poles; in living trunks, often in heart of living hardwoods, such as the mesquite or the live oak.

Nest Construction.—Cavity similar to that of the Red-bellied Woodpecker.

Nest Measurements.—Cavity, depth 15 to 18.

Eggs.—5, rarely 4 or 6, dull white, often soiled, 1.02×.77.

Voice.—Extremely noisy. A harsh, rapid, scolding *chuh-chuh-chuh-chuh-chuh-chuh-chuh;* a metallic *whah-whah;* a loud, long-drawn *sk-k-k-k-ah-er-r-r-r* or *tcher-r-r-r, tcher-r-r-r;* a short *check, check-check.* Both this species and the Red-bellied Woodpecker have the same *chow, chow, chow, chow* call; however, there is a striking difference in the tone; the call of the Red-bellied Woodpecker may be imitated by completely filling the mouth with air and keeping the lips pushed well forward, while that of the Golden-fronted Woodpecker—*choogh-choogh*—is best given by pulling the lips back tightly, tautening the vocal chords, and making a hoarse, croupy noise in the throat, since the bird at all times sounds as if it has a bad cold.

Description.—Back and outer tail-feathers, finely barred black and white; rump plain white. Middle feathers of tail black, outer ones barred black and white. Forehead, tufts about nostrils, and patch at nape of neck, rich golden yellow. Under-parts light gray, washed with yellowish on belly. Big patch of red on crown. Female, yellows paler; no red on crown. Young, duller, less distinctly marked. L. 10. W. 5.50. T. 3.60. B. 1.30.

Field Marks.—Medium-sized; back barred black and white. Commonly confused with Red-bellied Woodpecker, but only crown is red, set in larger patch of gray; forehead and *hindneck golden-orange-yellow;* belly tinged with yellow instead of red; and, in flight, *conspicuous white rump* and *white bands near tips of wings.* Differs more in voice than in appearance or habits.

Popular Names.—Big Ladder-backed Woodpecker; Yellow-faced Woodpecker; Yellow-bellied Woodpecker; Yellow-naped Sapsucker; Yellow-fronted Woodpecker; White-rumped Woodpecker; Mesquite Woodpecker.

FLICKER

Colaptes auratus auratus (Linnæus)

Extremely rare summer resident, observed only at irregular intervals. *Recorded:* CEFG.

Geographical Distribution.—Southeastern United States, from North Carolina, southern Illinois, and southeastern Kansas southward to Southern Florida, the Gulf Coast, and southeastern and central Texas (Houston and Austin). Austroriparian.

Habitat.—Dead willows, lines of pecan trees, pecan groves, and mixed mesquites and pecans; always in marginal or bottomland timber, in open woods rather than in forest; usually beside some winding road.

Local Haunts.—Eastern half of the Region, west to the edge of the hills. Bouldin Creek, on the flattened valley of the Colorado River, several hundred yards back from the river's edge; Wheeler's Pecan Grove on Waller Creek; east bank, in valley of Barton Creek, about 50 yards below Barton Springs.

General Habits.—Similar to those of the Northern Flicker.

Breeding.—Probably middle April to early June. Nest containing eggs was found several years ago by small boys in Austin (B).

Nest Location.—10 to 20 feet, or higher up, in stubs of dead trees, or in high dead limbs, particularly those of willows and pecans.

Nest Construction.—Cavity dug by the birds.

Nest Measurements.—Entrance, diameter 2 to 4, average 2.35. Cavity, depth 13 to 18, diameter near bottom 4 to 6.

Eggs.—5 to 9, pure white, glossy, 1.09×.86.

Voice.—Similar to that of Northern Flicker. Beats a rolling tattooo with its bill on dead limb. Spring nesting call, a long, rapid, rolling *cuh-cuh-cuh-cuh-cuh-cuh-cuh-cuh-cuh* or *kuk-kuk-kuk-kuk-kuk-kuk-kuk-kuk-kuk*, sometimes raised to a higher-pitched *if-if-if-if-if-if-if-if-if-if* or *yik-yik-yik-yik-yik-yik-yik-yik-yik;* kept up for minutes at a time.

Description.—Similar to that of Northern Flicker, with subspecific differences.

Subspecific Characters.—Smaller, darker, and with more black and white below than Northern Flicker, and with broader, wider, black bars above. W. 5.65. T. 3.65. B. 1.33.

Field Marks.—Large size. Not streaked or barred with white, but spotted with black on breast and sides. Moustaches black in male, wanting in female. In flight, distinct white rump-patch; under surfaces of wings and tail conspicuously golden-yellow.

Popular Names.—Same as Northern Flicker.

NORTHERN FLICKER

Colaptes auratus luteus Bangs

Common winter resident; rarely late September, usually early October, not becoming common until a few days after arrival, to April, rarely staying to end of the month; begins moving northward late in February, and migrating commonly during March. In fall, September 20, 1919 (A); September 23 to October 4, 1902, tolerably common (R); October 3, 1915, 10 (F); October 11, 1914 (A); October 15, 1916 (F). In spring, April 30, 1921 (A); April 24, 1919 (A); April 22, 1915 (A); April 10, 1900 (T). *Recorded:* ABCDEFGHIJKMPQRTWY.

Geographical Distribution.—East of Rocky Mountains, from limit of trees in Alaska and northern Canada, southward to Virginia and central Illinois; occasionally on the Pacific Coast northward from northern California. Winters from northern United States southward to the Gulf Coast and southern Texas.

Habitat.—Wooded creek and river bottoms; edges of forests; open groves, mixed open woods along water courses having little underbrush, and wooded flats; oak woods on gravel terrace uplands; wooded vacant lots and dooryards about town.

Local Haunts.—Across the whole of the Region, but more commonly east of the hills. Pease north pasture; wooded bottoms of Walnut, Waller, Shoal, Onion, Williamson, and Barton creeks; vacant lots in town.

General Habits.—Observed singly or in pairs, and in small bunches or flocks, the latter particularly during migratory movements in fall and spring. A striking and forceful bird, though usually very shy, taking flight at close approach. In colder winter weather, keeps close to deeper ravines.

Feeding Habits.—Quite often found feeding on the ground, a habit unusual with woodpeckers and rarely indulged in by other members of the order. Tongue very long, with few barbs, and with a sticky salivary secretion used to hold insects. Searches for ants about decayed logs and stumps; feeds on bugs, crickets, grasshoppers, and caterpillars; eats weed seeds, grain, berries, and insects on the ground.

Flight.—Bounding, wave-like, undulating, up and down.

Voice.—Quite noisy. A rather soft, mellow *cuh-cuh-cuh;* a loud *clape, clape;* a sharp *wick, wick, wick;* a distinct *quit-u, quit-u;* a loud, emphatic *kew-yer, kee-you, keè-yer,* or *ka-yei,* discordant and nasal, more common in fall; a clear *kee-er;* a vigorous *keeough, skeeow, keearp,* or *kéorp;* a clear *piute;* a swishing *weechew, weechew, weechew,* tail stiffly spread, bowing and bobbing to another Flicker.

Description.—Brownish-gray above; brownish-white, washed with yellow, below. Narrowly barred on back and thickly spotted on breast with black. Slaty to ashy-gray crown, nape, and running onto back, with scarlet band across back of head; throat and sides of head pinkish-brown. Rump white. Tail black above, wings black above, both with shafts and under sides of feathers bright yellow. Black crescent on breast; black moustache patches. Underparts frequently paler to vinaceous-tinged whitish. Female, without black moustache patches; young females have dark moustache, which is lost as birds grow older. L. 12. W. 6.10. T. 4.05. Exp. C. 1.35.

Subspecific Characters.—Larger, paler, less black and white below than in Southern Flicker; narrower black bars above.

Field Marks.—No white streaks or bars, and no crest. Large medium size. Distinctive calls. Bill long, pointed. Ashy-*gray head, instead of* grayish-*brown* as in Red-shafted Flicker. In flight, *conspicuous white rump,* and *yellow under wings and tail.*

Popular Names.—Yellow-hammer; High-hole; Golden-winged Woodpecker; Whiterump; Ground Woodpecker; Yucker, Clape; High-holer; Pigeon Woodpecker; Flicker; Yellow-shafted Flicker; Ant Woodpecker. At least 124 popular names have been discovered in different parts of the country.

RED-SHAFTED FLICKER

Colaptes cafer collaris Vigors

Uncommon and irregular winter resident, rarer in colder parts of winter; since it is rarer than the Northern Flicker in the Region, dates of fall arrival and spring departure are not so extreme, although this form begins its northward spring migration later. In fall, October 13,

1916 (F); October 17, 1914 (A); October 22, 1919 (A). In spring, March 17, 1919 (A); March 18, 1917 (B); March 21, 1915 (A). *Recorded:* ABCDFGHI.

Geographical Distribution.—Western United States, southwestern Canada southward through Rocky Mountains to northwestern Mexico, west into Oregon and Washington and to Pacific Coast from northern California to Lower California, east to South Dakota and western Texas. Winters throughout milder parts of its range, southward into northern Mexico, southeastward to the edge of the limestone hills in south-central Texas.

Habitat.—Mixed open upland woods, post oak woodlands, pecan groves and marginal timber along streams, telegraph poles in town, and shade trees on vacant lots and along quieter streets.

Local Haunts.—More common in the Limestone Hill Area, where it begins to replace the more eastern Northern Flicker. Edges of Austin, hackberry shade trees and telegraph poles in town, upland post oak woods in northern part of town; Oakwood Cemetery; tall pecans in Wheeler's Grove.

General Habits.—Usually observed singly, rarely during migrations in pairs or in very small, loose flocks containing sometimes as many as 9 birds.

Feeding Habits.—Rather similar to those of the Northern Flicker. Feeds on insect larvae and on insects, particularly ants, grasshoppers, and crickets; and on seeds, acorns, and wild berries.

Voice.—Much coarser, rougher, and heavier than that of the Northern Flicker, easily distinguished when the two are heard calling near each other. A loud *kyee-yuk* or *chee-up;* flight call, *koh ur ur ruck* or *kruh ur rur ruh r-ruck*, repeated fairly rapidly during the undulating flight of the bird.

Description.—Very similar to Northern Flicker, similarly barred on back and spotted on breast with black. No red band on nape of neck, rump similarly white, tail and wings black above, and black crescent on breast. Sides of head and throat, gray instead of pinkish-brown. Red under wings and tail. Red moustache patches. Female, moustache patch buffy to brown; young without moustache. L. 13.25. W. 6.75. T. 4.75. Exp. C. 1.44.

Plumage Peculiarities.—Intermediates between the Northern Flicker and the Red-shafted Flicker, frequently called Hybrid Flicker, *C. auratus hybridus* (Baird) or *C. auratus luteus* X *C. cafer collaris*, found along the area of overlapping of ranges of the two, are not uncommon in winter in and about Austin and in the hills west of the city; all combinations between the two plumages occur, sometimes nearer one species, sometimes nearer the other, as perhaps a Northern Flicker with half the tail-lining orange-red, moustaches red, or moustache mixed black and red.

Field Marks.—Richer colored than the eastern Flickers; no red on back of head. *Crown* and neck light *brown instead of* dark *gray*. Red moustache patches instead of black. *Under side of wings and tail golden red* instead of yellow, conspicuous in flight. Sides of head and throat gray instead of pinkish-brown.

Popular Names.—Red Hammer; Western Flicker; Rocky Mountain Flicker.

CHUCK-WILL'S-WIDOW

Antrostomus carolinensis (Gmelin)

Common summer resident, though slightly more common during migrations, when birds from other regions are passing through; middle April to early September. In spring, arrivals, April 10, 1904 (H); April 16, 1905 (B), and common April 18, 1905 (B); April 16, 1920 (A); April 17, 1921 (A); April 18, 1915 (F); April 13, 1919 (A); April 21, 1895 (L); April 23, 1922 (A). *Recorded:* ABCDEFGHIJKLMNOPQWY.

Geographical Distribution.—Eastern United States, from Virginia and Missouri south to the Gulf States and central Texas, west to Fort Clark, Texas; reaches in the hills west of Austin the western limit of its common and regular range. Winters from southern Florida to northern South America.

Habitat.—Leaf-strewn ground in thickets on dry ground of slopes and flat tops; dense, cedar-clad limestone hillsides; oak woodlands on slopes and gravelly terraces. Never in low, wet wooded valleys or bottoms except during migrations.

Local Haunts.—Cedar-clad slopes in the hills, particularly the cedar and mixed wooded slopes of Barton, Onion, and Williamson creeks, east to the San Antonio road; Taylor's lime kiln; Waller Creek east of the University; Hornberger's Hill on eastern edge of Austin; Pease west pasture; slopes of Lake Austin; south slope (facing north) alongside the Barton Creek river-bottom road between Barton Springs and Austin. Migrates northward along the wooded valleys of Shoal, Waller, and Walnut creeks.

General Habits.—An Austroriparian and Lower Sonoran bird observed singly or in pairs; in migrations, rarely in small companies, never in large flocks. Spends the day silent and hidden away in dark, shady places in woods, especially on dry rocky hillsides or ravine slopes in the hills resting on the ground, on fallen logs among underbrush, or lengthwise on the limb of a tree. Rarely seen on the wing in the daytime because of its shy and crepuscular habits, though occasionally accidently startled from its hiding place; but after nightfall it becomes alert, and as many as a dozen may be heard calling in a favorable locality; moves about mainly during the dusky hours at nightfall and around daybreak.

Migration.—Migrates by night.

Feeding Habits.—Begins feeding at twilight, flying hither and thither, catching its food on the wing; its gape is enormous, its wide-open mouth measuring about 2 inches from corner to corner. Feeds largely on beetles, winged ants, and other insects which fly about at night; large objects may be easily swallowed, and it has been known to pursue, catch, and swallow hummingbirds, warblers, and sparrows, which may have been mistaken for large moths.

Flight.—Noiseless, like an owl; extremely graceful and agile, generally low, constantly twisting and turning from one course to another as it feeds on passing insects, dropping down suddenly to skim the ground for an instant, then dashing upward again.

Breeding.—Earliest: May 15, 1905, 2 fresh eggs (E); May 16, 1909, 2 eggs, incubation advanced (E); May 17, 1893, 2 heavily incubated eggs (O); May 27, 1906, 2 eggs, one almost hatched, the other infertile (E). Latest: June 16, 1907, 2 slightly incubated eggs (E). Probably eggs may be found during last week of April. Usually one, occasionally two broods. *Breeding recorded:* BCEHJLMNOW.

Nest Location.—On ground in shadows of dense thickets and under low trees whose branches nearly touch the ground, generally on cedar-clad slopes, slopes of rocky ravines, and brush-covered hillsides; less commonly in dry flat woods.

Nest Construction.—None. Eggs laid on ground on dry leaves or dry brown cedar mast, with which they harmonize so closely that they can scarcely be seen.

Eggs.—2, equally rounded at both ends, moderately glossy; a faint, subtle creamy-pink, lightly and delicately mottled and faintly marbled and spotted with tawny, fawn, pearl and lilac-gray, lavender, drab, and buff-brown, 1.38×1.02.

Voice.—A moderately rapid, melancholy (*chuck*)-*weeow'-weeow'*, the first note low and short, the last two full, equal, and steady, rather harsh and distinctly not a clear whistle; uttered at regular intervals all night, from nightfall until daybreak, but most commonly before nine and after dusk; on a still night the call may be heard for a mile or more; sometimes the chuck is so low that only a quick ear catches more than the last two parts of the call. Call said also to sound like *chuck-will's-wid'ow* or *jack-mar'd-a-wid'ow*, though both are rather fanciful: sometimes written *che qui bro, che qui bro*, a brief pause after the first three syllables. When flushed from eggs, a low *chock, chock*. Call, louder than that of the Whippoorwill, less rapidly uttered.

Description.—General color all over, dark cinnamon-brown, more reddish-brown on wings and tail; body mottled, spotted, and barred with tawny and blackish; throat tawny; imperfect whitish band across upper breast. Terminal third of outer tail-feathers whitish-buff, the outer vane of each feather edged with rusty. Female, upper-breast band buff, and without whitish-buff in tail. Young, lighter, tawny on wings, grayer on top of head. Large, stiffened rictal bristles at edges and basal corners of mouth, with long, conspicuous, lateral filaments or hair-like branches. L. 12. W. 8.80. T. 6.25. B. .40.

Field Marks.—Larger and much lighter brown in color than the Whip-poorwill, of which this is the southern representative. General cinnamon color, with *buffy throat*. Long, *branching bristles* along mouth-edge at base of bill.

Popular Names.—Whip-poor-will; Jack-married-a-widow; Mosquito-eater; Brown Will-o'-the-Wisp; Dutch Whippoorwill; Spanish Whip-poorwill; Carolina Goatsucker.

WHIPPOORWILL

Setochalcis[141] *vocifera vocifera* (Wilson)

Rather rare migrant; middle September to late October or, rarely, early November, and second week in April to early May. In fall, September 23 to October 4, 1902, 1 killed (R); November 4, 1921 (A); September 16, 1914 (A). In spring, March 29, 1914 (G); April 10, 1922 (A); April 27, 1916 (F); May 6, 1919 (A). *Recorded:* ABCD-FGR.

Geographical Distribution.—Southeastern Canada and eastern United States south to northern parts of Georgia, Louisiana, and Texas, west to the Great Plains in North Dakota and Kansas and to middle northern border of Texas. West to central Texas during migrations. Winters from southern parts of the Gulf States and the lowlands of South Carolina southward to Central America.

Habitat.—Deep woodlands and undergrowth, usually near prairies: generally where there is little underbrush and where the ground is bare and carpeted with leaves. In migrations, woodlands along creek valleys; patches of oak and elm woods.

Local Haunts.—Patches of open woods near the prairies northeast of town: Waller Creek cedar brakes: Shoal Creek and Pease Park: along roads in the river valley.

General Habits.—Observed singly. During daytime squats lengthwise on dead limbs in dark, secluded woodlands or on dead leaves among thickets in woods; chiefly nocturnal, awakening at dusk and beginning its hunt for food. Awkward on the ground because of its weak, short feet. Occasionally indulges in dust-bath along well traveled roads to rid itself of vermin.

Feeding Habits.—Glides like a shadow close along the ground after night-flying insects, particularly grasshoppers and large beetles, which it catches on the wing; hunts along edges of woodlands.

Flight.—Strong, swift, graceful, entirely noiseless; stays close to the ground, never sweeping through the air or remaining high overhead as does the Howell Nighthawk. Wing expanse, 16 to 18 inches.

Voice.—Usually quiet during its migration; sometimes during the early part of the night, beginning at dusk, its clear, ringing, plaintive, rapid *w-w-whipp''-poor-will'* is frequently repeated with a snap and a swing for minutes at a time; a vigorously uttered *w-w-whip'-poor-will, w-w-whip'-poor-will, w-w-whip'-poor-will*, a regular, rhythmical, metallic whistle, of each triplet the second lower than the first and the third higher than the first two. Close at hand one hears a soft, preliminary, inhaling chuck, and the call sounds like (*cuh*)-*whip-poor-wick*, (*cuh*)-*whip-poor-wick*. Flight calls, while feeding, an almost imperceptible *zue-see, zue-see* and a low, purring, grunting *dack-dack*.

Description.—Mottled dark gray and black, mostly black in streaks, spots, and bars; under-parts mixed tawny and black; throat blackish, edged below with a thin white band on upper breast; breast blackish; belly cream-buffy, irregularly barred with blackish. Outer 3 tail-feathers on each side broadly and distinctly tipped with white for more than terminal third of their length. Female, throat band more buffy; less white in tail, more obscured; duller. Young, bright tawny above, mottled gray on crown; plain buffy below; black spots on crown and shoulders. Wide mouth, short bill, and rounded tail. Rictal bristles about base of bill, long, stiffened, simple, without lateral filaments or hair-like branches. L. 9.75. W. 6.10. T. 4.75. B. .38.

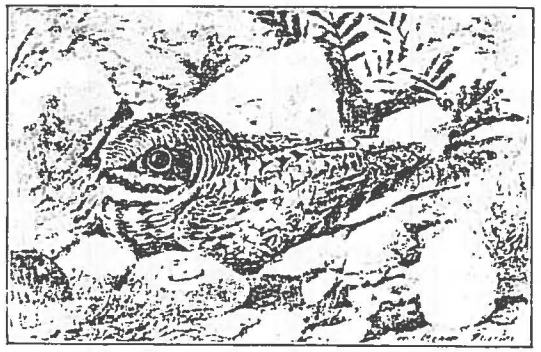
Field Marks.—Quite similar to Chuck-will's-widow, but smaller; deep, dark brown to almost blackish, instead of rich cinnamon-brown. *No white spots in wing. Conspicuous large white corners to dark tail.* Characteristic whistle-call.

Popular Names.—Night-jar; Will-o'-the-Wisp; Black Whippoorwill.

POORWILL

Phalaenoptilus nuttallii nuttallii[142] (Audubon)

Extremely rare summer resident, from middle March to early October. In spring, March 16, 1921 (A); April 10, 1900, 1 (T); April 24, 1922 (A); April 29, 1919 (A). In fall, September 18, 1916, common and evidently migrating (F); October 5, 1921 (A). *Recorded:* ACFT.



Bailey LAF

POOR-WILL

Geographical Distribution. — From southwestern Canada and North Dakota south through the western part of the United States to Arizona, southern Texas, and northern Mexico; east to the edge of the Great Plains in central Texas, though range irregular and local in western Texas; fairly common summer resident in Bexar, Kerr, Young, and Eastland counties. Winters from southern California and southern Texas to central Mexico.

Habitat.—High, gravelly flats or bits of plateau grown with post oak timber and with occasional moist spots; gravel patches dotted with

catsclaw bushes, located in post oak growth on slopes and flat tops of hills; high prairies on rough ground along the terraces of valleys; bare ground on rocky hillsides; among shrubbery or on open semi-arid flats.

Local Haunts.—Upland gravel terrace post oak woods in and east of the city; thickets near Austin; catsclaw flats in river bottom at Austin. In fall migration, on mountainous slopes in hills 5 miles southwest of Barton Springs.

General Habits.—This tiny, beautiful little "Night-jar" may be more common than is generally supposed; it is usually observed singly, though several birds may be heard calling in a general vicinity; the voice is better known than the bird. Its eyes are of little use in the daytime, and bright sunlight blinds it. In the daytime it rests lengthwise on small tree limbs along creeks and washes or among bushes on gravelly ridges; flies about in the dim light, many probably moving down to the dry gravelly flats of the Colorado River at night to feed. Its plumage above is soft, velvety, moth-like; its colors blend with the leaves and rocks of shady places under bushes.

Feeding Habits.—Hunts beetles, moths, locusts, and other night-flying insects along roads and across open flats, catching them on the wing. Indigestible parts of food are, as in birds of prey, ejected from the mouth in the form of pellets.

Flight.—Soft, noiseless. Sits on ground, and flies up and flutters around in short sallies.

Breeding.—Possibly. Late March and early April, possibly to middle May.

Nest Location.—Bare patches of gravel or low, flat rocks under catsclaw bushes in small clearing, less commonly among shrubbery or on open flats, in post oak growth on slopes and on flat tops of hills.

Nest Construction.—None. Eggs laid on bare gravel or on rock.

Eggs.—2, rather blunt elliptical-oval, smooth and moderately glossy; such an extremely faint cream-color as to be practically pure dead white, unmarked, 1.10×.80.

Voice.—A mellow, mournful-sounding *puih-whee-ee, puih-whee-ee,* the last syllable so low that it cannot be detected unless the bird is close at hand; sometimes resembles a mournful *poor-will-ee;* slightly further away, sound *poor-will, poor-will;* still further away, *p'-will, p'-will.* Calls just after dusk, repeated, and answered by other birds in the neighborhood; a soft, soothing voice of warm evenings in moonlit canyons.

Description.—Colors blended and mottled grayish-brown, black, bronze, gray, and white, with sharp, clear, black bars and arrow-shaped marks. Sides of head and chin black; broad white zone or bar across throat, bordered below with black. Tail tipped with white on all but middle feathers; under-tail-coverts plain buffy; remainder of underparts barred. Female, narrower white tips to tail. Young, more silvery-gray and rusty above; white markings of throat and tail smaller and tinged with buffy; and black markings smaller and less distinct. L. 8. W. 5.60. T. 3.60.

Plumage Peculiarities.—A smaller, decidedly paler, less conspicuously black-marked color-phase—distinctly gray to silvery or hoary above, with little if any solid black on chest, and with mottled grayish-brown chin and sides of head—is recognized by many as a separate subspecies, the Frosted Poorwill, *P. n. nitidus* Brewster, ranging from Kansas and Arizona to Texas and northern Mexico.

Field Marks.—Small size. Broad white corners to rounded tail (narrower and buffy in female). *Frosted-gray* or *silvery-gray colors.*

Popular Names.—Little Whippoorwill; Pale Poorwill.

HOWELL'S NIGHTHAWK

Chordeiles minor[143] *howelli*[144] (Oberholser)

Common migrant and fairly common summer resident, last of April to early October; migrates commonly, August 10 to September 22, and April 20 to May 15. Earliest: April 16, 1920 (A); April 17, 1921 (A); April 18, 1915 (A); April 19, 1919 (A); April 19, 1922 (A); April 27, 1895 (L). In fall, last local breeding birds seen, August 28, 1915 (O). *Recorded:* ABCDEFGH[145]IJKLMNOPQWY.

Geographical Distribution.—Southern portion of the Great Plains and the Rocky Mountain district, through northwestern, central-northern, and central Texas, reaching its southern limit at Austin. Migrates southward across central and southern Texas. Winters in South America.

Habitat.—Always in open country, never in deep woods. The plains; barren fields; cowtrails in pastures; roadsides and along railroad tracks; barren gravelly ridges, and gravelly surfaces in the open, barren hills; blackland plowed fields; rocky hillsides; edges of woodlands; flat, gravelly roofs of office buildings in town.

Local Haunts.—Gravel beds on south side of Colorado River, between the two upper bridges; gravel island below Congress Avenue bridge; rocky rises or ridges in hard-baked cotton and corn fields; tops of buildings in town; rarely, open gravel spots and plateau remnants back in the hills.

General Habits.—Usually observed singly or in pairs, though occasionally in flocks during migrations. More active during the declining hours of the day, usually spending the brighter hours in drowsy sleep. Alights usually on the ground, where its color harmonizes with the surroundings, or on flat surfaces, such as rocks, tops of fence-posts, flat roofs, and similar places, where it remains with closed eyes and with its long wings shut against its sides; when it alights on the limb of a tree, it is generally compelled, because of its weak feet, to sit lengthwise on the perch; when flushed from her gray, gravel-colored eggs or her downy young, the female flutters and limps away as if crippled, drawing attention away from her possessions, which, because of their protective coloration, disappear against their background once the observer takes his eye from them; frequently dives and with her wings strikes the observer at the nest; it has been once observed, however, sitting crosswise of a heavy guy-wire ascending at an angle of forty-five degrees.

Migration.—Arrives by ones and twos, usually about April 18; and, sometimes, a week later by small flocks. Generally migrates by night, usually at a tremendous height from the ground; often, however, swift-flying flocks pass over during the cloudy, drizzly days, for the Nighthawk is a rapid migrant. More frequently seen in flocks during the fall migration. Gathers in flocks in late summer, mid-July to third week in August; migration begins early in August, and by the end of that month the local breeding birds have departed; hundreds pass through, August 10 to August 30, but the last have not gone until late in October. During one fall migration flocks containing as many as 200 to 300 birds were observed on the open prairies northeast of Austin (B). During both migration seasons the various subspecies of nighthawks mix up on their way to and from South America, so that identification of migrants is hopeless without a specimen in hand.

Feeding Habits.—With a mouth so wide as to form a miniature cavern, the bird spends most of its waking hours aloft, coursing back and forth with mouth agape, catching all of its food on the wing, engulfing moths, flies, beetles, grasshoppers, crickets, weevils, flying ants, and mosquitos. Mounts high in the air shortly after sunset to begin

its feeding. Rarely touches water except during hot summer days, when it lightly skims ponds or gently-flowing streams with open mouth and gently lowered mandible.

Flight.—Spends most of its time in the air, principally at twilight, on cloudy days, and on moonlight nights, though it may occasionally be observed at any time during the day; darts, flaps along in a straight line, circles, sails with wings set at an upward angle, and drifts lightly and swiftly overhead. Wings are abnormally developed, and the flight is strong, swift, light, bat-like, graceful. One of the strongest and most graceful of flyers, frequently demonstrating wonderful aerial performances as it flies erratically about. Now and then dives earthward on half-closed wings with tremendous speed; just before the ground is reached, the bird checks its rapid descent by an abrupt upward turn and a roaring *BOOM-M-M!* of its wings, caused by the quick passage of air between the primary flight-feathers as the bird suddenly checks its sky-coasting, and mounts upward again on leisurely wings.

Breeding.—Second week in May to last week in June. Earliest: May 23, 1910, 2 eggs, one slightly incubated, the other heavily incubated (B); May 5, 1895. 2 fresh eggs (L); May 6, 1919, 2 fresh eggs (A). Latest: June 20, 1905, 2 slightly incubated eggs (B); July 15, 1906, 2 eggs, one-third incubated (E). Eggs deposited on alternate days; incubation, beginning usually with laying of first eggs, lasts about 16 days. Two broods, with an average of 52 days from laying of first to laying of second set; if eggs are destroyed, as many as four sets are laid in succession. *Breeding recorded:* ABEFGJLMNO.

Nest Location.—Bare gravelly ground on gravel beds; gravel islands along the river flats and valleys; little gravelly ridges and gravelly spots on rises, and the rocky and semi-barren pastures, in the blackland farming sections. Occasionally flat, gravel-covered roofs of office buildings in town.

Nest Construction.—None. Eggs laid on bare, gravelly ground or on flat, gravel roofs of buildings, where the mottling of the eggs presents an excellent example of protective coloration against the gravel surface, making them exceedingly difficult to find. Occasionally placed on hard-baked, dark soil or on bare rock.

Eggs.—2, elliptical, oval-oblong, rarely subspherical; white, gray, buff, or light olive; much mottled and marked all over, speckled, spotted, and irregularly marked with small streaks of blackish, drab, gray, olive, plumbeous, olive vandyke-brown, greenish-olive; and faintly clouded with lilac-gray and olive-gray. Three distinct types of eggs: (1) rich olive-buff, handsomely but sparingly marked with olive and brownish; (2) gray, with evenly-distributed, blended, gray-brown, salt-and-pepper markings; and (3) whitish-gray, with bold, gray-brown, blackish, and olive markings, thickest in a perceptible ring or wreath about the middle of the egg. Size, 1.17×.84, with considerable variation; longest 1.26, shortest 1.07; widest .91, narrowest .78.

Voice.—A peevish *peenk* or *peent*, sometimes varying to *ach-enk'* or *peeyuk*, uttered at more or less regular intervals, and usually followed by two or three flitting wing-beats; often distinctly heard when the bird is but a speck in the sky; a common night-migration sound, uttered also commonly by summer birds on dull days, at twilight, and during parts of the night. Male of pair, a nasal *spēē-rk* or *spaerk;* female, a clear, somewhat higher *spēēt'* or *spee* and a low, rapid *puck-puck-puck-puck*. For booming sound, see description of flight. Nestling, voice somewhat like that of a barnyard chick: a low, nasal, purring *wherrp;* when frightened, *skah* or *pea-rp'*.

Description.—Dark brownish to blackish-gray, mottled above, marked with fine, wavy lines below; white patch at throat, white line across near tip of slightly forked dark tail, and white patch near tip of each wing on 5 outer quills and mainly nearer bend of wing than tip of seventh quill. Female with little or no white on tail. Wide slit mouth and prominent nostrils; but tiny, obscure beak. Almost no bristles about mouth. Feet small, weak, and practically useless. Young, mottled dark gray, cream and brown, like flattened ball of fluffy worsted, harmonizing well with usual soil tints; grown young, feathered, more mottled than adults. L. 9.12. W. 7.12. T. 4.20. B. .25.

Plumage Peculiarities.—Austin bird approaches the smaller, paler, grayer Aserri Nighthawk, *C. m. aserriensis*, of southern Texas, in being smaller than the usual Howell Nighthawk but like it in color. Austin is between the ranges of the two forms, and such a condition is to be expected; inter-gradation between the two takes place somewhere between Austin and San Antonio, where *aserriensis* occurs.

Subspecific Characters.—Dark of upper-parts is rather rufous-brown, and the light mottlings ochraceous-buffy. Breeding female shot July 12, 1915 (A), for subspecific identification.

Field Marks.—Easy, erratic, day flying, with diving and booming. Nasal cry. *White* bar or *crescent across wing*, appearing like a hole in flight. *White throat* (rusty in female). Male with *white band across tail.*

Popular Names.—Bull Bat; Mosquito Hawk; Goatsucker; Will-o'the-wisp; Piramidig; Nighthawk.

CHIMNEY SWIFT

Chaetura pelagica (Linnæus)

Uncommon irregular migrant, occasionally very common for a few days in spring; first half of October, and late March to middle May. In fall, October 2, 1921 (A); October 16 1920, 3 (A). In spring, 1915, March 26, pair (A); April 25, 16 in singles and pairs (A); April 25 to 27, many migrating bunches (B); May 14, 1 (A); also, April 1, 1916, 4 (G); April 28, 1919, 10 (A); May 2, 1919, 100 (A); May 5, 1919, pair (A); May 10, 1919, 7 p. m., 1 flying northwest (H). *Recorded:* ABCEGKMNQW.

Geographical Distribution.—Eastern North America, from southern Canada and Labrador to the Gulf Coast, west to the edge of the Great Plains from eastern Montana to eastern Texas. Rarely west of the Austin Region. Migrates to Mexico and northern Central America for the winter.

Habitat.—About towns; where alternation of open fields and patches of woods may be found.

Local Haunts.—Business district of Austin; open country, both uplands and river bottoms, along south side of Colorado River and east of Barton Creek, particularly along the Oak Hill road about 3 miles from Austin.

General Habits.—Occurs singly or in small flocks of from 3 to 15, rarely in larger flocks to 300. During migrations it is more common immediately following heavy rains. Usually flies high, moving rapidly northward or southward when migrating, at any time of the day. More active during the early morning and about dusk in the late afternoon. Never known to alight except in chimneys or in hollow trees, in which it roosts by clinging to the walls with its strong feet and using its many-pointed, spine-tipped tail as a prop or brace. Out by dawn, twittering gaily about, flying incessantly; hitches its way up the sooty upright surfaces inside chimneys by use of its small feet and its bracing tail-spines. At dusk the birds circle high over housetops; and, as it grows darker, they dart, stop short, dive, and flutter down the black mouths of chimneys where they spend the night.

Feeding Habits.—Feeds entirely upon insects caught while flying about from daylight until dark; largely insect pests, such as winged adults of weevils, aphids, moths, mosquitos, gnats, and flies.

Flight.—Powerful, swift, trembling, irregular, with rapid, alternating strokes of its incredibly long, sabre-shaped wings. Circles overhead or whizzes rapidly across the sky, alternately beating its wings so fast that they cannot be seen, and then sailing for a few yards, sometimes with wings held aloft over back. Slides smoothly along, rowing through the air on blurry wings.

Breeding.—Possibly. May and early June.

Nest Location.—In dark chimneys, generally about 8 to 10 feet from the top; occasionally in hollow trees.

Nest Construction.—Half saucer, composed of tiny twigs and saliva glue, and glued or stuck like a small bracket-shelf or wall-pocket to bricks on the perpendicular inside wall of a chimney; this strange gummy salivary glue of the Swift is peculiar to it, and defies all but the hardest rain.

Nest Building.—Gathers nesting material on the wing, pausing momentarily in flight to break off tiny twigs. Nest-building requires about 18 days, largely because only a small amount of glue is secreted daily.

Eggs.—4 or 5, rarely 6, oblong, pure white, .80×.50.

Voice.—A rolling, twittering, sharp, rapid *tick, tick, tick, tick, tick, tick-tick-tick-tick-zig-zig-zig-zig-zig-zig-zig-zig, tick, tick, tick,* or a sharp-sounding, rolling *chip chip chip chip chip chip-chip-chip-chip-chip-chip-chip-chip chip chip chip chip chip!*, uttered on the wing. A soft, low, rapid *pewp-pewp-pewp-pewp*, sometimes becoming a sharper, more distinct *pweep, pweep.*

Description.—Sooty-gray or very dark, indefinite dark brown all over, paler on throat. Tail-feathers tipped with spines, the shafts extending beyond the vanes of the feathers. Tarsus and toes naked, with hind-toe pointing backward. L. 5.50. W. 5. T. (incl. spines) 2. B. from N. .15.

Field Marks.—Peculiar flight and habits; seen only on the wing in flickering flight, alternating with sailing, soaring, circling, wheeling, or darting. *Sooty*, dusky, *bow-and-arrow body; long wings;* and short tail. Resembles a winged cigar.

Popular Names.—Chimney Swallow; Chimney Sweep; Storm Sparrow; Chimney Swift; Eastern Swift; American Swift; Bristle-tailed Swallow.

RUBY-THROATED HUMMINGBIRD

Archilochus colubris (Linnæus)

Moderately common migrant, uncommon summer resident, and very rare winter resident; usually observed from late March to middle October, particularly common during migrations from April 6 or 10 to early May and through September into early October. In spring, migrant arrivals, March 26, 1916 (G); March 28, 1919 (A); March 28, 1922 (A); March 29, 1914 (G); March 31, 1921 (A); April 1, 1912 (B). In fall, migrant departures, October 3, 1915 (F); October 15, 1914 (A); October 18, 1921 (A). Winter record, January 17, 1920 (A). *Recorded:* ABCDEFGHIJKLMNOPQRWY.

Geographical Distribution.—Eastern North America, from Canada to the Gulf Coast, west to the Dakotas and Kansas, and southwest in Texas to Austin and Houston. Winters from southern Texas, southern Louisiana, and the southern tip of Florida southward to Central America. The only one of our five hundred and more hummingbirds that is found in the eastern United States.

Habitat.—About honeysuckle, trumpet, and morning-glory vines and city flower-gardens; orchards, particularly those of peach or pear; generally along small waterways or in open, cultivated country interspersed with small patches of mixed woods.

Local Haunts.—Big pear trees in orchards and big elms in mottes, east and southeast of town; large live oaks around the old Kavanaugh home, southeast of the University campus; oak shade trees through residential section immediately north of campus; campus of the University; flower-beds and honeysuckle vines edging porches in the southeastern part of town. West to the eastern edge of the hills, which it enters only during migrations. Migrates commonly along Shoal, Waller, Walnut, and Barton creeks.

General Habits.—Usually observed singly or in pairs, though during the courtship season several males may be seen assembled to pay homage to a single female. Notwithstanding its diminutive size, this bird is practically fearless, and is warlike and pugnacious, attacking any bird of any size, if such intruder should disturb its domain. Occasionally confused with the sphinx or hummingbird moth. Common everywhere during migrations, particularly during spring, when it moves northward along stream valleys; but, locally, very irregularly distributed during the breeding season. As soon as the nest is built and the eggs are laid, the male departs and deserts, leaving the female to care for the young, which leave the nest in about three weeks and fly with ease at once. Perches frequently on trees or bushes, being either aerial or arboreal, and preens its feathers; delights in a bath, much as do certain other birds.

Feeding Habits.—During feeding it hangs suspended in front of its flower, its wings beating so rapidly as to appear a gray film with the edges as mere black threads; sometimes it perches on runners and feeds in the nearest flowers. Usually visits favorite feeding grounds several times a day, feeding about tube and trumpet flowers, particularly the long-tubed honeysuckle, on nectar, tiny insects, and spiders, which it secures by means of its proboscis-like tongue. Feeds young by regurgitation, plunging long bill deep into nestling's open mouth and throat and pumping its food, which consists mainly of minute predigested insects. Particularly fond of feeding about the honeysuckle, red buckeye (whose blooming in spring announces the arrival of the hummer), scarlet creeper, *Penstemon*, and similar flowers; in summer, when tube-flowers are scarce, it feeds on honey-dew and tiny insects among the leaves in heavier patches of woodland.

Flight.—Rapid, darting, with a whirr and a flash, from flower to flower, with a stable poising in front of each; a dazzling beating of wings in flight; so rapid on the wing that it shoots away to a speck, like a winged bullet, so quickly that the eye seems scarcely able to follow it. In order to draw its slender needle bill out of a trumpet flower, it flies backward by a quick downward and forward flirt of its expanded tail. But a comparatively small part of the time is spent on the wing.

Courtship.—Males chase one another about with considerable noise, and disport themselves and even fight in front of a quiet, onlooking female.

Breeds.—May and June. Eggs and young on numerous occasions, but no definite date for record. *Breeding recorded:* BCILNW.[16]

Nest Location.—6 to 20 feet from ground, saddled on an inch-thick limb toward the end of a horizontal or drooping branch of an orchard pear or a large live oak; generally in a pear orchard, an oak shade tree, or an extremely thick honeysuckle vine, though once on a cypress limb overhanging the water of the Colorado River, just above the mouth of Barton Creek. Never found nesting in the hills.

Nest Construction.—Beautiful, felted, cup-shaped structure, about the size of a hulled walnut, composed of fine wooly plant fiber and spider webs, warmly lined with soft plant down, and ornamented outside with a mosaic coating of bits of gray-green lichen fastened with spider webbing. Resembles a small bunch of moss or a small lichen-covered knot on a limb.

Nest Building.—Nest frequently added to during incubation of eggs and rearing of young. New nest frequently built on top of old one.

Nest Measurements.—Outside, diameter 1.50, height 1.25. Inside of cup, diameter 1, depth .62. Larger when placed on thicker limbs.

Eggs.—2, elliptical oval, capsular or bean-like, usually oblong, nearly alike at both ends; delicate, but comparatively thick-shelled; nearly pure dead white, very rarely with a faint pinkish glow; .51×.32.

Voice.—Low, very faint twittering or warbling twitter, with a chippering buzzing quality; a very rapid series of harsh, rather shrill, squealing squeaks, *zick-zee-zee-a-zee-zee*, the first note much higher than the others; angry twitters and squeaks; sharp, squeaky, mouselike when excited or suspicious. Flight call, while feeding, a very short, low, deep, throaty *tzook*.

Description.—Upper-parts glistening greenish; wings and tail dark; under-parts light dusky to greenish dusky. Chin velvety black, and throat a dead black until the light strikes it from a certain angle, when throat seems dazzlingly afire with crimson or ruby-red; bordered on breast by whitish. Tail blackish, slightly forked for about a third of an inch. Female, without ruby-throat; paler to whitish below; tail nearly even, double rounded, largely blackish but with central feathers greenish, and with white spots at tips of three outer pairs. Bill long and needle-like. L. 3.20 (female 3.70). W. 1.54 (female 1.70). T. 1.15. B. .70.

Field Marks.—Bright glistening greenish upper-parts. Long, needle-like bill, extremely thin and pointed. Gorget, or throat-patch, of male, glowing metallic ruby-red, changing to golden-red.

Popular Names.—Hummer; Honeysuckle Hummer; Eastern Hummer; Northern Hummer; Eastern Hummingbird.

BLACK-CHINNED HUMMINGBIRD

Archilochus alexandri (Bourcier & Mulsant)

Very common migrant, and fairly common summer resident: arrives last week in March, abundant first week in April, and departs late September or early October. In spring, March 28, 1915, males arrived (A); April 4, 1915, females arrived (A); April 1, 1912, abundant (B). In fall, last observed, September 14, 1916 (F); September 27, 1914 (A); October 4, 1919 (A). *Recorded*: ABCDEFGHIJLMOQ.

Geographical Distribution.—Western North America, between the Rocky Mountains and the Pacific Ocean, and from Canada to northern Mexico; east to Utah and to west-central Texas at Austin and San Antonio, south into Sonora, Mexico. Winters in western, central, and southern Mexico.

Habitat.—Along sycamore-lined water-courses in canyons of the limestone foothills; most abundant in the foothills, although found from lowlands to mountain top; live oak hills and valleys: mountain Spanish oak and mountain live oak flats in valleys along the base of the hills.

Local Haunts.—Campbell Hole bend and flat on Barton Creek, and from that point upstream; slopes of Mt. Bonnell and Mt. Barker; deep canyon of Hamilton's Pool; base of Deep Eddy cliffs; western slope of Lake Austin; rough, rocky slope of hills along canyons. Confined to the Limestone Hill Area in the Austin Region, though of much more general distribution further west.

General Habits.—Observed singly and in pairs; rarely, several together in family group, in flock during migration, or in assemblage of contestants during courtship season. Quiet and modest, though occasionally quite pugnacious; one pair nested but three feet away from the occupied nest of a pair of Blue-gray Gnatcatchers. More abundant during moist seasons, when the hillsides are covered with rich flowers; particularly abundant after the season of spring rains because of the abundance of flowering plants; scarcer during dry seasons. Perches on twigs of bushes, touching its feathers here and there with its long bill in preening. Males are seldom seen along the edges of creeks, where the nests are located.

Feeding Habits.—Hovers and feeds about the laterally-clustered pink flowers of the Texas buckeye, the pink flowers of the Texas redbud, and the rich purple and overpoweringly-perfumed flowers of the Texas mountain laurel on slopes and flattened valleys in the hills, largely on minute insects but also on nectar, pollen, and dew.

Flight.—Quite like that of the Ruby-throated Hummingbird, ricochets away like a winged bullet.

Courtship.—Males show themselves before and frequently fight for a female.

Breeding.—April, May, and June. Earliest: April 19, 1908, 2 eggs, on the point of hatching (E). Latest: June 12, 1895, 2 fresh eggs (L). Two broods. *Breeding recorded:* AEH[147]IJLMO.

Nest Location.—4 to 20, average 7, feet up in sycamore, cedar elm, mountain Spanish oak, cottonwood, and black willow trees and bushes, generally overhanging or within sight of water, usually in canyon among foothills; generally a living, rarely a dead, tree; but saddled as a rule on a small dead branch or fork at extremity of horizontal or drooping limb of such living tree or shrub standing on the edge of a stream in canyon.

Nest Construction.—Differs from the nest of the Ruby-throated Hummingbird in having, typically, a yellowish, spongy appearance, being composed largely of yellow fuzz from the under side of sycamore leaves and of other light-colored plant down and fibers, without exterior decoration of moss, lichens, or flowers. Composed of plants varying from white to buff or yellow, and of delicate grass seed stems and tiny, downy sycamore buds; felted cottonwood and willow down; occasionally small leaves, oak blossoms, or minute flowers are worked into the nest or attached by spider webs; thickly lined with plant down or numerous very tiny, fine feathers. Tiny, nearly circular, rounded, high-rimmed, deeply-cupped, yellowish, spongy structure; thickly coated with spider webs; rarely with a lichen or two scattered irregularly over the outside surface, but never with a thick covering of lichens.

Nest Building.—Male collecting spider webs from dense bed of prickly-pear cactus, May 16, 1915 (A).

Nest Measurements.—Outside, diameter 1.50 by 1.55 to 1.80, height 1.06. Inside of cup, diameter .75 to .87 by .79 to .91, depth .60 to .70.

Eggs.—2, elliptical, pure white, a trifle smaller than eggs of the Ruby-throated Hummingbird; .48×.34.

Voice.—Song, by male, a sweet and low, though very high-pitched warble, like the sound produced as a result of whistling through the teeth; on still air, can be heard for 25 or 30 feet. Chase note, similar to song, but louder and chippering, like a light and rapid smacking of the lips together, uttered as one bird rapidly chases another hither and thither.

Description.—Greenish above, to green on sides; soiled white below. Throat patch or gorget, front half opaque velvety black, back half metallic violet, glittering with lights of purple, blue, and peacock green. Female, more bronzy-green above, more grayish below; tail much rounded, with middle pair of feathers longest and entirely green, next two tipped with black, and outer three tipped with white. Young, similar to female, but more rusty-buffy-tipped above; dusky streaks on throat of young male. L. 3.55 (female 4). W. 1.73 (female 1.95). T. 1.25. B. .73.

Field Marks.—Slightly larger than Ruby-throated Hummingbird. Gorget or throat patch of male, opaque velvety-black for more than upper or front half, metallic violet or amethyst, changing to blue, on

the lower, showing distinctly as the bird turns. Female has slightly rounded tail, with middle feathers longest, as compared to the double-rounded tail of the female Ruby-throat, which has middle feathers about as short as outer ones.

Popular Names.—Hummer; Mountain Hummer; Western Hummer.

SCISSOR-TAILED FLYCATCHER

Muscivora forficata (Gmelin)

Abundant migrant, especially in fall, and fairly common summer resident; third week in March to fourth week in October. In spring, March 10, 1914 (F); March 16, 1915 (A); March 17, 1921 (A); March 19, 1919 (A); March 19, 1920 (A); March 29, 1895 (L); March 29, 1905 (B); March 31, 1916 (FG); April 2, 1922 (A). Sn fall, October 27, 1914 (A); October 24, 1915 (F); October 15, 1916 (FG). *Recorded:* ABCDE-FGH[147]IJKLMNOPQR[145]TWY.

SCISSOR-TAILED FLYCATCHER
Bailey LAF

Geographical Distribution.—Great Plains of the United States, from southwestern Missouri and southern Kansas south to southern Texas; casually east to the western parts of Missouri, Arkansas, and Louisiana. Winters in Central America.

Habitat.—Open country: Mississippi hackberry trees along country roadsids in farming country; prairies dotted with live oak trees and mottes; mesquite prairies; open chaparral country; rolling blackland prairies; arid plains country. During migrations, along telegraph and fence wires in and about towns, about truck gardens, and in and about cotton and corn fields.

Local Haunts.—Throughout the Region, commonest on the open country throughout the eastern half only; roadside trees north, east, and south of Austin; University campus and shade trees along nearby streets; broad, open valley of the Colorado River.

General Habits.—Typical of the southwestern prairie country, this bird is usually seen singly and in pairs, though during early spring small companies of males are seen, during summer family groups wander about, and in fall large flocks assemble for migration to the winter home. As one crosses the prairie country, he sees these beautiful birds perching on hackberry trees or on fence or telegraph wires at intervals along roadsides. In spring each pair selects a small grove or solitary tree, and holds it throughout the season, attacking vultures, hawks, crows, and caracaras, alighting on their backs in flight when they draw too near, and pecking them and screaming in their ears. Rarely alights on the ground because of the awkward length of its tail. Very pugnacious at its nest, twittering excitedly, and fanning an intruder's face with its wings. In fall, family groups wander about the cotton fields.

Migration.—Small flocks of from four to a dozen put in their appearance in spring about March 15, and are common by April 1. At

the close of the nesting season the birds form small family groups which wander about for some time before they move southward for the winter. Large droves roost in a huge old tree in the downtown alley to the rear of the Scarbrough Department Store, within less than a hundred yards of the very center of Austin's business district. At dawn the birds scatter out for miles across the cotton fields to feed, but congregate at dusk, alighting on the light wires to await darkness, just before which they go into the trees, as many as a thousand or more in a single tree, there to spend the night. On July 22, 1919, at dusk, common in a scattered company averaging about 20 birds to the block, along the business streets of Austin, sitting on wires and on edges of roofs, and flitting back and forth across the open streets in their pursuit of insects (A); August 10, 1915, 70 to 75 in flocks on wires in town (A); August 20, 1915, at dusk in town, 300 in one locality (A); common to October 21, 1914 (A), though the majority moved southward with the norther of October 12-13—the poles, wires, towers, and buildings on the 12th being thick with excited, uneasy birds (A).

Feeding Habits.—Food secured while on the wing, in true flycatcher fashion, consisting principally of bugs, gnats, flies, beetles, moths, crickets, grasshoppers, locusts, butterflies, bees, and similar insects; occasionally cottonworms and some berries are added to the food.

Flight.—In a straight, even line with long feathery tail, closed and thin, streaming out behind, as though the bird were carrying a strip of rag. Occasionally darts out, gyrates and cuts queer figures in the air, flies almost perpendicularly upward, seesaws up and down or hovers on quivering wings, and then opens and shuts the long fork of its tail like a long pair of white scissors, chattering the while. Twists and flutters in midair in quite an acrobatic fashion, now seesawing, then executing a sharp-angled V. Often flies up from perch and then flutters down again to the same spot.

Courtship.—Begins about April 26 (A).

Breeding.—Early May to early July. Earliest: May 2, 1894, 5 slightly incubated eggs (Lindolph); May 16, 1897, 4 fresh eggs (J); May 14, 1894, 5 fresh eggs (Klein); June 1, 1915, 4 newly hatched young (A). Latest: June 8, 1905, 3 eggs, incubated about 3 days (B); June 12, 1895, 4 fresh eggs (Caldwell); June 21, 1919, 4 slightly incubated eggs (A). Two broods; one pair made complete cycle in 42 days, from selecting of first site, building nest, laying and incubating 5 eggs, rearing young, to selecting second site. *Breeding recorded:* ABCEF-GHJLMNOPQWY.

Nest Location.—7 to 30 feet from ground, generally on a horizontal limb or fork, less commonly in a crotch, in an isolated, open-foliaged hackberry, mesquite, cedar elm, eastern live oak, or horsebean retama tree, standing alongside a country road, a fencerow, or a quiet city street; in a truck garden; beside a farm house; in pasturelands; or on the edges of scattered woodlands. Occasionally on knolls in the open country, particularly in post oaks, or in peach and other orchard trees; in metal windmill towers; on the crossbars of telegraph poles; in the iron skeletons of aerial light towers in Austin; and in the iron framework of river bridges.

Nest Construction.—Roughly built; base and sides composed largely of Indian tobacco weed and small twigs, with some rootlets, weed stems, and cotton, onto which base is built a nest mass of thistledown, cotton, wool, and Indian tobacco, and sometimes cotton waste, corn husks, rags, and twine. Lined with rootlets, horsehair, cotton, or Indian tobacco.

Nest Building.—Commencing to build, May 6, 1892 (C).

Nest Measurements.—Outside, diameter 4.50 to 6.25 by 6, height 2.75 to 3. Inside, diameter 2.75 to 3 by 3.50, depth 1.75 to 2.25.

Eggs.—3 to 6, usually 5, ovate or rounded-ovate, smooth and moderately glossy; clear white or very pale creamy-white, rather sparingly

marked with a few very conspicuous blotches, spots, and specks of claret-brown and lavender, generally near the larger end; .84×.64.

Voice.—A rather low-pitched but penetrating *kittle-ti, kittle-ti, kittle-kittle-kittle,* uttered as the bird hangs in midair on quivering wings. A screaming, penetrating clatter, *ka-quee—ka-quee—ka-quee—ka-quee.* Dawn call, uttered usually only in the dim light at break of day, and usually only in spring, a loud, emphatic *chk-chk, chk-chk-chk-chk-chk-chk-chk-PUKE PEW-EE,* uttered with increasing rapidity; occasionally the *chk* notes rise to a higher-pitched *chick;* again, a low, rapid, goat-sucker-like *chuck-chuck.* Fall flocking call, a low, rather rapid, conversational chitter, *cheurt-cheurt-cheurt;* a low, rapid, chittering *chup-chit-chit-chup.*

Description.—Pale ashy-gray, shading to blackish on wings and to whitish on throat; concealed red spot of crown; prominently, strikingly salmon on under wing-coverts, arm-pit feathers, and under tail-coverts. Tail long, deeply forked, middle feathers blackish, outer feathers white tipped with black. Female, smaller, with shorter tail and duller colors. Young like female, but without crown patch. L. 12.15. W. 4.80. T. 7.10 or 7.12.

Field Marks.—Very pale grayish or whitish dove color. Glistening colors of black on wings and shorter tail-feathers, and bright rich *salmon-scarlet under wings* on sides of body. *Long, deeply-forked tail,* with outer feathers long, white, and feathery. Characteristic call-note.

Popular Names.—Scissor-tail; Swallow-tail; Texas Bird-of-Paradise; Fork-tail.

KINGBIRD

Tyrannus tyrannus tyrannus[149] (Linnæus)

Uncommon migrant, and rare summer resident; April to late September or early October; in migrations, middle April to middle May, and early August to early October. In spring, March 18, 1920 (Edward Mather); April 6, 1915 (A); April 7, 1902 (E); April 14, 1905 (B); April 18, 1916 (G); April 27, 1902 (E); April 27, 1919, pair and 6 (B). In fall, August 27, 1921, migrating southward (A); October 8, 1919 (A). *Recorded:* ABCDEFGHIJKLMW.

Geographical Distribution.—Southern Canada, and the United States south to Oregon, northern New Mexico, central Texas, southeastern Texas to Houston, the Gulf Coast, and central Florida; chiefly east of the Rocky Mountains. Winters in Central America and in northern South America.

Habitat.—Gardens and about pear and apple orchards; edges of timber and open woods; roadsides and scattered trees on the edges of town; borders of prairie streams; quieter residential streets in town; honey locusts on the edge of town; mottes on prairies at farm houses; prairies and fields.

Local Haunts.—Eastern half of the Region, west to the edge of the hills; edge of slope at Samuel Huston College, southeastern part of Austin; Colorado River valley, at lower end of Deep Eddy, upland edge of Sand Beach, southeastern edge of town, and Three-Island Bottoms; Shoal Creek pecan trees at West Avenue. In migrations, along country roads and railroad tracks in the open country north of town.

General Habits.—Generally observed singly or in pairs in spring and early summer, although it arrives in small flocks, gathers in family groups in mid-summer, and moves southward in larger flocks. Perches on telegraph and fence wires or on occasional trees along roadside or railroad track, always in the open in plain sight. Quite aggressive; pronounced enemy of, and driving away vultures, hawks, crows, and other large birds, although not particularly quarrelsome in its habits

and in spite of the fact that it is friendly to birds of its own size; as a result, farmers are always glad to have a pair nesting near the poultry yard. Male usually perches for hours in prominent place near tree containing the female on its nest.

Migration.—Forms in family groups in mid-summer, and in flocks in late July. Begins moving southwad in early August, flocks passing southward during the second week of that month; gone by the last of September or by early October, when it rarely occurs as late as the second week. In spring, usually arrives between April 10 and 20; migrating northward, May 6, 1892, numerous (C); May 8, 1905 (B); and May 12, 1915 (B).

Feeding Habits.—Sits upright and quiet on dead twig offering prominent perch, watching for passing insects, and sallying forth with a dash, true flycatcher-fashion, to snap them up on the wing and return to its perch. Food consists practically always of injurious insects such as grasshoppers, crickets, weevils, wasps, caterpillars, butterflies, and gadflies; not of honey bees, as commonly supposed; only 14 out of 218 stomachs examined by the United States Department of Agriculture contained bees, and most of these were drones.

Flight.—Occasionally flies up in the air and hangs or hovers on quivering wings.

Breeding.—Middle May to late June. Earliest: May 14, 1903, 4 fresh eggs (E); May 19, 1919, 4 slightly incubated eggs (A). Latest: June 13, 1892, 4 slightly incubated eggs (L); June 8, 1902, 2 fresh eggs (E).[150] Spring of 1914, 3 young just out of nest (B). Two broods. *Breeding recorded:* ABCELMW.

Nest Location.—5 to 35 feet up, very firmly placed near extremity or end of horizontal branch or in a substantial fork of a honey locust, large live oak, willow, or hackberry, or in a peach or pear tree in orchard.

Nest Construction.—Composed of dried weed stems, twigs, clover, Indian tobacco weed or wax-weed, and large quantities of thistle-down; nest often contains strips of grapevine, grass, roots, cotton, moss, rags, string, and bark; ragged and loose, but well-cupped and compact inside, and lined with thistledown, plant down, hair, fine grasses, cotton, rootlets, and feathers. Quite similar to the nest of the Scissor-tailed Flycatcher, but usually more substantially built.

Nest Building.—May 20, 1902, carrying materials and constructing nest (E).

Nest Measurements.—Outside, diameter 4.25 to 5 by 5.60, height 3. Inside, diameter 2.75 by 3, depth 2.

Eggs.—3 to 5, commonly 4, more elongate-ovate than eggs of the Scissor-tailed Flycatcher; white or creamy-white, marked with wide, short streaks of chestnut, cinnamon, and rufous, with no large rounded spots or blotches; heavier marked and larger than the eggs of the Scissor-tail; .97×.70.

Voice.—A loud, shrill, sharp, thin, metallic, nerve-racking, twittering clatter, *ti-cheé -ti-ti-ti-ti-ti-ti* or *heet-heet-tee-tee-tee-tee-tee,* varying to *twip-ip-ip-ip-ip* or an extremely rapid *tsee-tsee-tsee-tsee-tsee-thsee-thsee-thsee-thsee,* uttered with redoubled vigor when an intruder approaches its nesting site. Occasionally, in early morning during the nesting season, a short and pleasing song. Call, shrill *screep, screep* or *tcheup.*

Description.—Upper-parts, blackish or grayish-slaty, darker to black on head, rump, and tail; under-parts, pure white, washed with grayish on chest. Black tail tipped with narrow white band. Concealed orange-red patch on middle of crown. Young, duller, more brownish on tail, chest, and shoulders; no crown-patch. Outer primaries deeply emarginate at tip: two in male, usually one in female, none in immature. L. 8.50. W. 4.60. T. 3.55. B., from N., .54.

Field Marks.—Black above, pure white below. *White-tipped black tail*, conspicuous in flight. Voice.

Popular Names.—Bee Martin; Bee-bird; Young Scissor-tail; Tyrant Flycatcher; White-bellied Kingbird; Common Kingbird; Kingbird; Eastern Kingbird.

ARKANSAS KINGBIRD

Tyrannus verticalis Say

Very rare migrant; second week in April to middle May, and early September to early October. In spring, April 8, 1914, 1 (F); May 6, 1915 (A); May 9, 1919 (B); May 14, 1919 (A). In fall, September 3, 1919 (A); October 6, 1914 (A). *Recorded:* AB.

Geographical Distribution.—Southwestern Canada south across western United States to northern Mexico, east to western parts of Minnesota, Iowa, Kansas, and regularly to western Texas, breeding in the Panhandle; west to the Pacific; accidental throughout northeastern United States. Winters from western Mexico, rarely in western Texas, southward to Guatemala.

Habitat.—Open country, particularly plains, prairies, and the edges of timber or wooded prairie streams.

Local Haunts.—Border of woodlands on northeastern edge of Austin; Mt. Bonnell road crossing of the I. & G. N. railroad track; northwestern edge of Austin; sand beach below Deep Eddy; southern edge of Country Club grounds.

General Habits.—Perches on telegraph wire or fence or atop an elm, mesquite, or honey locust in the open along a roadside or woodland edge, moving about very little during its transient stay. In its summer home it is quite noisy and combative, fighting its rivals, or driving a hawk, crow, or owl from its domain with screaming, clawing, pecking vigor; not quarrelsome with other species of its own or smaller size.

Feeding Habits.—Sallies forth with a dash from its perch, flycatcher-fashion, to snap up passing insects—mainly grasshoppers, but also flies, winged ants, large black crickets, moths, butterflies, and even slower-moving caterpillars—and soaring back on outspread wings and tail.

Voice.—Thin, high-pitched, emphatic, repeated, very much like that of the Scissor-tailed Flycatcher; a harsh, discordant scream; a shrill metallic squeak; a low twittering.

Description.—Upper-parts and breast, light ashy-gray, paler on throat; belly lemon-yellow; concealed red patch on crown; brown on wings, the ends of the long wing-quills with long, very gradually narrowing tips. Female, crown-patch smaller; tips of wing-quills less narrowed. Young, duller, no crown-patch. Tail, black, with outer web of outer feathers abruptly white. L. 9. W. 5. T. 3.80. B., from N., .53.

Field Marks.—Conspicuous perch. Grayish above, darker on wings and tail, paler on throat. Lower breast and *belly conspicuously yellow*. Abrupt, sharply contrasting white edging on either side of blackish tail, easily seen when tail is spread, distinguishes this species from all other flycatchers but the Scissor-tail, which has a distinctly forked instead of a square-ended tail as in the present case. Attenuated wing-feathers; long, gradually narrowing tips.

Popular Names.—Arkansas Kingbird; Yellow-bellied Kingbird.

NORTHERN CRESTED FLYCATCHER

Myiarchus crinitus boreus[151] (Linnæus)

Common migrant, and fairly common summer resident; last of March to early October; migrating in April and early May, and again in September. In spring, March 21, 1919 (A); March 22, 1914 (G); March 24, 1921 (A); March 27, 1915 (A); April 22, 1895 (L). In fall, September 24, 1916 (F); September 29, 1921 (A); October 3, 1920 (A); October 7, 1919 (A); October 8, 1914 (A). *Recorded:* ABCDEFGH[152]IJKLMNOPQW.

Geographical Distribution.—Southeastern Canada southward over the whole of the eastern United States to southern Florida and southern Texas (as far as Refugio County), and west to the edge of the Great Plains and to west-central Texas. Winters from eastern and southern Mexico to northern South America.

Habitat.—Rough oak-clad slopes and knolls; mixed oak woodlands; timbered bottomlands; patches of woods not far from water; oak groves of gravelly terraces on uplands; live oak mottes on rises in the blackland prairie.

Local Haunts.—Lower part of Austin, along the edge of the Colorado River valley; University campus; rough country between Austin, the Austin Dam, and Mt. Bonnell.

General Habits.—Noisy but quite shy, and not often seen except around nest; its whistle is often heard in woodlands. Flies about in the tree-tops or perches on dead tops of tall forest trees. Explores hollows and old woodpecker holes. Apparently quarrelsome, since only one pair is usually found in each piece of woodland. The birds chase each other about, raising crest and spreading wings and tail.

Feeding Habits.—Food consists principally of insects, particularly beetles, flies, grasshoppers, and butterflies, and of their larvae, though some berries are eaten.

Breeding.—Middle May to middle June, usually only one brood. Earliest: May 18, 1894, 4 fresh eggs (L). Latest: June 15, 1908, 5 eggs, incubated about 4 days (B). *Breeding recorded:* ABCEFGHIJLMNOPW.

Nest Location.—6 to 30 feet up, usually in rather open situations in edges of woods, in woodpecker hollow or natural cavity in eastern live oak, mountain Spanish oak, willow, or elm trees, in telegraph poles or old stumps, and in bird boxes, cans, buckets, and old tin chimneys in unused cabins.

Nest Construction.—Bulky, composed of dead grasses, fine twigs, strips of cedar bark, weed stems, dead leaves, rootlets, bunches of cattle hair, horse-hair, cotton rags, straws, and invariably cast-off snake skin. Lined with feathers and horse-hair.

Nest Building.—Male calling and looking on, while female carried material and built nest, May 6, 1915 (A); April 27, 1919, nest completed (H).

Nest Measurements.—Hollow, depth 8. Cup of nest, diameter 3, depth 2.

Eggs.—3 to 8, commonly 5 or 6, ovate, slightly glossy; creamy or deep buffy in color, heavily marked with longitudinal streaks of reddish-brown, dark brown, chocolate, and lavender; .89×.67.

Voice.—Very noisy: a loud, penetrating, far-reaching *wheek, wheek;* a loud *wheep-wheep;* a loudly whistled *whooie;* a clear, whistled, repeated *wit-whit, wit-whit;* a clear *quip-quip-quip;* a whistled *puree* or *huiree;* a loud *per-r-r-ap* or *per-app*, ranging to *pra-a-a-ap* and *peer-r-r-rp, peer-r-r-p;* noisy calling and chattering. The noisy voice of this species is one of the common summer sounds of the Region.

Description.—Head and neck, grayish-brown; back greenish-olive; throat and chest dark ashy-gray or pearl-gray; belly bright sulphur-yellow; wings and tail darker, with inner webs of primaries and tail-feathers (except middle ones) pale reddish-brown; two curved pale-buffy wing-bars. Head slightly crested. Bill light, rather longer than that of average flycatcher. Young, tail more reddish-brown. L. 8.75. W. 4.10. T. 3.85. Tars. .80. B., from N., .60.

Field Marks.—Whole head, throat, and breast, dark ashy-gray. Belly bright sulphur-yellow. *Reddish-brown tail-feathers. Big, oversized, crested head.*

Popular Names.—Great-crested Flycatcher; Great-crest; Eastern Crested Flycatcher; Northern Crested Flycatcher.

ASH-THROATED FLYCATCHER

Myiarchus cinerascens cinerascens (Lawrence)

Very rare summer resident, late March to early September. *Recorded.* AH.[153]

Geographical Distribution.—Western United States and northwestern Mexico, north to southern Washington, Utah, central Colorado, and central Texas, where it is common north to Comal (B) and Caldwell (H) counties. Winters south to Central America.

Habitat.—Mesquite country; desert regions, often a number of miles from water, though frequently line of mesquite or chaparral forest along creek or resaca; roadsides through mesquite-forest country.

Local Haunts.—Extreme southeastern part of the Region; mesquite forest near Manchaca road and Williamson Creek.

General Habits.—A typical bird of the southwestern desert country from the Lower Rio Grande through Utah and Nevada to southern California. Dignified and quiet, perching more or less erect at top of tree or shrub, or moving about with raised crest.

Feeding Habits.—Usually ants, caterpillars, flies, beetles, grasshoppers, butterflies, and moths form the diet of this bird, though occasionally berries, especially those of the mistletoe, are relished.

Breeding.—Second week in May to early June. *Breeding recorded:* H.

Nest Location.—4 to 18 feet up in knotholes and hollows or natural cavities in trees, generally in the mesquite; frequently in old hollows of the Texas Woodpecker.

Nest Construction.—Nest composed of rootlets, grass, and dry manure, and lined with hair and fur. Occasionally cast-off snake skins are found around the edge of the nest.

Eggs.—4 to 7, usually 6, creamy to pinkish-buff, covered with hairlines and longitudinal streaks of purple, .87×.63. Much paler and less heavily marked than eggs of the Common Crested Flycatcher.

Description.—Upper-parts, grayish-brown; chest and throat pale ashy, the latter almost white; belly pale sulphur-yellow. Reddish-brown wings with two white wing-bars. Tail, dusky brown on middle to brownish outside, the outer feather with the outer web distinctly white, the inner web dusky at tip. Young, tail-feathers rufous, with dark median stripe. L. 8.25. W. 4. T. 3.90. Tars. .91. B., from N., .56.

Field Marks.—Outer web of outer tail-feather distinctly white. Chest pale ashy; a *distinct, conspicuous white throat-patch.* Belly *pale* sulphur-yellow. Tail brownish dusky, instead of distinctly black as in the Western Kingbird.

Popular Names.—Mesquite-woods Flycatcher; White-throated Great-crest.

PHOEBE

Sayornis phoebe (Latham)

Moderately common migrant and winter resident, and fairly common summer resident; in winter, early or middle October to middle April; begins moving northward late in February; in summer, late February and early March to last of October. Wintering, October 13, 1916 (F); October 15, 1916 (G); October 11, 1914 (A); and through winter season, as late as April 18, 1915 (AF); March 29, 1905 (B). *Recorded:* ABCDEFGHIJKLMOPQSW.

Geographical Distribution.—East of Rocky Mountains, in southeastern Canada and eastern United States, south to the Georgia highlands, northern Mississippi, central Texas (Austin to Tom Green and Concho counties), and northeastern New Mexico. Winters in south Atlantic and Gulf States, southward into southern Mexico.

Habitat.—In summer, vicinity of running water, particularly wide and shady ravines and in cool caves and cliffs along canyons and valleys in hill country. In winter, open meadows and open water-ways; moist, open woodlands and clearings; open, streamside pastures; edges of timber and open fields; meadows along gentle valleys; edges of town; brushy and open country.

Local Haunts.—In summer, confined to the Limestone Hill Area, along Lake Austin and the valleys and canyons of Barton, Bull, and Bee creeks; Campbell Hole and Deep Eddy cliffs; overhanging ledge of Dry Creek, at north end of Mt. Barker; large cave in face of bushy, rocky bluff on east side of Barton Canyon three-quarters of a mile above Campbell Hole. In winter, across eastern half of Region and into the edge of the hills; between lines of trees on the Colorado River flood plain at Deep Eddy; along Shoal, Waller, Williamson, Onion, and Walnut creeks.

General Habits.—Sometimes quite shy; always of amiable ways and gentle manners, and of particularly plain voice. A pair becomes strongly attached to one locality, returning there year after year to nest, perhaps building a new nest, often merely rebuilding the old. Frequent loss of eggs or young due largely to coachwhip, garter, ribbon, and chicken snakes, which crawl into nest and swallow its contents. Bird usually occupies a conspicuous perch on a dead twig, its tail drooping, calling at intervals.

Feeding Habits.—Darts out to catch passing insects—chiefly those which are injurious—and returns to the perch on which it waited, nearly straight up and down after the manner of most of the flycatchers, for its prey.

Breeding.—March to June. Earliest: March 17, 1907, 4 fresh eggs (E); April 4, 1915, 5 fresh eggs (A); April 24, 1905, grown young (B). Latest: May 17, 1905, 4 fresh eggs (E); June 27, 1915, 6 fresh eggs (A). Two or three broods, generally third week in March, last week in April, and first week in June. *Breeding recorded:* ABCEFHILMO.

Nest Location.—5 to 15 feet up in caves, cliffs, and under ledges, firmly attached to perpendicular spot on receding limestone beneath overhanging ledge or crevice in cliffs, bluff, or cave, in shady place; on shaded bridge-beam under bridges and culverts; in barns and sheds and in eaves of piazzas.

Nest Construction.—Neat and symmetrical. A semi-circular, bracket-pocket shelf, constructed of mud pellets brought by the birds themselves, each from .25 to .75 in diameter, mixed with a bit of fine tree-moss to hold it together. On this bracket is built a compact felted structure of shredded cedar bark and other plant fiber, bits of twigs, grass seed-stems, bits of grass and leaves, weed stems, and feathery green tree-moss and lichens. Lined with fine pepper-grass stems and other fine plant stems, fibers, and plant down, and a few horse-hairs. Outside sparingly plastered and decorated with bits of green moss.

Nest Building.—Nest nearly completed March 9, 1905 (B); another ready for eggs March 17, 1905 (B); Campbell cliff pair carrying material for nest on April 11, 1915 (A). Phoebe cave pair, in 1915, 5 eggs on April 11, destroyed; 3 eggs on May 16 in same nest, later hatched and subsequently eaten by snake; 4 eggs in new nest on June 13, destroyed; 6 eggs in same second nest on June 27, one later eaten by small snake and subsequently 5 nestlings reared by birds (A). Frequently uses same nest over and over again, and begins new nest

while preceding brood is still in downy stage (A); changes quarters also because parasites are frequent in nest, so bad that sometimes they kill nestlings before parents can prevent.

Nest Measurements.—Outside, diameter 3.60 to 4.50 by 5.50, height 2 25 to 4. Inside of cup, diameter 2.20 to 2.65 by 2.12 to 2.25, depth 1.20 to 1.75.

Eggs.—3 to 6, usually 5, pure white, occasionally sparingly and minutely dotted with reddish-brown, .70×.56.

Voice.—Harsh, abrupt, and monotonous *pe-wit pheu-be* or *(p)hui'' vzet'*, alternating with *che-hew* or *che-who* (first syllable short); sometimes sounding like *see-hee, see-whee*, always with a pause between; occasionally lengthened to *phoé-be-te;* quite unlike the drawling, soothing *pee-a-wee* call of the Wood Pewee. Short-call, *tchit*, uttered with a jerk of the tail. Occasionally rises on fluttering wings and utters a series of *phoebes*.

Description.—Worn, pale brownish-olive-gray or grayish-brown above, darker to fuscous or blackish on crown; under-parts dirty mottled white, tinged grayish on breast; inconspicuous wing-bars; outer web of outer tail-feather white or whitish. In late August and September, molts to more olive above and on sides of chin, throat, and flanks; to a primrose yellow below, with a faint grayish breast-band; wing-bars more prominent; wears to a dingy shade by spring. Bill black. L. 6.80. W. 3.40. T. 3. B., from N., .40.

Field Marks.—Dusky brownish or grayish above, with darker *blackish cap* and tail; whitish below, tinged with yellow in fall. *Olive-gray tail* distinctly jerked, usually when bird is calling; abrupt motions, jerky manners. Distinguished from Wood Pewee by call, *blackish lower mandible, white margin to outer tail-feathers*, and distinctly darker fuscous crown.

Popular Names.—Water Flycatcher; Bridge Pewee; Water Pewee; Cliff Flycatcher; Dusky Flycatcher; House Pewee; Barn Pewee.

SAY PHOEBE

Sayornis sayus (Bonaparte)

Very rare migrant; may occur rarely in winter; in migration, March to third week in April, and middle November to early December. In fall, November 17, 1919 (A); December 4, 1921 (A). In spring, March 5 1915, 2 (A); April 12, 1919 (A); April 17, 1919 (A). *Recorded:* A.

Geographical Distribution.—Western Canada and western United States, from central Alaska to the Mexican boundary, east to North Dakota, western Kansas, the canyon country of northwestern Texas, and southern New Mexico; rarely straggling east of the Mississippi River. In winter, from central California, southern parts of Arizona and New Mexico, and central Texas (to Corpus Christi and Beeville), southward into Mexico.

Habitat.—Caves, cliffs, and deserts of the western country; rocky canyons; about mining camps and cattle ranches.

Local Haunts.—Edge of the hill country and the sharply-cut valleys west of Austin; western edge of town.

General Habits.—The commonest of flycatchers in the western country, perching on boulders or flittering silently from bush to bush. Breeds in shelving rocks and shallow caves and about barns and bridges, very much after the manner of its eastern relative.

Feeding Habits.—Feeds on flies, grasshoppers, crickets, weevils, moths, butterflies, and the like, which it catches on the wing. Like many other flycatchers, and like hawks, owls, and many terns, it ejects pellets consisting of indigestible parts of its food.

Voice.—Usually silent. During breeding season, a plaintive twittering warble. A plaintive *phee-eur*.

Description.—Upper-parts dark gray, shading to black on tail and wing-quills; throat and breast grayish; lower breast and belly tawny-brownish. Young, more brownish on shoulders. L. 7.80. W. 4.10. T. 3.55.

Field Marks.—Slightly larger than the Eastern Phoebe. Dull colors *black tail*, and lower breast and *belly rusty brown*.

Popular Names.—Western Phoebe; Western Dusky Flycatcher; Rusty-belly; Western Bridge-bird; Western Bridge Pewee.

Remarks.—Named by the describer in honor of his friend, Thomas Say.

OLIVE-SIDED FLYCATCHER

Nuttallornis borealis (Swainson)

Rather rare migrant; last week in April to end of May, and end of August to middle October. In spring, April 26, 1914, pair (G); April 27, 1922 (A); April 29, 1919 (A); April 30, 1905 (B); May 29, 1919 (AO); May 30, 1920 (A). In fall, August 27, 1919 (A); September 13, 1919 (A); October 15, 1916 (G). *Recorded:* ABCDEG.

Geographical Distribution.—Alaska and Canada, and parts of the United States: northeastern United States, from Massachusetts to Michigan, and south in the Alleghanies to North Carolina; coniferous forest of the West, south to southern California, Arizona, and western Texas. Winters in Central America and northern South America.

Habitat.—Open woodlands along streams; country roadsides; water courses and hillsides in hilly country; black-jack and post oak woods; cedar elm shade trees.

Local Haunts.—East of the hills and along streams in the hills; in shade trees along quieter streets in Austin; along Shoal Creek and Waller Creek; lines of trees around the campus of the University.

General Habits.—Bold, conspicuous, alert, and swift. Sticks to prominent perches at tops of trees, generally on dead limbs or topmost dead branches of very tall trees. Quiet of pose, but head continually turning as it watches for insect prey.

Feeding Habits.—Catches prey—beetles, grasshoppers, moths, butterflies, gadflies, and similar insects—on wing with sudden dart from perch; turns and sails back to perch with wings and tail spread.

Voice.—A loud, conspicuously whistled *pi-pee*, which may be heard for half a mile; a loud, clearly whistled *whip-wheeu*, first short and sharp, second long-drawn to plaintive ending; a sharp, loudly whistled *wheu-o-wheu-o-wheu-o* or *puip-puip-puip;* a clear, penetrating *sweechew;* a mellow, soothing *pu-pip, pu-pu-pio, pu-pip, pu-pu-pio;* a call something like that of the Wood Pewee, but louder and more commanding, of three syllables, *whip-pui-whee* or *"come right here,"* the first short and quick, the last two more drawn out. When disturbed, *pip-pip-pip* or a *chip*. Calls heard more commonly at twilight, particularly in the shadows of evening.

Description.—Upper-parts, dark olive to fuscous, darker on wings and tail; throat and middle of belly white or yellowish-white, with a narrow whitish line running down the middle of the breast from the one to the other, between dark, somewhat streaked, brownish breast-sides and all of sides; conspicuous tuft of fluffy yellowish-white cottony feathers on lower flanks and sides of rump, usually concealed by brownish to blackish wings. L. 7.40. W. 4.20. T. 3. Tars. .57. B., from No., .55; Exp. C. .64.

Field Marks.—Rather heavy, stocky, short-tailed flycatcher, with rough crest-feathers and large head. Dark under-parts and sides; *dark gray breast* with white median line; *no yellow below*, usually white, rarely tinged with yellowish. First quill longer than fourth. *Loud*

whistle heard for long distance. *Peculiar yellowish-white, silky, fluffy tufts of feathers on flanks* and sides of rump, generally showing both above and below dark wing-feathers and on sides of rump when bird is at rest.

WOOD PEWEE

Horizopus virens (Linnæus)

Fairly common summer resident, middle April to middle October; begins moving southward in August. In spring, April 10, 1920 (A); April 16, 1922 (A); April 18, 1915 (A); April 27, 1919 (B); May 2, 1914 (F). In fall, October 3, 1919 (A); October 16, 1921 (A). *Recorded:* ABCDEFGH[154]ILMW.

Geographical Distribution.—Eastern Canada and eastern United States, south to central Florida and southern Texas, and west to the Dakotas, eastern Nebraska, and central Texas (to Austin and San Antonio, and irregularly to Tom Green and Concho counties). Winters in Central America and northern South America.

Habitat.—Open post oak and black-jack woods on upland gravel terraces where tree-limbs are feathered with lichens; open woodlands; shaded glens and deep woodlands; second levels and gravel terraces covered with oak woods; oak woods on river bottoms.

Local Haunts.—Williamson Creek above Manchaca road crossing; Pease Park; Insane Asylum grounds; marginal oak timber of Waller and Onion creeks; post oak gravel terrace woodlands back of West Austin firehall; Barton Springs grove; oak woods along Colorado River valley; Wheeler's Grove and East Woods.

General Habits.—Gentle, and of retiring disposition. The female sits close to her eggs, leaving them only when danger seems quite imminent. The nest can nearly always be located by listening for and locating the voice of the male, which sits with drooping tail on the tip of a nearby limb in the upper-parts of trees in the darkened post oak woods and calls at intervals.

Feeding Habits.—Food taken on the wing in typical flycatcher manner, the bird sallying forth from its perch and capturing a passing insect with a snap of its small mandibles.

Breeding.—Middle May to middle July. Earliest: May 15, 1902, 3 fresh eggs (H); May 24, 1910, 3 fresh eggs (B). Latest: June 15, 1905, 2 very slightly incubated eggs (B); July 11, 1915, 3 heavily incubated eggs (A). Two or three broods; if three, third about second week in July. *Breeding recorded:* ABCEHI.

Nest Location.—8 to 25 feet up, rarely higher, securely saddled on horizontal limb or fork of post oak, black-jack, or winged elm, in woodland glens, in open woods or the borders of woods, or along woodland roadsides.

Nest Construction.—Compact, symmetrical structure, composed of bits of weed stems and small twigs, fine grasses, thin strips of bark, small rootlets, green tree-moss, and plant fibres, held together with plant down, caterpillar silk, and spider webs; usually quite shallow, with thin floor and thick walls. Lined with felted gray plant down, tiny grass seed stems, fine fibres and bark threads, and a few horsehairs. Thickly plastered and decorated externally with bits and pieces of lichens, until the nest appears but a lichen-covered knot on the limb.

Nest Building.—Often rebuilds old nest of same or preceding year for second or third brood.

Nest Measurements.—Outside, diameter 2.80 to 3.30, height 1.50 to 2. Cup of nest, diameter, rim to rim, 2.25 to 2.40, diameter inside, 1.80 by 2 to 2.10, depth .90 to 1.10.

Eggs.—2 to 4, usually 3, ovate or rounded ovate, smooth but without gloss; pale milky-white to creamy, spotted in a wreath around the larger end with blotches and specks of brown, chestnut, rufous, and lavender; .67×.52.

Voice.—Two distinct variations of a long-drawn-out, plaintive call, perfectly attuned to calm woods or quiet summer days: one rising, with plaintive inflection, *pee-e-uwee* or *pee-ah-uwee;* the other hushed or shut down suddenly on the second syllable, *pee'-yew* or *pee'-yer.* When disturbed, a low *chit* or continuous chitter. Common call uttered throughout the day, though especially at dusk.

Description.—Upper-parts very dark olive-grayish-brown, tinged with olive-green, darker on wings and tail; under-parts whitish, washed with gray on sides of throat and breast, and slightly tinged with yellowish. Wings decidedly longer than tail, with two distinct white wing-bars. Crown feathers ruffled. No whitish eye-ring or lores. Upper mandible dark, blackish; lower mandible yellowish to brownish, darker toward tip. Tarsus short. Young, wing-bars buffy or brownish. L. 6.20. W. 3.30. T. 2.70. Tars. .50. B., from N., .40; Exp. C. .47; W. of B. at base .27.

Field Marks.—Smaller, slenderer, and darker than the Phoebe; *darker,* more fuscous, than most other small flycatchers. *Wings decidedly longer than tail; two white wing-bars.* Call, *pee-ah-wee,* different from all other birds, including the Western Wood Pewee, which has a characteristic *pueer.*

Popular Names.—Pewee; Oaks Flycatcher; Oak-woods Flycatcher; Eastern Pewee; Pee-a-wee.

YELLOW-BELLIED FLYCATCHER

Empidonax flaviventris (W.M. & S.F. Baird)

Very rare migrant, observed at irregular intervals; late April and May, and late August to early October. In spring, April 25, 1920 (A); May 16, 1922 (A). In fall, August 20, 1916 (FG); September 13, 1916 (G); October 2, 1919 (A). *Recorded:* ACFG.

Geographical Distribution.—Eastern Canada and the northeastern United States south to New Hampshire, mountains of Pennsylvania, and northern Michigan; west to North Dakota. In migrations, west to the Plains and to central Texas. Winters from southern Mexico to Panama.

Habitat.—Northern evergreen forests; swampy woods. Shaded woodland glens with water dashing over rocks; woodlands along streams; thickets and undergrowth of woods; edges of creek-side timber.

Local Haunts.—Wheeler's Grove and East Woods; Pease Park; heavy timber along lower parts of Boggy and Walnut creeks; small wooded creek at Twenty-eighth Street, between Speedway and Guadalupe.

General Habits.—Usually observed singly, sitting erect on a low twig. Mournful song and notes of complaint are perfectly attuned to the quiet of shaded forests; usually silent during migrations.

Feeding Habits.—Sallies forth after prey, which it captures with a snap of its bill.

Voice.—Rarely heard to call or sing during migrations, when it is usually so silent as to appear dumb: a low, soft, mournful, plaintive *peeh, peeh* or *pee-a,* ranging to a repeated and drawling *ti-pee-a* or a rising and prolonged *chu-e-e'-p;* a rather explosive, harsh, abrupt *pse-ek, pse-ek* or *pee-wick,* almost in one syllable, uttered with a convulsive jerk of the head.

Description.—Upper-parts, dark olive-green, lighter on the head, darker on the wings and tail; entire under-parts, including throat, quite bright with sulphur-yellow, the belly more so than in any other member

of the group, the yellowish throat being tinged with olive-green. Distinct whitish eye-ring and two whitish or yellowish-white wing-bars. Bill, upper mandible black, lower mandible white to yellowish-white or flesh-color. L. 5.60. W. 2.60. T. 2.15. B. from N. .33.

Field Marks.—Difficult to identify in field; best to have bird in hand. First primary shorter than fifth. Eye-ring and two wing-bars whitish. Bill with yellowish. *Most yellow of the small flycatchers;* under-parts nearly uniform yellow.

ACADIAN FLYCATCHER
GREEN-CRESTED FLYCATCHER

Empidonax virescens (Vieillot)

Rare migrant, and very rare summer resident; middle of April to late September and middle October, beginning to move southward in August. In spring, April 17, 1922 (A); April 25, 1915 (A). In fall, August 27, 1921, migrating (A); October 7, 1914 (A). *Recorded:* ABCD.

Geographical Distribution.—Eastern United States, from New York and Michigan south to Florida and the Gulf Coast, west to northwestern Nebraska and southern Texas (to Kerrville, San Antonio, and Houston). Winters in northern South America.

Habitat.—Open glades in timber near running water, and along creeks; woodland ravines; rarely in heavy woodlands, usually in dry, deciduous second-growths along water courses; Spanish oaks overhanging creek valleys in hills; woodland roadsides; deep, shady woodlands or second-growth forests, watered by small streams, and with either little or much undergrowth and vine-tangle.

Local Haunts.—In migrations, Shoal Creek valley and Pease Park; Waller Creek; wooded borders of Colorado River valley. Creeks back in the hills, particularly those lined on slopes with mountain Spanish oak; Wheeler's Grove on Waller Creek.

General Habits.—This flycatcher occupies low perches, rarely over 20 feet from the ground; and, while perching, it twitches its tail constantly.

Breeding.—Probably in May and early June.

Nest Location.—3 to 20, usually 8, feet above ground or over creek, attached by rim to fork of small drooping limbs of trees and bushes; bottom of nest unsupported. Partial to lower limbs of mountain Spanish oaks overhanging creek valleys in the hills, and the *Usnea* moss associations along wooded streams.

Nest Construction.—Rather shallow, trash-like, open-work, saucer-shaped structure, with very thin bottom and scarcely any shape; composed of fibres, roots, grasses, plant stems, and blossoms.

Eggs.—2 or 3, rarely 4, ovate, pale cream to buff, occasionally almost unmarked but usually sparingly marked near larger end with medium-sized spots and specks of brown and light rufous. .74×.53.

Voice.—A single *peet* or *spee*, with a twitch of the tail; or a louder *pee-e-yuk*, uttered with wings trembling and bill pointed up. A soft, murmuring, whistling call, rarely heard, uttered during a short, fluttering flight. A loud, quick, and emphatic, or again faint and fretful, *tshee-kee, tshee-kee* or "what-d'-see, what-d'-ye-see." A short *wick-up* or *hick-up*, followed by a harsh, abrupt *queep-queep*. A short *whoty-whoty*. Calls frequently uttered.

Description.—Live dark olive-green on back, paler olive-buffy on head, darker to fuscous on wings and tail; distinct white eye-ring and space from eye to bill; two conspicuous yellowish-white wing-bars. Under-parts very light, pale gray or whitish, the throat and belly white, the breast shaded pale grayish or pale yellowish-greenish. Upper part of upper mandible blackish; remainder of bill whitish or flesh-color. L. 5.70. W. 2.80. T. 2.30. B., from N., .35.

Field Marks.—White eye-ring and two yellowish-white wing-bars. First and fifth primaries of equal length. White below, washed with pale yellowish, tinged with greenish on breast; but *throat* (and frequently center of belly) *pure white. Back light olive-green*, with no tinge of brown.

Popular Names.—Small Green-crested Flycatcher; Small Pewee; Brook Flycatcher; Woodland Flycatcher.

LITTLE FLYCATCHER

Empidonax traillii brewsteri[153] (Oberholser)

Very rare migrant; probably late April to middle May, and late August through September.—*Recorded:* D.

Geographical Distribution.—Western North America, from southwestern Canada to California, east to Illinois, Ohio, and Tom Green County in western Texas, and south into Mexico. Migrating rather commonly along the Central Texas Limestone Hills (in Kerr County). Winters in Central America.

Habitat.—Willows and brushy, shrubby growth along streams, particularly in hilly country in migrations; borders of willow-covered islands; swampy tangles rather than dense upland woods.

Local Haunts.—Probably along brush fringes of streams in the Limestone Hill Area.

General Habits.—Quiet, perching well within cover of foliage, or flitting restlessly about in protecting shade under tops of bushes.

Feeding Habits.—An energetic, aggressive flycatcher, never staying long in one place, moving from perch to perch, snapping insects on the wing; food consists almost exclusively of harmful insects, such as grasshoppers, caterpillars, and ants, with a few moths and butterflies.

Voice.—Usually silent when migrating. An explosive, rapid *ee-zee-e-up* or *wee-zee-up*, first rasping, and then musical at the close, the bird doubling up and vibrating with its effort; a shrill, hurried *pree-pe-deer;* a *whuish-whuish;* a shorter *ca-weet*. Alarm-note, *pep* or *pip*.

Description.—Upper-parts olive-brown to very brownish, with little, if any, tinge of green; wings and tail blackish, with yellowish-white wing-bars. Throat pure white, and breast grayish; belly and under surface of wings, pale yellowish. Thin whitish eye-ring. Bill, upper mandible dark to blackish, lower mandible flesh-tinted or dirty yellowish to whitish. Young, browner above, yellower below. L. 6. W. 2.80. T. 2.45. Tars. .68. B., from N., .37; width at base .29. Female smaller.

Subspecific Characters.—This is a still browner, western variety of the Alder Flycatcher, *E. t. traillii* (Audubon), of the northeastern United States and northern Canada, a form characterized by shorter and broader bill and by strong yellowish wash on flanks and under tail-coverts, lacking in the Traill Flycatcher.

Field Marks.—Olive-brownish back distinguishes it from Acadian and Yellow-bellied Flycatchers. Distinctly *larger* than the Least Flycatcher. *Whitish under-parts.* The most *brownish* (*not greenish*) appearing of the small flycatchers.

Popular Names.—Little Flycatcher; Western Alder Flycatcher; Brown Flycatcher; White-throated Little Flycatcher.

Remarks.—Originally named by Audubon in honor of his friend, Dr. Traill of Liverpool.

LEAST FLYCATCHER

Empidonax minimus (W.M. & S.F. Baird)

Uncommon and irregular migrant, sometimes rare, sometimes very common; middle April to middle May, and late July to early October.

In spring, April 14, 1922 (A); April 19, 1914 (G); May 14, 1914 (G); May 14, 1922 (Wolfe); May 22. 1919 (A). In fall, August 20, 1916, 2 (F); September 10 to 14, 1916, numerous (F); October 11, 1914, 1 shot (AB). *Recorded:* ABDFG.

Geographical Distribution.—Southern Canada and northern United States, from Atlantic Coast west to Montana and Wyoming, south to Iowa, Indiana, New Jersey, and the Alleghenies to South Carolina. Migrant across eastern and southern Texas. Winters from northeastern Mexico south to northwestern South America.

Habitat.—Borders of woods and thickets; canyons; lowland woods; woodlands along water courses; creek valleys; fruit and shade trees of village lawns and orchards preferred to woodlands.

Local Haunts.—Across the whole of the Region. Streams just east of the edge of the Limestone Hills; Shoal, Williamson, Waller, and Barton creeks.

General Habits.—Friendly, generally quiet, and perching usually on cedar and elm trees along creek valleys during migrations. Flits among the branches of the small trees.

Feeding Habits.—Sallies forth after passing insects, snapping its bill and shaking its wings and tail. Feeds on boll weevils in cotton fields.

Voice.—A characteristic, dry, unmusical *che-beck* or *sebic*, frequently uttered, as *chebec, chebec,* with a slight jerk of the head; a low, twittering *whit-wee-wee;* an absurd *chebec tooral-ooral, chebec, tooral-ooral,* uttered on trembling wings.

Description.—Upper-parts dark olive, with brownish and greenish tinges, darker to fuscous on wings and tail; distinct whitish throat, gray-washed chest, and whitish belly sometimes slightly tinged with yellowish. Distinct whitish eye-ring and space from eye to bill, edged with darker; distinct whitish wing-bars. Tail slightly forked. Lower mandible usually horn-colored or brownish. Young, more olive above; wing-bars brownish. L. 5.30. W. 2.40. T. 2.20. Tars. .64. B. .56; from N. .30; width at base .25.

Field Marks.—Very small size: the smallest of flycatchers. Call note distinctive. Practically *no yellow on under-parts.* Olive-*brownish* back. *Brownish or horn-colored lower mandible.* Fluffy, whitish-breasted little flycatcher.

Popular Names.—Chebeck; Chebec; Little Flycatcher.

VERMILION FLYCATCHER

Pyrocephalus rubinus mexicanus Sclater

Straggler from the South, recorded once: March 16. 1914, a single male (F). Will probably appear more often and eventually become a rare summer resident. *Recorded:* F.

Geographical Distribution.—Mexican boundary and southward; from southeastern California, southwestern Utah, western and southern Arizona, southern New Mexico, and southern Texas (breeding to Comal County and to the Nueces River near Corpus Christi), south to Central America; accidental once in Florida.

Habitat.—Lower Sonoran country; chaparral thickets near water courses; along gullies in the mesquite country; oak mottes of Texas prairies; semi-open thickets along sluggish streams and resacas.

Local Haunts.—Slender cedar-elms of an open, nearly vacant city block on the edge of the residence section of Austin, west of the University campus, and two hundred yards east of Shoal Creek valley, north of Twenty-second Street.

General Habits.—A rare tropical bird of the Mexican border, the most gorgeously colored of the American flycatchers. Occupies a conspicuous perch on a dead twig atop a mesquite, oak, slender cedar-elm, or chaparral tree, though occasionally found close to the ground. Hovers in the air on quivering wings as it calls.

Feeding Habits.—Hovers over grassy, flower-covered meadows and pastures. Darts out, flycatcher fashion, and catches grasshoppers, small beetles, and other insects on the wing.

Breeding.—Possibly early April to late June, particularly about the middle of May.

Nest Location.—6 to 14 feet up, saddled on horizontal twigs, fork, or limb of mesquite, willow, cottonwood, or similar tree, usually in open woods, in thickets along water courses, or along gullies in the mesquite country.

Nest Construction.—Quite similar to that of the Wood Pewee; frail and flimsy, composed of trash, short twigs, hay, plant tops, fibers, down, fiberous roots, feathers, moss, cocoons, and lichens; lined with horse-hair and rootlets, and occasionally with wool, fur, and feathers; covered on the outside with lichens.

Eggs.—2 to 4, buffy or rich creamy-white, boldly spotted and blotched with dark brown and lavender, principally about the middle of the egg; .66×.52.

Voice.—Rather noisy. A shrill, twittering, piping *zi-bree, zi-bree,* usually uttered while hovering 20 to 30 feet up in the air; made a nuptial performance by puffing up red breast-feathers, twittering ecstatically, and fluttering downward like a ball of down. A conversational twitter. Call, quite loud and persistent.

Description.—Upper-parts grayish-brown, darker to slaty on the wings and the nearly even-ended tail, the latter of broad feathers. Erectile crown, full-rounded crest, and under-parts of body, brilliant scarlet-red. Dark line through eye. Female, more gray above; whitish below, streaked gray on chest, and yellow to red on belly. Young, like female, with whitish edgings above, and no tinge on belly. Young male, like female, but with some red on crown and breast. Tarsus much shorter than middle toe with claw; bill, slender, narrow at base. L. 5.90. W. 3.30. T. 2.70.

Field Marks.—Small, handsome, scarlet-breasted flycatcher, with bright red crown and crest. Grayish-brown upper-parts, wings, and tail.

Popular Names.—Red-breasted Flycatcher; Red-headed Flycatcher.

PRAIRIE HORNED LARK

Otocoris alpestris praticola Henshaw

Rare and irregular winter visitor, from October to April. In fall, average arrival, 3 years, October 9; earliest, October 8, 1893 (C). January 17, 1905, 3 shot (B) and identified (LBB). In spring, average departure, 2 years, March 27; latest, April 11, 1894 (C). *Recorded:* ABCDHI.

Geographical Distribution.—Northeastern United States, southwest to eastern Kansas and central Missouri, and south to West Virginia and Connecticut. Winters south to South Carolina, Georgia, and Texas, rarely west to Arizona. Range gradually changed with settlement of country, moving onto cleared lands which once were forest.

Habitat.—Prairies and open barrens; large, flat, open tracts; open, sparcely-grassed country; plains and deserts; country roads; gravel beds; scrubby plains; stubble fields; exposed places in winter.

Local Haunts.—Prairies north of Austin; gravel beds of the Colorado River lowlands near town; open roads near the city.

General Habits.—Flocks of from 3 to 20 birds appear as visitors only in the severest of cold winter weather. A ground bird, sitting on fence posts but never in trees cannot perch because of its long

hind toe-nail. Unlike most passerine birds, it walks, runs, and patters along, never hopping as do most roadside birds; runs along on the nearly bare ground, or creeps about in among stubble. When it is approached too closely, it erects its narrow, pointed ear-tufts until they appear as two little black horns; at other times these tiny black ear-feathers usually lie flat.

Flight.—Irregular and hesitating, usually not high above the ground; alights with a sudden turn, and runs along the ground.

Voice.—Song, in its more northern home, a low, sweet, continued warble, uttered aloft on the wing, like that of the Skylark, rarely from stone or clod; generally heard at dawn and at dusk. Call, a sharp, sibilant, whistled *tsswee it, tsswt* or *tseet, tseet*, not soft like that of the Common Pipit.

Description.—Upper-parts, grayish-brown, tinged with vinaceous; most strongly vinaceous on shoulders, and less strongly on back of head, neck, rump, and sides. Lower breast and belly white, soiled with dusky spots on breast. Forehead and line over eye, white, occasionally faintly tinged with yellow; throat whitish, occasionally faintly tinged with yellowish. Space between eye and bill, moustache-patch, triangular breast-patch, and narrow pointed ear-tufts, black. Tail-feathers black, outer pair edged with white, inner ones edged with brownish and vinaceous. In winter, black slightly veiled. L. 7.25. W. 4.10. T. 2.85. B., from N., .37.

Subspecific Characters.—A smaller, paler, whitish-throated race of the Common Horned Lark, *O. a. alpestris* (Linnæus), of the eastern Arctic and eastern Canada in summer and south to Georgia, the Ohio Valley, and rarely Louisiana in winter; also more easily characterized by having forehead and line over eye white instead of yellow. Darker than the Desert Horned Lark, *O. a. leucolaema* (Coues), of the Great Plains and the Middle West, and with upper-parts less yellow and more distinctly streaked.

Field Marks.—Thick-set and square-shouldered, larger than the Pipit and not so dark; *pinkish-brown* or grayish-and-brown in appearance, with brownish back, *pale grayish rump*, and *black tail* with light edges. Small *blackish horns* or pointed tuft of dark feathers above and behind each eye; black moustache stripe along side of head; black mark across breast. Black face marks rather obscure in winter. Runs and *walks* (does not hop). Long hind-toenail. Whistles when it flies.

Popular Names.—Winter Lark; Road Lark; Horn Lark.

~~FLORIDA~~ SOUTHERN BLUE JAY

Cyanocitta cristata cristata[157] (Linnæus)

Quite common, permanent resident; few, if any, move southward in winter. Specimens collected January 31, 1901 (B); March 30, 1901 (B); December 27, 1912 (B). *Recorded:* ABCDEFGH[15]IJKLMNOP-QRTWY.

Geographical Distribution.—Florida and the Gulf Coast, west and southwest to Houston and Austin in Texas; local and isolated, perhaps accidental, at San Angelo and Eagle Pass in Texas.

Habitat.—Live oak clumps, groves, and mottes along rocky creek beds; rocky slopes near creek valleys; rocky crests of live oak entirely surrounded by rich farming lands; gravelly upland oak terraces and post oak woodlands; mixed woods; edges of bottomland timber.

Local Haunts.—Live oak shade trees in town; post oak and black-jack gravelly terraces on Insane Asylum grounds and along eastern edge of town; University campus; flattened oak woods along western shore of Lake Austin, below and across from Mt. Bonnell; Shoal, Barton, and Waller creeks; commonest in live oak shade trees in town,

in live oak formation, and in mixed live oak and shin oak formation. In fall and winter, hill country west of Austin and along pecan-growing creek valleys and in forests where acorns are abundant.

General Habits.—Observed singly and in pairs, assembling in family groups in summer, and roving about in larger bunches and small companies in fall and winter. Partial to civilization. Very active and mischievous, worrying other birds considerably and sometimes even destroying their eggs and young. Quiet, shy, and cautious in the vicinity of its own nest; away from it, bold, noisy, conspicuous.

Feeding Habits.—During the nesting season it feeds largely on grasshoppers, caterpillars, and other insects, and on berries and grain. Particularly fond of mast. Pecans along creeks and acorns in oak woodlands and hill shinneries form its favorite winter food; gathers acorns and other nuts and hides them for future use.

History.—Said to have first appeared at Austin shortly before 1870 (O), but was rare and irregular until about 1890 (B), since when it has gradually increased in abundance. None seen in San Antonio before 1890, when Attwater first observed them there; practically none have been recorded from that place since that time.

Breeding.—Late February to early May. Earliest: February 27, 1902, 4 eggs (H); March 21, 1894, 4 fresh eggs (O); March 26, 1901, 5 fresh eggs (B). Latest: May 7, 1915, 4 slightly incubated eggs (B). Usually only one brood, rarely two; majority of sets completed by end of March. *Breeding recorded:* ABCEFGHIJLMNOPQW.

Nest Location.—10 to 30, usually 20, feet up, well hidden and securely placed in sturdy fork of eastern live oak, Mississippi or rough-leaved hackberry, pecan, cedar-elm, post oak, black-jack oak, and cedar trees. Usually in a large shade tree near a house, about town, along creeks, or on slopes about city.

Nest Construction.—Bulky, well cupped nest, composed of twigs, roots, Spanish moss, leaves, rags, strings, and paper; plastered with more-or-less clayey mud, and lined with fine black rootlets and occasionally some horse-hair.

Nest Building.—April 27, 1919, pair building nest (H).

Nest Measurements.—Outside, diameter 5.50 to 6 by 6.50 to 8, height 4 to 4.50. Inside of cup, diameter 3.50 to 4, depth 1.50 to 2.50.

Eggs.—3 to 5, commonly 4, ovate, smooth and but slightly glossy; olive-green to olive-buff or olive-drab, irregularly spotted with brown and lavender, markings thicker near larger end: 1.06×.80.

Voice.—*Noisy.* A loud, scolding, clamorous *djay, djay, djay* or *ja-a-y, ja-a-y*, sometimes sounding like *k k k k*. A repeated, three-syllabled, bell-like *jerry-ko!* or *jelly-koc!*, the first two notes even and moderately high, the third lower. A soft *cable, cable, cable* or *querdle, querdle, querdle*. A loud *cay-ah, cay-ah, cay-ah*. A low, conversational *eck, eck, eck*. Mimic and ventriloquist, imitating the calls, cries, and alarm-notes of other birds, particularly the smaller ones and the Red-tailed, Red-shouldered, and Sparrow Hawks.

Description.—Blue, duller on body, paler below, brighter on wings and tail, which are barred with black. Black crescent hanging from ears across upper breast. Tail long, rounded, tipped with white, showing wider at corners. Sides of head, throat, and markings in wings, white. Distinct crest. L. 10.75. W. 5.10. T. 4.85. B. .95.

Subspecific Characters.—A smaller, grayer race of the common Blue Jay, *C. c. cristata* (Linnæus), of the northeastern United States; white tips to outer pair of tail-feathers generally less than 1.00 long, similar markings in the northern race being *rarely* less than 1.00 long.

Field Marks.—Brightly marked; *blue*, duller on body, paler to *whitish below* on throat and belly. Brilliant blue wings and tail; shoulders and inner part of wings barred with black; tail-feathers, except middle pair, tipped with white. *Distinctly crested head;* black forehead. Black

crescent hanging from ears across upper breast. Loud *harsh calls* and cries.

Popular Names.—Jay; Jay-bird; Florida Blue Jay.

SOUTHERN CROW

Corvus brachyrhynchos paulus[159] (Howell)

Fairly common permanent resident; slightly more common in fall and winter. November 2, 1915, 1 shot (B) and identified (A). *Recorded:* ABCDEFH[160]IJKLMNOPQRSWY.

Geographical Distribution.—Gulf States, north to District of Columbia, northwest to southern Illinois, and west to central Texas.

Habitat.—Post oak flats along creeks and lowlands and on gravelly terraces and uplands; big, heavily-wooded creeks of the open farming country; semi-arid woodland pastures; river bottoms; corn fields and newly-plowed fields; borders of woods.

Local Haunts.—Whole of the Region. Crow-roosts, evergreen cedars in brakes in the wild mountainous hills in the western part of the Region; groves along streams such as Onion, Walnut, and Williamson creeks. Flies over University Campus.

General Habits.—More or less clannish, even during the nesting season; highly gregarious during colder winter months, flocking and roosting in colonies, in certain parts of the United States occasionally as many as 300,000 birds in one colony. Usually nests two or three pairs in one community. Extremely shy and difficult to approach; not easy to entrap; occupies conspicuous perches, and watches carefully on all sides. Droll, amusing, and keenly intelligent. Migrates by day, high in the air. More active at dusk than at other times.

Feeding Habits.—Leaving roost in morning, flies low, straggling, looking for food; late in the afternoon, since it is satisfied, it flies high and straight in to the roost. Flocks settle on corn and oat fields and on newly-plowed fields; decidedly fond of corn, but even in thickly settled sections it does more good than harm, where any ordinary precautions are taken to protect young chickens and newly-planted corn, for it is particularly fond of insect pests, such as cutworms, weevils, and grasshoppers, and of field mice, rabbits, gophers, and other harmful rodents; hence it should not be killed. It is also fond of grain and nuts of various sorts; and along the coast it feeds to some extent on fish, mollusks, and other sea-food. Mrs. Florence Merriam Bailey recommends soaking seed-corn in tar before planting; and the scattering of a few quarts of corn about a field will protect 10 acres or more.

Flight.—Vigorous, straight-away. Wings appear saw-toothed when spread.

Breeding.—Late March to early May. Earliest: March 20, 1905, 5 heavily incubated eggs (E). Latest: May 1, 1894, 4 fresh eggs (L). One brood. *Breeding recorded:* ABCEGHIJLOW.

Nest Location.—15 to 50 feet up, usually in triple crotch in upper branches or tops of large, densely-foliaged, bottomland live oak, post oak, pecan, or willow trees in woods; 10 to 20 feet up near main trunk in large cedars in secluded pastures.

Nest Construction.—Bulky, usually well-constructed; composed outwardly of sticks, weed stalks, corn husks, stripes of cedar bark and grapevine bark, moss, feathers, and other coarse material. Lined with cedar bark, grapevine bark, fine roots, dry grass, leaves, straw, moss, rags, wool, hair, oak blossoms, and once an old coffee sack; lining varying in different localities.

Nest Building.—When not molested, nests are often resorted to for several seasons in succession. Nest-building begins about third week in February.

Nest Measurements.—Outside, diameter 15 by 18, height 9 to 12. Inside diameter 7 by 7.50 to 10, depth 4 to 5.

Eggs.—3 to 6, common 5, ovate, sea-green or pale bluish-green to olive-green; usually rather thickly blotched, spotted, and speckled with different shades of dark brown, brown, gray, and drab, sometimes over the entire surface, sometimes only about the larger end; 1.69×1.12.

Voice.—A harsh, but loud and clear, *caw, caw*, four or five times in rapid succession. Less commonly, *yuke, yuke, yuke* or *krah, krah.* Always loud and clear, but with variations: *kher-kher; ker-r-r-r, ker-r-r-r,* or *krer-r-r, krer-r-r; khar-khar; cahk-cahk; h'waw, h'waw, h'waw.*

Description.—Entirely black, with steely bluish-purple reflections; duller below. Feet and heavy bill, black. L. 17.50. W. 12. T. 7. Exp. C. 1.30.

Subspecific Characters.—Much smaller than either the Northeastern Crow, *C. b. brachyrhynchos* Brehm, of eastern Canada and the northeastern United States, or the Florida Crow, *C. b. pascuus* Coues, of the Florida Peninsula, both of which average over 19 in length, and 2 in bill.

Field Marks.—Glossy black all over. Characteristic voice, and well-known habits. *Large size, short tail, and thick bill.* Normal, short, rounded feathers on neck.

Popular Names.—Crow; Corn Thief; Small Crow; Alabama Crow.

BOBOLINK

Dolichonyx oryzivorus (Linnæus).

Very rare migrant; last week in April to first week in May, and probably during late September and early October. In spring, 1914, male and 3 females (G); April 26, 1922, flock of about 50 (A). *Recorded:* ADG.

Geographical Distribution.—Southern Canada, and the northern United States south to New Jersey, West Virginia, Indiana, Missouri, Utah, and the northeastern part of Nevada; summer range gradually spreading westward (see History). Greater bulk of United States Bobolinks migrate southeastward through Florida and the West Indies. Winters in northern South America.

Habitat.—Low fields, grain fields, orchards, and meadows.

Local Haunts.—Grassy place on Waller Creek in College Court; campus of the University.

General Habits.—Migrates both by day and by night, calling back and forth as it passes overhead. Moves northward in spring in separate flocks, males in flocks in full song a few days ahead of females; rarely observed at that season in mixed flocks. Countless flocks of immense numbers are found in fall in the southeastern United States, where they occasionally do much damage to rice fields.

Feeding Habits.—Food consists largely of grasshoppers, caterpillars, locusts, weevils, and similar insects, and of weed seeds, oats, and rice; it is principally during the fall, when insects are not so easily found and when there are large numbers of birds to be fed in a small area, that depredations of the Bobolink become serious.

History.—Due to the fact that irrigation of the northwestern United States is attracting small colonies of Bobolinks from their original breeding grounds in the northeastern United States east of the Dakotas, the Bobolink is beginning to appear and grow more common as a migrant in Texas, where formerly it was rarely known west of Louisiana.

Voice.—Song, sung in its northern summer home, a wonderful, ecstatic, bubbling, rippling *bobolink, bobolink, bobolink, spink-a-spink* or *spink-spink-spink;* given by Wilson Flagg as *phew, shew, Wadolincon; listen to me, Bobolincon.* A loud rattling or chucking when flushed. Call, a clear, monotonous, metallic *chink!* or *clink!* or *tink, tink,* often heard in the dead of night as the birds pass over during migrations; a harsh *chah.*

Description.—In spring, top and sides of head, entire under-parts, wings, and tail, black; face and under-parts slightly veiled by yellow feather-tips, which wear off by June; lower back, rump, and wing-coverts, pale grayish-white; back of head and hind-neck with large buffy-yellow patch; upper back lined with yellow; bill blue-black. Female (and fall male similar, but with darker streaking), crown dark, with light line down middle and another over each eye; back with several distinct buffy, brown, and black stripes; rump paler; sides of head and under-parts, yellowish-buffy-white, streaked on flanks and lower sides; wings and tail brownish. In fall, both sexes in general slightly more olive-buffy. Complete molts, both in spring and in fall, to acquire breeding and winter plumages. L. 7. W. 3.75. T. 2.70. B. .62. Female slightly smaller.

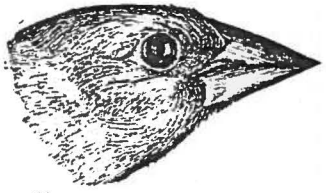
Field Marks.—Dark crown, with light line down middle, and another over each eye; buffy color, with paler to *whitish rump*, and distinct black and brown stripes down back. *Very short, thick bill. Stiff-pointed tips to tail-feathers* identify obscure female. Male in spring, black, with yellow hindneck and pale gray rump. Call, *clink!*

Popular Names.—Ricebird; Reedbird, Skunk Blackbird; American Ortolan; Meadow-bird; Bob-o'-Link; Robert of Lincoln; Robert o' Lincoln.

COWBIRD

Molothrus ater ater (Boddaert).

Common migrant, and scarce and irregular winter resident, common in mild winters; middle September to April, common in November and again in March and April; begins moving northward late in February.



Chapman
COWBIRD

In spring, migrating, April 4, 1915, 20 (A); April 27, 1919, many large flocks migrating (B); April 30, 1919, 60 (B); April 16, 1921, 45 (A); April 25, 1920, 110 (A). In fall, September 14, 1914, flocks 22, 45, 18, and 22 (A); November 7, 1919, abundant (A). *Recorded:* ABCDEFGH[161]IJKLMNOPQRW.

Geographical Distribution.—Eastern North America, from southeastern Canada west to Montana and southern New Mexico; south to the Gulf Coast and to north-central and central-western (Kerrville) Texas. Winters from north-central United States and southeastern California south to the Gulf Coast and to Central America.

Habitat.—Dairies, stock-pens and stockyards, and cow pastures; fields and open farming lands; truck gardens; roadside telegraph wires, fences, bushes, and trees.

Local Haunts.—Open country east of the hills, particularly dairies north of town and stock-pens on the river flats below town; grassy portions of the gravel beds; University campus. In fall, roosts in Aldridge Place.

General Habits.—Usually occurs in flocks of from 10 to 50, though occasionally flocks of from 1000 to 3000 are seen. Associates in winter with the Yellow-headed Blackbird, the Red-winged Blackbird, and the Bronzed Grackle.

Feeding Habits.—Feeds about grazing cattle in pastures, picking up insects disturbed by their browsing, or about cattle in stock-pens and at dairies; occasionally alights on the backs of cattle, searching for parasites. Feeds largely on harmful weed seeds and injurious insects, taking only a very small amount of grain.

Description.—Glossy black, with metallic bluish-green reflections; head, neck, and throat, uniform light chocolate-brownish or coffee-color; bill pale bluish-gray. Female, dark brownish-gray or mouse-gray all over, with indistinct dusky streaks; lighter below, with lighter throat and light line over eye. L. 7.90. W. 4.25. T. 3. B. .67. Female smaller.

Subspecific Characters.—A larger race. Male, W. 4.15-4.56; T. 2.76-3.15; B. .68-.77. Female, W. 3.68-4.12; T. 2.43-2.77; B. .60-67.

Investigation.—Series of spring and summer cowbirds from higher hills and plateaus in extreme western and northwestern parts of the Region may add this form as a local breeding bird; its eggs average .88×.64.

Field Marks.—Black, with rich brown head, neck, and breast. Large size. Call-notes. Female, dark grayish-brown above, lighter below.

Popular Names.—Cow Blackbird; Brown-headed Blackbird; Cow Bunting; Chucking Blackbird; Common Cowbird; Northern Cowbird; Large Cowbird; Northeastern Cowbird; Coffee-headed Blackbird; Buffalo-bird.

DWARF COWBIRD

Molothrus ater obscurus (Gmelin)

Rather common summer resident; middle of March to late August; flocks break up by second week in April. In spring, March 22-25, 1905, common (B); March 25, 1919, 6 (A); March 29, 1921 (A); April 18, 1915 (AF); April 19, 1905, 1 shot (B); April 24, 1905, 1 shot (B). In fall, August 18, 1915 (A); August 27, 1921 (A); August 28, 1916, 8 (F). *Recorded:* ABCDEFGH[162]IJKLMNOQWY.

Geographical Distribution.—Mexico and southwestern border of United States, from southern Louisiana, south-central Texas (Austin and San Antonio), central Arizona, and southern California, southward. Winters southward into Mexico.

Habitat.—Brushy pastures and scattered woodlands; mesquite flats, forests, and prairies; creek valley slopes; shrubbery along water-courses; edges of woodlands; dairies, cattle pens, and cultivated fields; less thickly settled parts of towns and villages.

Local Haunts.—More common in the hills, along hill creeks, and in the semi-arid country between the city and Lake Austin and south and southwest of Colorado River; Dry and Bull creeks; Barton canyon; shores of Lake Austin; Pease pastures; University campus.

General Habits.—The villain of the bird world. Usually observed singly, or in pairs and by twos and threes to sevens, a male with several females. Shy and retiring, wandering about in very small companies. Carefree, easy-going small flocks, with no family duties; entirely lacking in maternal and conjugal instincts; male polygamous, female polyandrous, neither pairing nor building. Usually observed sitting on topmost twig of tree in pasture or along edge of woods; thus locates the nests of other birds, where its eggs may be deposited. Occasionally the female throws out the eggs of her host before depositing her own egg. The host frequently deserts or builds herself a second bottom to cover the Dwarf Cowbird egg or eggs; usually, however, she assumes her enforced adoption with good grace. The young cowbird is gluttonous, and its size frequently aids in crowding out and killing the nestlings of the host bird; stays with its foster-parents until fully grown, and then joins fall flocks of its own kind.

Feeding Habits.—Stands about the feet of feeding cattle, catching insects; occasionally perches on a cow's back and picks off ticks.

Flight.—Small flocks wheel overhead in unison. Acts in concert: when one flies, all fly; when one alights, all alight. Flight wavy, up and down.

Breeding.—Middle April to middle June. Earliest: April 16, 1893, 1 fresh egg (L); April 27, 1894, 1 fresh egg (L). Latest: June 4, 1917, 1 fresh egg (B); June 17, 1915, 1 slightly incubated egg (A). Date of egg-laying depends largely on time of laying of host birds, since it usually waits until they have deposited each one an egg or two. *Breeding Recorded:* ABCEFGHIJLMNOWY.

Nest Location.—That of host.

Nest Construction.—None. Builds no nest, but lays its eggs in one nest or in different nests of other birds: Bell Vireo, Orchard Oriole, Texas Painted Bunting, Dickcissel, Eastern Yellow-breasted Chat, Western Lark Sparrow, Blue-gray Gnatcatcher, Golden-checked Warbler, Sennett Black-crested Titmouse, Rio Grande Red-winged Blackbird, Eastern Blue Grosbeak, Eastern Bluebird, Scissor-tailed Flycatcher, Eastern Summer Tanager, Western Mockingbird, Carolina Wren, and Gray-tailed Cardinal. Usually selects a nest the owner of which is smaller than itself.

Eggs.—1 to 5, usually 8 to 12 in season; dull white, sprinkled with specks and spots of lilac and brown, heaviest near the larger end; lighter and more sparingly spotted than eggs of the Eastern Cowbird; largest, .84×.64, smallest .71×.54, average .76×.59.

Voice.—Gurgling, guttural, rasping, bubbling whistle, followed by a few sharp notes; a sliding, glassy whistle: a whistled *spreelee* or *skee-teet;* a rather rapid, shrill, rattling chatter; a liquid, wiry squeak, with a spreading of wings and tail; a very high-pitched, two-syllabled, squeaking *swee-zee;* a low *chack.*

Description.—Similar to the Eastern Cowbird, with subspecific differences.

Subspecific Characters.—Similar to the Eastern Cowbird, but smaller, averaging at least a half inch shorter. Male, W. 3.71-4.10, av. 3.95; T. 2.45-2.87, av. 2.71; B. .60-.70, av. .64. Female, W. 3.40-3.70, av. 3.57; T. 2.30-2.62, av. 2.50; B. .55-.62, av. .59.

Field Marks.—*Glossy black,* with light *chocolate-brown head,* neck, and breast. Eye brown. No contrasting black or white colors. Calls. Female dull, streaked, brownish-gray.

Popular Names.—Cow Bunting; Cow Blackbird; Cowpen Bird; Lazy Bird; Coffee-headed Blackbird; Shifty-bird.

YELLOW-HEADED BLACKBIRD

Xanthocephalus xanthocephalus (Bonaparte)

Fairly common but irregular migrant, occasionally abundant in spring; formerly very scarce; March and April, and again in November. In spring, 1891, 50 in flock (B); April 13, 1916, 1 (B); April 17, 1915, 2 (Q); April 23, 1922, 2 males (A); April 27, 1919, abundant (B); April 30, 1919, 50 males and 10 females (B). In fall, November 6, 1919, 5 (A); November 27, 1921, 4 (A). *Recorded:* ABCDHJKNOQW.

Geographical Distribution.—Southwestern Canada, south across the western United States into Mexico; east to Wisconsin and Indiana and south to Iowa and Illinois in central United States. Winters from southwestern Louisiana and the Mexican border to California, south into Mexico.

Habitat.—Cattle-pens; open pastures and truck gardens along open river bottoms; peach orchards; grain fields, waste fields, meadows, pastures, and roadsides in farming country; gravelly terrace uplands, and oaks on rises; corrals. Western prairie country. In North, tulé or quill-reed marshes and sloughs.

Local Haunts.—Cattle-pens and stockyards in river valley across from city; live oak and post oak and elm shade trees in vacant lots in town and near Insane Asylum; peach orchards along river lowlands. East of the hills.

General Habits.—Rarely observed singly, usually occurring in flocks of from 5 to 100 birds, or in composite flocks with northeastern Cowbirds, Red-winged Blackbirds, and Bronzed Grackles.

Feeding Habits.—Feeds mainly on grasshoppers and locusts and their eggs and larvae; also takes small seeds and wild rice, and in the farming districts occasionally eats a small amount of corn, wheat, and oats.

Voice.—Noisy; loud, varied, with much effort, and with a spreading of tail and a puffing of chest: strained and harsh squeals, creaks, grunts, and groans; harsh, guttural, frog-like croaks; a harsh *chack.* Young birds, a wooden, rolling call.

Description.—General color, black; whole of head (except black space from eye to bill and black chin), neck, throat, and breast, orange-yellow; large white patch on shoulder of wing. In winter, more brownish on crown. Female, grayish-brown replacing black; crown darker; mixed dirty yellow and white replacing orange of head and breast. L. 10. W. 5.50. T. 4. B. .90. Female much smaller.

Field Marks.—Handsome. Black body, and bright yellow head and upper breast; white patches in wing in flight. Female, dull-colored, brownish; brown also partially replacing yellow of head.

RED-WINGED BLACKBIRD

Agelaius phoeniceus predatorius[163] (Wilson)

Common migrant and winter resident, slightly more abundant during migrations; November to April. *Recorded:* ABCEHIJKLMN.

Geographical Distribution.—Eastern Canada and eastern United States, exclusive of the Gulf Coast Regions; west to eastern Nebraska and northeastern Texas, but not onto the Great Plains. Winters from north-central United States southward over the Gulf States and the eastern half of Texas.

Habitat.—Open country; wet prairies, wet meadows, and marshes; open waste fields and plowed fields.

Local Haunts.—East of the hills; Barton Creek pecan grove; bottoms of Colorado River; open prairies north, northeast, and southeast of town.

General Habits.—Usually occurs in compact, swiftly-moving flocks or bands of from 20 to 50, or in composite flocks with Common Cowbirds and Yellow-headed Blackbirds; less commonly, but occasionally in November and March, in flocks of thousands, wheeling and circling over the open country, at a distance so thick as to resemble clouds of smoke. Large companies move along the river bottoms. The female winters in flocks with others of her sex.

Feeding Habits.—Food consists largely of weed seeds and injurious insects, with a small percentage of grain. Numbers of birds follow the plow on plowed fields, wheeling and turning and alighting as they search for cutworms and other insects. Large flocks observed over old grain fields in November, picking up waste grain.

Description.—Glossy, silky black, with dusky edgings to feathers of head and back; bright scarlet-vermilion shoulders (lesser wing-coverts), edged behind with rich buffy. Female, harsh brown to blackish, broadly streaked all over with rusty and buffy, especially clear with black and whitish streaks below; pale buffy line over eye and along each side of yellowish throat; reddish-tinged spot on shoulder of wing. Male in fall, buff on shoulders deeper; dusky to buffy edges to body feathers, giving it a mottled or scaled-brownish to rusty-black appearance. L. 9.50. W. 4.75. T. 3.75. B. .87; depth at base .50.

Subspecific Characters.—Wing-coverts paler; female darker-backed; and larger than the Rio Grande Red-wing. Male, W. 4.58-4.90; T. 3.49-3.80; B. .87-1.00. Female, W. 3.75-4; T. 2.75-3.10, B. .68-.82.

Field Marks.—Black; red shoulder-patch, with yellowish line behind it. Square tail. Female, broadly streaked brownish, with pale line over eye and along side of throat.

Popular Names.—Ricebird; Swamp Blackbird; Red-shouldered Blackbird; Common Red-winged Blackbird; Winter Red-wing; Red-wing.

RIO GRANDE RED-WINGED BLACKBIRD

Agelaius phoeniceus megapotamus[164] Oberholser

Fairly common, but locally distributed, summer resident; middle March to September; begins moving southward in middle July. In spring, arrivals, March 2, 1920, 2 males (B); March 13, 1919, 2 males and 13 females at breeding grounds (B); March 15, 1920, 3 males and 7 females (A). *Recorded:* ABCDEFGH[165]JKLMNOPWY.

Geographical Distribution.—Northeastern Mexico and northern Vera Cruz, northward into central-southern Texas, east to the Brazos River and north to Giddings and Austin. Winters in northeastern Mexico.

Habitat.—Marshy and swampy spots, generally close to water of streams, sloughs, and ponds, and grown with cattails, tules, rushes, reeds, grass, bloody horseweeds, and small bushes. Willow saplings and trees along bottoms and river margins; prairie ponds, meadow draws, and slough borders. Bits of green marsh in the brown-grass prairies of summer.

Local Haunts.—Average census: (a) Insane Asylum pond, 6 pairs; (b) willows along south side of Colorado River below Congress Avenue bridge, 6 pairs; (c) willows on north bank of river, west of railroad bridge and near sand beach, 20 pairs; (d) bloodweed patch on north side of river in Tenth Ward, 10 pairs; (e) bloodweed patch in marshy draw in farming country across from Neams place, 1.5 mile north of Fiskville, 15 pairs; (f) bloodweeds and marsh grasses of slough on Georgetown road just south of The Oaks, 2 pairs; (g) swampy spot along I. & G. N. Railroad track 5 miles south of Austin, 10 pairs; (h) colony now gone, formerly in rank grass which grew at mouth of Barton Creek, 18 pairs.

General Habits.—Breeds in pairs and in small colonies. The male challenges intruders in his domain with shrill or harsh notes, and circles about overhead as he flutters his wings to show their conspicuous rich crimson-red epaulets.

Breeding.—Early May to early June, the season much shorter than in other localities. Earliest: May 5, 1893, 4 fresh eggs (L). Latest: June 3, 1915, 4 fresh eggs (AB); May 22, 1917, 5 fresh eggs (B). *Breeding Recorded* ABCEFGHJLMNO.

Nest Location.—1 to 20, usually 6, feet up, firmly woven to limbs and twigs of willow or ligustrum trees or bushes, to cattails, bloodweeds, reeds, rushes, tules, cane, or saw-grass; along creeks, sloughs, river margins, draws, edges of pasture ponds, and about artificial lakes.

Nest Construction.—Rather coarse structure of buffy, dried Johnson grass, marsh grass, hay, foxtail grass, weed-stalks, and weeds; less commonly, cattail leaves, willow leaves, strips of pond-lily pads, rushes, fiberous bark, paper, cloth strips, string, and mud. Lined roughly with grass stems and fibers and a few grass seed stems, and cup finally lined with fine interwoven grass tops or hairlike buffy rootlets and a few horsehairs.

Nest Measurements.—Outside, diameter 4.00 by 4.50, height 3.80 to 5, occasionally more. Inside of cup, diameter 2.25 to 2.50 by 3, depth 2.25 to 3.

Eggs.—3 to 5, commonly 4, rounded ovate, rather smooth; clear, pale bluish green or light blue, sparingly spotted and blotched and singularly scrawled near the larger end, less commonly over the whole surface of the egg with blackish-brown and purplish; .98×.70.

Voice.—Noisy, discordant. Song, *ska-lcee oo squee, cheenk-cheenk-cheenk-cheenk.* A rich, mellow, liquid *konk-quer-ree-e-e-e-e!* or *kong-ker-ee-e-e.* A long-drawn *ker-whee-e-e-e-e-e-e' oo.* An ascending *cuh-lag gee-e-e-e-e-e-e-e-e-e!* A whistled *oka-lee oo!* or *oka-lee!* A loud *kuh-spraaay'!* and a *klee-e-e-ya!* A grating *tzkee-e-e-e-e-e-e-e-e-er!* A metallic *ta-loo.* Sharp call notes: an emphatic *tchayt* or emphatic *tchack,* uttered with a twitch of the tail; a high-pitched *kee,* a harsh *cack,* and a rusty *chep;* a challenging *chuck* or *chut.*

Description.—Similar to the Northeastern Red-winged Blackbird, with subspecific differences.

Subspecific Characters.—Similar to the Vera Cruz Red-wing, *A. p. richmondi* Nelson, of Mexico, Yucatan, and British Honduras, but larger; female more grayish above and less ochraceous below. Longer-winged and shorter-billed than the Florida Red-wing, *A. p. phoeniceus* (Linnæus), of the Gulf Coast and the eastern Texas coastal belt; female much lighter colored. Deeper-colored wing-coverts (deep buff to tawny instead of pale buff), particularly in winter, than the Northeastern Red-wing; in female, upper-parts, pale colors predominating instead of dark colors. Male, W. 4.54, T. 3.42, T. C. .89. Female, W. 3.66, T. 2.70, T. C. .77.

Field Marks.—Coal-black; shoulder scarlet-red, edged behind with yellow. Female, spotted and streaked buffy, grayish, and brown.

Popular Names.—Swamp Blackbird; Marsh Blackbird; Red-shouldered Blackbird; Red-wing; Chuck; Cattail Blackbird; Red-winged Oriole; Red-winged Starling.

MEADOWLARK

Sturnella magna magna (Linnæus)

Very rare winter resident, December to early March. *Recorded:* CDJ.

Geographical Distribution.—Southeastern Canada and northeastern United States, south to North Carolina, Missouri, and northern Texas; west to western Iowa, eastern Kansas, and northwestern Texas. Winters throughout eastern United States, mainly south of Potomac and Ohio Valleys into the Gulf States.

Habitat.—Meadows, grassy fields, pasturelands, dried short-grass marshes, and county roadsides.

Local Haunts.—Open country east of the hills; prairies, north, northeast, and east of town; campus of the University.

General Habits.—In fall, gathers in flocks and moves southward or out into the marshes. Wary, and difficult of approach in open, exposed situations; on tall-grass prairies they allow approach within a few feet before taking wing. Nervously flirts its tail on perching. One shot from a wintering flock of Western Meadowlarks (C).

Flight.—Flapping and sailing, straightaway, suggestive of the Quail, but without a burring sound.

Voice.—Song, feebler than that of the Western Meadowlark, a metallic twitter, *quip-quip-te-te-te-te-te-te-te-te* or *zreet, zreet, zreet-te-te-te-te-te-te;* a sharp *dzit* or *yert,* followed by a rapid, shrill, metallic rolling twitter, *peent-peent-peent-peent-peent-peent.* At intervals, a high-pitched, fife-like, clear-cut song, piercing and sweetly whistled, "Spring o' the y-e-a-r, spring o' the year!" Again, a flutelike *laze-kill-dee* or a clear, high-pitched, flutelike *tseu-tseer* or *tseeu-tseeer.* Sings from daybreak until sunset. Call, an occasional liquid *weet-weet.*

Description.—Upper-parts, streaked and mottled with rich buffy and rufous, barred with dark brownish and blackish. Under-parts, from chin to upper belly, rich lemon-yellow; sides of throat and ear-coverts, whitish; chin and line over eye, yellow, veiled with buffy feather-tips; large, conspicuous black crescent on chest, more or less veiled with buffy or ashy feather-tips in winter. Crown dark brownish, with distinct pale buffy line down center and another over each eye. Belly

and sides whitish, streaked with blackish. Outer tail-feathers, mostly white; imperfect, connected bars on middle ones, not reaching margin of feathers. In winter, generally rufous-brown above, duller yellow, and with buffy-veiled black breast-crescent. L. 10.75. W. male, 4.82; female, 4.23. T. 3.15. B. 1.30.

Field Marks.—Moderately large, thickly built, brownish bird, with *short tail.* Quail-like, but fairly long bill, *yellow breast with blackish crescent,* and characteristic *flight,* with *outer tail-feathers conspicuously white.* Dark upper-parts, blackish in summer, rufous-brown in winter. *No yellow on sides of throat.* Imperfect, confluent bars on middle tail-feathers.

Popular Names.—Old-field Lark; Fie'lark; Field Lark; Northern Meadowlark.

RIO GRANDE MEADOWLARK

Sturnella magna hoopesi Stone

Very rare winter visitor from the South; formerly, rare summer resident. Record: January 30, 1905, a single first-year female shot (B). *Recorded:* BCEH[166]IJNOQW.

Geographical Distribution.—Northern Mexico north to north-central Arizona, southern New Mexico, and south-central Texas; east to the Texas Coast.

Habitat.—Big, open, virgin prairie, and its remnants along railroad rights-of-way; pasturelands in open country; meadows and corn-fields; Lower Sonoran plains.

Local Haunts.—Eastern half of the Region, east of the hills; prairies north and northeast of Austin; I. & G. N. railroad line northwest of town; prairies in extreme southern part of the Region; University campus. In winter, cockleburr thickets on sandbeach of river at town.

General Habits.—Formerly fairly common on the big uncultivated prairies and short-grass plains of the Region, but disappeared rapidly with settling up of the country, particularly when the waxy blackland was found so rich for cultivation and turned with the plow; no summer birds have been seen for about three decades. The one winter bird recorded was shot from a flock of Western Meadowlarks which had doubtless moved south to the Rio Grande Valley in advance of a December cold snap, then shifting northward once more with a return of mild weather, luring this individual northward beyond its present range.

Breeding.—Formerly, early May to middle June. *Breeding Recorded:* W.

Nest Location.—On ground, usually in shallow depression or cow-hoof print, among tall grasses or grains in open fields, hay-fields, or meadows; well hidden in a tuft of grass.

Nest Construction.—Domed structure, well constructed, compact, of coarse, wiry, dry grasses, arched over with dead grasses, and lined with finer grasses.

Nest Measurements.—Entrance of domed nest, width 3.10, height 3.20. Inside of nest, diameter, side to side 3.63, front to rear 3.50, top to bottom 4.10.

Eggs.—3 to 5, white, speckled and dotted more or less over entire surface with reddish-brown and purplish, 1.10×.80.

Voice.—Quite different and easily distinguished from that of the Northeastern and Southeastern Meadowlarks and that of the Western Meadowlark. Most conspicuous difference, neither the wooden roll of Western nor the hard, metallic, sharp, shrill twitter of the eastern varieties; rather, a soft, entirely pleasing, decidedly characteristic, *lutl-lutl-lutl-lutl,* varying to a softer, but clearer, *lewtl-lewtl-lewtl-lewtl,* usually following the familiar *laze-kill-dee* call.

Description.—Similar to the Northeastern Meadowlark, with subspecific differences.

Subspecific Characters.—Smaller than the Northeastern Meadowlark; and brighter yellows, slightly orange in brightness and tint; paler, grayer, above. Northeastern Meadowlark has upper-parts browner, under-parts more lemon-yellow in tint. Female, with yellow more orange in tint. Young, duller, markings indistinct; black chest crescent faint. Throat, intense yellow, restricted, not encroaching on cheeks as in the Western Meadowlark. L. 8.50. W., male, 4.40-4.96, av. 4.61; female, 393-4.35, av. 4.19. T. 2.55-3.15; female, 2.50-2.90. B., male, 1.20-1.40; female, 1.18-1.32. Tars. 1.60.

Field Marks.—In size and general appearance, more like Western Meadowlark, but with *cheeks whitish,* as in the Northeastern Meadowlark, rather than yellow as in the Western. *Yellows richer, deeper,* more intense, with orange tint. Upper-parts more brownish and more black than the Northeastern Meadowlark, wing shorter and body smaller, bill larger, feet and legs decidedly longer and stouter.

Popular Names.—Texas Meadowlark; Mexican Meadowlark; Feelark; Fie'lark; Meadowlark.

WESTERN MEADOWLARK

Sturnella neglecta neglecta[167] Audubon

Abundant migrant and common winter resident; October to April. In fall, October 10, 1915 (F); October 10-11, 1914, arrived during night (AB); October 18, 1913 (B); October 18, 1915 (F); October 8, 1916 (F). In Spring, April 13, 1913 (B); April 16, 1919 (A). *Recorded:* ABCDEFGHIJKLMNOPQSWY.

Geographical Distribution.—Southwestern Canada southward over western United States to Mexican boundary and northwestern Texas; east to the Dakotas. Winters across western United States to southwestern Mexico, and southeastward to the Gulf Coast of Texas.

Habitat.—Open country: prairie lands, plains, large grass fields, hay and stubble fields, meadows, sorghum fields, and uplands covered with a thick growth of grass and weeds; among stalks in cotton and corn fields, particularly in fall; river bottom flood-plains; country roadsides; vacant lots in sparsely settled parts of towns.

Local Haunts.—More common east of the hills, in open country and open fields near town; grassy flats on the edges of town; vacant lots in Austin; University campus; among cockleburrs on the sand-beach; river lowlands.

General Habits.—Occurs usually in flocks of from 10 to 100, rather scattered except during migrations, when the birds move in close flocks. Becomes shy as soon as the hunting season opens in fall.

Migration.—Most commonly migrating, late October to the middle of November, and again during the first half of March. Small flocks begin moving northward in January, but fall back before each cold spell; migration in full swing by early March.

Feeding Habits.—Feeds on beetles, on grasshoppers and their eggs, and on the large black cricket which is so destructive and which appears in such immense swarms in fall in Austin; many other insect pests are eaten by this bird.

Voice.—Song, loud and clear, melodious, and really wonderful; it is much louder, richer, sweeter, more varied and more of a flute-like mellow bubbling than, and not so shrill and fife-like as, the song of the Eastern Meadowlarks, whose songs cannot be compared with it for melody. A series of bubbling, flute-like notes, consisting of four or five repetitions of mellow, whistled *wheu,* rapidly increasing in speed, followed by a bubbling, jumbled warble, as the bird rises on fluttering

wings 20 to 30 feet from its perch into the air; quite different from the "*straight* whistling" of the Easterner. Sings from ground, barbed-wire fence, and from the lowest to the highest tree in the open; and sings more frequently on the wing than does the Eastern Meadowlark, particularly during the mating season. Scarcely quiet for a moment during spring; whole flocks sing and warble at the same time. Singing as early as February 10, 1907 (S); and bursting their throats with song. March 7, 1915 (A). Call, *chuck, chuck,* followed by a rolling, wooden *br-r-r-r-r-r,* quite unlike the *dzit* or *yert* and the metallic twitter of the Eastern Meadowlark.

Description.—Similar to, but larger and lighter-colored than, the Northeastern Meadowlark; almost grayish when looked at from above; yellow of throat extends onto cheek. Upper-parts grayish-brown, streaked and faintly barred with black, particularly barred on rump; buffy stripe down the middle of the crown and another buffy line over each eye; throat, breast, and upper belly yellow, spreading across the sides of the throat and touching the ear-coverts; black crescent on breast; sides and belly whitish, spotted and streaked with black. In winter, lighter and more grayish-brown above; duller yellow below; and black crescent veiled with whitish. L. 10.25. W. 4.60; male, 4.65-5.10; female, 4.10-4.60. T. 3; male, 2.70-3.25; female 2.37-2.85. B. 1.25; male, 1.15-1.45; female, 1.07-1.30.

Field Marks.—Yellow of throat encroaching across cheek-patch below eye, and touching ear-patch; cheek buffy-white in Northeastern, Southeastern, and Texas Meadowlarks. Voice and song very markedly different. General appearance, especially white outer tail-feathers showing in flight, quite similar to eastern birds; but bars on middle brownish-gray tail-feathers generally *not* connected and usually reaching the margins of the feathers. Eastern birds have upper-parts darker and with broad conspicuous black streaks, quite different from the paler, grayer, more-barred-than-striped upper-parts of the Western Meadowlark.

Popular Names.—Fee-lark; Fie'-lark; Field Lark; Old-field Lark; Prairie Lark; Pale Meadowlark; Dago Quail.

Remarks.—Even though against the law, many are still shot for sport and for the pot.

ORCHARD ORIOLE

Icterus spurius (Linnæus)

Common summer resident, middle April to middle September. In spring, April 13, 1904 (H); April 13, 1916 (G); April 14, 1919 (A); April 16, 1921 (A); April 20, 1914 (G); April 25, 1920 (A); April 25, 1922, 2 adult and 2 first-year males (A); April 27, 1920 (B); April 28, 1915, 2 (F). In fall, September 14, 1916, 8 (F); April 17, 1919 (A). *Recorded:* ABCDEFGH[168]IJKLMNOPQWY.

Geographical Distribution.—Eastern North America, from Ontario in Canada south across eastern United States to Florida, the Gulf Coast, and southern Texas, south into Mexico; west to central Nebraska, western Kansas, and southern Texas. Winters from southern Mexico southward to northern South America.

Habitat.—Prairie country; trees and shrubbery along streams, roads and fences; orchards and groves; trees in truck gardens, about ranch and farm houses, along country roadsides and along fence-rows; hackberry trees along country roads; edges of town; slender door-yard trees in town; sparsely wooded river banks; lines of trees or pasture-lands on the river flood plains.

Local Haunts.—Eastern half of the Region, west to the hills, and open flats and bits of plateaus in the hills; hackberry trees along country roads north of and southeast of town; mesquite trees on the

mesquite prairie south of town; peach and pear orchards near Austin; shade trees in town; willow trees along Deep Eddy; University campus.

General Habits.—Observed singly or in pairs, except during migrations, when it moves about in family groups and in flocks. After the nesting season is over, the birds scatter rather widely, the family groups gradually forming into flocks early in July, the males soon leaving, and the females and young moving about together. Quiet, refined bird.

Migration.—Males arrive about April 13, the females four or five days later; usually common by the fourth week in April. Family groups wander about in July and August, and males usually leave about first week in August; females and young move about during August and first half of September, gradually leaving during first two weeks in September. Occasionally as early as second week in July—once on July 6, 1915—in flocks migrating slowly southward in feeding about cotton fields (A).

Feeding Habits.—In summer, forages in small family parties along fence-rows and edges of woods, after boll weevils in cotton fields, and through mesquite pastures after geometrid caterpillars and similar insects. Feeds on caterpillars, insects of various sorts and their larvae, particularly small beetles, smooth caterpillars, cabbage worms, flies, plant lice, and grasshoppers.

Breeding.—Early May to middle June. Earliest: May 8, 1894, 4 fresh eggs (L). Latest: June 4, 1901, 5 fresh eggs (B); June 12, 1915, 2 fresh eggs (A); June 12, 1895, 5 fresh eggs (L). Large set: May 16, 1897, 7 fresh eggs (J). One or two broods. *Breeding recorded:* ABCEGHIJLMNOWY.

Nest Location.—2 to 35, average 12, feet from ground, hanging to slender twigs at tip or extremity of projecting limb or near to, rarely settled in fork, of hackberry, mesquite, cedar elm, winged elm, peach, pear, huisache, retama horse-bean, honey locust, eastern live oak, black willow, or pecan tree, in open or semi-open country, about farm or ranch houses, along country roads, in orchards, truck gardens, or in door-yards; usually well concealed in foliage. Rarely in large trees or in woods.

Nest Construction.—A small, round, semi-pensile bag, basket, or purse-shaped nest, composed of long, very fine, dry, greenish or yellowish grasses and grass seed stems and central stems of retama leaves, elaborately and finely interwoven; lined with tiny yellow or pea-green threads of grass, soft thistle down and other vegetable down, or, less commonly, cotton, a few horse-hairs, or feathers. Rarely constructed externally of Spanish or Usnea mosses when in post oak or black-jack trees.

Nest Building.—Pair building nest, May 4, 1914 (G), and April 25, 1920 (Wolfe).

Nest Measurements.—Outside, diameter 3 to 3.40 by 3.80 to 4.10, height 3 to 3.90. Inside, rim diameter 2.30 to 2.50, middle diameter 2.40 by 3, depth 1.75 to 3.10.

Eggs.—3 to 7, average 5, grayish or pale bluish-white, with lavender cloudings and black blotches, scrawls, and pen-marks, .75×.54.

Voice.—Rich and full of expression; a sweet, rapid, lively chant, cheery, and so rapidly uttered as to be more or less a confused warble-jumble, *too-wee-che, wee-too-chee, wee-chee-too, wee-wee-wee-too* or *too-too-tee-tee-tee-tee-ter-too-chee-br-r-r-r-r,* the notes fairly tumbling over one another, the song stopping suddenly; usually uttered while securely hidden in the dense foliage of the tree-tops; sometimes sung on the wing, but only when the bird is flitting rapidly from one tree to another. Chattering alarm-note. Sings from arrival until July, but rarely heard from then until departure; sings all day long during nesting season, irregularly during the latter part of its stay.

Description.—Head, throat, neck, upper back, tail, and wings, black; remainder of body (rump, breast, shoulders, and under-parts), rich chocolate-brown or chestnut; brownish and whitish edgings to wings, light tip to tail. Female smaller, yellowish-olive, darker to fuscous on wings, darker to grayish above, brighter to dull yellow below on under-parts; rump distinctly brighter yellow; two white wing-bars. Immature male, yellowish-olive and yellow like female, but with black throat, and with occasional patches of chestnut on rump and under-parts. Winter, immature male like female, but browner on back; adult male, winter plumage acquired by fall molt occurring after bird has left for South, little clear black or brown, mostly buffy to yellowish, with blackish face and throat and mottled brownish under-parts; spring plumage of clear black and brown not assumed by molt, but by wearing off of buffy feather-tips, a fringe which made up the winter plumage and hid the spring plumage. L. 7.30. W. 3.10. T. 2.90. B. .63.

Field Marks.—Only oriole with black and rich chocolate-brown markings. Small size; comparatively dull colors for an oriole. Female, grayish olive-green, darker on wings, yellow below and on rump. Young male, like female, but with distinct black throat-patch.

Popular Names.—Hang-nest; Brown Oriole; Chocolate-and-black Oriole.

BALTIMORE ORIOLE

Icterus galbula (Linnæus)

Not uncommon migrant, usually more common in fall, though occasionally fairly common in spring; last half of April, and from middle August to late September. In spring, April 16, 1922 (A); April 18, 1915 (A); April 25, 1922 (A); April 27, 1914 (G); April 30, 1922 (A); May 4, 1919 (Wolfe); May 14, 1922, 4 (Wolfe). In fall, August 10, 1916 (G); August 30, 1915 (B); September 4, 1921, common (A); September 10 to 24, common, September 14, abundant, 1916 (F); September 29, 1919 (A). *Recorded:* ABCDFGK.

Geographical Distribution.—Eastern Canada and eastern United States, south to northern Georgia, central Louisiana, and northern Texas; west to the edge of the Rocky Mountains. Migrant across Texas as far west as Karnes County. Winters from southern Mexico south to northern South America.

Habitat.—North-and-south-running creek valleys; mesquite prairies; city shade trees; orchards; semi-cultivated lands; mesquite flats; shade-trees about farm and ranch houses on the prairie.

Local Haunts.—Eastern half of the Region; Shoal and Waller creek valleys; mesquite flats near heavy timber northeast of town; mesquite woods about town; shade-trees in Austin and on University campus.

General Habits.—Occurs singly and in small bunches of from 2 to 5. A gaily-attired, tropical-appearing bird, one of the most beautiful and highly-colored of all the orioles. The male of this species does not assist the female in the building of the nest.

Feeding Habits.—Feeds on harmful insects and their larvae, particularly locusts, grasshoppers, weevils, plant lice, caterpillars, ants, and click-beetles.

Voice.—Song, a clear, lively, five-note whistle, with third usually, fourth rarely, highest; a two-note, querulous warble-whistle, usually quite clear. A plaintive, whistled call-note; a scold-note. Young ceaselessly, persistently, monotonously call for food, *dee-dee-dee-dee.*

Description.—Entire head, including cheeks and throat, and nape, neck, upper back, and most of tail, black; body, including rump, breast, and under-parts, rich orange or reddish-orange; big orange patches on corners of black tail; wings black, with white bars and yellow shoulder-markings. Female, streaked brownish replacing black of body; entire tail and body, yellowish to grayish-orange; wings as in male. L. 7.50. W. 3.60. T. 2.80. B. .70.

Field Marks.—Black and rich orange colors. Whole head, including cheeks, black; Bullock Oriole has orange cheeks.

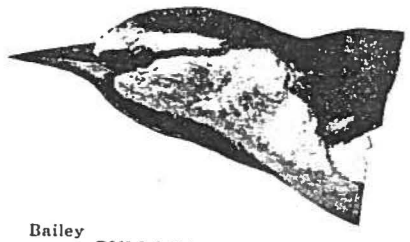
Popular Names.—Golden Oriole; Golden Robin; Fire Robin; Black-and-orange Oriole.

Remarks.—Named Baltimore Oriole because its bright orange and black colors were exactly the tone of the livery of Lord Baltimore, founder of Maryland.

BULLOCK'S ORIOLE

Icterus bullockii bullockii[169] (Swainson)

Rare summer resident, late March to early August, rarely middle September. In spring, April 15, 1920 (A); April 30, 1919 (H); May 11, 1919, pair (AB); May 20, 1919 (H). In fall, September 20, 1919 (A). *Recorded:* ABEH.[170]



Bailey

BULLOCK ORIOLE

Geographical Distribution.—Western United States and northwestern Mexico, north to southwestern Canada, east to eastern South Dakota, central Nebraska, western Kansas, south-central and southern Texas; occasionally east of the Mississippi River as a straggler. Winters in Mexico.

Habitat.—Mesquite country, nesting along winding roadsides and trails rather than back in the thicket; rolling prairie country; orchards, gardens, and vicinity of farm buildings; cottonwood hedges along irrigation ditches; groves fringing streams and resacas; tall pecans and hackberries on open river flood plains. In fall in mesquite thickets and about cotton fields.

Local Haunts.—Schutze home, among pecan trees on Colorado River second bottoms, beside Barton Road and east of Barton Creek; mesquite thickets in southeastern part of Region and southeast of town; southwestern quarter, and possibly western half, of Region; mesquite flat southeast of Montopolis bridge.

General Habits.—A western species resembling the Baltimore Oriole in its general habits. The male is conspicuous, the female very retiring.

Feeding Habits.—Feeds on injurious insects and their larvae, and particularly fond of the smooth geometrid caterpillars or inch-worms found in mesquite country; also eats a few wild berries and some wild fruit.

Breeding.—Late April to middle June. Records: June 3, 1906, 5 heavily incubated eggs (E); empty used nest, summer, 1906 (B). *Breeding recorded:* ABEH.

Nest Location.—6 to 25, average 12, feet from ground, suspended by rim in fork or crotch in top branches of large, mistletoe-laden mesquite, elm, sycamore, cottonwood, willow, or pecan, near and along small draws on the rolling prairies, and alongside winding trails in the mesquite country; almost always placed in or near a bunch of mistletoe.

Nest Construction.—Bag-shaped, composed of twine, yarn, raw cotton, and principally of woven horse-hair, with some fine grasses and plant fibers, in marked contrast to the dried-grass nest of the Orchard Oriole. Lined with cotton, wool, thistle-down, plant down, and similar materials woven together with horse-hairs. Sometimes constructed entirely of plant fibers and cotton.

Nest Measurements.—Outside, diameter 3.50 to 5, height 5.50 to 10, compact height 3.95. Inside, diameter at top 2.50 by 2; depth 3.50.

Eggs.—3 to 5, commonly 4, elongate-ovate, slightly glossy; grayish-white or pale bluish-white, blotched and scrawled with thin, irregular lines and tracings of black, brown, and smoke, sometimes in a wreath; .90×.60.

Voice.—Song, a few short, quick notes, uttered at intervals.

Description.—Crown, hind-neck, back, narrow throat-patch, and line through eye, black; body, including under-parts, forehead, sides of head, and line over eye, orange; conspicuous white patch in wings; tail, middle black, outer feathers yellow. Female, lemon yellow below, to gray on belly; olive above, to brownish or blackish-streaked brownish on back, and to olive-yellow on rump and tail; white wing-bands. L. 7.50. W. 3.85. T. 3.10. B. .75.

Field Marks.—Black and orange. Line over eye and *whole of cheek, orange;* crown, throat, and upper-parts, black.

Remarks.—Named in honor of its discoverer. Although specifically different, it is really the western-southwestern representative of the Baltimore Oriole.

Popular Names.—Baltimore Oriole; Western Baltimore Oriole; Black-and-orange Oriole.

RUSTY BLACKBIRD

Euphagus carolinus (Müller)

Rather rare migrant, though probably more common than generally supposed; migrates from late February and early March to early May, and again from late October to late November. In spring, March 3, 1921, 5 (A); February 26, 1922 (A); May 4, 1922 (A). In fall, October 17, 1921, 13 (A). *Recorded:* AD.

Geographical Distribution.—Alaska, eastern Canda, and northeastern corner of the United States south to New York and New Hampshire, west to western Nebraska and to Colorado. In migrations, west to the Plains. Winters south of Ohio and Delaware valleys to the Gulf Coast.

Habitat.—Inland fresh-water meadows; forests; thick swamps; bushes along river banks; open bushy swamps and the edges of swampy woods.

Local Haunts.—Marshy woods and grackle roosts at south edge of Aldridge Place; Colorado River valley.

General Habits.—Least conspicuously marked and the least conspicuous of the blackbirds. Occurs singly and in small flocks. Gathers in flocks quite early in summer and migrates in flocks.

Feeding Habits.—Prefers insects such as the grasshoppers and beetles; also takes weed seeds and a small amount of grain.

Flight.—Suggestive of that of the Red-winged Blackbirds.

Voice.—Usually quiet and retiring; in spring, however, flocks sing a medley of sweet, high-pitched whistles. A harsh *cluck* call-note.

Description.—Uniform glossy bluish-black all over; under tail-coverts more or less edged with whitish. Female, smaller, brownish slate color, more glossy above, darker and more glossy on wings and tail, duller below. In winter, adult and immature males, buffy line over eye; black feathers widely tipped above with rusty, below with yellowish-buff or cream-buff; adult and immature females, lighter, feathers widely tipped above with rusty, below with yellowish-buff or cream-buff. L. 9.50. W. 4.55. T. 3.50. B. .75.

Field Marks.—About size of Red-winged Blackbird. Tail-feathers of nearly equal length. *Eyes pale yellow* or straw-colored. *Slender bill.*

Glossy bluish-black; later in year, fall and winter, even uniform rusty-black. Female, glossy slate above, duller below; this gray female is quite unlike the streaked female Red-wing.

Popular Names.—Dull Blackbird; Grayish Blackbird; Yellow-eyed Blackbird; Square-tailed Blackbird.

BREWER'S BLACKBIRD

Euphagus cyanocephalus cyanocephalus[171] (Wagler)

Fairly common but irregular migrant, sometimes quite scarce; very rare winter resident; late August to fourth week in May; more common and migrating in October and in March, slightly more common in fall. In fall, August 20, 1916 (F); September 20, 1916 (F); October 6, 1914, 240 (A); October 1914, about 3000 in flock, moving southward shortly after daybreak (A). In spring, March 16, 1915 (F); May 23, 1919 pair (AB). *Recorded:* ABCFGHK.

Geographical Distribution.—Western Canada and western United States, south to Lower California, New Mexico, and western Texas; east to northwestern Minnesota, western Nebraska, and Kansas. Casual east to Illinois and Louisiana. In migrations, moves south and southeastward through Texas. Winters from southern Canada and Kansas southward to Central America.

Habitat.—Freshly plowed fields; scattered timber along creeks; meadows along the edges of woods; marshy draws; city shade-trees.

Local Haunts.—Edges of town, large shade-trees on vacant city lots; Barton Springs pecan grove. Passes over the city in migrations.

General Habits.—Usually occurs in flocks of considerable size, occasionally numbering into the thousands; rarely singly and occasionally in spring in pairs. Probably the handsomest of the blackbirds. Nests in small colonies of from 5 to 10 pairs in its more western-northwestern summer home.

Feeding Habits.—Quickly attracted to fields where plowing is under way, and follows close behind the plowman in its search for grubs and other insects; also feeds on grasshoppers and weed seeds, and to a slight extent on grain, usually waste lying on stubble field.

Migrations.—Migrates usually about daybreak, less commonly at dusk and by night.

Voice.—Calls: a loud shrill whistle; a low *kwee* or *twee-dle;* a slow, soft *tcheck, tcheck,* similar to sound made by farmer encouraging his plow-horse; *tchak* or *k-chick,* much less harsh than call of the Bronzed Grackle.

Description.—Glossy greenish-black, shading to purplish-black on head and neck; tail square. Female, darker above, glossed bluish-green on wings and tail; paler to brownish-gray on head, neck, and under-parts; with faint gloss of violet on head and neck, and a greenish gloss below. In fall, tail-feathers molting commonly, leaving bird bob-tailed. In winter, male even more highly glossy; female, paler than in summer, and more buffy-gray in front. L. 10. W. 5. T. 3.90. B. .88. Female smaller, B. above .75.

Field Marks.—Shiny greenish-black, with *deep violet-purple or glossy* bluish-purple head. *Square-ended tail,* distinctly *not* trough-shaped and pointed as in grackles. Conspicuous by reason of striking whitish or *pale yellow eyes. Stout bill.* Comparative absence of such rusty tips to feathers as are characteristic of the Rusty Blackbird.

Popular Names.—Square-tailed Blackbird; Blue-headed Blackbird; Yellow-eyed Blackbird; Glossy Blackbird.

Remarks.—Collected by R. Kennicott at Pembina, Minnesota, September 20, 1857, and named in honor of Thomas M. Brewer.

BRONZED GRACKLE

Quiscalus quiscula aeneus Ridgway

Very abundant migrant and common summer resident; migrating during March and early April, and from September to early November. In spring, February 26, 1904 (H); March 1, 1905 (B); March 1, 1921 (A); March 4, 1915, 2 small flocks (A); March 7, 1915, 50 (F); March 10, 1895 (L). In fall, October 6, 1914, 2000 in flock moving southward (A); October 15, 1916, thousands (F); October 17, 1915, 3 (F). *Recorded:* ABCDEFGH[172]IJKLMNOPQRTWY.

Geographical Distribution.—Central and northeastern North America; eastern half of Canada, south to Connecticut and Pennsylvania; and down the central United States, between the Rockies and the Alleghenies, east to Kentucky, central West Virginia, and northern Louisianna, south to central-southern Texas, and west to the eastern base of the Rocky Mountains in Montana, Colorado, and west-central Texas. Winters south to the Gulf Coast.

Habitat.—Woods near lakes or ponds; oak woodlands; groves along streams; quiet orchards.

Local Haunts.—Trees in southeast part of town and trees near the river; common about town, particularly near the river; post oak woods east of Austin; observed on University campus. Roosts, hackberry and oak woods north of Twenty-eighth Street and between Speedway and Guadalupe streets; mouth of Waller Creek; southwestern part of city, south of Sixth and just east of Blanco streets.

General Habits.—Serious, gloomy, sedate bird, observed singly and in pairs and small bunches, almost continually to be seen passing over the residence sections of Austin, moving between breeding colonies and feeding grounds. Gregarious, four or five pairs frequently nesting in the same tree. Special roosts where the birds usually spend the night. Frequently observed walking sedately about on the lawns.

Migration.—Usually migrates in flocks of from 50 to 100, though occasionally flocks of 2000 or more are seen. Appears in large, close, noisy flocks the last week in February or the first week in March; migrates commonly until early April. Flocks up in July and wanders about; around August 1 begins assembling at dusk and spends night in immense numbers in local grackle roosts, coming in from all directions after sunset and leaving for feeding grounds at daybreak. Flocks of thousands move southward about the middle of October.

Feeding Habits.—Feeds in the farming country north and northeast of town, following the plow for grubs, or searching for grasshoppers, crickets, locusts, and other injurious insects; also takes a small amount of grain and a little corn, though generally after the nesting season and when the harvest has already been gathered from the fields. Walks about over grass of lawns and back-door-yards, searching for crumbs and scraps with which to feed its open-mouthed, noisy, begging youngsters perching on a nearby fence. The young are taught by example to search for food, following the parents about as soon as they are barely able to fly.

Flight.—Straight, steady, with tail acting as a rudder.

Breeding.—Early April to early June. Earliest: April 12, 1909, 5 fresh eggs (B). Latest: May 22, 1901, 4 slightly incubated eggs (B); June 1, 1896, 4 eggs (Caldwell). *Breeding recorded:* ABCEFGHJLMNOQW.

Nest Location.—6 to 60, usually 20, feet up in dense foliage, in upright fork or saddled on or in small branches at top of thick live oaks, cedar elms, pecans, and hackberries; in other localities occasionally placed in cavities.

Nest Construction.—Large, bulky, but compact nest, composed of sticks, cedar bark, mud, string, cotton rags, straw, coarse grasses, hay, Spanish moss, weed stems, rubbish, roots, manure, corn husks, and feathers; cemented together with mud; lined with grass roots, horsehair, grass, mud, grass stems, and rootlets.

Nest Measurements.—Outside, diameter 6 to 8, height 4.40 to 4.50. Inside of cup, diameter 3.50 by 4 to 4.62, depth 2.60 to 3.75.

Eggs.—3 to 6, commonly 5, pale greenish-white or smoky-blue, blotched, spotted, and streaked, and scrawled with irregular lines, of various shades of dark brown and blackish, and marked about the larger end with cloudy blotches; 1.14×.82.

Voice.—'Song' louder, more musical, more metallic than that of the more eastern varieties; a clatter, and gurgling and squeaky noises. Cracked, wheezy calls; a wheelbarrow chorus; a harsh *tzerr* or *tklay;* a coarse *clack* or *tchack.*

Description.—Glossy black, with brownish-bronze tint to back and lower parts; head, neck, and breast, bottle-bluish, purplish, or greenish-black; wing-coverts, secondaries, and tail, brownish to metallic purplish-black or plum-purple with no metallic glass. Iris of eye conspicuous bright pale yellow. Female, smaller, duller; more brownish on back and belly; sometimes without any metallic reflections. Molt in August, many birds losing all of their tail-feathers at once. L. 12.50. W. 5.60. T. 5 (female, 4 to 4.50). B. 1.25.

Subspecific Characters.—Never with iridescent bars across metallic seal-bronze of back, bars so prominent on the back, rump, and belly of the Purple Grackle, *Q. q. ridgwayi* Oberholser, of the middle Atlantic Coast; and present, but more or less concealed, in the Florida Grackle, *Q. q. quiscula* (Linnæus), a smaller bird of south Atlantic and Gulf coasts to eastern Texas, with back, shoulders, and lower parts nearly uniform dull olive or bottle green, instead of uniform brownish-bronze as in the Bronzed Grackle.

Field Marks.—Glossy black all over; brassy back and uniform bronze tint to body. Head deep purple, green, or dark purple to peacock blue. Yellow eyes. Tail long, graduated, pointed.

Popular Names.—Crow Blackbird; Fan-tailed Blackbird; Little Jackdaw; Bronzed Blackbird; Maize Thief; Pointed-tailed Blackbird.

GREAT-TAILED GRACKLE

Megaquiscalus major macrourus (Swainson)

Rare and local summer resident; early March to July. In spring, March 3, 1920 (A); April 3, 1919 (A); March 5, 1921 (A). *Recorded:* ABCDEH[173]IJKLMNOPQ.[174]

Geographical Distribution.—Northwestern corner of South America, northward over Central America and southern and southwestern Mexico, and north along eastern Mexico and into southern Texas, reaching its northern limit in central Texas at about the latitude of Austin. Moves southward and southeastward to the coast in winter.

Habitat.—Practically always near water, and in the open or semi-open country; in mottes and wind-brakes of hackberry, bois-d'arc, and live oak in the open farming country; live oak mottes, shin oak prairies and elm mottes along running streams; small mottes and timber near ponds and cattle tanks in semi-open pastures.

Local Haunts.—Colony of about 400 breeding birds in old L-shaped bois-d'arc and hackberry windbrake on north and west sides of stock pens beside Fiskville road, about 9 miles north of Austin and 2 miles north of Fiskville. Waller Creek woodlands; Six-mile Lake for water; a few pass over city and campus in migrations, rarely singles and pairs in summer.

General Habits.—Gregarious, breeding in extremely noisy, irregular colonies; arrives usually a few at a time in flocks of Bronzed Grackles, and are generally on the breeding grounds by the middle of March. Polygamous; more females than males in colonies. Both birds love to play and pose, but especially so the male, which spreads wings and tail, flaps wings frantically, and poses with bill and neck extended toward sky.

Feeding Habits.—Walks or wades about shores, or moves from one aquatic plant to another in lakes and marshes; sometimes springs into the air for passing insects. Food consists largely of insects and their larvae, crustaceans, dead fish, seeds, and grain.

Flight.—Slow and labored, but in a straight and even line, with great tail dragging behind.

Breeding.—Middle April to June, possibly later. Earliest: May 5, 1916, 4 eggs, incubation advanced (B); May 22, 1916, 3 newly hatched young (B). Latest: June 3, 1915, 4 slightly incubated eggs (B). One, possibly two, broods; Quillin has found two broods a season in Kleberg and Bexar counties, young ready to fly in early May in Kleberg County and sets later in the same month, and many sets found near San Antonio between July 4 and 25. *Breeding recorded:* ABH.

Nest Location.—14 to 40, usually 18 feet up in upright fork in tops of trees, in oak mottes on prairie, in orchard and tall shade mottes about farm and ranch houses, and in bois-d'arc and hackberry windbrakes in open country.

Nest Construction.—Bulky mass of dried Johnson grass hay, sorghum grass, Bermuda grass, leaves, straw, and a small amount of cotton, twine, string, and binding cord cuttings, mixed loosely together and piled in a triple upright fork. In top center of this mass of hay a compact nest is built; first a layer of partially decayed vegetation, rarely a little coating inside with mud, then fine Bermuda grass stems, thickly woven together with a few Bermuda grass rootlets and a few live hackberry leaves; roughly lined inside with fine Bermuda and fox-tail grass stems.

Nest Measurements.—Outside, rough mass, diameter 10, height 11; nest proper, diameter 6 by 6.75, height 4.60. Inside of cup, rim diameter 3.50 by 3.90, middle diameter 3.75 by 4.20, depth 3.50.

Eggs.—3 or 4, rarely 5, commonly 4, elongate to blunt ovate, rather variable in size and shape; buffy, grayish-white, or pale greenish-blue, somewhat smoky or cloudy in appearance; coarse and irregular shaped spots, blotches, lines, tracings, and grotesque scrawls of dark brown, brownish-purple, black, and smoky-gray, with a faded, running appearance; 1.44×.91 to 1.11×.81, average 1.27×.86.

Voice.—Very noisy, probably the noisiest of birds. Hoarse, forced whistles, rattles, brush-breaking sounds, and all sorts of crazy, weird call-notes; a loud shriek, followed by a series of chattering notes; a sharp creaking or grating note, resembling the screeching of rusty gate hinges; a singular rolling, pattering call; a high falsetto squeal, *quee-ee, quee-ee, quee-ee;* some very sweet notes, not unlike the call-notes of the Eastern Goldfinch.

Description.—Glossy steel-bluish-black, more black on wings and tail, more purplish on head, throat, and chest, and more greenish on back and belly. Female, distinctly smaller; blackish-brown above, dark brown head, dirty yellowish-buff or hair-brown below; glossed with green and purple. Immature male, first year, black, more sooty below, glossed above with bluish-green. Young, like female but without gloss; browner above, and more buffy below. L. 18. W. 7.55. T. 8.60. B. 1.70.

Subspecific Characters.—On the east coast of Texas, near Houston, it intergrades with the Boat-tailed Grackle, *M. m. major* (Vieillot), a smaller bird with relatively shorter tail (Male, L. 16, W. 7.50, T. 7, B. 1.55), the female of which is lighter and more buffy-brown (less grayish-brown) below; the violet color of anterior parts is confined in the Boat-tail to head, neck, and chest, not extending onto upper back as in the Great-tail; the Boat-tail ranges eastward along the Gulf Coast lowlands to Florida and northward along the Atlantic Coast lowlands to Chesapeake Bay. More exact comparative measurements would be: Boat-tail, W., male 7.18, female 5.62; T., male 6.73, female 5.10. Great-tail, W., male 7.45, female 5.95; T., male 8.55, female 5.82. Intergrades in northwestern and in southwestern Mexico with other subspecies.

Field Marks.—Large size. Immensely-broadened, flattened, scoop-like, pointed tail. Black, glossy blue-black, or brownish-black. Female much smaller and duller than male. Weird, noisy calls.

Popular Names.—Jackdaw; Texas Grackle; Great-tailed Blackbird; Big-tailed Blackbird; Fan-tailed Blackbird; Giant Grackle; Texas Great-tailed Grackle; Big Blackbird; Big Crow Blackbird.

PURPLE FINCH

Carpodacus purpureus purpureus (Gmelin)

Very rare and irregular winter visitor, end of October to middle March. Three seen in winter of 1890 (Green). Specimens collected, February 27, 1912; March 2, 1912; and March 4, 1912 (B). *Recorded:* (B and Green).

Geographical Distribution. — Southern Canada and northeastern United States, south to New Jersey and northern Illinois and the mountains of Pennsylvania and North Dakota. Winters from Canada south to Florida, the Gulf Coast, and middle Texas (Austin and Gainesville).

Habitat.—Wild mountain forests and thickets; tops of shade trees in town; orchards and gardens.

Local Haunts.—In and about the edges of Austin; cedar elm shade trees on lawn on hillside in western part of Austin, 610 Baylor Street.

General Habits.—Occurs in small scattered flocks or small companies of about a dozen, rarely composite flocks with Eastern Goldfinches and various sparrows. Roving, restless, alert, usually remaining hidden in foliage of tree-tops. One flock remained for a week about one backyard in Austin.

Feeding Habits.—Visits orchards and fruit trees, where it feeds on swelling buds and blossoms. Feeds on peach tree buds in early spring.

Flight.—Airy, sweeping in descent.

Voice.—Song, usually brief, though occasionally long and continued, rich, full, careless, flowing, warbling, melodious, best heard during the nesting season, although attempted in fall and early spring; the bird frequently rises in the air with ecstacy. Call-note, a low, querulous whistle. Flight call, a short, clear but not very loud, dull, almost metallic *creak, creak.*

Description.—Streaked; dull rosy-red, brick-red, pinkish, or washed with crimson or carmine, brightest on the head, throat, and breast, brownest on the back; paler on sides to white on belly. Wings and tail dark brownish, washed with reddish; tail shallowly but distinctly forked, outer feathers longest. Pale thick bill; nostrils covered by tuft of bristly feathers. Females and young males, sparrow-like; heavily streaked grayish-brown above and on wings; darker above, finely streaked with black; belly whitish; whitish line over eye and down side of face; streaked and spotted below with fuscous; heavy pale bill. L. 6.10. W. 3.23. T. 2.25. B. .46.

Field Marks.—Stout conical bill. Brownish streaky appearance. Slightly crested feathers on crown. Dull rosy-red, brightest about head

and breast. Females and young males, distinguished from sparrows, which they resemble, by *rounded pale bill, tufts of feathers over nostrils*, and *forked tail.*

Popular Names.—Purple Finch.

Remarks.—Named after the famous Tyrian purple, near magenta in shade, and not the violet-purple of today.

AMERICAN GOLDFINCH

Astragalinus tristis tristis (Linnæus)

Common regular migrant, and fairly common irregular winter resident; abundant in spring; migrating commonly, middle November to early December, and middle March to middle April. In fall, September 22, 1914 (A); November 14, 1915, 7 (F); November 15, 1921, abundant (A). In spring, April 23, 1915, 6 (A); April 29, 1920 (A); May 4, 1919 (A); May 11, 1922, 11 (A). *Recorded:* ABCDEFGHIJKMPSWX.

Geographical Distribution.—Southern parts of eastern Canada south across eastern United States east of the Rockies as far as northern Georgia, central Arkansas, southern Oklahoma, and eastern Colorado. Winters over most of eastern United States, southward to the Gulf Coast.

Habitat.—Tops of trees along sheltered creek valleys; shade trees in town, in yards, and in parks; patches of tall thistles, ragweeds, and cockleburrs along creek sides; live oak mottes on upland ridges; trees along rivers and creeks; groves of trees along creeks.

Local Haunts.—Shoal and Waller creek valleys; Pease Park; willows along the river; shade trees in town and on University campus. Eastern half of Region, west into box canyons along edge of hills.

General Habits.—Small scattered flocks, troupes, and family parties of from 5 to 30; in immense flocks, often to 4000, as it moves northward along wooded creek valleys in spring; during nesting season in its summer home it scatters about in pairs over the countryside. More numerous when the elms are budding in spring, moving along easily from tree to tree.

Feeding Habits.—Scours leaves and twigs for insects. In fall and winter, it feeds on weed seeds in thistle, sunflower, ragweed, and cockleburr patches; on sycamore balls, picking them to pieces in getting to the seeds; and on hackberries and cedar berries. In spring, flocks are almost universally found on the almost bare, leaf-budding tops of cedar elms along creek valleys, feeding on rain and dew-moistened buds.

Flight.—Light, undulating, bounding, in waves.

Voice.—Ecstatic love-song, canary-like, but wild, ringing, and free. A soft, lazy, lisping, ventriloquistic call, *pier-ree-ee* or *peee-ie-ree*, first note low, second high, third slightly lower than second, pretty and plaintive; a flight-call, varying from *per-chic-o-ree, per-chic-o-ree* or *per-chic-o-ree, per-chic-o-ree* to *per-chee-chc-chee*, uttered rhythmically on the wing, usually as it rises on a wave of its undulating flight; a twittering in flight; a low, chippering *yup-yup-yup:* a low *ce-ree;* a musical *cheer;* a low, sparrow-like *chip;* at times quite noisy, particularly so when preparing to move northward in early spring; a low, chippering *eyup-yup-yup-yop.*

Description.—Rich bright canary-yellow body; crown, tail, and wings, black; white wing-bars and partially hidden tail-patches. Female, more greenish-yellow, browner above, duller yellow below; back brownish or grayish-brown, tinged with olive; paler rump; brownish-buff sides; white markings wider and more buffy. Immature, still more brownish-cinnamon than female. In fall and winter, brownish or grayish-brown upper-parts and back, olive-tinged; rump paler; brownish-buff sides; throat and chest dull yellow, to whitish on belly; wings and tail same as in summer, but white edgings wider; lesser wing-coverts still yellow; immature male, lesser wing-coverts grayish-olive-green instead of yellow. L. 5.15. W. 2.85 (female 2.70). T. 1.85 (1.71). Exp. C. .40 (female .39).

Subspecific Characters.—Decidedly smaller, darker, and with whitish areas in wings and tail more restricted than in the paler, grayer Western Goldfinch, *A. t. pallidus* (Mearns), of the Rocky Mountain plateau from southwestern Canada to northern and eastern Mexico, wintering southward into Mexico and southeastward across western Texas, a race characterized by longer wing (2.99, female 2.85), longer tail (1.98, female 1.84), and longer bill (.41). Collection of specimens through the hills west of Austin will probably add the western race to the local list.

Field Marks.—Thick build. Characteristic peculiar undulating flight. Short, thick bill. Plain dress, easily overlooked in winter; *dusky greenish-yellow, unstreaked,* brownish on upper-parts and back, paler below; *shoulder-patch canary-yellow;* wings and tail, black, with white markings. *Plaintive call.* Changes to yellow and black plumage in April, beginning in early part of month and completing it early in May.

Popular Names.—Wild Canary; Thistle-bird; Black-capped Wild Canary; Yellow-backed Goldfinch; Brown-backed Goldfinch.

ARKANSAS GOLDFINCH

Astragalinus psaltria psaltria (Say)

Rare migrant, and very rare summer resident; March to early November; local winter records probably erroneous. In spring, March 7, 1915 (A); March 24, 1905, specimen collected (B); April 28, 1905, specimen collected (B); March 24, 1905, specimen collected (B); April 28, 1905, specimen collected (B); May 4, 1919 (AB). In fall, August 6, 1915, pair (B); October 22, 1916, 10 (G); November 6, 1919, 3 (A); November 11, 1920 (A). *Recorded:* ABCDGM.

Geographical Distribution.—Middle and northern Mexico (except northwestern part), northward through the middle Southwest to northern Colorado and central-northern Texas. Winters through southern part of its range, north in Texas to Kerr County.

Habitat.—Limestone hill country of central and southwestern Texas; woodlands near water; slopes of the hills, among oak and cedar bushes; cottonwoods and sycamores along stream margins in canyons; mesquite slopes and pastures near hills; thistle and sunflower patches;[176] tall trees along water courses in the hills. In migrations, thistle and sunflower patches along creeks.

Local Haunts.—Hill country across western half of the Region. Line of sycamores along Dry Creek at Bull Creek road-crossing; slopes of hills up Lake Austin, some distance from town; crevices and gorges in Deep Eddy cliffs, and hills back of Deep Eddy; Bull and Bee creek valleys. In migrations, along the edge of the hill country and west of the I. & G. N. railroad; mesquite and live oak country between Shoal Creek and Mt. Bonnell.

General Habits.—Resembles the Eastern Goldfinch in general actions and habits. Observed in pairs during the breeding season, in small parties during migrations or in groups of from 2 to 4, roving about.

Feeding Habits.—During migrations it feeds on weed seeds in thistle, sunflower, nettle, and cockleburr patches on flats along hill valleys surrounded by steep slopes, particularly the large flat near the mouth of Bull Creek.

Flight.—Never flies in a straight line, but always in graceful undulating curves, a good field identification for all goldfinches.

Breeding.—Probably, since immature birds just out of nest have been seen. May and June, usually first week in June. Rare breeder, but no nest found (D).[175] July 26, 1915, immatures with parents (A). Observed through nesting season, birds acting as if nest nearly (B).

Nest Location.—3 to 15 feet from ground in upright forks of tall bushes or low trees.

Nest Construction.—A cup-shaped structure, compactly woven of plant fibers; lined with down and other soft materials.

Eggs.—3 to 5, commonly 4, pale greenish-blue or bluish-white; .62×.45.

Voice.—Sweet and musical, quite like that of the Eastern Goldfinch.

Description.—Entire upper-parts and ear-patches, black; wings and tail blackish, the former with white markings and edgings; canary-yellow below. Female, plain dull olive-green above, no black on head; wings and tail dull black, with much less white; light greenish-yellow below. Immature, crown black; back and ear-coverts ranging from olive-green to solid black; yellow below. L. 4.55. W. 2.55 (female 2.48). T. 1.62 (female 1.54). Exp. C. .38.

Plumage Peculiarities.—Some years are passed before the black back is acquired; young, green-back males are found breeding. At least three common types of birds have been found breeding: (1) back and ear-patches or ear-coverts, plain olive; (2) back and ear-patches, olive mixed with black; and (3) back and ear-patches, solid black; these were shown by Dr. Oberholser in 1903 to be different stages in the development of one species, where formerly they were thought to be different races and were carried under different subspecific names, respectively (1) Arkansas Goldfinch, *A. p. psaltria* (Say); (2) Arizona Goldfinch, *A. p. arizonae Coues;* and (3) Mexican Goldfinch, *A. p. mexicanus* (Swainson), the two last now being considered synonyms for the first.

Field Marks.—Black above, yellow below. Females and immatures, brownish or mottled black-and-olive above, with black cap or its traces, and with white in wings and tail. Call. Characteristic flight.

Popular Names.—Arkansas Goldfinch; Arkansas River (Colorado) Goldfinch; Rocky Mountain Goldfinch; Rocky Mountain Black-backed Goldfinch; Mexican Goldfinch; Arizona Goldfinch; Olive-and-black-backed Goldfinch; Mountain Goldfinch; Plateau Goldfinch.

PINE SISKIN

Spinus pinus pinus[176] (Wilson)

Fairly common irregular migrant and winter resident, at times quite abundant; common in winter of 1913-1914 and springs of 1905 and 1920. In fall, October 20, 1914 (A); October 23, 1919 (A). In spring, migrating March 26, 1916 (G); and April 3, 1914 (F); specimens collected February 10, 1905 (B); and March 27, 1905 (B); latest, May 17, 1922 (A); and May 27, 1919 (A). *Recorded:* ABCDEFGH.

Geographical Distribution.—Alaska, Canada, and the northern United States to Minnesota and Michigan, and principally in the higher mountains south in the Alleghenies to North Carolina and down the Rockies to southern New Mexico and northern Lower California. South in winter to the Gulf Coast, Texas, and northern Mexico.

Habitat.—In breeding season, northern coniferous forests. In migrations and winter, slopes and bottoms of creek valleys; trees along bottoms, and bushy hillsides dotted with larger trees; small elms and oaks in scattered open woodlands; weedy patches, cedars; shade trees in and about edges of town.

Local Haunts.—Uplands overlooking creek valleys; East Woods; Pease Park and Shoal Creek valley; Barton Creek valley; trees in open pastures in Colorado River bottoms; Pease pastures; city shade elms

and groves about the city; shade tree on University campus and in nearby residence section.

General Habits.—Wanders erratically. Rarely observed singly, usually in close-massed small troupes of from 6 to 10, which move as one bird; occasionally in immense flocks in spring migrations, as in 1905 when a flock of 1500 spent two weeks in the sparsely-settled country along Shoal Creek valley at Pease Park (B). Very friendly and tame, and may be closely approached. Associates with the Eastern Goldfinch, with which it has many habits in common. Gathers in tall spreading elm shade trees preparatory to migrating. Movements governed by food supply, and hence irregular in occurrence.

Feeding Habits.—Acts strikingly like a chickadee in feeding, frequently hanging upside down from the tips of the outer branches. Flies high and swiftly, dropping in compact flock into a tree-top, then working down to the lower branches, where it feeds on ligustrum berries, arbot vitae, and hackberries; feeds on elm buds on tips of lower limbs, where it performs its acrobatics in search for food. Feeds much upon the ground.

Flight.—When disturbed from feeding, short and circling. Flocks fly high in moving from one place to another.

Voice.—Somewhat similar to, but softer and sweeter than, that of the Eastern Goldfinch, yet with a slight, characteristic nasal twang. A plaintive *cha-cha;* a plaintive *cheer* or *tcheer;* a high *e-eep.* Less musical flight-song and perch-song than the Goldfinch.

Description.—Grayish-brown, darker above and whitish below, heavily streaked all over with grayish-brown and blackish-brown. Wings and tail deep olive-brown; sulphur-yellow patch in middle of wing, and yellow on basal portion of all but middle tail-feathers. Dull white below, tinged with buffy on breast and sides, and streaked with olive-brown or blackish. Bill sharply pointed; small tuft of bristly feathers over nostril. Sexes alike. Immature, more brownish-yellow above, with brown wing-patches. L. 5.10. W. 2.80. T. 1.80. B. .43.

Field Marks.—Very small size. Notched or narrowly-forked tail. Sharp little bill. Streaked under-parts. *Yellow patch in middle of wing and near base of tail,* showing plainly in flight or when spread in balancing.

Popular Names.—Pine Finch; Streaked Finch; Fork-tailed Siskin.

CHESTNUT-COLLARED LONGSPUR

Calcarius ornatus (J.K.Townsend)

Very rare migrant; perhaps a few occur in winter; middle November to early December, and March to middle April. In fall, November 12, 1919, 3 (A); December 4, 1919 (A). In spring, March 13, 1921, 2 (A); April 26, 1920 (A). *Recorded:* A.

Geographical Distribution.—Great Plains west to the base of the Rockies, from southern Canada south to central Kansas. Winters from Nebraska and the middle United States southward through Texas, New Mexico, and Arizona into Mexico; straggles east to New England States. In Texas, from Cooke County south through Travis, Comal, Kendall, and Bexar counties.

Habitat.—Prairies and plains; open valleys; open places on rocky uplands.

Local Haunts.—Plowed fields north and northwest of Austin; plains southeast and southwest of the city; edges of town.

General Habits.—Occurs in flocks, usually small, though sometimes of considerable size, running into the hundreds.

Feeding Habits.—Feeds largely on weed seeds.

Voice.—In summer home, song uttered on wing, a short and shrill but very sweet trill. Call, a rather musical chip, sharper when alarmed.

Description.—In breeding plumage, bright chestnut collar circling upper half of neck on nape; streaked back; whitish throat; dusky-black breast and belly, crown, shoulder-patch, and markings on side of head. Female, obscure, buffy-brownish, streaked blackish above, lightly on breast and belly. Immature, blackish feathers bordered with whitish and brownish; throat white, flecked with dusky; dull buffy below, streaked on breast. In winter, brownish to buffy tips obscuring black and reddish-brown of male; female, colors more blended. Four outer tail-feathers largely white, two outer ones white to tip, and white bases to all but middle pair; McCown Longspur has all but outer feather conspicuously tipped with black. Long, pointed wings. L. 5.75. W. 3.30. T. 2.15. B. .41.

Field Marks.—May be known by V-appearance of tail, the base of the tail forming the base of the V, thus differing from the T-tail of the McCown Longspur; differences in tail readily obvious in flight. *Extensive white in tail.*

Popular Names.—Black-shouldered Longspur; White-tailed Longspur; V-tailed Longspur.

McCOWN'S LONGSPUR

Rhynchophanes mccownii[177] (Lawrence)

Rare and irregular migrant and winter resident, middle November to late March. In fall, November 15, 1914, 35 (A). In spring, March 27, 1919, 16 (A). *Recorded:* AD.

Geographical Distribution.—Great Plains west to the Rockies, from south-central Canada southward to northeastern Colorado and southwestern Minnesota. Casual east to Illinois. Winters from Colorado and Kansas to Arizona, Texas, and northern Mexico.

Habitat.—Weedy and grassy corn and cotton fields; flat open stretches on dry river bottoms.

Local Haunts.—Fields along north and northwest edges of city; river bottoms at town.

General Habits.—Occurs in small flocks of from 10 to 50, less commonly in composite flocks.

Feeding Habits.—Feeds largely on weed seeds.

Flight.—When disturbed at feeding, circling and undulating.

Voice.—Flight song, in breeding season, bird hovering with wings pointed almost straight upward, a shrill, sweet, rapturous, twittering warble; a practice quite similar to that of the famous Skylark of Europe. A *chirp* note, frequently uttered once with each stroke of wing in ordinary undulating flight.

Description.—Black crown, and white line over eye; nape grayish or grayish-brown; back brownish-gray streaked with black. Sides of head and throat whitish; black streak from bill along throat. Chestnut wing-coverts. Under-parts dusky whitish or brownish, with small black patch on breast. Central pair of tail-feathers without white; all other tail-feathers white, and all but outer pair conspicuously tipped with black. Stout conical bill. In winter, browner; upper-parts uniform brownish-buff, streaked blackish-brown; obscured black crescent. Female, like winter male, no chestnut shoulder-patch or black crescent on breast; brownish above, buffy below; more grayish above, whiter below, in summer. L. 6. W. 3.50. T. 1.95. B. .46.

Field Marks.—In flight, a very distinct black T in tail, the base of the T at the base of the whitish tail; quite different from V-marking in tail of Chestnut-collared Longspur. Reddish-brown shoulder-patch.

Popular Names.—Chestnut-shouldered Longspur; T-tailed Longspur.

Remarks.—Named in honor of Captain McCown, who discovered it in Texas, where he obtained specimens.

VESPER SPARROW

Pooecetes gramineus gramineus (Gmelin)

Rare winter visitor, probably late October to early April. December 19, 1915, 2 specimens collected (B). *Recorded:* B.

Geographical Distribution.—Southern part of eastern Canada, and eastern half of the United States south to North Carolina, Virginia, and Kentucky; west to western Minnesota and central Missouri. Winters in southern half of eastern United States south to the Gulf Coast and west to middle Texas.

Habitat.—Dry weedy pastures and dusty weedy roadsides; dry upland fields; dry pastures dotted with bushes and grown with weeds.

Local Haunts.—Eastern half of the Region; between Austin and the hills, just west of the Windsor road-crossing of the I. & G. N. railroad track.

General Habits.—Crouches low and runs swiftly through the grass or along footpaths and roadsides. Usually on ground, but perches on fence-rail or tree.

Flight.—Low and bounding.

Voice.—In its summer home, sings early morning and late afternoon, best at sunset: loud, clear, ringing, plaintive, rich, serene, simple, sweet song, resembling that of the Song Sparrow, and heard for several hundred yards; a series of clear, ascending whistles, uttered from tall weed or post. Call-note, a sharp chirp.

Description.—Upper-parts brownish-gray, wings and tail darker to fuscous; pale, streaked all over, except on belly, with blackish, grayish, orange-brownish, buffy, and white. Wing-coverts reddish-brown or bright bay, forming a distinct, conspicuous shoulder-patch; two whitish wing-bars. Outer feather on each side of tail, white. Under-parts white, breast and sides streaked black and orange-brownish-buff. Sexes alike, little seasonal change. L. 6.15. W. 3.05. T. 2.40. B .40.

Subspecific Characters.—Browner above, with wider streaks, shorter wings and tail, and heavier bill than the Western Vesper Sparrow.

Field Marks.—Large, chunky, streaked brown sparrow, with square-ended tail having *outer pair of feathers white*, very conspicuous in flight. Rich *reddish-brown shoulder-patches.*

Popular Names.—Bay-winged Sparrow; Grass Finch; Bay-winged Bunting; Big Brownish-gray Sparrow.

WESTERN VESPER SPARROW

Pooecetes gramineus confinis Baird

Fairly common migrant and winter resident, occasionally very common; late October to March, migrating northward commonly in March. In fall, October 19, 1919 (A); November 21, 1915, 20 (F). In spring, February 7, 1904, moving northward (H); March 2, 1915, 2 specimens collected (B); March 14, 1915, specimen collected from flock moving northward (A); April 18, 1915, pair (A). *Recorded:* ABCDEFGHKS.

Geographical Distribution.—Southern part of western Canada, and western United States south to California, Arizona, New Mexico, and northwestern Texas. Winters from central Texas and Lower California southward over Mexico.

Habitat.—Weedy pastures; grassy-weedy fields; sapling thickets on edges of woods; grassy clearings in woods; roadsides; sagebrush; brushy fence-corners; weedy waste fields and weedy edges of plowed fields.

Local Haunts.—Common in pastures just east of hills west of Austin; Pease pastures; plowed fields on blackland prairies and on Colorado River bottoms near town; common all winter in a few protected localities.

General Habits.—Observed singly, in pairs, rarely in small flocks; frequently associated in composite flocks with the Nevada Savannah Sparrow. Colors blend so well with dried grass and earth that the bird is difficult to see. Flocks observed migrating through in fall and spring.

Feeding Habits.—Feeds on weed seeds on the ground under sparse growth of weeds.

Description.—Upper-parts brownish-gray, streaked dusky; dull white below, tinged dusky buffy, streaked across breast and on sides of throat; bend of wing reddish-brown; outer tail-feathers partly white. Similar to Eastern Vesper Sparrow, with subspecific differences.

Subspecific Characters.—Paler, grayer than the Eastern Vesper Sparrow, and not so brown above, with streaks on back paler and narrower; wings and tail longer, and bill more slender. Comparison, Eastern Vesper Sparrow, male, W. 3.19, T. 2.41, Exp. C. .44, D. B. at B. .33; female, W. 3.05, T. 2.32, Exp. C. .43, D. B. at B. .31; and Western Vesper Sparrow, male, W. 3.29, T. 2.59, Exp. C. .44, D. B. at B. .30; female, W. 3.15, T. 2.44, Exp. C. .44, D. B. at B. .30.

Field Marks.—Large, chunky, streaked grayish sparrow. The Common Pipit is slender and rises in bounding flight. *Tail square, outer tail-feathers white,* conspicuous in flight. *Bright chestnut shoulders* (on wing-bend). Grayish upper-parts, and slightly longer wings and tail, distinguish this race from the Eastern Vesper Sparrow.

Popular Names.—Bay-winged Bunting; Grass Finch; Big Gray Sparrow; Bay-winged Sparrow.

SAVANNAH SPARROW

Passerculus sandwichensis savanna (Wilson)

Rather rare migrant; October and early November, and March and early April. In fall, October 8, 1919, 7 (A). In spring, March 13, 1905, specimen collected (B); March 14, 1915, specimen collected from flock of 15 moving northward (A); March 27, 1915, flock of 8 moving northward (A). *Recorded:* AB.

Geographical Distribution.—Eastern Canada and northern part of eastern United States, south to New Jersey, Pennsylvania, Indiana, and Iowa. Winters from southern edge of the breeding range in New Jersey and Indiana south to the Gulf Coast, Cuba, and northeastern Mexico.

Habitat.—Grassy, bushy pastures; cultivated lands; thick bushes and trees bordering plowed fields; open spots in meadows and pastures with closely-cropped grasses; fields; wet, boggy meadows; thickets and fence-rows.

Local Haunts.—Upland thickets on western crest of Shoal Creek valley opposite Twenty-fifth Street; north Pease pasture.

General Habits.—Gathers in flocks in fall and moves southward along hedges and fence-rows; winters south of the Region. Moves about in flocks of from 8 to 15, and not at all difficult to observe. Darts into thickets at danger,-or drops into grass and sneaks away rapidly. Springs up from underfoot in a startling manner, wings whirring.

Feeding Habits.—Feeds on newly plowed land, plowed furrows, or open ground between bushes, always near bushes, small trees, or bushy pastureland where it may take shelter.

Flight.—Resembles that of the Vesper Sparrow, but more darting.

Voice.—Song, grasshopper-like notes, followed by a weak, insignificant, musical, little trill or twitter: *tsip-tsip-tsip se -e-e-s'r-r-r,* sung from favorite perch on weed or fence post, more frequently nearer sundown. Call, a sharp *tsip* or *chip* of alarm, common during migrations; chippers at passersby.

Description.—Under-parts brownish-black with ashy edgings; wings pale brownish to blackish; pale yellow mark on bend of wing and before eye; buffy line over eye; buffy line from lower mandible down side of throat to a pale neck mark; tail blackish, with outer webs margined whitish. Under-parts whitish, buffy on throat and neck; heavily streaked on sides and flanks with blackish-brown, and breast feathers tipped with small wedge-shaped marks. Sexes alike. In winter, deeper colors; browner, more ochraceous, with less sharply defined markings. L. 5.68. W. 2.73 (female 2.61). T. 1.94 (female 1.86). Exp. C. .41; D. B. at B. .26-27.

Subspecific Characters.—Darker and browner than the Nevada Savannah Sparrow, and decidedly smaller and with thicker bill than the Western Savannah Sparrow. Average measurements of race given above.

Field Marks.—A rather pale, brownish sparrow with no white tail-feathers. *Plain brownish crown* and *buffy throat.* Distinct *lemon-yellow* spot or line *in front* and above *eye,* more prominent in spring, duller in winter.

Popular Names.—Grass Sparrow; Ground Sparrow; Prairie Sparrow.

NEVADA SAVANNAH SPARROW

Passerculus sandwichensis nevadensis[173] Grinnell

Rather common migrant and winter resident, middle October to middle April; migrating commonly, late October and early November, and through March. In fall, October 11, 1919, 5 (A); October 24, 1908, specimen collected (B); October 24, 1916, 6 (F). In spring, March 27, 1905, specimen collected (B); April 29, 1919, 3 (A); May 3, 1915, 2 (A). *Recorded:* ABCEFGIMP.

Geographical Distribution.—Great interior of the western United States, from North Dakota to Nevada and through the Great Basin. Winters in Texas, the Colorado desert, California, and northern Mexico.

Habitat.—Broomweed prairies and pasturelands; low prairies with weeds and grasses; sparsely wooded prairies; cockleburrs on sand beaches; cotton and corn fields; meadows with prairie grasses and weed patches; less commonly, plowed fields.

Local Haunts.—Pease and Zilker pastures; sand beach on the Colorado River bottoms; campus during migrations. Occasionally on vacant broomweed lots in town.

General Habits.—Little seen because of fondness for hiding. Occurs singly and in small bunches, frequently assembling in scattered flocks in the afternoon. Ranges about in small flocks, scattering out to feed. This rather small, inconspicuous, plain, brownish-colored sparrow generally escapes notice, since it prefers running to one side or the other through the grass to taking wing. As the observer walks through a cotton field or grassy pasture, the bird darts up and zigzags over the grass tops a short distance before again dropping into the grass, hopelessly lost.

Voice.—A low, insect-like *ptsip, ptsip, ptsip, zee-e-e-e-e.* When flushed out of grass, a startled, squeaky note.

Description.—Similar to the Eastern Savannah Sparrow, with subspecific differences. W. 2.77. T. 1.96. Exp. C. .41; D. B. at B. .22.

Subspecific Characters.—Extremely pale, the palest of the Savannah Sparrows; distinct whitish edgings to wing and tail-feathers, conspicuously so on tail (outer web and tip of outer feather white). Bill much smaller than that of the Eastern Savannah Sparrow, though wing length about same; coloration very divergent, since it is on the opposite or paler side of the Western Savannah Sparrow, *P. s. alaudinus* Bonaparte, of the Pacific Coast and the Rockies from Alaska to northwestern United States; in all its plumages much paler than the Western Savannah Sparrow throughout, white replacing buff and thus making the black streaks more contrasting, with also a comparative absence of hazel, which becomes clay-colored in the Nevada; averages slightly smaller and shorter in wing and tail than the Western Savannah Sparrow, which measures, W. 2.86 (female 2.76), T. 2.04 (female 1.98), Exp. C. .42, and D. B. at B. .21, which is characterized by smaller, slenderer bill, with yellow line over eye paler and never passing over the eye, and often wholly wanting.

Plumage Peculiarities.—One specimen (LBB. 12862) shot March 27, 1905 (B), from a flock of Nevada Savannah Sparrows, is referred by Dr. Bishop to the Western Savannah Sparrow because of its very small and slender bill. Collection of a series of Savannah Sparrows through the hills in the western part of the Region should add the Western Savannah Sparrow to the list as a regular winter resident, since it has been found the common wintering form in the same faunal area at Kerrville.

Field Marks.—Very plain, small, inconspicuous, striped-backed, gray sparrow. Zig-zag flight, and fine insect-like song; distinctly larger size prevents confusing this with the Grasshopper Sparrow.

Popular Names.—Grass Sparrow; Ground Sparrow; Great Basin Savannah Sparrow; Interior West Savannah Sparrow.

GRASSHOPPER SPARROW

Ammodramus savannarum australis Maynard

Rather rare but regular migrant; middle March to middle April, and prabably commonly from middle to late October. In spring, March 14, 1915, 3 (A); March 27, 1915, 4 seen and 1 collected (A) and identified (HCO); April 18, 1915, 5 (A). *Recorded:* A.

Geographical Distribution.—Southeastern Canada and border of the United States south over eastern United States to North Carolina, Georgia, central Alabama, and southern Louisiana; west to eastern edge of Great Plains. Winters from North Carolina and Illinois to the Gulf Coast of the United States and Mexico. The only authentic record for Texas is that at Austin (HCO).

Habitat.—In migrations, closely cropped pastures dotted with mesquites, floored with some stubble and buffalo-grass, and edged with weed patches, brush thickets, weedy fence-rows, and plowed ground.

Local Haunts.—Flat upland of Pease north pasture, between Shoal Creek and I. & G. N. railroad track, and north to the Windsor road, a short distance east of the edge of the hills; open grass pasture dotted with mesquites.

General Habits.—Observed singly, very quiet, and quite different in actions from the Western Grasshopper Sparrow. Usually perches on horizontal mesquite limb or twig about 4 feet from ground, its short, narrow tail hanging straight down. Both this and its western relative are easily overlooked; this race, during migration, is more silent and will remain unknown to the observer unless he knows how and where to look for it.

Voice.—Generally quiet during its presence, rarely uttering a low, sparrow *chip*.

Description.—Upper-parts rufous-brown, with black spots edged with cream-buff and ashy, the spotted lines of brown and black giving the back a quail-like appearance. Crown black, with cream-buff line down center; orange mark before eye; sides of head pale buffy. Bend of wing yellow. Tail dark grayish-brown, end half of outer feather generally dusky white. Under-parts, rich buff on breast and sides, whitish on belly. Nestlings, breast spotted blackish. Sexes alike. L. 5.38. W. 2.40 (female 2.37). T. 1.75. Exp. C. .45; D. B. at B. 29 (female) .28). Tars. .79 (female .78).

Subspecific Characters.—Longer tarsus and shorter wings and tail than the Western Grasshopper Sparrow; darker, with more black above.

Field Marks.—Tiny, stoutly-built sparrow. Short, stubby, narrow, *sharp-pointed tail-feathers* of equal length; tail small. Absence of black streaks. *No streaks below. Grayish mark on outer tail feather. Bend of wing conspicuously bright lemon-yellow.* Yellow spot above and in front of eye in spring. Blackish crown with buffy stripe down center. *Quail-like appearance of back.*

Popular Names.—Yellow-winged Sparrow; Eastern Yellow-winged Sparrow; Small-tailed Sparrow.

WESTERN GRASSHOPPER SPARROW

Ammodramus savannarum bimaculatus Swainson

Common migrant and uncommon summer resident; possibly occurs rarely in winter; few seen in summer after first of June; migrating, March to early May, and middle September to last of October. In spring, March 13, 1905, 2 specimens collected (B); March 27, 1915, rather common (A); April 10, 1900, migrating (T); May 1, 1919, migrating commonly (AB). In fall, September 21, 1919, migrating commonly (A); October 13, 1916 (F); November 2, 1919 (A). *Recorded:* ABCEFGH[179]IJT.

Geographical Distribution.—Southwestern Canada and western United States south to Mexican border, east to southern Minnesota and Texas (Austin and San Antonio). Winters from southern California and Southern Texas (Kerr County) southward to Central America.

Habitat.—High rolling prairies not under cultivation; dry, weedy, grassy pastures and fields where grass is shallow and short; open upland hayfields; big prairies, grassy fields, and weedy old pastures and old fields; old dry daisy and sorrel fields; broom-sedge fields.

Local Haunts.—Very locally distributed, confined to open grassland habitats. Open fields north and immediately northwest of town, where scattered small weeds dot the grass; favorable localities southeast and south of town; Pilot Knob grasslands; grassy hilltops and plateau remnants in the hills. In migrations, vacant lots, grassy and weedy flats on the gravel beds, and University campus.

General Habits.—Observed singly or in pairs; extremely inconspicuous. Spends most of time on ground running through grass, only taking wing when forced too close or when almost stepped on. When frightened, it drops from perch to secure hiding place in weeds below; then slips, sneaks, and runs away through the grass, hiding behind every available tuft. Female hides in the grass; male sings from nearby convenient weedstalk, grass-top, or fence-wire, inconspicuously perching with head pulled between shoulders and tail drooping low. Female usually sticks close to nest and flushes almost straightaway; incubation lasts for about 12 days, young covered with dirty-looking down appear and are gone from nest in another 15 days.

Feeding Habits.—Feeds largely on insects, mostly grasshoppers, beetles, caterpillars, and similar pests.

Flight.—When flushed, it pursues a zig-zag course for a few yards and then dives back into the weeds or grass; zig-zags from one weed-top to another. In open fields, flight rapid and extended before bird drops to ground.

Breeding.—Through May and June; in 1919 Quillin found a heavily incubated set of 5 eggs further south, in Kleberg County, on May 5. Breeds sparingly. *Breeding recorded:* H.

Nest Location.—Sunken in slight depression or hollow in ground or in cowtrack in open pastures; nest-top flush with ground and well concealed or protected by weed or tuft of grass on open old short-grass field; not on wet lands, but on lower dry lands, side of hills sloping toward depressions, and on hilltops.

Nest Construction.—Bulky, either open or arched over top, composed of fine dried grasses, fine dead weed-stalks, and grass rootlets; early nests are usually well-constructed and partially roofed, while nests later in the season are more frequently plain and flat-topped. Deep cavity is well lined inside with fine dry grass, frazzled grass-seed heads, and horsehair.

Nest Measurements.—Outside, diameter 4.50 to 5.50, height 2 to 2.25. Inside of cup, diameter 2.50 or 3 by 3.25, depth 1.25 to 1.30.

Eggs.—4 or 5, short-ovate, plump and full, clear white and slightly polished, with numerous reddish-brown spots and sometimes a few black specks and touches of lilac-gray, chiefly near the larger end, often in the form of a wreath or ring; .75×.57.

Voice.—Song, a thin, fine, wiry, monotonous, grasshopper-like or insect-like *wick-up, z-z-z-z-z-z-z-z;* ranging to *pit-tuck, zee-e-e-e-e-e-e e-e-e* or *ka-tsick, ka-tsee-e-e-e-e-e-e-e-e-e* or *x—y—zee-e-e-e-e-e-e-e-e-e; as* the bird jerks its head back and points its bill upward; so thin that it can be heard only for a short distance, as much as nearly a hundred yards by a trained observer, although unnoticed at a dozen feet by one unacquainted with it. A succession of rapid, squeaky notes; a thin and wiry *wick-up, wick-up, wick-up.* Sings constantly, from March to June, rarely in July or August, from a convenient Mexican-hat flower, nigger-head, or other convenient weed-top, rarely from a low fence.

Description.—Similar to Eastern Grasshopper Sparrow, with subspecific differences. Upper-parts, reddish-brown, black, gray, and buffy; crown with buffy stripe down middle and a blackish stripe on each side; reddish-brown markings on ashy-gray nape; back feathers with black eye-spots nicked with reddish-brown. Edge or bend of wing yellow. Sharp-pointed feathers to double-rounded tail. Young, practically no reddish-brown above, feathers conspicuously bordered buffy and whitish; more ashy median-crown stripe; dull buffy-whitish below, chest streaked dusky. Winter, brighter; occasionally indistinct, broken streaks on chest and sides.

Plumage Peculiarities.—One migrant collected (B) has bill like the eastern race but coloring like the western.

Subspecific Characters.—Paler and grayer than the Eastern Grasshopper Sparrow, with more chestnut or rusty-brown and less black above. Longer wings and tail, shorter tarsus, and smaller and relatively more slender bill. W. 2.46. T. 1.84. Exp. C. .43 (female .42); D. B. at B. .25 (female .26). Tars. .77 (female .75).

Field Marks.—Tiny size. Thin insect-trill. Short tail, double-rounded with pointed feathers. Scaly or quail-like appearance of back. Yellow on bend of wing.

Popular Names.—Yellow-winged Sparrow; Western Yellow-winged Sparrow; Quail Sparrow.

WESTERN LARK SPARROW

Chondestes grammacus strigatus Swainson

Abundant migrant and common summer resident; fairly common winter resident; migrating, late March, and middle September to early November. In spring, March 16, 1919, arriving on nesting grounds (A); May 24, 1905, specimen collected (B). In fall, September 13, 1914, local breeders migrating southward (A); October 24, 1915, 30 (F); October 25, 1914, local breeders migrating southward (A). *Recorded:* ABC[1s0]DEFGH[181]IJKLMNOQRSTVWY.

Bailey LAF
WESTERN LARK SPARROW

Geographical Distribution.—Western United States, from southwestern Canada south into northern Mexico, east to central North Dakota and eastern Texas. Winters from California and central-southern Texas to Central America.

Habitat.—Tablelands of the West; rocky mesas; dusty roadsides, rather open prairie country and short-grass pastures dotted with bushes and small trees; neglected, sparsely wooded pasture; roadsides and fence rows; low trees bordering cotton, corn, stubble, and clover fields; partially wooded pastures; trees along edge of woods; second-growth timber. In migrations, roadsides. In winter, leafless lines of trees along edge of river flood plains.

Local Haunts.—Pease north and west pastures; pastures between Austin and the Dam; small, bushy pastures along Shoal Creek; roadsides and pastures toward Fiskville and Bluff Springs; gentle slopes of Lake Austin and Mt. Bonnell; bushy vacant lots in town; University campus. In migrations, along roadsides of the blackland prairies and the limestone hills.

General Habits.—One of the commonest birds of the Region, familiar to every farmer's boy of the Southwest and West. Observed singly and in pairs except in migrations and in winter, when flocks of from 15 to 50 are observed. A very attractive bird, both because of its beautiful face markings and because of its general air of alertness; raises its crown frequently. Eggs are incubated for about 12 days, and the young birds stay in the nest for about 16 days longer.

Migration.—Summer resident birds arrive about middle March and immediately scatter for nesting; more northern breeders are then just beginning to move northward. After the breeding season, local birds assemble in August and wander about open country east of the hills; they begin moving southward about middle September, and a few are still present toward latter October.

Feeding Habits.—Feeds on the ground along roadsides and in cotton fields, where it searches for grasshoppers, locusts, and weevils, and for weed seeds, grass seeds, and waste grain.

Courtship.—March 28, 1915, already paired (A). May 1, 1919, in pairs, courting and chasing one another among fragrant catsclaw bushes on ridges of gravel beds (AB).

Breeding.—Late April to July. Earliest: April 15 (D); April 23, 1905, 4 eggs about one-third incubated (E); April 26, 1889, 5 fresh

eggs (O). Latest: June 14, 1901, 4 slightly incubated eggs (B); June 15, 1891 (D); July (H). Two broods, rarely three. *Breeding recorded:* ABCDEGHIJLMNOQVWY.

Nest Location.—1.2 to 30, usually 10, feet up in upright fork or on horizontal fork or twigs of bushes or low trees, most commonly in scrubby eastern live oak, mountain rock cedar, winged elm, cedar elm, and Mississippi hackberry; less commonly in mountain live oak, prickly ash, mesquite, agarita, chaparral, and similar bushy trees or shrubs; usually on low horizontal limb in tree-dotted pasture. Rarely on ground on prairie or in cotton or corn field. Rim sunken to its level in hollow or depression, concealed and shaded by muslin or Indian tobacco weed, milkweed, mesquite bush, cotton plant, or grass tuft, a location much more common in true prairie country; sometimes in mistletoe.

Nest Construction.—Generally rather compact structure, composed of Indian tobacco or muslin wax-weeds, tiny twigs, weed stems, grass stems, cedar bark, bits of straw, rootlets, and occasionally a small bit of cotton, leaves, string, Spanish moss, rags, paper, and feathers; ground nests are more loosely constructed. Lined with horsehair and long hairs from the tail of a cow, and occasionally with small grass stems, rootlets, and rarely some cotton.

Nest Building.—Pair building nest, April 18, 1905 (B). Occasionally an old nest of the Western Mockingbird, the Scissor-tailed Flycatcher, or the Orchard Oriole is rebuilt or repaired and relined, though in the great majority of cases the birds build new nests. April 27, 1919, 4 nests completed (L).

Nest Measurements.—Inside, diameter 1.75 to 2 by 2 to 2.50, depth 1.50 to 1.75.

Eggs.—3 to 5, commonly 4, dull-white or pearly-white, marked with dark brown, clove-brown, blackish, and occasionally red-umber and lilac, in scratchy, wavy lines, in spots, and in zig-zag scrawls, and shell-markings of lavender, almost always confined to the larger end, .76 ×.61.

Voice.—Song, very sweet and musical, uttered hurriedly, a jumbled series of thin, sweet, musical notes, characterized by a metallic tremolo or purring. Loud, varied, metallic notes, vigorous of delivery, hurried, with clear chants and emotional trills. Sings best when spreading tail and quivering wings before mate. Migrants and winter birds rarely sing; earliest full songs, March 29, 1915 (A), heard almost continually. Call, sharp, quick *tchēēp'!*

Description.—Upper-parts brownish-ash, streaked blackish on back; line down middle of crown and another over each eye, white or whitish; sides of crown and ear-patches chestnut; sides of throat with black streak; rounded blackish tail, the outer feathers tipped white; whitish below, with small black spot in middle of breast. Young, no chestnut, black, or white on head; streaked buffy-brownish above; wedge-shaped blackish streaks on chest. L. 6.40. W. 3.40. T. 2.70. Tars. .81. Exp. C. .49 (female .47); D.B. at B. .32 (female .31).

Subspecific Characters.—Somewhat paler, browner, more narrowly streaked above, and with lighter chestnut-colored head-markings than the Eastern Lark Sparrow, *C. g. grammacus* (Say), which inhabits the Mississippi Valley east of the Great Plains and from Canada to Alabama and southern Louisiana. The eastern race has slightly shorter tarsus (male .79, female .80), and bill smaller (Exp. C., male and female, .45; D.B. at B., female .30, male .31).

Field Marks.—Ear-patches and sides of crown, chestnut. Black spot on center of dusky whitish breast. *White rim to rounded tail*, particularly prominent at corners, and quite conspicuous during flight. *Distinctive variegated face-markings* of rich brown and white.

Popular Names.—Road Bird; Ground Sparrow; Bush Sparrow; Tree Sparrow; Field Sparrow; Buffalo Bird; Lark Finch; Fan-tailed Sparrow; Snake-bird; Grass Finch; Pale Lark Sparrow; Brownish Lark Sparrow.

HARRIS' SPARROW

Zonotrichia querula (Nuttall)

Fairly common migrant and winter resident; more common when weather is cold. In fall, earliest, November 20, 1914 (A). Specimen collected, December 1, 1907 (B). In spring, March 7, 1915, 25 in flock migrating (AF); March 29, 1921, 7 migrating northward (A). *Recorded:* ABCDFGK.

Geographical Distribution.—Northern and central Canada to the Barren Grounds of the North. In migrations, west to the Rocky Mountains and east to Illinois. Winters from northern Kansas and western Missouri southward to southern Texas.

Habitat.—Thickets and underbrush along streams and fencerows in pastures; willows along stream margins; thickets bordering plowed fields; roadside Cherokee rose vines and vine tangles in open country; bushy undergrowths and edges of low woodlands; semi-cleared lands; in and about brush heaps.

Local Haunts.—Zilker's pastures; cockleburrs and willows on Colorado River Sand Beach; thickets on northeastern side of Deep Eddy; thickets on slopes overlooking Barton Springs.

General Habits.—Usually observed singly or in small bunches or flocks of from 3 to 13, rarely in scattered composite flocks with White-crowned, White-throated, and Lincoln Sparrows, Slate-colored Juncos, and Arctic Towhees. Sticks close to the ground, even during migrations.

Feeding Habits.—Keeps close to the ground, where it scratches among leaves and rubbish for seeds and insects.

Voice.—Sings on warm, sunshiny days in fall and spring, pleasing, plaintive, musical whistling notes or a series of musical piping whistles. Queer, low, chuckling, contented, musical notes; a clear *whee! whee-e-e!* or *heap! heap!*; a short *ter-twee-too!* Call, a loud, sharp, metallic *clink*.

Description.—Upper-parts brownish-gray, streaked with black, to brownish-ashy on rump and blackish-gray on tail. Crown, throat, breast, and space from eye to bill, glossy black; cheeks gray. Two white wing-bars. Belly white; black streaks on sides. Immature, buffy cheeks, flanks, and under tail-coverts; brownish crown; throat and breast marked with black blotches and streaks; occasionally grayish tips to crown and breast. L. 7.40. W. 3.45. T. 3.20. B. .51.

Field Marks.—Large, heavy sparrow. Conspicuously handsome, distinguished. *Buff-gray cheeks* and pinkish or *reddish bill. Breast, crown, and throat black.* Streaked brown above; white below.

Popular Names.—Black-headed Sparrow; Black-breasted Sparrow; Gray-cheeked Sparrow.

WHITE-CROWNED SPARROW

Zonotrichia laucophrys (J. R. Forster)

Fairly common winter resident, late October to late April; begins moving northward in February. In fall, October 25, 1914 (A); November 21, 1915 (F). In spring, April 10, 1900, 3 (T); April 27, 1919 (A); April 29, 1921 (A). *Recorded:* ABCDFGH[132]ST.

Geographical Distribution.—Eastern Canada, from limit of trees, southwestward to Rocky Mountains of western United States from

Wyoming and southern Oregon south to southern New Mexico and central California. Winters from Ohio Valley and southern Kansas south to Louisiana, Mississippi, and from southern Arizona and Lower California southward over Mexico.

Habitat.—Hedges, brush-heaps, and thickets; fencerows; in fields and pastures, along roadsides, on slopes, and on the outskirts of town; thickets along edges of woods; undergrowth and brush along stream bottoms; Cherokee rose vine tangles on open prairie country; mountain meadows and willow bordered streams. In migrations, thickets and hedgerows.

Local Haunts.—Zilker's pastures; Wheeler's Grove; thickets along Mt. Bonnell road; ravines and gulches in the hills; valleys of Shoal and Waller creeks.

General Habits.—Usually observed singly, rarely in small loose flocks and composite flocks with other sparrows; never observed in close flocks.

Feeding Habits.—Feeds on caterpillars, wasps, and ants, and on weed seeds such as ragweed and Johnson grass seeds.

Voice.—Song, a clear, soft, sad, sweet, piping, whistled refrain, *see-dee-dee-dee-dee-e*, frequently sung in dark woods or at night; two long whistled notes, rich, plaintive, and ringing, the first sliding up with grace notes to the second, which is followed by three rapid repetitions of a lower note. A sharp chip.

Description.—Upper-parts grayish-brown, streaked with grayish; wings brownish, with white edge, and two white wing-bars; shading to brownish-ash on rump. Under-parts brownish, unstreaked; grayish throat, nape, neck, and breast; flanks and under tail-coverts cream-buff. Broad white stripe down middle of crown, with two broad black stripes leading from bill back along each side of head (one stripe along side of crown and one stripe through eye) separated by white stripe *over* eye—white not extending in front of eye; space from eye to bill, black. Female, median crown-stripe narrower and grayer. Young, browner, more buffy and streaked below; black and white of head replaced by browns and grays. L. 6.90. W. 3.10. T. 2.95. B. .45.

Field Marks.—Rather large sparrow. Handsome markings. Throat and breast gray, with no streaks below. *No yellow on bend of wing.* Three bold distinct black and four white stripe-bands along head and crown. *Black between eye and bill* distinguishes it from the White-throated Sparrow, a near species with yellow before its eye.

Popular Names.—Mountain Sparrow; Stripe-headed Sparrow.

WHITE-THROATED SPARROW

Zonotrichia albicollis (Gmelin)

Rather scarce winter resident, late October to late April, rarely early May; begins moving northward late in February. In fall, October 21, 1914 (A); October 27, 1919 (A). In spring, March 25, 1905, specimen collected (B); March 27, 1915, flocks moving northward (A); April 18, 1915, 3 (A); May 2, 1919 (A). *Recorded:* ABCDE.

Geographical Distribution.—Eastern Canada and northeastern part of eastern United States, west to southern Montana, south to New York, Pennsylvania, central Minnesota, and Wisconsin. Winters from southern New England and the Ohio Valley south to Florida, the Gulf Coast, southern Texas, and northeastern Mexico.

Habitat.—Hedgerows; thickets and underbrush along the edges of timber; small patches of woods; woodland undergrowth; brushy borders of fields; dense thickets and clumps of evergreens; ground among dead leaves under thicket.

Local Haunts.—Pastures along Mt. Bonnell road; thickets along Shoal and Waller creeks; Barton canyon; gulches in the edge of the hills; pastures west of Austin.

General Habits.—Occurs in small loose little flocks or companies and composite flocks of from a dozen to 50 or 100 birds, with Lincoln, Eastern Song, and Fox-colored Sparrows. Sociable; not conspicuous, but easily found.

Feeding Habits.—Seeks food among dead leaves, often scratching with both feet at a time, making considerable noise. Feeds on insects, weed seeds, and wild berries.

Voice.—Song, a clear, ringing, musical, plaintive, sympathetic, piping whistle, *hear, hear, Peabody, Peabody, Peabody* or *I, I, pea-body, pea-body, pea-body,* occasionally sounding *all day, whit-tle-ing, whit-tle-ing, whit-tle-ing;* a fine whistler. A clear, plaintive, whistled *swee-e-e-e, e-he-e, e-he-e, e-he-e,* first drawn out, last three rapidly uttered. Call, a low, sharp, thin, penetrating *tseep;* a characteristic sharp *chink.*

Description.—Rusty-brownish body, streaked with blackish on back; grayish-brown rump and tail and tinge on flanks and under tail-coverts; two white wing-bars. Crown black, with median whitish line; distinct line along side of head from bill over eye, bright yellow in front of eye and white over and beyond it; distinct square, pure white throat-patch, contrasting sharply with gray of breast and sides of head; black line from eye back; yellow on bend of wing. In fall and winter, dusky, streaked with brown and buffy on crown; yellow duller; throat-patch less distinct and sometimes obscured; brownish-white, streaky under-parts; belly whitish. L. 6.75. W. 2.90. T. 2.90. B. .45.

Field Marks.—Brownish sparrow with distinct white throat-patch. Two distinct white wing-bars. Yellow on bend of wing. *Yellow spot before eye,* and white line over eye. Young, back and wings more rusty, lateral crown-stripes deeper brown than young of White-crowned Sparrow.

Popular Names.—Peabody Bird; Canada Sparrow; Yellow-browned Sparrow.

CHIPPING SPARROW

Spizella passerina passerina (Bechstein)

Rather scarce migrant and winter resident; very rare summer resident; more common during migrations, late February to late April, and late October to end of November. In fall, October 15, 1916 (G); and October 22, 1914 (A), migrating. Specimen collected, January 12, 1916 (B). In spring, March 27, 1915, flock of 45 moving northward (A); April 4, 1915, 2 (F), paired (A). *Recorded:* ABCDFGK.

Geographical Distribution.—Eastern Canada and eastern United States, south to central Georgia, southern Mississippi, and central Texas, where it breeds southward along the limestone hills from Austin to Boerne and Kerrville. Winters in Southern States, from southern New Jersey, rarely, and Oklahoma southward.

Habitat.—Dooryards and upland fields; grass meadows and woodland borders on slopes. In migrations, fencerows, thickets, brush along creek bottoms; undergrowth along edge of woods and under mottes on prairies.

Local Haunts.—Probably breeding along sloping front of the whole hill region; edges of clearings and dooryards of mountain ranches in the hills. In migrations, Shoal, Waller, and Onion creek woodlands.

General Habits.—Observed singly and in pairs in summer. In migrations and in winter, small flocks and composite flocks, usually about 25 birds together; usually keep well to cover. Neat, trim little fellow in summer; humble, unassuming, and unattractive in winter. Young birds leave the nest in about 12 days.

Feeding Habits.—Feeds largely on caterpillars and other injurious insects, on worms, and on weed seeds.

Courtship.—Pairs observed, mated, as early as April 4, 1915 (A).
Breeding.—Probably, middle April through May and June. Immature birds observed, being fed by parents, July 16, 1915 (A). *Breeding recorded:* A.

Nest Location.—4 to 25 feet up in vines, shrubs, bushes, or low trees.

Nest Construction.—Shallow structure composed of fine dry grasses, weed stalks or stems, small twigs, rootlets, and vegetable fibers; lined with horsehairs or long hairs from the tail of a cow; though appearing frail, the nest is durable and compact.

Nest Measurements.—Outside, diameter 2.75 to 3 by 3.50, height 2.15. Inside of cup, diameter 1.90 to 2.25, depth 1.20 to 1.25.

Eggs.—3 to 5, usually 4, uniform light greenish-blue or bluish-green, speckled and spotted with purplish and blackish-brown, at times in a circle around the larger end, .70×.50.

Voice.—Song, high, wiry, strident, monotonous, many-times repeated *chippy-chippy-chippy-chippy-chippy-chippy*, or *chip, chip, chip, chip, chip,* often quite near an insect-like trill. Call, *chip! chip!*

Description.—Bright, sharply-contrasting, reddish-chestnut crown or cap, with black forehead; back of neck grayish, separating crown and back; back dark brownish streaked, with black and pale buffy-ochraceous; unstreaked on neck, breast, and sides. Wide dusky white line over eye; black line through eye and behind it. Plain grayish below, white on throat and belly. Inconspicuous wing-bars; tail not extra long. Bill entirely black. In fall and winter, bill dusky, crown streaked like back, eye-stripe less pronounced, and no black on forehead. L. 5.35. W. 2.72 (female 2.64). T. 2.24 (female 2.15). Exp. C. .37 (female .36). Tars. .64.

Subspecific Characters.—There are many differences between this race and the Western Chipping Sparrow, *S. p. arizonae* Coues, of western North America from Alaska to northern Mexico and from the Rockies and western Texas to the Pacific, wintering southward to Lower California and southern Mexico. The Western Chipping Sparrow has a paler body and paler cap; the ground-color of its back is grayish-buffy or pale wood-brown, without the strong rusty-brown of the ground-color of the eastern race; the rump is decidedly a paler gray instead of mouse-gray or deep olive-gray as in the eastern; and the ear-patch is paler gray, not sharply contrasting with stripe over eye; wings, tail, bill, and tarsus of the western are slightly longer; W. 2.84 (female 2.74). T. 2.40 (female 2.31). Exp. C. .38. Tars. .67.

Field Marks.—Small size. Medium, square-ended tail. *Silky-white* under-parts. *Blackish bill;* dusky brownish in winter. *Cap bright chestnut* or cinnamon in spring, more buffy-streaked in winter, at which season its more reddish-brown upper-parts distinguish it from the Clay-colored Sparrow. In winter or spring, slaty-*gray rump.*

Popular Names.—Chippy; Red-headed Chipping-bird; Hair-bird; Social Sparrow.

CLAY-COLORED SPARROW

Spizella pallida (Swainson)

Common irregular migrant, at times abundant in spring; middle October to late November, and late March to middle May. In fall, October 17, 1917, 7 (A); November 12, 1916, 12 (G). In spring, March 30, 1915 (F); April 15, 1907, specimen collected from flock of 3000 (B); April 18, 1915 (F); April 24, 1907, 5 specimens collected from large flock (B); April 25, 1920, 6 (Wolfe). *Recorded:* ABFG.

Geographical Distribution.—Interior North America, from southern Canada south to Michigan and northwestern Illinois, and southwest to western Montana and southeastern Colorado. Winters from southern Arizona and southern Texas southward to southern Mexico.

Habitat.—Prairies and Great Plains; roadsides and fencerows; mesquite pastures; cactus and grassy meadows; edges of woods and brush; scattered growth of trees and bushes.

Local Haunts.—More common east of the hills, in pastures near Dam, along roadsides and fencerows northeast of town; Waller and Shoal creeks; gravel beds and thickets of fragrant catsclaw on Colorado River flood plains at town.

General Habits.—Occasionally observed singly or in pairs, though usually in small scattered flocks. Very similar in actions and habits to the Chipping Sparrow, with which it sometimes associates in migrations, though less friendly. In the spring of 1907 a flock of 3000 spent two weeks in the western part of the city, along Shoal Creek valley and in Pease Park, on the wooded slopes, and southwestward to the hilltop at 610 Baylor Street; the birds lit on trees and fairly covered them, then dropping to feed on the weedy ground and the quiet streets.

Feeding Habits.—Found almost constantly on or near the ground, where it searches for weed and grass seeds.

Voice.—Song, a hoarse, harsh, rasping, grating *kah-kah-kah-kah-kah-kah-kah-kah;* another of three notes and a slight trill. Birds call back and forth, one commencing and the others taking it up. Call, an ordinary *tsip.*

Description.—Distinctly grayish above; streaked crown and broadly-streaked back; crown light brown, with pale median stripe and another line over eye; gray on hind-neck; more or less sharply-defined ear-patch; rump pale grayish-brown; white line over eye; sides of head buffy-brown, edged above and below with black; whitish jaw-line, with dusky line between it and throat. Buffy wing-bars. Under-parts whitish, washed brownish on chest and sides, and streaked with black on sides. Sexes alike. In fall, more buffy and brown; crown streaks narrower. L. 5.30. W. 2.43. T. 2.35. B. .37.

Field Marks.—Dull, pale grayish; erectile *crown largely black,* with distinct stripe down middle, line over eye, and line through eye. Whitish jaw-line; more or less sharply defined ear-patches. Tail shorter than Field Sparrow, longer than Chipping Sparrow. *Rump brownish,* instead of slaty-gray as in the Chipping Sparrow. *Streaked upper-parts* and sides; *plain gray hind-neck.*

FIELD SPARROW

Spizella pusilla pusilla (Wilson)

Quite common migrant, uncommon winter resident, and moderately common summer resident; migrating, March, and from August to October. Specimens collected, February 23, 1913 (B); March 29, 1905 (B); July 17, 1917 (B); July 18, 1915 (A); and December 27, 1912 (B). *Recorded:* ABC[1S3]DEFGHIJKSWY.

Geographical Distribution.—Southeastern Canada and eastern United States south to northern Florida, central Louisiana, and central Texas (Austin and San Antonio). Winters from New Jersey, Illinois, and Missouri southward to the Gulf Coast.

Habitat.—Bushy, brushy upland pastures, where stunted cedar, cedar elm, winged elm, mesquite, and scrubby oak abound; edge of upland woodlands; along cotton fields and the borders of thickets. In migrations, thickets and weed patches along creek bottoms and slopes. In winter, thickets and cover along creek bottoms and ravines; dense thickets in pasturelands.

Local Haunts.—Distribution local, along the lower country within about 5 miles of the edge of the hills; Pease north pasture; Taylor's lime kiln; pastures along Williamson Creek at Manchaca road-crossing.

In migrations, Barton canyon, Shoal and Waller creeks, and the cedar hills back of Deep Eddy. In winter, Sand Beach, vacant lots in southwest Austin, and creek valleys.

General Habits.—Elusive and shy, more often heard than seen, since it sings in dense thickets of stunted trees and bushes. Occurs singly and in pairs in summer; in flocks of from 15 to 75 in migrations and in winter, occasionally larger flocks in migrations in the cedar hills. Of very local distribution during the breeding season, there being only a few favored localities where it may be found. Parents bold and noisy when the nest is once discovered, but they will quickly desert it if it is disturbed. Young birds leave the nest in about 12 or 13 days.

Feeding Habits.—Feeds largely on insects and wild seeds.

Breeding.—Middle April to middle June, rarely early July. Earliest: April 15, 1891, eggs (D); April 29, 1915, 3 fresh eggs (AB); May 18, 1896, 3 fresh eggs (B); May 23, 1915, 1 young about four days old (A); May 24, 1915, 4 fresh eggs (B). Latest: June 15, 1917, 3 fresh eggs (B). Two broods, possibly three. *Breeding recorded:* ABDY.

Nest Location.—1.5 to 12, average 4, feet up in dense foliage in vertical crotch or group of small twigs, usually in low winged elm or cedar bushes, rarely in low cedar elm tree; usually in bush or shrubs skirting woods; rarely on ground under cotton plant in cotton field.

Nest Construction.—Compact, beautiful, well-cupped, composed of flat grasses, grass seed stems, roots, and occasionally leaves; neatly and compactly lined with fine grasses, fine hair-like grass-seed stems, horsehair, fine inner bark of cedar, and rarely small, flattened bits of chaff, carefully worked in. Mouth of cup slightly narrower than cavity.

Nest Measurements.—Outside, diameter 3 by 3.30, height 3. Inside, rim diameter 1.90 by 2.10, inside diameter 2.10 by 2.30, depth 2.10.

Eggs.—3 or 4, usually 4, elongate-oval or ovate, white to greenish or bluish-white; dotted or blotched with reddish-brown, occasionally dense near larger end and frequently very beautiful, .71×.54.

Voice.—Song, considerable variation, usually a sweet, clear, plaintive whistle, uttered from low thicket limbs to top-most twigs of low pasture trees, every note of the same pitch, not rising and falling, *chwee, chwee, chwee, chwee, chee-chee-chee-chee-chee-chee-chee-chee-chee*, the first four steady and rather leisurely uttered, the last eight rapid and almost merging into a trill; or *cher-wee, cher-wee, cher-wee, cher-wee, chee-o, de-de-de-de-de-de*, ending in a trill; a shorter *swee-see-see-see-e-e*, usually when the bird is frightened. Begins singing in late March or early April—April 3, 1905 (B)—and continues to August. Sings all day, even in hot summer, but more commonly in early morning or late in the afternoon. Scolds noisily when alarmed.

Description.—Upper-parts reddish-brown; pale gray stripe down crown and a gray line over eye; no black edge to crown or black line through eye; side of head gray and reddish; brownish-ashy rump; long light chestnut tail; two white wing-bars. Whitish below, tinged pale brownish-buffy on breast and sides. Sexes alike; no marked seasonal changes. Immatures and winter adults, duller, more grayish on crown. L. 5.50. W. 2.55 (female 2.41). T. 2.46 (female 2.37). Exp. C. .37. Tars. .70 (from larger birds west of Alleghenies).

Subspecific Characters.—More rusty colors, smaller, and shorter of wing, tail, and tarsus than the Western Field Sparrow.

Field Marks.—No spots on breast. No black markings on crown or ear-patches, which are brown. *Long tail*, light chestnut. General *bright reddish-brown* color, particularly to *back*. Pinkish, coral, or *flesh-colored bill.*

Popular Names.—Pasture Sparrow; Bush Sparrow; Red-billed Sparrow; Long-tail Sparrow.

WESTERN FIELD SPARROW

Spizella pusilla arenacea Chadbourne

Rather rare migrant; probably rare winter resident, late August to mid-April. Records: August 16, 1890, 2 killed (D); March 7, 1915, specimen collected from flock of 15 (A). *Recorded:* AD.

Geographical Distribution.—Northwestern part of the Great Plains, from southeastern Montana and southwestern North Dakota into South Dakota and central Nebraska. Winters from Nebraska to southern Louisiana and southern Texas and inland to northeastern Mexico.

Habitat.—Bushes and cedar elm trees along creek valleys and valley slopes.

Local Haunts.—Shoal Creek valley, just below State Street crossing.

General Habits.—Similar to those of the Eastern Field Sparrow. Loose flocks *chip* about under cover of bushes, at that season of winter resembling long-tailed winter Chipping Sparrows rather than Field Sparrows.

Description.—Similar to Eastern Field Sparrow, with subspecific differences.

Subspecific Characters.—Much paler than the Eastern Field Sparrow, general tone of color hardly browner than that of Clay-colored Sparrow; more strongly marked than the eastern race; back is distinctly *buffy*, grayish, and rufous, streaked with black; crown mostly gray instead of reddish-brown, usually with somewhat indistinct lateral brownish stripes; reddish-brown streak from eye back; bill reddish-brown to orange. Young duller, streaked below, with less distinct head markings. Grayer, cap almost wholly gray, and larger size with longer wings, tail, and tarsus. W. 2.74 (female 2.44). T. 2.71 (female 2.47). Tars. .76 (female .72).

Field Marks.—Orange-red bill. Buffy back, marked with gray, black, and reddish; gray crown. Appears to be, in winter plumage, a long-tailed winter Chipping Sparrow.

Popular Names.—Pallid Field Sparrow; Pale Field Sparrow; Larger Field Sparrow; Texas Field Sparrow (inapplicable).

SLATE-COLORED JUNCO

Junco hyemalis hyemalis (Linnæus)

Common irregular migrant and winter resident, quite common some seasons; middle October to middle April. In fall, October 13, 1914 (A); October 19, 1919 (A); November 12, 1916, 40 (G); November 14, 1915, numerous (F). Two specimens collected, February 15, 1905 (B). In spring, April 18, 1915, 12 (A); April 13, 1920 (A); April 12, 1922 (A). *Recorded:* ABDEFGHIJKMS.

Geographical Distribution.—From limit of trees in Alaska and Canada into northeastern United States to New York, Pennsylvania, and Minnesota; chiefly east of the Rockies. Winters throughout eastern United States, from Canada to the Gulf Coast.

Habitat.—Thickets and brush along creek bottoms; brush and thickets in pastures and on hillsides; borders of woods; mixed open cedar and deciduous slopes; tangles of logs, roots, and fallen tree-tops; slopes and valleys; cedar hillsides, and brushy creek valleys.

Local Haunts.—Shoal Creek valley west and northwest of Austin; wooded pastures between Austin and Dam; among bushes along bluffs of Deep Eddy and Barton Creek.

General Habits.—Quiet, social bird, occurring in somewhat loose companies, flocks, or composite flocks of from 5 or 10 to 30, rarely more. Feeds on the ground among cedar trees and bushes, or perches contentedly in bushes; difficult to see against dark earth.

Feeding Habits.—Hops about on the ground, picking up seeds and berries, particularly along the edge of woods where it can find weed seeds and a few insects.

Voice.—Song, low, sweet, pleasing, warbled; a sweet, simple, unbroken, rattling trill; a rapid *chew-chew-chew.* A short, sharp, unmistakable, deep metallic *tsip;* alarm-note, a kissing sound.

Description.—Upper-parts, throat, breast, and sides, dark slaty-gray, almost black on head; upper-parts faintly washed with grayish-brown; sides more grayish; no wing-bars; tail fuscous or blackish, two outer feathers on each side white; belly white, sharply defined against dark gray breast; bill distinctly white or flesh-color. Female, browner above, paler below. Immature, sides washed with pinkish-brown. In winter, more richly washed with brownish or rusty. L. 6.25. W. 3.12 (female 2.95). T. 2.62 (female 2.53). B. .43.

Plumage Peculiarities.—Immature female specimens occasionally have pinkish-brown sides similar to those of the Montana Junco, but the breast of such birds is always heavily washed with brown, not at all like the gray breast of the Montana.

Field Marks.—Slaty-gray, small, plump bird with white belly. Flesh-colored or *white bill.* Distinct white outer tail-feathers in flight. Comparative absence of brownish or pinkish wash, particularly on sides, distinguishes this form from other Juncos; back of same color as back-cap and hind-neck. Dark back, and sharp breast-line where gray contrasts with white of belly.

Popular Names.—Snowbird; Black Snowbird; Slate-colored Snowbird; Slaty Snowbird; White-bill.

MONTANA JUNCO

Junco oreganus montanus[184] Ridgway

Very rare winter resident. December 18, 1912, specimen collected (B). *Recorded:* BD.

Geographical Distribution.—Northern Rocky Mountains, from southern Canada to Montana and Idaho. Southward and eastward in winter to Arizona, northern Mexico, and Texas, and east casually to upper Mississippi Valley and rarely New England.

Habitat.—Brushy thickets along streams; brushy thickets in cut-over woods; ravines in hills.

Local Haunts.—Ravines in the hills, and brushy hillsides west of Austin.

General Habits.—Sometimes associated in winter in loose flocks with the Slate-colored Junco. Habits rather similar to its more eastern relative.

Description.—Not so dark and slaty as, but lighter and browner than, the Slate-colored Junco; back grayish-brown, but decidedly brown, conspicuously different and sharply defined from slaty-gray of head, which approaches black on forehead; neck and chest slaty-gray, belly white, and sides extensively pale pinkish or strongly washed with brownish-pink or cinnamon-buff; outer tail-feathers largely white. Female, duller, with brown from back extending even onto crown; chest and throat paler. In winter, plumage softer. L. 6. W. 3.13 (female 2.91). T. 2.66 (female 2.50). B. .42.

Plumage Peculiarities.—Those immature female Slate-colored Juncos which have side-markings like the Montana Junco also have breast heavily washed with brown, a condition never found in the Montana Junco.

Field Marks.—Similar to Slate-colored Junco, but sides pinkish-brown instead of slaty-gray; breast comparatively clear gray. Back dull light brownish or rusty-brown, different in color from back-cap and hind-neck.

Popular Names.—Snowbird; Rusty-backed Snowbird; Montana Snowbird; Mountain Junco.

BLACK-THROATED SPARROW

Amphispiza bilineata bilineata (Cassin)

Rather common spring migrant, scarce summer resident, and very rare winter resident; migrating, through March, and from early September to middle November. In spring, migrating, March 14, 1915, 2 pairs and 6 single birds (A); March 27, 1915, 11 single birds (A). *Recorded:* ABC[185]DFGH[186]IJM.

Bailey
BLACK-THROATED SPARROW

Geographical Distribution.—Southern and southeastern Texas, north through northern middle Texas and Oklahoma to western Kansas, and south into northeastern Mexico; in Texas, from Tom Green and Concho counties to Eastland, Travis, Bexar, and La Salle counties and the Lower Rio Grande. Winters from central Texas southward into northern Mexico.

Habitat.—Upland cactus pastures; endless tangles and large beds of prickly pear and rat-tail cactus, with a scattering of elm, cedar, agarita, and similar chaparral on gravelly rises; upland gravel terraces thick with prickly pear; chaparral growth; catsclaw bushes; thorn brush and mesquite plains; desert and barren wastes along the east end of the Lower Sonoran Subzone.

Local Haunts.—Pease north pasture; uplands back of Deep Eddy cliffs; Barton canyon at Campbell Hole flats and uplands above Campbell cliffs; cactus country immediately northeast of Dam; uplands overlooking lower end of Deep Eddy, at north side of Colorado River; western slope of Lake Austin; flat hilltops and slopes west of Bull Creek; Pease north pasture more commonly from middle March to May. In winter, thickets along river valley and its slopes at Austin.

General Habits.—A bird of the southwestern desert country, migrating singly and in pairs rather than in flocks; may be found scattered through its brushy habitat, the males usually perching in low bushes, singing. Rarely leaves the ground or the low bushes of which it is so fond.

Breeding.—Second week in March rarely to early July; usually in April. Earliest: March 10, 1902, fresh eggs (H); April 7, 1916, 3 young about 10 days old (B); April 14, 1916, 3 young about 7 days old (B). Latest: July 16, 1902, fresh eggs (H). Two broods, rarely three. *Breeding recorded:* ABHM.

Nest Location.—1 to 6, usually 3, feet from the ground, securely placed between or among cactus pads in thick prickly pear tangles, less commonly in low evergreen or catsclaw chaparral among prickly pear; rarely on ground among roots of bush or cactus or in bunch of high grass.

Nest Construction.—A loosely piled nest of fine shreds of bark, fine weed stems and stalks, dried grasses, and rarely a few twigs; nest falls to pieces easily. Lined prettily with woven horsehair and cowhair, grasses, rootlets, bits of cotton, and perhaps a few feathers.

Eggs.—4, rarely 3 or 5, pure white, with a very faint bluish tinge, usually unmarked, rarely lightly spotted, .71×.52.

Voice.—Song, a soft, tinkling, most entrancing, musical *weet, weet, too, quay-ay-ay-ay-ay,* first two notes similar to its ordinary call, followed by a single short note, and then a quavering, gentle, bell-like reminder of the burring, buzzing song of the Western Lark Sparrow;

a rich, metallic *zip-zip-zip-zee-zee-zee*, ascending for three notes, descending for three notes. Sings about noon every day after the second week in March, from the ground, a low mesquite perch, or a bush-top with head thrown back; few sing on dark days, singing usually commencing when the sun comes out. Call, tinkling and bell-like, or a very musical *weet;* a cluttering alarm-note.

Description.—Upper-parts plain grayish-brown, darker about head; mainly whitish below; two broad white stripes on each side of dark blackish-gray head, one of them over eye and the other along side of throat from corner of mouth; big black throat-patch covering chin, throat, and upper breast; space from eye to bill black; black tail, all but middle feathers marked with white. Young, without distinct black markings; light buffy-brown shoulders; white throat marked with grayish, chest streaked. L. 5.35. W. 2.49 (female 2.44). T. 2.33 (female 2.30). B. .39.

Subspecific Characters.—Darker, smaller, with shorter wings and tail, and with larger white spot at tip of inner web of outer tail-feather, measuring in male .39-.70, average .55, and in female .48-70, average 60, in length, instead of short as in the Desert Black-throated Sparrow, *A. b. deserticola* Ridgway, of the arid plains and deserts of southwestern United States from western Texas (El Paso, Fort Davis) to southwestern Colorado and western Nevada and to southern California and northwestern Mexico, length of spot in male .09-.45, average .29, and female .17-.38, average .30; the Desert Black-throated Sparrow also has longer wing (male 2.65, female 2.54) and tail (male 2.53, female 2.37) than the race of middle Texas.

Field Marks.—Broad white line along side of throat and another over eye. In flight, *blackish tail,* outer feather edged and tipped with white; *lighter colored upper-parts.* In adult, *black throat, sharply outlined* against white under-parts.

Popular Names.—Smaller Black-throat; Darker Black-throated Sparrow; Texas Black-throated Sparrow.

CASSIN'S SPARROW

Peucæa cassinii[187] (Woodhouse)

Rather scarce summer resident, formerly rather common; late March to September or early October, rarely as late as December 1. In spring, March 20, arrives (Nehrling); March 24, 1919, 2 (A). In fall, departs late in October (Nehrling); November 3, 1920 (A); December 1, 1889 (D). *Recorded:* ABD[188]U[189] (and Nehrling[190]).

Geographical Distribution.—Southwestern Kansas, southeastern Colorado, and southeastern Nevada south to the mouth of the Rio Grande into northwestern Mexico; in Texas, western and northwestern parts, east to Matagorda, Bexar, Travis, Lee, and McLennan counties.

Habitat.—Mesquite thickets; semi-open country, plains, and very barren country covered with low stunted bushes; small open spots in the higher parts of the thorny brush and cactus country; among stunted bushes of the mesquite plains; dry gravelly knolls; arid western country along eastern end of the Lower Sonoran Subzone. Never found in limestone country or among cultivated fields.

Local Haunts.—Gravelly flats dotted with chaparral; among fragrant catsclaws on gravel beds of the Colorado River flood plains; tops of the gravelly chaparral-covered hills back of Deep Eddy cliffs.

General Habits.—A particularly interesting bird of the southwestern country, attracting considerable attention from an ornithologist because of its flight-song. When alarmed, it glides rapidly over grass and shrubbery, and takes refuge in small bushes. Leaves for the South in scattered companies.

Breeding.—Probably through May and early June; in 1919, Kleberg County, Quillin found it very common with full sets as early as the last week in March.

Nest Location.—On ground among roots at foot of small, slender-stemmed rat-tail or needle cactus (*Opuntia leptocaulis* P.D.C.), small evergreen shrub or bush, or in bunch of grass; rarely up to one foot in low bushes; usually in clearing on somewhat gravelly, arid ground, with sparse grass, and dotted with stunted chaparral bushes, small mesquite trees, and various species of cactus.

Nest Construction.—Very frail, composed of dried grasses, and lined with finer grasses, a few hairs, and some rootlets.

Eggs.—4, rarely 5, ends rounded alike, pure smooth glossy white; considerably larger than eggs of the Black-throated Sparrow, .74×.57.

Voice.—Song, melodious and pleasing, a long trill, followed after a slight pause by a series of five notes: *she-e-e-e-e-e-e; pretty, pretty she.* When singing, the bird springs straight up with abandon and ecstacy into the air several feet above its perch or ascends in spirals for 10 to 20 feet, head high, and with a tremulous motion of its outspread wings dropping or slowly floating back down again frequently to the same perch or to another within a few feet of where it started, its pleasing, lengthened, twittering song accompanies its entire flight, the apex of its flight marking the close of its song. In spring and early summer sings all day, and not infrequently heard singing at night; heard singing December 1, 1889 (D).

Description.—Upper-parts pale ashen, streaked with sandy-brown; feathers of back with narrow black cross-bars near end with a central shaft-streak, the remainder of the feather sandy-brown, widely margined with gray. Bend of wing yellow; yellowish tinge on shoulder; middle tail-feathers decidedly barred. Under-parts grayish, tinged with brown on chest and sides; flanks streaked with brownish. Young, distinctly streaked above and on chest. L. 5.80. W. 2.50. T. 2.40 or longer (to 2.82). B. .43.

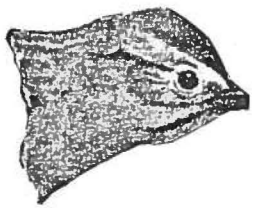
Field Marks.—Song flight easily identifies it. Small and pale, with scarcely any distinguishing marks. Somewhat similar to Grasshopper Sparrow, but without reddish-brown on back, and with longer tail; no bright chestnut patch in wing. Spotted or barred appearance of back; *sandy-brown streaking on gray upper-parts.*

Remarks.—Discovered by Dr. Woodhouse at San Antonio, Texas, April 25, 1851, and named by him in honor of John Cassin, ornithologist.

ROCK SPARROW

Aimophila ruficeps eremoeca (N.C.Brown)

Common permanent resident. Specimens collected, January 24, 1913 (B), 2 on March 17, 1905 (B), and 2 on April 14, 1913 (B). *Recorded:* ABCDEFGHIJKMNSU[191]WX.



Bailey

ROCK SPARROW

Geographical Distribution.—Limestone mountains of central Texas northward through Cooke County, Texas, to the Wichita Mountains in Oklahoma, and southwestward from Travis, Comal, and Kendal counties to Kinney and Maverick counties on the Rio Grande River and southwest to the Pecos River. Winters from central Texas southward to central and eastern Mexico.

Habitat.—Rocky slopes and crests of limestone hills, usually in close proximity to a creek, among small cedars and stunted oaks that grow on the loose limestone; parched, heated hillsides grown with sage and brush; rocky flats grown with scrubby cedars and

small trees and brushes; occasionally on barren slopes and divides, a mile or more from streamways. In winter, weedy patches along hill streams, and in heavy brush covering hillsides.

Local Haunts.—Limestone Hill Area, east to the edge of the hills; slopes of Dry and Barton creeks; western slopes of Lake Austin and the slopes of Mt. Barker and Mt. Bonnell; a few at outcropping limestone ledges on the west side of Shoal Creek just above Twenty-second Street and in Pease gorge.

General Habits.—Shy and rarely seen. Occurs singly, in pairs, or in small family groups; more gregarious in winter, though never in flocks, a dozen single birds and pairs frequently found within a small sheltered area and then no more may be seen for perhaps a mile. Shy, elusive, skulking, hiding under rock, boulder, bush. or weed until compelled to take flight, which it rarely does. Shuffle a foot among the rubbish of its habitat, and the sudden alarm-note will be heard. Flush a bird from the rocky slope and there is but a glimpse of it before it is gone into the depths of another pile of rubbish or brush. The female is very elusive, hiding at all times during the nesting season, leaving the nest long before the observer reaches it, dodging behind bushes or from one tuft of grass to another, and deserting quickly if the nest is disturbed. The male is shy, but during the nesting season he may be observed from a distance, singing from a conspicuous perch atop a small tree near the nest.

Courtship.—Mating April 14, 1915 (A).

Breeding.—Early April to late June. Earliest: Late April (C); May 6, 1892, 4 fresh eggs (C).[192] Latest: May 16, 1915, 1 fresh egg (A); June 23, 1919, 4 fully-fledged young wandering about with parents (AB). Probably two broods. *Breeding recorded:* ABC.

Nest Location.—On ground, or within 2 feet of ground, well hidden in thick tussock or tuft of grass or under bush; usually under 12-inch ledge running horizontally along side of terraced slope near hill top; less commonly, wedged in among thickly-sprouting, upward-growing branches of low bush or scrubby cedar tree; on limestone slope, ridge, or crest overlooking creek or gorge, as at Campbell Hole on Barton Creek, river slopes of Mt. Bonnell and Mt. Barker, slopes of Mt. Barker along road to cut, and in and out between Mt. Barker and Mt. Bonnell.

Nest Construction.—Very pretty, compact, neat, deeply-cupped structure of fine cedar twigs, fine grass stems, a few narrow cedar bark strips, with considerable Indian tobacco or muslin weed in base; neatly and compactly lined with fine soft cedar bark fiber and other plant fibers, shredded and packed into a smooth-surface lining, into which a few fine grass seed stems have been woven; occasionally rather loosely built and bulky, the lining sometimes containing horsehairs.

Nest Measurements.—Outside, diameter 3.30 by 3, height 2.65. Inside of cup, rim diameter 1.76 by 1.38, inside diameter 2.08 by 2.12, depth 1.80.

Eggs.—3 to 5, plain white, with faint bluish tinge, .80×.62.

Voice.—Song, several scolding mews give way to an exceedingly rapid, trill-like whistle: *me-e-e-w, me-e-e-w, me-e-e-w, pew-tee-tee-dee-dee-dee-dee-dee-dee* or *mew-mew-mew, tieu, tieu, tieu, tieu, tieu-tieu-tieu-tieu-tieu-tieu*, no change in rapidity from start to finish of the trilling part, elusive, attractive, with a peculiar rising near the middle and a warbling strain through the whole. Call, a sharp *quirk, quirk*. Alarm-call, a sudden, thin, startled, wren-like, scolding *mew*, sometimes slowly drawn out, *me-e-e-w or mee-e-e-w*. Calls all the year; heard singing from March 17, 1905 (B), through spring, to July 18, 1915 (A). Birds very noisy, mewing, scolding, and singing, especially at approach of daybreak and near close of nesting season. Song starts suddenly.

Description.—Upper-parts ashy-gray, back-feathers dull brownish centrally, and with central black shaft, streaks; well-marked black line down side of throat; reddish-brown cap without black border; under-parts plain grayish-white. Bill dark. Immature, very pale grayish; bill pale grayish-white; no distinct markings on head. L. 6. W. 2.64 (female 2.49). T. 2.69 (female 2.63). Exp. C. .49 (female .48); D.B. at B. .27 (female .26). Tars. .79.

Subspecific Characters.—A race with paler streaked, ashy-gray back, the streaks very narrow. General aspect of upper-parts gray, which distinguishes this form from other United States races of the species, its distinctly palish, ashy-gray upper-parts from all other races; the Scott or Boucard Sparrow, *A. r. scottii* (Sennett), of the northwestern Mexican plateau and adjacent parts of Arizona and New Mexico into El Paso County, Texas, has a more slender bill and is rather reddish above, upper-parts broadly streaked with reddish-brown.

Field Marks.—Hiding habits, limestone habitat, mews, and trilling call. Reddish-brown cap without black border; dark bill; no black streak through eye; no yellow on bend of wing; medium size. Immature birds, pale like dirty limestone rock, no distinctive head-markings; pale grayish-white bill.

Popular Names.—Rufous-crowned Sparrow; Brown's Sparrow; Boucard's Sparrow; Rock Sparrow; Kitten Sparrow.

SONG SPARROW

Melospiza melodia melodia (Wilson)

Rather uncommon winter resident, middle October to late April. In spring, March 27, 1915, 3 migrating northward (A); April 8, 1919 (A); April 18, 1915 (F); April 27, 1919 (B). In fall, October 18, 1914, 2 (A); November 21, 1915 (F); December 29, 1912, specimen collected (B). *Recorded:* ABCDFGI.

Geographical Distribution.—East of the Rocky Mountains in Canada and the United States, south to Virginia, Kentucky, and Missouri, and the mountains of North Carolina. Winters from Massachusetts, Illinois, and Nebraska, south to the Gulf Coast.

Habitat.—Thickets along small creeks; bushes and brush along water courses; dense thickets of weeds and brush in lowlands; edges of woods; brushy slopes; always near ground or in low bushes, rarely far from water.

Local Haunts.—Shoal and Waller creeks; thickets on the gravel beds, and Sand Beach of Colorado River flood plains, among cockleburr thickets and in willows and drift along water's edge; pastures near Shoal Creek.

General Habits.—Quiet, gentle bird, not particularly shy and frequently permitting examination at close range; usually observed singly, rarely in small companies or composite flocks with other sparrows. Found commonest in colder winter weather. Famous because of the ease with which it adapts itself to different environments.

Feeding Habits.—Feeds on weed seeds and injurious insects.

Flight.—When flushed from one thicket, it makes for another in somewhat jerky flight with pumping tail; never flies up, always forward or down.

Voice.—Song, rendered in northern breeding grounds, pleasing, voluble, merry, uninterrupted sweet chant, *maids, maids, maids, hang on your teakettle, teakettle-ettle-ettle.* Call, a mild, characteristic *trink* or an impatient, rather nasal *chimp, chimp.* Alarm-note, a simple metallic *chip.*

Description.—Upper-parts reddish-brown, with black streaks on back, grayer later in breeding season and sometimes with brown edgings worn off; blackish streaks on sides of throat and head; brown crown narrowly streaked black, with grayish line down center and grayish line over each eye. Tail with decided reddish tinge, outer feathers shortest.

Under-parts whitish, heavily marked on breast with blackish-brown wedge-streaks, edged with rusty-brown, streaks of middle breast so close as to form one larger reddish-brown blotch; sides streaked blackish-brown; belly white. Sexes alike. Immature, more buffy-brownish above, without gray; more buffy-white below; narrower, less distinct streaks. In winter, browner; chest-streaks browner. L. 6.40. W. 2.65 (female 2.56). T. 2.63 (female 2.51). Tars. .86 (female .84). Exp. C. .49 (female .48); D.B. at B. .32 (female .31).

Subspecific Characters.—Distinct black or blackish chest-streaks, distinct black streaks on grayish-reddish-brown back, conspicuous grayish edgings to feathers of upper-back, back feathers with brown streaks between black and gray, white ground color to breast, and medium size with stouter bill distinguish this race of the Song Sparrow from other races.

Geographical Variation.—To the novice in ornithology there appears a bewildering number of geographical races or subspecies of the Song Sparrow. Of all North American birds, this species is the most sensitive to slight changes of physical environment, the most easily affected as to size and color by the climatic conditions under which it lives; as a result of this, so many geographical races of the Song Sparrow have been described that even many of the specialists in the classification of birds have become vexed. Some of these races have extensive range while others are confined to a very small region, in either case the area of distribution being limited by or coinciding strictly with the uniformity or continuity of physical conditions; the Eastern Song Sparrow has the widest distribution, occurring from the wooded valleys of the Great Plains eastward across the Atlantic watershed; those races along the Pacific slope have the most limited range, due to the fact that the topographic and resultant climatic conditions are so extremely varied and complex, frequently each isolated drainage area having its own peculiar race. The advancing temperature of altitude or latitude affects the size of the Song Sparrow to a marked degree, the smallest subspecies being the tiny Alameda or Salt Marsh Song Sparrow, *M. m. pusillula* Ridgway, confined to a very small section in the salt-marshes around the south arm of San Francisco Bay, length only about 5.50, wing about 2.30; moving onto higher land of the Rocky Mountains or the Sierras and their plateaus, or going northward along the Pacific Coast, the races are progressively larger, until the extreme upper limit of size variation is reached with the gigantic Aleutian Song Sparrow, *M. m. sanaka* McGregor, of the extreme Alaskan Northwest, measuring nearly 9 in length, with wing and tail about 3.40. Rainfall affects its colors, birds from the arid regions being pale, from humid regions dark; the palest is the Desert Song Sparrow, *M. m. fallax* (Baird), inhabiting the southwestern deserts from southeastern Arizona and southwestern Utah south into northern Mexico and west to southern Nevada and northeastern Lower California, and characterized by absence of black, its upper-parts light gray streaked with rusty, lower-parts nearly white streaked sparingly with clear rusty, its pale sandy-grayish colors matching the light open ground; where the rainfall is heaviest for the United States, with extremely moist air, dense vegetation, and dark soil—at Neah Bay, Washington—the extremely dark, almost sable-brown Rusty Song Sparrow, *M. m. morphna* Oberholser, of the Pacific Coast from southern Alaska to northern Oregon, is found, always near water in swamps near coasts or brush patches along streams, its plumage very dark rusty to blackish-olive-brown, heavily streaked below with dark rusty; belonging to this same group of very dark birds are two others from the Pacific Coast, one on either side of the Rusty Song Sparrow, the more northern Sooty Song Sparrow, *M. m. rufina* (Bonaparte), of southern Alaska, dark uniform sooty with wing and tail about 2.73 in length, and the more southern Oregon Song Sparrow, *M. m. phaea* Fisher, of the immediate Oregon Coast from Roque River to Yaquima River, a bird practically identical with the Sooty Song Sparrow in color and markings but smaller, with wing and tail only about 2.49 long.

Field Marks.—Pronounced maxillary stripes on each side of head, blackish and distinct, one back from base of each mandible, separated by whitish; *ear-marks*. Good-sized bill. Characteristic flight, and call. No yellow on wing, and no white wing-bars. *Heavy streaking; streaked spots on breast*, fusing on central breast-feathers to *form large blotch* or spot.

DAKOTA SONG SPARROW

Melospiza melodia juddi Bishop

Rather uncommon winter resident, but apparently more common than the Eastern Song Sparrow; early November to middle April. In fall, November 7, 1919, 2 (A). Specimens collected, February 17 and 20, 1913 (B), and 2 on February 23, 1913 (B). In spring, March 23, 1919 (A); April 18, 1915 (A). *Recorded:* ABF.

Geographical Distribution.—North Dakota regions, from Turtle Mountains into southwestern Saskatchewan in adjacent Canada. Winters south to southwest-central Texas, the common form at Kerrville.

Habitat.—Brush and weeds along streams, and nearby bush-dotted slopes.

Local Haunts.—Waller Creek; Barton Creek, bushy slopes on western side of mouth and open, bush-dotted slope on east side between springs and bridge; Pease north pasture, overlooking Shoal Creek; brushy woods on edge of Austin.

General Habits.—Similar to those of the Eastern Song Sparrow.

Description.—Similar to the Eastern Song Sparrow, with subspecific differences.

Subspecific Characters.—A slightly grayer race of the Song Sparrow, lighter above and brighter below.

Field Marks.—Those of the Eastern Song Sparrow, but distinctly grayer, lighter, less reddish, and brighter below.

Popular Names.—Judd's Song Sparrow; Gray Song Sparrow.

LINCOLN'S SPARROW

Melospiza lincolnii lincolnii[193] (Audubon)

Common migrant and winter resident, middle October to early May; migrates northward commonly in March and early April. In fall, October 13, 1919, 7 (A); October 24, 1915, 3 (F); October 25, 1921, 18 (A). Specimen collected December 29, 1912 (B). In spring, April 14, 1913, specimen collected (B); April 18, 1915, 30 (A); April 23, 1907, specimen collected (B); April 27, 1919 (B); May 7, 1922 (A); May 12, 1920 (A). *Recorded:* ABDFGKQ.

Geographical Distribution.—Eastern Alaska and Canada and the colder parts of the United States south as far as the northern parts of New York and Minnesota, and in the mountains of the West south to California and northern New Mexico. Winters from northern Mississippi, southern Oklahoma, and California south into Central America.

Habitat.—Thickets, shrubbery, weed patches, brushy and swampy spots, and weedy fencerows along creek margins and the edges of timber; edges of meadows near rivers and creeks; lowland woods and damp clearings; willow thickets along streams, and the brushy borders of ponds and brooks; edges of lowland meadows; fencerows in bottoms; roadside thickets and brushy hillsides.

Local Haunts.—Shoal and Waller Creek thickets and wooded slopes; Zilker's pastures; margins of pastures along Colorado River; fencerows and roadside thickets about the edges of Austin, particularly along northwest side of city.

General Habits.—Occurs singly and in loose companies, usually migrating in scattered flocks of from 4 to 8. Extremely shy and retiring; one of the commonest, yet also one of the least known, of our wintering sparrows because of its retiring habits and inconspicuous appearance. Generally stays on the ground among thickets and skulks and slips through weeds and brush along fences, particularly those in lowlands, like a mouse. Usually a silent migrant.

Feeding Habits.—Feeds on grass and weed seeds and on many insects.

Voice.—Song, rarely heard, loud, clear, gurgling, or low, bubbling, and vibrant; quite un-sparrow-like. Call, a sharp, clear, metallic chirp.

Description.—Upper-part dark brown and olive; dark crown streaked with brown, black, and buff, with a distinct light median stripe; back finely streaked grayish-buff and black; paler wings and tail; tail-feathers narrow and rather pointed, outer ones shortest. Space from eye to bill, line over eye, and sides of neck, grayish-buff; cream-buff stripe down side of throat, edged by dark brownish line. Under-parts, including throat, white, with broad cream-buff band across breast and along sides, sides tinged with cream-buff, and throat, breast, and sides finely streaked with black. L. 5.60. W. 2.45. T. 2.35. B. .43.

Field Marks.—Brush-hugging habits, and mouse-like creeping. Looks very much like Song Sparrow, but shorter and decidedly more slender; crown dark-streaked; *broad cream-buff breast-band* and wash on sides; *finely streaked with black on breast*, sides, and white throat.

Popular Names.—Lincoln's Song Sparrow; Brown-backed Song Sparrow; Buff-breasted Sparrows; Thicket Sparrow; Cream-breasted Sparrow; Band-breasted Sparrow; Brown-backed Lincoln Sparrow; Eastern Lincoln Sparrow.

Remarks.—Named by Audubon in honor of his young friend, Thomas Lincoln, discoverer of the species.

SWAMP SPARROW

Melospiza georgiana (Latham)

Very rare migrant and winter resident, October to early April. In fall, October 6, 1919 (A); October 18, 1921, 18 (A); December 12, 1915 (F). In spring, April 3, 1920 (A); April 7, 1919, 4 (A). *Recorded:* ABF.

Geographical Distribution.—Southern part of eastern Canada and northeastern United States south to New Jersey, the West Virginia mountains, Missouri, and northern Nebraska; west to the eastern edge of the Great Plains. Winters from southern edge of its breeding range south to central Florida, the Gulf Coast, western Texas, and into Mexico.

Habitat.—Thickets in pastures and in low places along creek bottoms; undrained waste sections; edges of low swamps; grassy-marshy thickets in bottom woods; dry old fields of broom-sedge; large grassy marshes, wet meadows, and reed-bordered streams; swampy pastures; sedges and reeds fringing brooks and meadow sloughs.

Local Haunts.—Marshy thickets in woods along Shoal Creek; swampy field west of I. & G. N. railroad track at Windsor road crossing, among tall weeds and grass; swampy spot edging Waller Creek above East Woods.

General Habits.—Occurs singly, in pairs, and in small flocks, particularly in migrations. Very shy, quiet, unobtrusive, and retiring. Creeps about among rank weeds and undergrowth, or patters about on the soft mud.

Feeding Habits.—Feeds on seeds and insects.

Flight.—Flies without jerking its tail.

Voice.—Song, a sweet, simple, monotonous chant, *tweet-tweet-tweet*, sometime running off into a trill. Call, a sharp, metallic *cheep*.

Description.—Dark colored; upper-parts brownish, black-streaked; paler to rufous-grayish-brown on rump and tail, unmarked with black; crown bright chestnut-brown, blackish at forehead, and streaked with black and gray in fall; space from eye to bill, whitish; grayish line over eye, black one behind it. Wings bright cinnamon, rufous, or rich reddish-brown, with black upper edge, but without white bars or yellow bend. Throat white, breast grayish-brown, belly dull white, and flanks tawny. Immature, and winter adult, washed brownish on breast; less gray on nape; crown streaked black, brown, and gray. L. 5.80. W. 2.40. T. 2.35. B. .45.

Field Marks.—Small, trim, neat, dark sparrow. Dark upper-parts; no patch or dark streaks on breast or under-parts. No yellow on bend of wing, and no light wing-bars. *Handsome, rich, reddish-brown wings.*

Popular Names.—Swamp Song Sparrow; Marsh Sparrow; Reddish-brown Sparrow; Swamp Finch; Chestnut-winged Sparrow.

FOX SPARROW

Passerella iliaca iliaca (Merrem)

Uncommon migrant and rare winter resident, late October to late April. In fall, October 24, 1915 (A); November 23, 1915, 6 (F); December 8, 1912, specimen collected (B). In spring, January 10, 1907, 1 seen (S); March 27, 1915; migrating northward, 12 individuals (A). *Recorded:* ABDFGIS.

Geographical Distribution.—Northern half of Canada, north to the limit of trees, and west to northeastern Alaska. Winters from Ohio and Potomac valleys south to northern Florida, the Gulf Coast and middle Texas (Navarro, Travis, and Kendall counties), casually west to California.

Habitat.—Quiet swamps; thickets and open woods along creek valleys; tangled thickets, brush piles, and undergrowth on wooded stream banks and along edges of woods; shrubbery of mountain ravines; tangled vines and bushes along fences and old stone walls; damp thickets; withered growths of tall weeds; roadside shrubbery of mountain ravines; roadside shrubbery and hedgerows; leaf-strewn slopes in woodlonds; weedy grain fields near thickety covering.

Local Haunts.—Ravines in the hill country west of Austin; Shoal and Waller creeks; river-margin thickets at upper end of Sand Beach; bushy ravines and slopes about 50 feet from river, along whole of Deep Eddy cliffs.

General Habits.—Occurs singly or in loose flocks, rarely in composite companies with the White-crowned Sparrows. Shy and retiring. Large and strong; scratches, rattles, and rustles among dead leaves on ground under thickets. In migrations in company with other sparrows it moves northward along creek valleys.

Feeding Habits.—Digs about on ground among bushes with its large, strong feet, kicking back with both feet at the same time. Feeds on insects, wild fruits, and ragweed seeds.

Voice.—Song, in evening at its summer home, full-throated, rich, and clear; loud, short, and joyful. Call, a feeble *tseep* or short, soft *chirp*, usually lisping, but louder, sharper, and metallic when the bird is alarmed.

Description.—Upper-parts reddish-brown, streaked with cinnamon and grayish, but no black; tail, rump, and wings, bright reddish-brown; 2 white wing-bars. Under-parts white, heavily and broadly streaked and spotted on breast and sides with rich reddish-brown and blackish; middle of belly white. Lower mandible yellowish. L. 7.25. W. 3.45. T. 2.80. B. .48.

Field Marks.—Large size, and rather plump body. Short, stout, sparrow-bill. Bright rich reddish-brown upper-parts. Bright spotted breast. *Two white wing-bars. Bright reddish tail.*

Popular Names.—Fox-colored Sparrow; Big Sparrow.

CHEWINK; TOWHEE

Pipilo erythrophthalmus erythrophthalmus (Linnæus)

Very rare migrant and winter resident; probably November to April. Record, January 7, 1920, 2 (A). *Recorded:* AD.

Geographical Distribution.—Southern Canada south to northern Georgia and central Kansas, west to the Great Plains. In winter, from southern New England and southeastern Nebraska south to southern Florida, the Gulf Coast, and eastern and central Texas, west to Austin and Kerrville.

Habitat.—Second-growth and scrub timber; thickets and underbrush along borders of woods and margins of creeks; brushy ravines in timber lands; cut-over timber; plum thickets.

Local Haunts.—Shoal and Waller creek valleys.

General Habits.—Occurs singly and in pairs. Vigorous, bustling, and energetic. Spends much of its time scratching among dead leaves on the ground among thickets, into which it dashes at approach of danger.

Feeding Habits.—Feeds on seeds and insects gleaned from among dead leaves on the ground.

Flight.—Hurried, jerky, and heavy, with a *fluff-fluff* of its short, rounded wings.

Voice.—Song, a number of variations: (1) *to-whick, to-whick, to-whee;* (2) *che-wink, che-wink, to-whee, to-whee;* (3) *chuck-burr, pill-a-will-a-will-a;* (4) *see-tow-hee-e-e;* (5) *dick-yoo, chiddle-chiddle-chiddle;* (6) *drink your tea-e-e-e-e;* (7) *sweet-bird-sin-n-n-g;* (8) *to-whee, to-hee-e-e.* A peculiar rapidly-whistled call, *che-wink* or *cheruik,* or occasionally *to-whee,* uttered with a rising inflection.

Description.—Upper-parts, head, neck, throat, and upper-breast, jet black; sometimes margined above with rufous; tail and wings blackish, with practically no white on wing-coverts or shoulders; white patches near ends of outer tail-feathers (tips of three outer pairs; outer web of outer feather entirely white); sides and flanks rich chestnut, lower breast and belly white. Iris bright red; bill black. Female, grayish-brown replacing black. Young, streaked with blackish on back and below; without dark chest-patch. L. 8.25. W. 3.51 (female 3.19). T. 3.71 (Female 3.39). Exp. C. .55 (female .54).

Subspecific Characters.—Large, more white in wings and tail, and iris carmine-red instead of brownish-yellow or yellowish-white as in the Florida Chewink or White-eyed Towhee, *P. e. alleni* Coues, of Florida and the Atlantic Coast to Charleston, South Carolina, a race with wing 3.12 (female 2.90), tail 3.50 (female 3.37), and exposed culmen of bill .56 in male and female, thus having shorter wings and tail and longer bill. Length of white on outer tail-feather, measuring along shaft, is also distinctive; in the present race there is more white, male 1.30-2.10 and averaging 1.56, female 1.05-1.56 and averaging 1.30; in the White-eyed Towhee there is less white, male .60-1.00 and averaging .69, female .50-.65 and averaging .60.

Field Marks.—Large size. Rather long, rounded tail, with large prominent white patches at corners, conspicuous in flight. Black head, breast, and upper-parts. Female, brown replacing black. *Red eyes.* Practically *no white on wings or shoulders.*

Popular Names.—Ground Robin; Towhee Bunting; Towhee Ground Finch; Grasel; Eastern Towhee; Red-eyed Towhee.

ARCTIC TOWHEE

Pipilo maculatus arcticus (Swainson)

Not uncommon winter resident, late October to early May; the common form of Chewink in the Austin Region. In fall, October 22, 1919 (A); October 27, 1921 (A); November 12, 1915, 2 (G). In spring, March 7, 1915, 2 (AF); April 5, 1905, specimen collected (B); April 18, 1915 (A); May 5, 1920 (A). *Recorded:* ABDFG.

Bailey

ARCTIC CHEWINK

Geographical Distribution.—Great Plains and the Rocky Mountains, from southern Canada south to northwestern Nebraska, west-central Montana, and southern Colorado. Winters from Washington and southern Nebraska south to central and western Texas.

Habitat.—Brushy second-growth; chaparral; thickets on slopes; thick underbrush and shady woodlands; thickets in lowlands, on slopes and hills, in valleys and canyons; weedy fields; fencerows and edges of clearings in bushy pastures.

Local Haunts.—Zilker's pastures; hillside thicket-patches on Mt. Bonnell; Bull Creek; hidden valley swinging back of hills to south and at lower end of Deep Eddy; ravines and brush back of Deep Eddy cliffs; occasionally the denser thickets along Shoal and Waller creeks.

General Habits.—Very shy, rarely seen in the open, and usually observed by twos and threes or in small bunches. Sticks close to the ground or on the ground in thickets among dead leaves, piles of brush, and underbrush, scratching for food.

Feeding Habits.—Scratches and rustles among dead leaves in brush heaps and among thickets for worms, insects, and seeds.

Flight.—Hurried, heavy, jerky, with white corners to tail flashing and large amount of white on wings showing plainly.

Voice.—Calls given with peculiar twang; a nasal *whank* or mewing *tow-hee;* when alarmed, a thin screep or short, hushed *mew;* a distinct *yang, kit-er-er.*

Description.—Head, neck, chest, back, and parts of wings and tail, black; back mixed with olive-gray; tail with large white patches at corners, outer tail-feathers largely white at end (more than half of part exposed beyond tail-coverts); flanks reddish-brown; belly white. Scapulars or shoulders, and wing-coverts extensively, heavily spotted with white, the shoulder markings lengthened into streaks, covert-tips forming two white wing-bars; sometimes a conspicuous white patch on wing. Female, olive-brown replacing black; chest and throat grayish-brown; back streaked black; white markings obscured. Young, more streaked above, more buffy below. Sexes practically same size. L. 8.50. W. 3.45. T. 3.75. B. .51.

Field Marks.—Similar to Red-eyed Chewink, but more white in tail, the outer feathers with more than half its length showing as white. Wings and *shoulders very heavily spotted with white* against black or dark brown of plumage, sharp and distinct for quite a distance, usually showing two white wing-bars or a conspicuous white wing-patch.

Popular Names.—Spotted Towhee; Chewink; Ground Robin; Northern Towhee Bunting; Spotted-winged Towhee; White-shouldered Chewink; Arctic Towhee.

GREEN-TAILED TOWHEE

Oberholseria[194] *chlorura* (Audubon)

Rare and irregular migrant: early September to middle October, and March. In fall, September 14, 1916 (FG). In spring, February 28,

1915 (A); March 17, 1921, 2 (A). *Recorded:* AFG.

Geographical Distribution.—Plateau of western United States, from Montana and central Oregon, east to the western edge of the Plains, south to western Texas, southeastern New Mexico, and southern California. Winters along the Mexican boundary, from western Texas to California, and in northern and central Mexico; accidental in Virginia.

Habitat.—Brushy, bushy slopes; bloody horseweed patches alongside creeks; thick shrubbery and brush; dense brush and thickets of chaparral; even scattered patches of dwarf brush on high rocky slides and talus slopes.

Local Haunts.—Bloody horseweed patches along Shoal Creek above Pease Park; slopes of Pease gorge; slopes of Mt. Bonnell.

General Habits.—Gentle, attractive, trim, and alert. A towhee or chewink related in many ways through structure and habits to the White-crowned, White-throated, and Harris Sparrow group. Perches atop a bush; frequently runs along in the brush rather than taking wing when frightened.

Feeding Habits.—Hops about on the ground and scratches in the brush, searching for insects and seeds.

Voice.—Song, a bright medley of short notes, with two outstanding, emphasized notes; sung from conspicuous twig. Call, *to-whee;* a loud chip; a soft, mewing *mew, mew-ah-eep.* Its song is sparrow-like, but musical, burring.

Description.—Upper-parts olive-gray, becoming bright olive-green or distinct greenish on rather long and pointed wings and long and rounded tail; cap rich bright reddish-brown, darker toward bill; white spot between eye and bill; throat-patch and small jaw-line, white, distinctly and abruptly set off against gray of breast and side of head; middle belly white; under-coverts, arm-pit feathers, and shoulder-edge of wing, bright yellow. Small conical bill. Sexes alike, with female but slightly duller; essentially no seasonal changes. Young, dusky-streaked on olive-grayish upper-parts and dingy-white chest and sides; brownish-buff wing-bars, otherwise wings and tail similar to adults. L. 7. W. 3.10. T. 3.20. B. .49. Female smaller.

Field Marks.—*Green bird,* particularly bright on wings and tail. *White throat-patch. Rich brown erectile cap.*

Popular Names.—Redtop; Green-tailed Bunting; Chestnut-capped Towhee; Chestnut-crowned Towhee; White-throated Towhee.

GRAY-TAILED CARDINAL

Richmondena[195] *cardinalis canicauda* (Chapman)

Abundant permanent resident. Specimens collected, May 7, 1912 (B); and 2 on December 29, 1912 (B). *Recorded:* ABCD[196]EFGH[197]IJKLMNOPQRSTWY.

Geographical Distribution.—Northeastern Mexico, north across greater part of Texas, west to Tom Green and Concho counties, east to Refugio and Eastland counties, possibly further.

Habitat.—Bushy and weedy pastures dotted with trees, along streams, on edges of woods, in bushy gorges, along canyon sides, and on slight hills; bushes about town, and on vacant lots in town; dooryards and flower gardens; upland pasture thickets; upland roadsides and fencerows; brushy patches; about farm and ranch dooryards; mesquite country; thickets and swamps of bottomlands; chaparral growth.

Local Haunts.—Pease north and west pastures; pastures between city and Dam; edge of Williamson Creek woodlands; wooded flats at base of hills along western side of Lake Austin just above the Dam;

Waller, Shoal, Williamson, Barton, and Onion creek valley bottom thickets in winter; University campus; dooryards in town.

General Habits.—Not particularly shy. Dazzling brilliant color flashes in and out of the dingy brush as the male moves about; occasionally the bird moves about on the ground, but there it is rather clumsy as it hops stiffly, heavily about, tail well up.

Feeding Habits.—Feeds on various noxious insects, and on berries, seeds, wild fruit, and waste grain. In winter, subsists chiefly on the mistletoe and other wild berries.

Breeding.—Second week in April to early June, rarely first week in July. Earliest: April 11, 1894, 4 fresn eggs (L); March 15, 1902, eggs (H). Latest: June 13, 1916, 3 slightly incubated eggs (B). Two broods, rarely three; first brood usually about April 25, second about May 26. *Breeding recorded:* ABCD[198]EFGHIJLMNOPQWY.

Nest Location.—1.5 to 12, usually 5, feet from ground, well concealed in bush, sapling, small tree, or vine tangle, either on damp or dry ground, usually in pastures along creeks or in edge of pasture woods or shrubbery along edges of deep woods; commonly placed in cedar elm bush; less commonly in cedar, winged elm, mountain live oak, small post oak, stretchberry briar vine, and mesquite; rarely in agarita, chaparral, hackberry, gum elastic, pin oak, shin oak, live oak, or Texas black persimmon.

Nest Construction.—A loose, rather frail structure, composed principally of dead leaves, cedar bark strips, and dried weed stems, frequently containing Spanish moss, paper, green weed stems, grasses, and grapevine strips, and occasionally a few slender twigs, Indian tobacco, strips of dry corn shucks, straws, and pieces of rag. Lined with fiberous rootlets and fine grass stems; less commonly with fine weed stems, horsehair, grass, fine weed tips, and bits of straw.

Nest Building.—Beginning nests, April 1, 1920 (A); nearly completed, but lining unfinished, April 6, 1919 (A); and ready for eggs, April 14, 1915 (A). Begins building about April 1 (D).[198]

Nest Measurements.—Outside, diameter 5.25 by 6.25, height 4 to 4.25. Inside, diameter 2.50 to 2.75 by 3, depth 1.50 to 2.

Eggs.—3 or 4, rarely 5, whitish, sometimes tinged with greenish or bluish; spotted and sometimes blotched with light and dark brown and purplish-gray; sometimes quite large and handsomely marked; considerable length variation; 1.00×.70.

Voice.—Song, varying, a loud but soft, clearly whistled, liquid, *q q q q* or *cue, cue, cue, cue;* a strong, rich *wheee, tieu-tieu-tieu-tieu;* a clear *cheo-cheo-cheo-cheo;* a long-drawn *ee!* or three *cheers;* a sharp, liquid whistled *whit-whit-whit-whit-whit-whit-whit-whit-whit-whit* or *hip-ip-ip-ip-ip-ip-ip;* a rich *whee-e-e-you, whee-e-e, hurry-hurry-hurry, quick-quick-quick;* a slow *peto-peto-peto-peet-peet-peet,* becoming more rapid toward the end; a clear *wet-chyear, wet-wet-wet;* various other whistled calls. A sharp, abrupt *tsip!;* a sharp, quick *pittt!;* a low *chee-tit-tit.*

Description.—Bright rosy-red, tipped olive-grayish above, the tips wearing off in midsummer; conspicuous bright red crest, and thick red bill; throat-patch and space all around about base of bill, black. Female, brownish-olive-gray replacing most of red; paler to grayish-buffy on belly, occasionally tinged with reddish on breast; cinnamon tint in dull red wings and tail; face and space about bill, dull grayish; crest partly red; tail-feathers broadly margined with gray. Young similar T. .4.12 (female 3.92). C. from base .77 (female .75); D.B. at B. .62 to female, but duller; bill blackish. L. 8.20. W. 3.66 (female 3.43). (female .59); W.M. at B. .49 (female .47).

Subspecific Characters.—On the whole, not a very satisfactory subspecies; those birds from the interior range of the race are quite distinct, but specimens along the margins of the range, where the birds intergrade with other races, cannot be distinguished with certainty.

Similar to the Eastern Cardinal, *R. c. cardinalis* (Linnæus), of the eastern United States and northeastern Texas, but male lighter and more intense red, narrower black line across forehead, back with more ashy-gray edgings, and averaging bill slightly larger and wing shorter; the female Gray-tailed Cardinal has a gray face, less distinct and paler, and she is grayer above and paler below, also having broad gray instead of olive-brown margins to tail-feathers; the Eastern Cardinal measures, W. 3.71 (female 3.58), C. from base .75 (female .74), D.B. at B. .61 (female .60), and W.M. at B. .48. Crest duller than breast, black at base of bill meeting across forehead and completing circle around bill, distinguishes the Gray-tailed Cardinal from the Arizona Cardinal, *R. c. superbus* (Ridgway), of southern Arizona to north-central Mexico, a form much larger and with relatively stouter bill, male without black across forehead, and female deeper colored, upper-parts olivaceous or greenish-brown shading to hair-brown on rump and with under-parts uniform tawny-clay, measuring, W. 4.01 (female .388), C. from base .87 (female .82), D.B. at B. .68 (female .62), and W.M. at B. .53 (female .50).

Field Marks.—Brilliant red. Long erectile crest. Unusually thick red bill. Chin and thin line around base of bill, black. Characteristic whistles, and sharp call-note. Female and immature, more brownish-olive.

Popular Names.—Redbird; Crested Redbird; Cardinal Grosbeak; Common Redbird; Winter Redbird; Virginia Nightingale; Red Cardinal.

ROSE-BREASTED GROSBEAK

Hedymeles[193] *ludovicianus* (Linnæus)

Extremely rare migrant; early October, and late April to early May. In fall, October 7, 1919, 2 (A). In spring, April 21, 1916, male (B); May 6, 1920 (A). *Recorded:* ABC.

Geographical Distribution.—Southern half of Canada into the eastern United States south to New Jersey, Ohio, Missouri, and Kansas, and the mountains of Georgia; west to Colorado. Winters from southern Mexico to northern South America.

Habitat.—Trees and shrubbery along banks of streams; borders of dense woods; young second-growths; forests and orchards; woodlands; less commonly, rather densely undergrown swamps; small patches of woods.

Local Haunts.—Upper-part of Shoal Creek; city shade trees; edge of University campus.

General Habits.—This rare black, white, and rose-colored beauty, with the dull streaked-brown mate, rarely appears in central Texas, then only momentarily as he passes in migration between his summer and winter homes.

Feeding Habits.—Feeds commonly on the buds and blossoms of orchard and forest trees, on seeds, and on potato bugs and other insects.

Voice.—Song, loud, full, joyous, musical, three or four repetitions of *ti-wee*, and concluded with a rich, full, clear, mellow, whistle-like carol-warble. Call, an occasional *clink;* a distinct, questioning, steely, *peek, peek,* or thin *eek;* a deep-toned *chirp.* Generally very quiet during migrations.

Description.—Upper-parts, head, throat, back, and neck, dusky black; wings and tail jet black, with large concealed white spot in wing and partially concealed white tip to tail; under-parts, belly, rump, and under surface of tail, white. Breast, front part of belly, and under wing-coverts, carmine or rosy-red. -Female, sparrow-like, grayish-brown above, buffy below; heavily streaked brown all over, darker on

head and wings; buffy line down center of crown; pale to whitish chin, and conspicuously white between eye and bill; pale stripe down side of throat, and on neck; conspicuous white line over eye; two whitish wing-bars; under wing-coverts salmon or cadmium-yellow in all plumages. Immature first-summer male, like adult male, but brownish in wings and tail. In winter, male, throat carmine, margined brown above and on throat. L. 8. W. 3.98. T. 2.95. B. .65.

Field Marks.—Plump and round. *Black body, rosy breast, and white belly.* Female streaked brownish, sparrow-like; conspicuous whitish stripe over eye; salmon-yellow under wings.

BLUE GROSBEAK

Guiraca caerulea caerulea (Linnæus)

Rather scarce summer resident, late April to early October. In spring, April 16, 1919 (A); April 22, 1920 (A); April 28, 1905, specimen collected (B); May 10, 1905, specimen collected. In fall, October 7, 1919 (A). *Recorded:* ABCD[199]EFGH[200]IJLMOU.[201]

Geographical Distribution.—Eastern United States, from Maryland, southern Illinois, and Missouri, south to northern Florida, the Gulf Coast, and central Texas; formerly common, now exceedingly rare, in the Atlantic Coast country from Maryland to North Carolina, having gradually moved its center of abundance westward.[202] Winters in Central America.

Habitat.—Second-growth on cut-over timberland; vine tangles; edges of woods; bushes and dewberry vines along roadsides and about old fields; brush along streams in canyons of foothills; briar patches along valleys and hill slopes; thickets of shrubs, briars, and tall weeds.

Local Haunts.—Mt. Bonnell and Mt. Barker; Barton and Bee creek canyons; Pease north upland pasture; slopes of Bee Creek inlet; bushy pastures immediately southwest of Barton Springs; pastures along I. & G. N. railroad west and southwest of town; sunflower and horse-weed patches on gravel beds of Colorado River flood plains; gorge at Sixth Street and I. & G. N. crossing; Shoal Creek below Sixth Street; weedy tangle at mouth of Onion Creek; Williamson Creek.

General Habits.—Occurs singly and in pairs. Very shy and difficult to observe, and not often seen at close range; hence often confused with the somewhat similar Indigo Bunting or the Dwarf Cowbird; frequently sits motionless for some time. Not found in forests or trees like its relatives, but in brush.

Migration.—Arrives from the South in small flocks, males a few days ahead of females.

Feeding Habits.—Feeds on seeds, buds, berries, and on various insects.

Breeding.—Early May to June. Records: May 15, 1889, 4 fresh eggs (O); May 18, 1901, 2 nests, 4 eggs each (B). *Breeding recorded:* BCEFGHLMO.

Nest Location.—1.25 to 3, rarely 30, feet from ground, placed in fork or saddled in small branches, in low bushes, vines, thickets, low trees, bunches of weeds, or high weedy growths, usually along creeks or on the edge of fields.

Nest Construction.—Compact, cup-shaped structure, composed of cedar bark, leaves, grass stems, plant stems, small roots, weed stalks, dried grass, pepper-grass, corn husks, and usually cast-off snake-skins; rarely pieces of paper; nest fastened together with spider webs. Lined with fine brown rootlets and horsehair.

Nest Measurements.—Outside, diameter 3.25, height 3. Inside, diameter 2.75, depth 1.75 to 2.

Eggs.—3 or 4, usually 4, oval, pale bluish or bluish-white, unmarked; rarely faintly spotted with reddish-brown, .84×.64.

Voice.—Song, beautiful, sweet, varied, low, and warbling. Call, a harsh *ptchick;* an explosive *spink;* a harsh, low, Redwing-like *tchănk'!*

Description.—Deep, dark, purplish-blue, appearing almost black; chin and space from eye to bill, black; blackish wings and tail, edged with bluish; two distinct chestnut-brown wing-bars. Large, conical, compressed bill with exposed nostrils, upper part black, lower grayish-blue. Female, grayish-brown, with occasional blue on head; wings and tail blackish; two brownish-buffy wing-bars; under-parts brownish-cream-buff, with concealed bluish at base of feathers. Immature male, mottled brown and blue for second summer, molting to adult winter plumage, black tips of which wear away the following spring to give him adult male blue plumage. Male in winter, widely margined, particularly on back, with rusty-brown. L. 7. W. 3.40 (female 3.21). T. 2.60 (female 2.46). B. .64.

Subspecific Characters.—Intergrades west of the Austin Region with the Western Blue Grosbeak, *G. c. lazula* (Lesson), of the southwestern United States from western Texas to California, a larger, lighter colored, less purplish, plain bright blue, Westerner with broader wing-bands and with white borders to under tail-coverts; the western race averages, W. 3.55 (female 3.33), T. 2.76 (female 2.60), and has two brownish bands across wing, the one across the tips of the greater coverts. 20.-.30 wide, and decidedly paler than the anterior band.

Field Marks.—Two distinct chestnut-brown wing-bars. Deep dark blackish-blue, appearing, except under the most favorable circumstances, to be an ill-defined, dusky color. Distinctly larger and heavier than the Indigo Bunting, which carries no chestnut on its wings.

Popular Names.—Blue Pop; Blue Pape.

INDIGO BUNTING

Passerina cyanea (Linnæus)

Rather uncommon migrant and summer resident; migrating, middle April to middle May, and middle September to middle October. In spring, April 19, 1920 (A); April 22, 1919 (A); April 25, 1922, male (A); April 25, 1920, male (A); April 27, 1919, pair (Wolfe). In fall, October 13, 1920, 2 (A). *Recorded:* ABCDEH[203]IKLPQW.

Geographical Distribution.—From Southern edge of Canada and east-central North Dakota south to central Georgia, central Alabama, southern Louisiana, and central Texas (Austin and Kerrville); west to the eastern edge of the Great Plains in eastern Kansas, rarely to Colorado. Winters throughout Central America, north to southern Mexico.

Habitat.—Timbered country along water courses; usually not in creek bottoms but up on slopes, crests, and brakes of the hills toward stream valleys; thickets and patches of high weeds; brushy slopes and flats; dewberry tangles; clumps of bushes in clearings in old pastures; steep hillsides.

Local Haunts.—River slope of Mt. Bonnell; Pease north pasture; river pastures below Mt. Bonnell; Barton Springs; Mt. Bonnell road near Camp Mabry; dewberry patch on Williamson Creek near Manchaca road-crossing; mouth of Barton Creek; Barton canyon just below Campbell Hole; observed on University campus.

General Habits.—The Easterner of the buntings, occurring singly and in pairs, though moving about in small family groups or flocks in late summer and fall. With the exception of the Texas Painted Bunting, this is the brightest of our sparrows. Suspicious; seeks concealment in leafy cover.

Feeding Habits.—Feeds on insects and seeds.

Breeding.—Late April to early June. Records: May 15. 1916, 2 fresh eggs (B); May 17. 1905, 4 eggs, one-third incubated (E). *Breeding recorded:* BCD[204]EHLW.

Nest Location.—1 to 4 feet from ground, placed in crotch or swung from fork of a low scrubby tree or bush, usually in winged elm or cedar elm, or in bunches of tall weeds.

Nest Construction.—An inartistic, loose, carelessly built structure, rarely a compactly built cup, composed of grass, weed stems, plant fibers, twigs, horsehairs, cotton, roots, bits of bark, leaves, and fine grass stems; larger and bulkier than nests of the Texas Painted Bunting. Lined with fine grasses, rootlets, and horsehair. Brim of nest sometimes covered with cobwebs; several pieces of cast-off snake skin placed prominently at base of nest.

Eggs.—3 or 4, very pale blue or greenish or bluish-white, unmarked, .73×.55.

Voice.—Song, a series of high, hurried, loud, ringing, metallic, canary-like notes, rising in *kew*, given by Mathews as *sip, swee, swee, swee, chir, chir, wis wis wis sir sir sir! fish, fish, fish!* Sings from April to August, from top-most twig of tall shrub or small tree, after the manner of the Texas Painted Bunting. Call, a sharp *pit* or *peet;* when alarmed, a metallic *cheep, cheep.*

Description.—Bright rich cerulean-blue, deeper to purplish about the head, brighter about the back; wings and middle tail-feathers black, both margined blue; space from eye to bill, blackish. Female, plain brownish or grayish-brown, sparrow-like, without streaks; blackish wings and tail with some bluish margins; under-parts whitish, washed brownish and indistinctly streaked, but whiter on belly. Young, like female, but browner, obscurely streaked. Male in fall and winter, like female, with traces, particularly in wings and tail, of its rich summer indigo blue; begins losing summer plumage in August. L. 5.50. W. 2.60. T. 2. B. .42.

Field Marks.—Small size. Rich brilliant blue, with black wings and tail; no chestnut in wings. *Female,* warm-brown, sparrow-like, back unstreaked, but with *glint of blue about shoulders and tail;* when flushed, twitches tail nervously from side to side.

Popular Names.—Indigo Bird; Blue Pop; Blue Pape; Bleu Pape.

TEXAS PAINTED BUNTING

Passerina ciris pallidior[207] Mearns

Common migrant and summer resident, early April to middle October. In spring, April 4, 1915 (A); April 19, 1922 (A); April 9, 1894 (C)[206]; April 25, 1922, 5 males (A); April 27, 1919 (B); April 16, 1905 (B). Specimens collected, April 29, 1907 (B); July 18, 1915 (A). In fall, October 14, 1914 (A). *Recorded:* ABCDEFGH[207]IJKLMNOPQWY.

Geographical Distribution.—Central, southern, and southwestern Texas, west into southeastern New Mexico. Winters in southern Mexico and Central America.

Habitat.—Bushy pastures and thickets, particularly in semi-open country along edges of larger woods; gardens and orchards; creek valleys and slopes; roadsides and fencerows; dense thorny undergrowth in waste places; cotton fields, and lines of thickets, saplings, and stunted trees along their fences; mesquite prairies; never in thick woods or on open prairie lands.

Local Haunts.—Pease west and north upland pastures; Barton and Bull creek valleys; Shoal Creek valley near Colorado River; edges of Williamson Creek woodlands near Manchaca road-crossing; edges of town and vacant lots in town; campus of the University; commonest west of town.

General Habits.—Very shy and retiring, seldom seen in the open, preferring to remain concealed, even while singing. Male helps female but little in nesting. Makes an excellent pet, and in former years many males were trapped by Mexicans and sold.

Migration.—Females usually arrive from 6 to 10 days later than males. In late summer, generally in early August, rarely as early as July 18, 1915 (A), females and immatures gather for migration; they wander about cotton fields and nearby brushy fencerows, and then begin moving southward about the middle of August. Majority of males leave by middle August; a few females and young are still present in early October. Migrates chiefly at night.

Feeding Habits.—The most common species about cotton fields in late summer, when it feeds on the cotton boll weevil. Feeds on insects and seeds.

Breeding.—Late April to late June. Earliest: April 27 1894, 3 fresh eggs (L); May 16, 1897, 4 fresh eggs (J); May 15 (D).[208] Latest: June 14, 1901, 3 slightly incubated eggs (B). Two broods. *Breeding recorded:* ABCDEFGHIJLMNOWY.

Nest Location.—1 to 8, usually 3 feet from ground, rarely as high as 20 feet; semi-pendant in thick foliage on horizontal fork, in crotch, or among twigs of scrubby bush, briar bush, thicket, sapling, or low tree; most commonly in cedar elm, winged elm, and mesquite; less commonly in gum elastic, black-fruited persimmon, Texas mountain laurel, or stretchberry briar; occasionally in mountain cedar, prickly ash, mountain live oak, and mountain Spanish oak.

Nest Construction.—Neat and compact, usually thinly-walled, deeply-cupped, tightly-woven structure of dead leaves, strips and shreds of cedar bark, bits of paper, slender weed stems, dry weeds, fine grass stems, pepper-grass stems, plantain heads, and bits of large white lichen; occasionally with some spider webs, cotton, bits of corn shucks, Indian tobacco weed, rags, and Johnson grass. Lined with horsehairs, small grass stems, and a few black, hair-like rootlets; rarely with bits of slender bark-fiber strips, grass seed heads, and fine weed seed stems.

Nest Measurements.—Outside, diameter 2.90 to 3.30 by 3.50, height 2.40 to 2.60. Inside of cup, diameter 1.75 to 2 by 2.12, depth 1.50 to 1.75; rim diameter of cup often smaller than inside diameter.

Eggs.—3 or 4, rarely 5, commonly 4, white or faint bluish-white, spotted and blotched with chestnut-brown and lilac, mainly near larger end. .76×.56.

Voice.—Song, short, loud, clear, a bright, merry, pleasing, sweet, musical chant, *pew-eata, pew-eata, I eaty you too*, carrying for quite a distance; sings most commonly during early morning, from prominent perch on top-most twig or small bush or tree in thick pastureland, along road, or in thicket. Anger-note, a chirping *tit-tit* or *tit-tit-tit*.

Description.—Head and sides of neck indigo-blue; back golden-green; dark wings (tinged green and reddish) and tail (tinged dull red); rump and upper tail-coverts purplish-red; greater wing-coverts parrot-green; entire under-parts brilliant red. Female, plain bright olive-green above, washed greenish-yellow on whitish under-parts; blackish wings and tail margined olive-green. Young, grayish-brown, shading to dull buffy below; tinged greenish in places above; buffy bands on wings. Practically no seasonal variations in plumage. It requires three years for male to attain full adult plumage; first-year breeding males resemble female, except for occasional presence of a few blue feathers about head. L. 5.50. W. 2.75. T. 2.10. B. .42.

Plumage Peculiarities.—Sometimes found with bright yellow feathers in plumage.

Field Marks.—Most gaudy of all North American birds, brilliant in reds, greens, and blues. Females and immatures, plain greenish, with a faint yellowish tinge. Characteristic song and calls.

Popular Names.—Mexican Canary; Nonpariel; Red Pop; Green Pop; Painted Finch; Western Painted Bunting; Pale Painted Bunting.

DICKCISSEL; BLACK-THROATED BUNTING

Spiza americana (Gmelin)

Very abundant migrant and common summer resident, though rather irregular, abundant some years and rare in others; migrating, late April and early May, and late July to early October, uncommon after August. In spring, April 14, 1920 (A); April 18, 1915 (A); April 25, 1922, 2 (A); April 27, 1919 (B); April 30, 1905, 8 specimens collected (B); May 1, 1916, migrating northward (B). In fall, September 23 to October 4, 1902, migrating (R); October 7, 1919, 5 (A). *Recorded:* ABCDEFGH[209]IJKLMNORW.

Geographical Distribution.—Eastern United States, from southeastern Canada and northeastern Wyoming south to southern Mississippi and southern Texas; now rare east of the Allegheny Mountains and in southeastern United States; formerly more or less common in the mid-Atlantic States.[204] Winters from Panama southward into South America.

Habitat.—Upland fields; grassy meadows, fields, and pastures; dry bushy mesquite pasturelands; hay fields; large patches of thistles; grain fields; very thick, weedy, mesquite flats; burning hot prairies almost devoid of life; sunflower, thistle, bloodweed, and ragweed patches; pasturelands with scrub oak and elm, with plenty of open grass and spots of weedy growth.

Local Haunts.—East of the hills, in more open country than that frequented by the Texas Painted Bunting; Pease north upland pasture; weedy vacant lots and edges of town; I. & G. N. railroad right-of-way; open country north of town.

General Habits.—Somewhat gregarious, as many as half a dozen to a dozen nests being placed in a single suitable patch. Female shy, generally hiding in the grasses; male perches on barbed-wire fences and telegraph wires along roadsides and railroad tracks, conspicuous even during hottest days of midsummer.

Migration.—Common in bunches and occasionally in immense flocks in spring migrations, moving along in close flocks of several hundred birds, alighting to feed on the prairies, the rear birds ever moving toward the front of the flock; occasionally stopping to rest in long rows on the fence wires.

History.—Common one decade and rare the next; especially common in moist years when weeds flourish in the pastures and along the railroad tracks near town. Rare about 1900, gradually increasing in numbers from year to year as a breeding summer resident; in 1915, 2 or 3 to 12 nests observed in a short day's walk; no birds remained to breed during 1916 and 1917, though thousands passed through in migrations (B);[210] breeding again since that two-year drought, the little rain not producing enough undergrowth and weed cover for them during that period (A). This is interesting when considered in connection with the move to westward of the range of the species.

Feeding Habits.—Feeds largely on grasshoppers, black crickets, and katydids, and on weed seeds and waste grain.

Breeding.—April to June. Earliest: April (H); May 1, 1891, first nest (D)[211]; May 8, 1892, 5 fresh eggs (L); May 23, 1915, 2 nests, 4 newly hatched young and 1 infertile egg each (A). Latest: May 30, 1915, 5 fresh eggs (A); May 30, 1919, 5 fresh eggs (B); June (H). Two broods. *Breeding recorded:* ABCDHILNOW.

Nest Location.—On ground or rarely to 10 feet, usually 3 feet, up in tussock of grass, tangle of weeds, scrubby bush, or low tree; usually among clumps of sunflowers and thistles, and similar weedy plants; less commonly in mesquite, cedar elm, winged elm, and scrub oak; generally in bushy pastures and weedy grassy fields.

Nest Construction.—Rather compact, composed largely of peppergrass weed stems, with some grasses, rootlets, dried thistle leaves, cedar bark, corn husks in thin strips, dead leaves, plant fibers, weed stems, and oat leaves or blades. Lined smoothly with interlaced grass seed stems, fine grasses, horsehairs, and a few rootlets.

Nest Measurements.—Outside, diameter 4.50, height 2.70. Inside, diameter 2.37 to 2.50 by 2.70, depth 1.90 to 2.

Eggs.—3 to 5, commonly 4 to 5, pale bluish or bluish-green, unmarked, considerable length variation, .79×.60.

Voice.—Song, loud and cheery, but very poor, harsh, burred, unmusical, (1) *chip-zerp, zerp, zerp, chip-ip, zerp, zerp, zerp, zerp;* (2) *dick, ciss ciss sell;* (3) *dick, dick, sell, sell, sell, quee quee qee;* (4) *dick, ziz-ziz-ziz-ziz;* (5) *dick ciss sell, quee quee quee.* Sings from roadside, barbed-wire fence, telegraph wire, stump, bush, or tall weed. The first arrivals are quiet, but a few days later the singing begins and continues almost incessantly, even throughout the hottest of midsummer days. Call, a *cack.*

Description.—Head and sides of neck, ashy-gray; back streaked pale grayish-brown and black; blackish wings, long and pointed; blackish tail; reddish-brown shoulder-patch on wing. Breast, line over eye, line on side of throat, and tinge on forehead, deepest and richest on breast, yellow; chin and belly, white. Rump brownish-ash. Black patch on throat. Female and immature, less yellow; no black throat-patch; grayish-brown head, and occasionally breast, streaked blackish. In fall, duller, less yellow; throat-patch partly concealed. Stout, conical, compressed bill. L. 6. W. 3.15. T. 2.20. B. .56. Male slightly larger, female slightly smaller.

Field Marks.—Thick bill. Brownish, with distinct chestnut shoulders. Breast yellow, with distinct black crescent at bottom of white throat. In perching, round head and straight-hanging tail. Immatures resemble the English Sparrow or European House Sparrow, but may always be identified by characteristic more-pointed tail-feathers.

Popular Names.—Little Field Lark; Yellow-breasted Bunting; Prairie Bunting.

LARK BUNTING

Calamospiza melanocorys Stejneger

Rare and irregular migrant and very rare winter resident; in migrations, middle August to middle November, and April to first week in May. In fall, August 18, 1915, 3 (A); November 13, 1920, 5 (A). In spring, April 3, 1919, 25 (A); May 3, 1922, 4 (A). *Recorded:* ADK.

Geographical Distribution.—Great Plains, from southern Canada south to northwestern Texas and northwestern New Mexico, east through Nebraska and to west-central Minnesota, west to the base of the Rockies. Accidental on the Atlantic Coast and occasional west of the Rockies. Winters in Mexico and the southern parts of Arizona and Texas. More common in migrations in western Texas.

Habitat.—Open treeless prairies and plains; open valleys.

Local Haunts.—Open country about the city of Austin, particularly the northwestern edge of town; open flats along the Colorado River valley.

General Habits.—Occurs in small flocks, numbering as many as 40 or 50 in spring, well trained, rising and wheeling simultaneously. Easily frightened at least movement, approach, or footfall; frequently hides in short brush.

Feeding Habits.—Feeds about on the ground, scattered among chaparral or among prairie flowers on the prairies or plains.

Voice.—Song, rich and varied; sometimes most of a flock will be singing at once; occasionally mounts into air while singing busily, a lively and sweet, modulated warble, and descends on set wings. Call, a soft, sweet *hoo-ee,* uttered with a rising inflection.

Description.—In spring, jet black, with large white patch on wing and occasional white marks on tail-feathers. Females and immatures, grayish instead of black, streaked with brown. In winter, male loses black; upper-parts grayish-brown, streaked with blackish; under-parts whitish, streaked with blackish, heavier on breast and lighter on throat and abdomen; chin and upper-breast dull black; wings and tail dull blackish, marked with very pale cinnamon, and with large distinct pale whitish patch; tail spotted with white. In early April males begin to molt rapidly to black summer plumage, and are usually in mixed plumage during migration in spring; in July, mixed black and brown, and by late August mostly brown. L. 7.25. W. 3.45. T. 2.65. B. .54. Female smaller.

Field Marks.—Striking white wing-patch, conspicuous in flight even in the dull gray female. *Striking black and white* plumage of male.

Popular Names.—White-winged Blackbird; White-wing.

SCARLET TANAGER

Piranga olivacea[212] (Gmelin)

Rather rare migrant; middle April to second week in May, and late July to middle September. In spring, April 12, 1914 (F); April 14 and 18, 1915 (A); April 19, 1922 (A); April 29, 1916 (G). In fall, July, third week, 1910 (A); September 19, 1914 (A). *Recorded:* ACFGK.

Geographical Distribution.—Southern half of eastern Canada and through the eastern United States, south to South Carolina, northern Georgia, northern Arkansas, and southern Kansas; west to the Plains. Winters in South America, northward, less commonly, to Central America, the West Indies, and southeastern Mexico.

Habitat.—Tree-tops of cool green deciduous woodlands; low, moist oak woodlands.

Local Haunts.—Shores of Lake Austin; oak woods along Waller Creek; wooded swale between North Guadalupe Street and Speedway, about Twenty-eighth Street; Shoal Creek valley.

General Habits.—Observed singly. Shy and usually quiet, practically always remaining in close hiding in the thick foliage of tree-tops.

Feeding Habits.—Feeds on insects, wild berries, and seeds. Frequently catches insects on the wing after the manner of flycatchers.

Voice.—Song, very sweet, loud, rythmical, warbling, quite similar to that of the Summer Tanager and suggesting the song of the Robin, but not so soft. Call, *chip-churr.*

Description.—Scarlet body and head; black wings and tail. Female, olive-yellowish-green, under-parts paler or more yellowish, to canary-yellow on under tail-coverts; wings and tail darker, blackish or fuscous, margined with olive-green. In fall, beginning late in July, male molts to appear like female, mottled with red to give patchwork plumage, though black wings and tail remain unchanged. Bill olive-yellowish. L. 7.25. W. 3.70. T. 2.60. B. .60 (from N. .45).

Field Marks.—Brilliant scarlet-vermilion. Black wings and tail. *Under wing-coverts white.* Call-note, distinct *chip-churr.*

Popular Names.—Black-winged Redbird; Red-and-black Tanager; Scarlet Tanager.

SUMMER TANAGER

Piranga rubra rubra (Linnæus)

Fairly common migrant and not uncommon summer resident; middle April to early October. In spring, April 7, 1919 (A); April 16, 1916, 3 (G); April 18, 1905 (B); April 18, 1915 (F); April 19, 1920 (A); April 21, 1904 (H); April 21, 1905, 1 shot (B); April 24, 1922 (A); April 24 and 25, 1905, 2 collected (B); May 5, 1914 (G). In fall, usually migrates southward early; September 10, 1916, 10 (F); September 14, 1916, 3 (F); October 7, 1914 (A); October 11, 1919 (A); October 12, 1921 (A). *Recorded:* ABCDEFGH[213]IJKLMOPW.

Geographical Distribution.—Eastern and southeastern United States, from Delaware, southeastern Wisconsin, and southern Iowa, south to central Florida, the Gulf Coast, and northeastern Mexico; west to the Great Plains and to eastern Colorado and central Texas. Winters from central Mexico to the northern part of South America.

Habitat.—Heavily timbered post oak, gravelly terrace caps and uplands overlooking valleys; oak woodlands along creeks; open mixed woods, oak trees, and edges of clearings; open sandy black oak country; cottonwoods and oaks along canyon streams. In migrations, city shade elms and hackberries.

Local Haunts.—Waller Creek woodlands; upland oaks along Barton, Bull, and Shoal creeks; trees along rocky bottoms and slopes of Bee Creek; oak woodlands along Williamson Creek; line of trees along margin of first bottoms at Deep Eddy; stream valleys in the hills.

General Habits.—Occurs singly and in pairs. A common bird of the Southern States, occasionally straying into gardens, though usually it is shy and rather difficult to observe, since it haunts the treetops.

Migration.—Males usually arrive in spring about 10 days ahead of the females.

Breeding.—Middle May, probably second week, to July. Earliest: May 21, 1901, 4 fresh eggs (B). Latest: June 1, 1901, 4 slightly incubated eggs (B); June 26, 1916, 4 tiny young (FG); July, eggs (E). *Breeding recorded:* ABCDEFGHILOW.

Nest Location.—5 to 25, usually 14, feet from ground, near extremity of a lower horizontal or drooping limb; generally saddled on small twigs, occasionally in a small fork; in live, post, or Spanish oak at edge of stream, along or overhanging roadside, or on margin of woods; occasionally in cedar elm or grapevine-covered cedar, rarely in sycamore growing along rocky bed of hill creek or canyon; usually well concealed in foliage, moss, or vines.

Nest Construction.—Rather flimsy, poorly-built, open-work structure, rarely compact, composed of grass and weed stems, leaves, catkins, Indian tobacco weed, pieces of wild mint, pepper-grass, strips of bark, and bits of Spanish and ball mosses. Lined with fine yellowish grass, a few catkins, or small pieces of yellow straw.

Nest Measurements.—Outside, diameter 5.50, height 3. Inside, diameter, 2.50 to 3, depth 1.50 to 1.75.

Eggs.—3 to 4, usually 4, light bluish-green or light emerald, finely speckled, spotted, and blotched with reddish-brown, lilac, and brownish-purple, .94×.62.

Voice.—Song, a musical, easy, querulous, elusive, changing, uncertain, very sweet, warbled whistle, *tew-tooit, te-pewit, pheert, te-tew er, phec-ter, te-tew* or *tew-tooit-pacert-te-tew ee-te-tew-wit,* one moment soft, the next loud; sometimes translated into *watch-it, way-it, way-it-me, tree-top;* the first two songs are commonly sung by mottled males in spring and summer; sings from April to late July. Calls, *ticky-tucky-tuck* or *chicky-tucky-tuck,* varying to *chi-tuck* or *pit-tit-tuck;* rarely, *wet, wet, wet;* in fall, *pit-tuck, tuck, tuck, tuck.*

Description.—Light rosy or vermilion-red, darker above and on back, brighter below; fuscous and rose-red on wings. Female, olive-yellow, or orange-olive-green, above; greenish-yellow or yellowish-orange below. Young males yellowish, or greenish-yellow, sprinkled, spotted, or mottled with poppy-red—a mixture of male and female plumage. No seasonal change (Dwight claims male changes to yellow-green in fall). L. 7.50. W. 3.75 (3.50 to 3.92, female about 3.62). T. 2.85 (2.62 to 2.94, female about 2.75). B. .66-.76 (from N. .55).

Plumage Peculiarities.—Those specimens collected in the eastern half of the Austin Region and at the Campbell flats on Barton Creek were typical *rubra;* but one (L.B.B. 12886) shot on April 19, 1915 (B), back in typical hill country on Bull Creek, is intermediate between *rubra* and *P. r. cooperi* Ridgway, the Cooper or Western Summer Tanager, of the southwestern United States and west-central Texas, a larger bird, with longer bill (.72 to .80, male average .76, female average .78), longer wing (3.66 to 4.18, male average 3.95, female average 3.88), longer tail (2.95 to 3.88, male average 3.17, female average 3.11), and with under-parts paler, lighter colored, to rose-pink; this intermediate is, however, slightly nearer the eastern form. Careful collecting during migrations and in summer in the extreme western part of the Region may add this slightly larger subspecies to the Austin list, particularly since the two forms mingle during migrations and in winter.

Field Marks.—Rosy-red all over. No crest. Comparatively small bill. Female greenish-yellow. Young males, first year and a half, like female, but spotted and marked irregularly with red in calico-pattern. Characteristic *ticky-tucky-tuck* call. Under wing-coverts *not white* (dull buff-yellow in female)..

Popular Names.—Summer Redbird; Smooth-headed Redbird; Redbird-without-a-crest; Red Warbler; Calico Warbler.

PURPLE MARTIN

Progne subis subis (Linnæus)

Very common migrant and fairly common summer resident. In spring, February 9, first arrival; 25, second arrival; 26, common, 1904 (H); February 15, first arrival; 21, common, 1916 (O); February 19, 1914 (G); February 22, 1920 (A); February 23, 1919 (H); February 23, 1921 (A); February 28, 1905 (B); February 28, 1922 (A); March 4, 1915 (A); March 10, 1895 (L); April 30, 1901, specimen collected (B). In fall, average departure, 2 years, September 17; latest, September 28, 1893 (C)[214]; September 13, 1914 (A); September 20, 1915, bulk departure (F); October 21, 1915, last straggler (F). *Recorded:* ABCDEFGH[215]IJKLMNOPQTWY.

Geographical Distribution.—Southern Canada and the United States, west to Idaho and Arizona, and south to the Gulf Coast and northeastern Mexico; not found on the Pacific Coast. Winters in the northern half of South America.

Habitat.—Eaves of barns, porches, crevices and eaves of wooden sidewalk awnings in front of stores; streets, dooryards, edges of town; about homes in the country, particularly back of farmhouses, where bird boxes are erected for its use.

Local Haunts.—Wooden sidewalk awnings in front of various stores along Congress Avenue; bird boxes put up for its use, in southeastern part of town, at Twenty-third Street and Speedway, at Eighth and Colorado streets, and on the Schutze place east of Barton Creek on the Barton Springs road; campus of the University; Congress Avenue awnings, at Fifth, between Sixth and Seventh streets, at corner of Fourth Street and Congress Avenue, and between Ninth and Tenth streets.

General Habits.—This common bird of the South usually occurs in loose companies or colonies, though it is frequently seen singly and in pairs when away from its nesting locality. It is gregarious, with a strong social feeling, nesting in colonies which are located close to evidences of civilization.

Feeding Habits.—Feeds on insects but a short distance from its home box or wooden awning. One of the first birds out in the early morning before daybreak, it immediately begins its feeding, which is kept up through the greater part of the day. Sixteen pairs of birds in one day carried 3277 loads of food to their nestlings, males making 1454 trips, females 1823 trips.

Migration.—Begins its northward migration before the cold has broken, occasionally appearing during warm spells as early as February 1 (O); the birds do not appear again until about February 14, returning after the break of winter into spring; occasionally they are again driven southward by a norther in late February, in which case they do not appear again until the second week in March; common by the middle of March. Nesting birds usually begin moving southward by late July or early August, and are gone by the middle of the month; latest, August 12, 1915 (O). More northern breeders appear in loose flocks on the open prairies and over town in middle August, and are moving southward commonly during latter August and early September.

Breeding.—April to June. Earliest: April 13, 1904, 4 fresh eggs (H). Latest: June 1, 1917, 6 fresh eggs (B). Two broods. *Breeding recorded:* ABCEFGHIJLMNOPQW.

Nest Location.—12 to 30 feet up in bird boxes or swinging gourds, under eaves and edges of wooden store-awnings even over busy sidewalks along Austin's main street; attics and lofts permitting entrance through cracks or holes; crevices and holes in stone walls or about rock buildings; torn cornices; formerly in cavities of hollow trees.

Nest Construction.—Rather loose and flimsy structure of leaves and straw, with some weeds, grass, bits of weed stems, small twigs, mud, rags, and feathers. Lined with feathers, and frequently with bark, horsehairs, and paper.

Nest Building.—Settled at nesting boxes, March 14, 1915 (A). Building nest, April 18, 1915 (F).

Nest Measurements.—Prefers cavities with height 7, width 5, length 8, and entrance diameter about 2.50 to 3.

Eggs.—4 to 6, usually 5, oval-oblong, pointed at one end, pure white; considerable size variation, about .91×.68.

Voice.—Song, a rather complicated, mellow, vibrant warbling, composed of several throaty notes and a sputtering trill; a pleasant, talkative twitter. Call, a whistled *koo-kee-koo;* a short *tchu-tchu;* a loud *pee-urp* or *peurp;* a clear *pew-rp;* a conversational *cheur-chup-cheeur-chip;* a *kerp* when alarmed; a grating *ka-a-a,* when two birds meet.

Description.—Glossy blue-black, duller on wings and tail; tail forked. Female, duller, gossy blue-black to brownish-black above; forehead, throat, neck, and under-parts, grayish; belly white. Immature male, like female, but with blue-black feathers scattered over under-parts. L. 8. W. 5.90. T. 3.10 (forked for .80). B. from N. .32.

Field Marks.—Large size, the largest of our swallows. Glistening purple-black or steel-blue colors. Slow and easy, wandering, swallow flight. Characteristic calls.

Popular Names.—Martin; Black Martin; Black Swallow; House Martin; Bird-box Bird; Hawk Driver; Scare-crow.

CLIFF SWALLOW

Petrochelidon albifrons albifrons (Rafinesque)

Fairly common migrant, occasionally very abundant in fall; late March to early May, and middle August to late November. In spring, March 27, 1919 (A); April 1, 1920, abundant (A); May 6, 1892, abundant (C); August 27, 1915, common (A); August 22, 1919, common (A); October 11, 1919, 3 (A); November 7, 1914, 2 (A); November 25, 1920, 1 (A). *Recorded:* ABCFGI.

Geographical Distribution.—North America, from the extreme north in Canada south to Colorado, northern Texas, and Virginia; and southwestward to the northwestern Mexican Coast. Winters in South America.

Habitat.—Open country and prairies; cotton and corn fields; ponds and lakes with open borders; wide, lowland meadows.

Local Haunts.—Open prairies north and east of Austin; open sky above the city.

General Habits.—Moves about, not in compact flocks, but in scattered companies extending from one horizon to the other, a bird here, a bird there, skimming over fields of grass and over woodlands, migrating by day, as do all swallows, in search of insects, feeding en route. Sometimes occurs in countless numbers in late April and early May, and again when it moves southward across the Region in late August and September.

Description.—Crown, back, wings, and tail, glossy dark steel-blue, darker to fuscous on the tail; whole rump, bright light cinnamon; conspicuous forehead crescent, pale cream or whitish; chin and cheeks, rich chestnut; nape and under-parts, rich buff. Immature, duller, throat black, occasionally mottled with white. L. 6. W. 4.30. T. 2.10. B. from N. .20.

Field Marks.—Square-ended tail. White belly; brownish ring around neck; brownish-gray chest, with steel-blue center patch and reddish tinge. Conspicuous *pale rusty rump* distinguishes the Cliff Swallow from all other swallows.

Popular Names.—Common Cliff Swallow; Short-tailed Swallow; Migrant Cliff Swallow.

LESSER CLIFF SWALLOW

Petrochelidon albifrons[216] *tachina* Oberholser

Common summer resident; end of March to early September; bulk arrives in early April and departs in August. In spring, average arrivals, 4 years, March 27, earliest March 18, 1893 (C)[217]; March 17, 1919, 3 (A); March 28, 1921 (A); April 1, 1916 (G); April 3, 1905, thousands circling over Mt. Bonnell (B); April 4, 1915, 11 at nesting colony (A); July 8, 1915 specimen collected (A); July 10, 1917, 2 collected (B). In fall, average departure, 2 years, September 17, latest October 1, 1893 (C)[217]; September 12, 1919 (A). *Recorded:* ABCDEFGH[218]IJKLMNOPQWXY.

Geographical Distribution.—Southern parts of Arizona, New Mexico, Texas, east through southwestern Texas to the eastern edge of the Limestone Hill Area in south-central Texas, southward through eastern Mexico to Vera Cruz.

Habitat.—Under overhanging ledges and on faces of limestone cliffs along canyons and streamways; sheltered locations; eaves of old stone buildings and concrete bridges; meadows and mud flats. Very local in its distribution, due to its particular choice of habitat.

Local Haunts.—Western, mountainous half of the Region, and the semi-arid strip within a few miles of the hills. Large massed colonies, one under eaves and buttresses of concrete viaduct over Colorado River at Congress Avenue, another (about 600 pairs) alternates between cliffs along Bee Creek inlet and cliffs on river-face of Mt. Bonnell; at low water in Lake Austin, under overhanging abuttments of stone on the north side of the Dam; Deep Eddy cliffs; formerly, on ramparts of the Capitol building, under eaves of stone buildings in town, on Dam powerhouse, and along Barton Creek. In hunting, eastern slopes of Mt. Barker, mud flats along the Colorado River floodplains, campus of the University of Texas, and open stretches near the hills.

General Habits.—Gregarious, breeding in colonies, the location of which changes from year to year. Usually seen in scattered, loose companies, rarely observed singly. Immediately after their arrival in spring thousands of birds circle and sail for days over larger colony locations, until finally the colony is crowded and the excluded birds are forced to new grounds. During spring the birds may be seen hovering at the water's edge along the river, digging in the soft sticky-clayey mud, diving and fluttering lightly down, barely touching the soft mud with their feet, body and tail well up to prevent soiling feathers, wings extended well over back and continually fluttering to keep feet from sinking or sticking in mud, and gathering mouthfuls of mud with which to build their retort-shaped nests. Occasionally a bird skims over the surface, tail up and seeming to stand on its head as it plows its bill into the mud, then straightening and flying away to its nesting site. After dry months, during which the birds have used low nesting sites, rising water in Lake Austin frequently destroys numerous nests on the north side of the Dam and on faces of cliffs in Bee Creek inlet. In fall, the bird occurs in flocks, preparatory to moving to the South.

Feeding Habits.—Flies so close to the tops of low trees and thickets on mountain slopes and terraces as it moves about in search of insects that its wing-beats can often be seen distinctly and heard quite clearly. Fond of flying insects of all sorts, though particularly so of winged ants.

Flight.—Between colony and feeding grounds, flight is quite rapid and direct. Continually sails and circles in vicinity of colony, flying abroad in pursuit of food, coming and going at irregular intervals, appearing suddenly near at hand and flying swiftly away again.

History.—During nesting seasons years ago this bird was quite a nuisance: it came down in hundreds to secure mud from the newly-sprinkled unpaved streets in Austin, carrying this material to the eaves of stone buildings and even to the magnificent dome of the granite State Capitol, frequently dropping bits of mud over sidewalks and building fronts. Nests were washed off buildings with a high-powered fire hose, and wire netting was placed along eaves and over cornices.

Breeding.—Late April to July. Earliest: May 9, 1915, 5 newly hatched eggs (A); May 23, 1892, 5 fresh eggs (L); May 29, 1919, eggs in hundreds of nests in a colony hatching at the same time (A); June 4, 1915, 3 or 4 to 5 young birds, each several days old, in hundreds of nests (A). Latest: July 8, 1915, 6 fresh eggs (A); June 19, 1905, 5 fresh eggs (B). Two, occasionally three, broods; two or three weeks after arrival the first nest is under way; then four or five weeks intervene between deposition of sets. *Breeding recorded:* ABCEFGHIJKLMNOPQWY.

Nest Location.—5 to 100 feet up, rarely higher, plastered or attached to under side of overhanging ledge in cliff or under projecting shelf in rocky canyon wall, where it is well protected from rain; under eaves of rock buildings, eaves of concrete bridges, and formerly under granite terraces of the State Capitol building hundreds of feet from the ground. Long cliffs overhanging canyons are sometimes covered with these nests.

Nest Construction.—Gourd-, retort-, or pouch-shaped structure, composed of numerous small pellets of mud; retort with a very short but distinct neck, rarely absent; overhanging ledge to which nest is attached usually functions as roof. Very scant weaving of a few straws and grasses, grass leaves, trash, and a small quantity of feathers; sometimes only two or three feathers form the lining.

Nest Building.—April 10, 1915, gathering mud and beginning retorts (A). May 20, 1915, swarms carrying mud from bit of mudflat along river margin, building nests (A). Avenue bridge colony, 1915, eggs of one brood, perhaps the first, all partially incubated on May 29; next brood, colony shifted from north end to south end of bridge, eggs hatching on June 28 (A).

Eggs.—3 to 6, commonly 5; in one colony of completed sets, all undergoing incubation, there were 12 sets of 6, 34 sets of ~~6~~, 5 and 11 sets of 4 (B); white or faint creamy-white, with dots, spots, and small blotches of reddish-brown, chiefly at the larger end; slightly longer, not quite so wide, and more heavily marked than eggs of the Coahuila Cliff Swallow; average .80×.54, considerable variation, largest .91×.58, smallest .69×.51.

Voice.—Calls, thin and fine, (1) *chieu;* (2) a very short *keet;* (3) *chee-uh;* (4) *tseet;* (5) *quee-quee;* (6) *qo;* (7) *quätt-qua-a-a-t;* (8) a thin, screeching *eek*, like a large tree creaking or squeaking in a strong wind.

Description.—Similar to the Northern Cliff Swallow, but with subspecific differences. The Coahuila Cliff Swallow, *P. fulva pallida* Nelson, breeding from northeastern Mexico northwestward to Kerr County, Texas, is like the Lesser Cliff Swallow, but larger and paler.

Subspecific Characters.—Decidedly smaller than the Northern Cliff Swallow, and with forehead ochraceous or brownish-orange instead of cream-color. L. 5 to 5.60. W. 4.08. T. 1.77.

Field Marks.—Small size. Square tail. Distinct light-colored, bright buffy-rufous rump-patch. Forehead light-colored, yellowish-brownish-orange, distinct.

Popular Names.—Mud Martin; Mud Swallow; Mud Dobber; Eaves Swallow; Crescent Swallow; Rocky Mountain Swallow; Canyon Swallow.

Remarks.—These birds are frequently killed and their nests destroyed through the mistaken notion that they harbor bedbuds; the parasite often found in nests is quite similar to the bedbug, but lives only on birds, and is therefore not to be feared by the housewife.

BARN SWALLOW

Hirundo rustica erythrogastris[219] Boddært

Fairly common migrant, and very rare and irregular summer resident; migrating, late March to third week in May, and middle August to middle October; commonest, early May, and through late August and September. In spring, March 18, 1920 (A); March 25, 1919, 6 (A); May 4 to 20, 1919, fairly common (A). In fall, August 20, 1914, first migrating flocks (A); October 3, 1915, 2 (FG); October 15, 1916 (G). *Recorded:* ACFGIW.

Geographical Distribution.—North America, from northwestern Alaska and Canada, south to North Carolina, northern Arkansas, and southern Texas (west of 97°); thence to southern California and into Mexico; breeds in western Texas. Winters from southern Mexico southward over South America.

Habitat.—Edges of towns, barnyards in the country, and along canyons in hills; meadows and broad open fields.

Local Haunts.—Eastern half of the Region, particularly over town and through the open country east of the hills, occasionally flying over the hills during migrations; flood plains of the Colorado River.

General Habits.—Perches in loose companies on fence wires and telegraph lines along country roadsides; skims prairies and open country in its search for food. Generally appears most commonly during drizzly weather or immediately after rains in migrations. Breeds in pairs and in colonies.

Feeding Habits.—On the wing from daylight to dark in pursuit of insects, skimming low over the prairies and pastures instead of high in the air as habitually with other swallows; particularly active in early morning and in late afternoon. Circles and darts about horses and roads, catching winged insects and large flies which accompany it.

Flight.—Very swift, easy, graceful, gliding, sliding, twisting at turns, and very low, skimming the prairie grasses and rising over fences; more erratic than that of any other swallow. Skims and darts to the grass tops in very light, erratic, marvelously easy, exceedingly graceful flight which seems a beautiful rowing in the air with long sweeps.

Breeding.—Possibly. Second week in May to early July.

Nest Location.—Placed on sheltered rafters or eaves about barns and other buildings, particularly about farm-houses; perhaps on side-walls in caves in the hill canyons.

Nest Construction.—Bracket-shaped nest of mud, open above, and lined deeply with grasses and feathers.

Eggs.—3 to 6, white irregularly marked, chiefly at the larger end, with reddish-brown and purplish; much more irregularly marked than eggs of the Lesser Cliff Swallow; .74×.55.

Voice.—A rapid, sibilant, broken twittering; a weak twittering warble; a lisping; a low, sharp *quit* or *witt, witt;* alarm-note, a harsh *t'r'r'r, t'r'r'r.*

Description.—Upper-parts, steel-blue to black. Forehead, chin, throat, breast, entire under-parts, and under surface of wings, bright chestnut-brown to rich buff, paler on belly. Sides of neck with partial blackish collar extending down from above. White patches (on inner webs of all but middle feathers) on under surface of tail, showing above as row of white dots when tail is spread; tail deeply forked for about half its length, the outside feather tapering to a point. Female, paler below; outer tail-feathers shorter. Immature, mixed with dusky above; paler forehead and throat; outer tail-feathers shorter. L. 7. W. 4.75. T. 3.75 (forked for 1.90). B. from N. .25.

Field Marks.—Long pointed wings. Low, skimming, swiftly turning and gliding, erratic flight. Only swallow with *deeply-forked, slender tail.* Beautifully trim and smooth. *Chestnut throat.*

Popular Names.—Forked-tailed Swallow; Rain Swallow; Prairie Swallow.

TREE SWALLOW

Iridoprocne bicolor (Vieillot)

Not uncommon migrant; perhaps very rare as a summer resident; migrating middle March to middle May, and middle August to middle November, rarely as late as early December. In spring, March 18, 1919 (A); March 27, 1915 (A); May 17, 1920 (A). In fall, August 20, 1914 (A); November 8, 1919, common (A); December 5, 1920, 3 (A). *Recorded:* ACIJR.

Geographical Distribution.—From the Arctics, northwestern Alaska, and northern Canada south to Virginia, Missouri, Colorado, and California; rare in central-western Texas, as at Matchell's Lake near San Antonio. Winters from the Gulf States, southern Texas, and southern California, southward to Guatemala.

Habitat.—Swampy localities, with wide stretches of tules, bullrushes, marsh grass, and open water; wet prairies and meadows; open waters of ponds, lakes, and streams; open flood-plains of rivers.

Local Haunts.—Open country throughout the eastern half of the Region; Lake Austin; over city and over campus of the University of Texas; flood-plains of the Colorado River; wet meadows northwest of town, along the eastern side of Shoal Creek.

General Habits.—Gathers in large flocks in late summer, and in fall moves southward, usually later than the other swallows. Migrates by day, feeding as it goes; perches on fence wires and telegraph wires to rest, often in large numbers; usually more common after showers. Frequently spends the night roosting or perching on cattails, rushes, and reeds in marshes. In midsummer, when preparing for its southward migration, flocks gather in marshes.

Feeding Habits.—Flits low over water of streams or ponds; sails in the sky; and skims plowed fields and the grasses of low, wet prairies, feeding on winged insects. In the coast country, feeds to a large extent in winter on myrtle, *Myrica*, berries.

Flight.—Highest of the swallows, particularly during migrations, when it flies at a great height. Circles habitually, flying higher in the morning, lower as the day progresses; flies low in circles at evening, usually about 30 to 40 feet up. Chase one another with marvellous speed, turning sharply. Widely circling flight, easily distinguished from the more angular flight of the Barn Swallow.

Breeding.—Possibly. Early May to late June.

Nest Location.—Old hollows in dead trees or stumps, generally over water. Also bird-houses or boxes erected for its use.

Nest Construction.—Composed of coarse, heavy grasses, straws, and leaves, and thickly lined with feathers.

Eggs.—4 to 7, pure white, .74×.54.

Voice.—A low, thin *tweet, tweet, twee-ee.*

Description.—Upper-parts and crown, dark iridescent green, with deep, metallic, steel-blue reflections; lores, eye to bill, deep black. Wings and tail, blackish, slightly tinged with greenish; wings sharply pointed, tail bluntly forked, outer feathers somewhat longest. Under-parts, including throat and breast, pure white, contrasting sharply with the upper-parts. Young, dull brownish-gray above, white below, sometimes dusky across the breast. L. 6. W. 4.65. T. 2.40. B. from N. 22.

Field Marks.—Deep *steel-blue-green back* and upper-parts. Slightly forked tail. Pure *shining white breast* and under-parts. Steely back and white breast flash in sunlight as bird dashes by.

Popular Names.—White-bellied Swallow; Marsh Swallow; Meadow Swallow.

BANK SWALLOW

Riparia riparia riparia[220] (Linæus)

Not uncommon migrant, and rare summer resident; migrating, late March to early May, and middle August to middle October. In spring, March 25, 1922, 6 (A); March 26, 1919, 3 (A); April 2, 1920 (A); April 26, 1914, 40 (A); May 11, 1915, flock of 9 (A); June 16, 1915, one (A); June 27, 1915, same locality, family group of 7 (AN). In fall, August 25, to September 20, 1919, irregularly common (A); August 28, 1915 (A); October 11, 1914, 3 (A). *Recorded:* ABLMNW.

Geographical Distribution.—From near the limit of trees in northern Alaska and northern Canada, through Canada and the United States south to Virginia, northern edge of the Gulf States, into Louisiana, Texas, Arizona, and southern California. Winters in South America.

Habitat.—Sand banks bordering streams; sandy or clayey bluffs over or near water; rivers and river roadsides; in migrations, the open prairies and over towns. Of very local distribution during the nesting season, due to its demands for nesting sites.

Local Haunts.—Sand banks, west side of Barton Creek about 75 yards above mouth, Waller Creek a few yards from Colorado River, Walnut Creek at Colorado River, and along Lake Austin and the River.

General Habits.—Usually found in small colonies, four or five pairs nesting together. Perches on telegraph wires, and skims the surface of waters.

Migrations.—Irregular in migrations, appearing with cool northers in fall, or immediately after cooling showers in both spring and fall.

Feeding Habits.—Catches winged insects as it moves about in flight.

Flight.—Moves much quicker than the Rough-winged Swallow.

Breeding.—Early May to late June. Records: May 28, 1917, young nearly ready to leave nest (B); numerous completed holes (B); occupied holes found but not opened (LM). *Breeding recorded:* BLM.

Nest Location.—In small narrow burrow or tunnel in bit of perpendicular sandy, sandy-clay, or reddish-loam bluff over or near water, generally on a creek a few yards back from the river. Entrance, a clean round hole; burrow usually enlarged into small chamber at rear end.

Nest Construction.—Burrow excavated by birds; nest in chamber at rear, composed largely of feathers, with a few grasses and straws.

Nest Measurements.—Excavation, 15 or 20 to 36 in length.

Eggs.—2 to 6, pure white, .69×.49.

Voice.—A twitter, *tr-r-r-t, tr-r-r-rt* or *r-r-r-r;* a chattering chorus when a flock is together.

Description.—Upper-parts, brownish-gray or soot, darker on wings and tail; under-parts, including throat, white; brownish-gray band across breast. Small tuft of feathers on back of tarsus above hind-toe. Small bill, with nostrils opening toward sides. No recurved hooklets on outer vane, of first (outer) primary flight feather. Emarginate tail, much shorter than wings. L. 5.20. W. 3.97. T. 2.10. B. from N. .18.

Field Marks.—Small size, slightly smaller than the Rough-winged Swallow. No metallic colors. *Dull brownish-gray upper-parts.* Under-parts, white, with a *distinct, dark, narrow, mouse-gray band across chest,* very distinct and *sharply defined against white throat* and white belly and lower breast.

Popular Names.—Sand Martin; Sand Swallow; Brown-chested Swallow.

ROUGH-WINGED SWALLOW

Stelgidopteryx serripennis serripennis (Audubon)

Scarce migrant and very rare summer resident; migrating, late March to early May, and middle August to early October. In spring, February 19, 1919, 4 (A); March 29, 1915 (A); March 31, 1921 (A); May 8, 1919 (A). In fall, August 29, 1915 (A); October 11, 1919, 7 (A). *Recorded:* AB.

Geographical Distribution.—Southern Canada south through the United States to northern Florida, the Gulf Coast, and southern California; and a few into northern Mexico. Winters from central Mexico southward through Central America.

Habitat.—Immediate vicinity of running water; in migrations, open country, prairies and plains, and low meadows or marshes.

Local Haunts.—Waller Creek, sand bank at mouth (one pair) and drain pipes 150 feet north of East Sixth Street (two pairs); in migrations, open country east of the hills, over town, and over the University of Texas campus.

General Habits.—Not very social during the breeding season, usually not more than one or two pairs in a locality; not so active as the Bank Swallow. Assembles in large flocks after the breeding season, and during migrations perches on wayside telegraph and fence wires.

Feeding Habits.—Insects, particularly flies, which it catches on the wing; not so quick as the Bank Swallow.

Flight.—Somewhat slower, less erratic, than that of the Bank Swallow.

Breeding.—Early May to early June. May, 1905, three pairs breeding on Waller Creek, in thickly-settled part of town (B). *Breeding recorded:* B.

Nest Location.—Immediate vicinity of running water, in crevice of stone wall or bridge, in old drain pipe, or in hole in perpendicular face of sandy bank of creek or ditch.

Nest Construction.—Nest usually large, bulky, and loosely constructed, of straw, coarse grasses, bits of weeds, leaves, twigs, and weed stalks. Lined with fine grasses and with leaves of the willow and other trees. When burrow is dug by the birds, the rear end is enlarged into a small chamber or cavern. Distinguished from nests of the Bank Swallow by absence of feather lining.

Nest Measurements.—Depth of tunnel 6 to 20. Passage to nest usually averages about 3.5.

Eggs.—4 to 6, pure white, .71×.50.

Description.—Upper-parts brownish-gray. Under-parts dull whitish, dusky or plain pale brownish-gray on throat, fading to white on lower belly and under tail-coverts. Outer web of first or outer primary quill of wing is margined with recurved hooklets and is rough and saw-toothed to the touch; roughened in female, even when hooks are sometimes absent. Tail slightly emarginate, or very slightly forked. No tuft of feathers above hind-toe. Bill small. Immature, rufous wash on throat, breast, and shoulders; no hooklets on outer primary. L. 5.50. W. 4.35. T. 2.15. B. from N. .19.

Field Marks.—Throat and breast dusky, uniformly colored, fading gradually to whitish under-parts. No distinct collar or breast-band. No metallic colors. Often confused with Bank Sparrow, which is slightly smaller and which has distinct breast-band.

Popular Names.—Sand Swallow; Brown-throated Sand Martin.

CEDAR WAXWING

Bombycilla cedrorum Vieillot

Common migrant and not uncommon winter resident; very abundant, but irregular, in spring migrations; begins moving northward early in March. In fall, average arrival, 3 years, November 6, earliest October 25, 1893 (C);[221] November 16, 1916, 20 (G); November 5, 1919 (A); October 24, 1920, 7 (A); December 25, 1916, 5000 (FG); January 26, 1905, 2 shot (B); February 10, 1907, several flocks (S). In spring, latest, May 23, 1922, 50 (A); May 8, 1915 (F); May 15, 1921, 10 (A); May 13, 1919 (A); May 4, 1920 (A); April 18, 1915, 40 (A); April 10, 1900, flock (T). *Recorded:* ABCDEFGHIJKLMNOPQSTWXY.

Geographical Distribution.—Southern half of Canada southward over northern United States to North Carolina, Kansas, northern New Mexico, and southern Oregon. Winters throughout United States, Mexico, and Central America.

Habitat.—Cedar-clad hills; woods along creek valleys; cut-over lands, sapling woods, and open woodlands; city shade trees.

Local Haunts.—In winter, cedar-clad hills across western half of Region; wooded slopes of creek valleys near hills; wooded slopes east of University and between Austin and the Dam. City shade trees in milder weather and in migrations. In migrations, wooded creek valleys running north and south; city shade trees.

General Habits.—An irregular wanderer, moving usually in restless flocks or squads of from 5 to 8 or companies of from 30 to 60; when resting, the plump forms sit very still, usually close together in the topmost branches of newly-leaved and budding elm trees along creeks and in town, upright, with short tails, oddly-folded wings, raising and lowering their crests. Silent, elegant birds, giving utterance only to their thin, screeching note. In winter, more common when driven into town by storms and freezes or by clearing up of cedar berries in the hills.

Migration.—In fall, arrives with the first wintery norther, each succeeding norther bringing in more birds. In the spring of 1915 Cedar Waxwing migration was observed with interest: on March 12 a flock of 30 birds stationed themselves in the tops of several tall leafless elms in the residential section of Austin west of the University, and shortly after daybreak all began screeching at the tops of their tiny voices. A flock of 20, coming in from the southwest, joined them and added to the screeching; a flock of 30 moved in from the south, and a flock of 29 from the southeast; then flocks came more rapidly, until ten minutes after the first birds had commenced calling the flock, which had grown to 270 birds, hushed as if by signal and swept as one bird from the tree-tops, moving northward several hundred yards, where in a similar grove of unusually tall trees they resumed their screeching and recruited more small flocks. On March 27 migration was well under way; a flock of 250 moved northward along Shoal Creek valley, and innumerable small bunches of from 12 to 27 individuals followed. On April 4, in the same locality on Shoal Creek, about even with Twenty-second Street, birds began rising from the freshly-green tops of the creekside elms, circling until there were countless thousands and thousands in the air, and then moving northward in a waving horde. On April 11 a flock of 100 was observed; on May 16 a flock of 20, and on May 20 a last flock of 7 (A). In 1922, disturbed weather conditions followed by a tornado, an event rarely occurring in middle Texas, resulted in later migration; assembling flocks of Cedar Waxwings were observed during the last week of April; large flocks were rising and moving northward toward the end of the first week in May; and numerous flocks of from 20 to 60 were seen almost daily in the tops of the city shade elms until the fourth week in May.

Feeding Habits.—Feeds on cedar berries in the hills, and on hackberries and mistletoe-berries in town; also fond of other seeds and berries, particularly of the pepper and mulberry; devours some insects, among them being the scale lice and the elm-leaf beetles; in spring, when the cedar elms begin to put forth their tiny leaf-buds, Cedar Waxwings feed on the delicate foliage.

Flight.—Even, close-ranked, on level with tree-tops. Wheel suddenly even in full flight, and dive into tree-top as one bird.

Voice.—A soft, subdued, thin, fine, lisping, beady, squeaky, pulsating *pe-e-e ee-ee ee-ee ee-ee ee-ee ee-ee*, resembling the faint screeching of a tight bearing or a sewing machine in need of oil; almost continually heard. A hushed whistle.

Description.—Soft, rich grayish-brown or fawn-color; grayer to blackish on wing-quills and tail; belly washed with yellow. Distinct crest; black forehead; black chin and black line through eye, separated by white line back from lower mandible. Mature bird with red tips to wing-coverts, resembling seed-drops of sealing-wax. Short tail terminating in lemon-yellow band; under tail-coverts white. Sexes alike. Immature, streaked below. L. 7.10. W. 3.75. T. 2.45. B. from N. .26.

Field Marks.—Conspicuous crest. Screeching, eery call. Narrow yellow tip to tail. Velvety black line through eye, edging crest. Conical, upright, bob-tailed appearance when perching. Flocks which touch tree-tops, and which move as one bird.

Popular Names.—Cedar Bird; Southern Waxwing; Carolina Waxwing; Rice-Bird; Cherry-bird; Cherry-eater; Fawn-breasted Waxwing; Pale-cheeked Waxwing; Crested Rice-bird; Crested Cedar-bird.

Remarks.—During migrations, small boys with air-rifles and nigger-shooters kill numbers in city shade-trees.

MIGRANT SHRIKE

Lanius ludovicianus migrans W. Palmer

Fairly common and regular winter resident, middle August to middle April, rarely early May; begins moving northward late in February. In fall, August 10, 1916 (G); August 10, 1915 (A); August 12, 1920 (A); August 15, 1921 (A); August 15, 1919, first, 20, second, then regular and almost daily (A). January 20, 1912, specimen collected for identification (B); February 11, 1902, 2 collected (B). In spring, May 6, 1915 (A); May 3, 1922 (A); April 22, 1919 (A); April 19, 1905, 2 (B); April 18, 1915, 2(A). *Recorded:* ABCDEFGH===IJKLMNOPQRSWY.

Geographical Distribution.—Southeastern Canada and northeastern United States, west to Mississippi Valley, and south to western North Carolina, Kentucky, Arkansas, Kansas, and eastern Oklahoma. Winters in southeastern United States, north to the Middle States and southern New England, and west to central Texas.

Habitat.—Open and semi-open country; prairie and country roadsides; flats and open river-bottoms; farming country and truck gardens near towns; hedges, roadside bushes, barbed-wire fences, and telegraph wires.

Local Haunts.—Eastern half of the Region, less common in the hills; open country of the rolling prairies and blackland farming country; broad open valley of the Colorado River; edges of Austin, about town, and on the University of Texas campus.

General Habits.—Observed singly, occupying conspicuous perch on tree-top, ridge-pole, cupola of house or barn, telegraph or fence wire, pole, post, or dead limb of tree. Taken by hunters as an indication of Bobwhites, since it frequently sits on a perch over a covey.

Feeding Habits.—Catches mice, small snakes, lizards, grasshoppers and other insects, and a few small birds, which, because of its weak feet, it is compelled to impale on thorns or fence-wire barbs so that it may tear the flesh with its strong, hooked bill. Equipped with powerful vision, which enables it to pursue its prey without losing sight of it. Frequently sits and waits for prey to come within striking distance. Eats many crickets during the periodic epidemics which strike Austin during unstable weather of migration periods. Catches and impales much more food than it eats; folklore has it that the bird lives under a curse which makes it possible for it to eat only every ninth item, hence the extra items impaled but never eaten.

Flight.—Level, not rising and falling; blurred beating of short wings, and big head held well up; ended with rising upward swing to alight on perch.

Voice.—Song, *pur-tee, pur-tee, peep, peep,* and many other not-unpleasant, mockingbird-like notes; first heard about the middle of March. Mating note, a weak, whining, insect-like *e-e-e-e-e-e-e-e.* Call, a loud, harsh squealing, unmusical, strident *kher-r-rt kher-r-rt kher-r-rt* or *khee-e-e-eert khee-e-e-eert;* an unpleasant *spee- e-e-yer* or *squee-e-e-e, squee-e-e-e, squay, squay, squay, squay,* gradually slowing at the end.

Description.—Similar to the White-rumped Shrike, with subspecific differences. L. 9. W. 3.90.

Subspecific Characters.—Lacks whitish upper tail-coverts of the White-rumped Shrike. Colors paler above and grayer, bill smaller, and wing longer than in the Loggerhead Shrike, *L. l. ludovicianus* Linnæus, of the southeastern United States from North Carolina to Florida (H. C. Oberholser), and which is characterized by following measurements: W. 3.22; T. 3.87; B. from N. .48, depth of B. at N. .35.

Plumage Peculiarities.—One specimen (LBB 12889) shot January 15, 1905 (B), in the broad lowlands of the Colorado River near town, has the wing and tail ratios of the Loggerhead Shrike, but has the small bill of the Migrant Shrike.

Field Marks.—Black-masked, hawk-billed songbird, occupying conspicuous perch. *Wings hazy in even flight. Clear grays, and sharply contrasting blacks and whites.* Outer tail-feathers conspicuously white.

Popular Names.—Butcher Bird; French Mockingbird; Spanish Mockingbird; Indian Mockingbird; Loggerhead; Northeastern Shrike; Grasshopper-killer.

WHITE-RUMPED SHRIKE

Lanius ludovicianus excubitorides Swainson

Very rare winter resident, doubtless occurring irregularly from late August to the end of March; probably occurs as a rare summer resident in the western part of the Region. February 23, 1913, 1 shot (B). *Recorded:* B.

Geographical Distribution.—Interior western North America, from southern Canada south to southeastern California, northern Mexico, and southwestern Texas; west to the western border of the Great Basin; and east to the eastern edge of the Great Plains in central Oklahoma and central Texas. Winters in southwestern United States, southward throughout Mexico.

Habitat.—Roadside and along railroads, where fence and telegraph wires offer conspicuous perch; small, scrubby, isolated trees in cultivated fields, small thickets along stream, roadside, or fencerow.

Local Haunts.—Limestone hill country across western half of Region, and semi-arid country which margins its eastern rim.

General Habits.—Similar to those of the much commoner Migrant Shrike. Like that conspicuous winter bird, it captures small mice, shrews, grasshoppers, frogs, insects, and a few small birds, some almost its own size and the execution of which demands both skill and courage.

Breeding.—Possibly. Mid-April to June. One, occasionally two, rarely more, broods a season.

Nest Location.—4 to 10 feet up, rarely higher, in thorny hedges, low roadside trees, thickets along railroads, brier or cactus patches, small isolated trees in cultivated fields, beheaded sapling oak or willow trees, or thorny shrubs.

Nest Construction.—Large, loose, bulky structure, composed of weed stems, leaves, bark strips, small twigs, grasses, corn stalks, and rootlets; lined with many chicken feathers, which form a soft lining and which conceal the eggs from view, and with a few grasses and hairs.

Eggs.—6, rarely 4 or 5, dull whitish or greenish-gray, spotted and marked with olive, light brown, and obscure purple, .97×.73.

Description.—Upper-parts light slaty-gray, shading to whitish on upper tail-coverts and pure white below, under-parts only occasionally very lightly marked; bill, nasal tufts, and space from eye to bill, wholly black; black face-patch continued back from eye to ear. Wings, black with white patches; tail black, rounded, tipped with white patches on corners and bordered with white on sides. Young, less contrasting, more brownish-washed; base of lower mandible light-colored. Bill distinctly hooked.

Subspecific Characters.—Slightly larger than *L. l. migrans* W. Palmer, of the northeastern United States; decidedly a paler gray above, changing abruptly to white on upper tail-coverts; scapular region largely white, contrasted sharply with gray of back. In company with *migrants* it differs from *L l. ludovicianus* Linnæus, of the southeastern United States, in having its tail about as short as, or shorter than, its wing; bill smaller and less strongly hooked, the exposed culmen much less than .63. Known by the more or less distinctly whitish upper tail-coverts; under-parts usually pure white. L. 9. W. 3.93. T. 3.88. B. from N. .46; depth at base .33.

Plumage Peculiarities.—The specimen (LBB 25321) collected February 23, 1913 (B), has the shade of *migrans* in the upper-parts, but the white rump and larger, wider white spaces of *excubitorides*, and is much nearer the latter, to which it is referred.

Field Marks.—See those for the Migrant Shrike. Rump distinctly whiter; more white on shoulder.

Popular Names.—Butcher Bird; French Mockingbird; Western Shrike; Spanish Mockingbird; Indian Mockingbird; Grasshopper-killer; Thornbird.

RED-EYED VIREO

Vireosylva olivacea (Linnæus)

Uncommon migrant, and scarce summer resident; second week in April to early, rarely late, October. In spring, April 12, 1914 (F); April 12 (A) and 27, 1919 (B); April 14, 1915 (A); May 8, 1905, 1 shot (B). In fall, August 25, 1919, migrants moving southward (A); September 10 and 14, 1916, migrants moving southward (F); October 29, 1914, last seen (A). *Recorded:* ABCDEFGN.

Geographical Distribution.—Southern Canada south across the United States to central Florida, the Gulf Coast, northern Coahuila in Mexico, western Texas, eastern Colorado, and southeastern Washington. Winters in the northern half of South America.

Habitat.—Tall trees in deciduous woods along streams; upland and lowland woods, though more especially timbered ravines and forest margins; great cedar elm trees; sycamore groves along streams. During migrations, city shade elms and other trees of woodland, park, and dooryard.

Local Haunts.—Tops of tall elms and oaks shadowing waters of Williamson Creek, particularly just above the Manchaca road-crossing; thickly wooded and shaded bottoms along Shoal Creek system northwest of Austin; majestic lines of cedar elms along base of Barton canyon cliffs; Waller Creek; ravine north of Eleventh Street and west of West Austin Fire Hall, thickly shaded with oaks and cedar elms.

General Habits.—Shy and elusive, rarely observed more than one at a time. Sings its lay continually as it moves restlessly about or through the tree-tops in search of insect-food.

Feeding Habits.—Carefully searches under and over leaves and twigs of the tree-tops for insects and their eggs and larvae; also includes a few small berries in its diet.

Breeding.—May and June. One shot May 8, 1905, at Parula habitat above Manchaca road-crossing in Williamson Creek, contained an egg which would have been laid in a day or two (B). *Breeding recorded:* BCEFG.

Nest Location.—4 to 25 feet up, rarely higher; hung or suspended by rim from horizontal forked twig in thick foliage of elm, oak, or wild plum, usually in open woodlands.

Nest Construction.—Cup-shaped and rather similar to nests of the White-eyed Vireo; composed of grasses, strips of bark, bits of dead wood, lichens, spider webs, plant fiber, and tiny bits of grass seed stems, all strongly and smoothly woven together, and often patched with bits of cocoons and wasp-nest material; lined with fine round grasses, horse-hairs, and occasionally with bits of newspaper, fine strips of bark, and vine tendrils.

Eggs.—3 or 4, rarely to 6, white, with a few dark reddish-brown specks near larger end; less heavily spotted than eggs of the White-eyed Vireo, .85×.56.

Voice.—As with all vireo songs, the song of the Red-eyed Vireo is much louder than would be supposed from the size of the bird; characterized by intermittent singing; and, as in Wilson Flagg's famous simile, once heard, the bird is always remembered as the Preacher, constantly and deliberately talking, "You see it—you know it—do you hear me?—do you believe it?"—disconnected, deliberate, with rising inflection and a pause between each short sentence, as if waiting for an answer. Sings through the day, practically all summer, from arrival in spring until September. Call, a frequently uttered, complaining nasal *whang*.

Description—Upper-parts, dull olive or pale olive-greenish; paler to pure whitish below. Crown slaty-gray, bordered on each side by thin black line; conspicuous white line over eye and black line through eye; iris of eye red. Young, back brownish-ash; sides washed brown; iris brown. L. 6.10. W. 3.20. T. 2.22. B. from N. .40; Exp. C. .53.

Field Marks.—Famous slow, steady chant song. Iris dull red, observable at close range. Nasal call, *whang*. *Well-defined dark or slaty-gray crown inclosed on sides by thin black lines; distinct white line over eye;* thin blackish line through eye. *No wing-bars.*

Popular Names.—Red-eyed Greenlet; Preacher; Preacher Vireo; Slate-capped Vireo.

WARBLING VIREO

Vireosylva gilva gilva (Vieillot)

Very rare migrant; middle April to middle May, and early September to middle October. In spring, April 16, 1921 (A); April 18, 1920 (A); early May, 1921 (Wolfe); May 13, 1919 (A). In fall, September 4, 1919 (A). *Recorded:* A (and Wolfe).

Geographical Distribution.—Southern half of eastern Canada, south across northern United States to Virginia, North Carolina, southern Louisiana, and northwestern Texas. Winter south of the United States.

Habitat.—In summer, mountain forests. In migrations, village shade trees, particularly elms in rows; mesquite flats overlooking creek valleys; in fall, weed patches along streams.

Local Haunts.—Western edge of city, along crest of Shoal Creek valley.

General Habits.—Very inconspicuous, usually observed singly when seen at all; generally remains in thick tops and upper branches of trees.

Feeding Habits.—Like other vireos, carefully scrutinizes each leaf and leans over to peer on its under side for worms. In fall, feeds in rank weedy patches along streams, in company with certain ground-loving warblers.

Voice.—Song, a rich, mellow, smooth, easy, continuously-flowing warble, consisting of about nine to eleven notes, *to-too te-ter too-te-ter too-te-ter-te*, gradually rising and then gradually, slightly dropping, with a peculiar alto undertone.

Description.—Upper-parts, pale grayish-olive or ashy olive-green, darker to dusky-brown on wings and tail, grayest on head, most olive on rump and at base of tail. Distinct whitish line over eye, dusky line through eye, and whitish semi-circle under eye. Under-parts, dusky whitish, paler on throat, and washed very slightly with yellowish on sides. L. 5.50. W. 2.80. T. 2.25. B. from N. .31; depth at Base .17.

Field Marks.—Warbling song. Small, colorless, leaf-tinted vireo. No wing-bars, and *no black* or white *lines over its brown eye.* Under-parts washed with a faint tinge of yellow. Song distinguishes it from the rather-similar Red-eyed Vireo. First primary very short, not more than an inch long.

YELLOW-THROATED VIREO

Lanivireo flavifrons (Vieillot)

Rare summer resident, formerly not uncommon; late March to middle October. In spring, March 20, 1919 (A); March 28, 1921 (A). In fall, August 27, 1916, 2 migrating (FG); October 22, 1914 (A). *Recorded:* ABCDFGHLM.

Geographical Distribution.—Southern edge of eastern Canada southward over eastern United States to central parts of Florida, Lousiana, and Texas. Winters from southern Mexico to northern South America.

Habitat.—Principally confined to the tree-tops of tall timber, usually on uplands near streams, though occasionally, rarely, in lowland woods; semi-open oak sapling woods; trees on upland terraces and banks along streams and ravines; oak woodlands, cottonwood groves. In migrations, along hedgerows and in orchards.

Local Haunts.—Small grove of cottonwoods on bit of plateau about 20 yards from junction of Waller Creek with Colorado River; tall trees west of University campus; shade trees in residential districts of Austin.

General Habits.—Usually observed singly; more frequently heard than seen. Moves slowly (hence never to be mistaken for the wood warblers with their busy, nervous movements) through trees in woodlands similar to those inhabited by the Red-eyed Vireo. An incubating female was removed from her nest by hand (L).

Feeding Habits.—Searches leaves and twigs of tree-tops, feeding on tiny insects and their eggs and larvae.

Breeding.—Middle April to late May. Earliest: April 19, 1892, 4 fresh eggs (L). Latest: April 28, 1894, 4 fresh eggs (L). *Breeding recorded:* HLM.

Nest Location.—4 to 50, usually 25, feet up, suspended from horizontal limb only about 4 feet from main trunk in large oak, elm, or cottonwood tree, in forest or grove, generally on high ground looking down onto creek valley.

Nest Construction.—Basket-like nest, composed of interwoven strips of thin bark and bark fiber, particularly that of cedar, and of wool, fine grasses, shreds of weed fiber, plant down, vegetable substances, and wooly materials. Adorned and decorated outside with bits of lichens, pieces of white cocoons, and small pieces of white pulpy wood, held in place with spider webbing and caterpillar silk. Lined with fine shreds of bark, fine grasses, small grass stems, and sometimes a few horse-hairs.

Nest Measurements.—Outside, diameter 3, height 2.50. Inside, diameter 2, depth 1.60.

Eggs.—3 to 5, usually 4, white or faintly pinkish-white, dotted with chestnut-brown and black, principally about the larger end, .33×.61.

Voice.—Much lower in tone, a contralto instead of a soprano, and more nasal than that of the Red-eyed Vireo, which it resembles somewhat in rendition; more throaty, deeper, richer, and without the clear whistles which characterize the song of the Red-eye; three or four groups of slurred notes, more deliberately uttered, a loud, distinct *pheet! keetooey! pew-it!* or *see me! I'm here! where are you?* In addition to this song, there is sometimes an intricate warbling trill, preceded or followed by scolding notes, yet reminiscent of the wonderful melody of the Ruby-crowned Kinglet.

Description.—Upper-parts, clear bright olive-green, grayer on rump; wings and tail gray, the former with two white bars; lores, eye-ring, throat, and breast, bright yellow; belly white. L. 5.95. W. 3.05. T. 2. 10. B. from N. .35.

Field Marks.—Clear olive-green above. Two distinct white wing-bars. Resembles a miniature Yellow-breasted Chat, for it has *bright canary-yellow throat and breast.*

Popular Names.—Yellow-throated Greenlet.

BLUE-HEADED VIREO

Lanivireo solitarius solitarius (Wilson)

Scarce migrant; rarely late March, usually middle April, to middle May, and middle September to early November. In spring, March 19, 1919 (A); April 22, 1915 (A); May 3, 1914 (G); May 19, 1915 (A). In fall, September 20, 1916 (F); October 11, 1914, 1 shot (AB); November 16, 1915 (A). *Recorded:* ABFG.

Geographical Distribution.—Southern half of eastern Canada southward into northeastern United States as far as Rhode Island, mountains in southern Pennsylvania, Michigan, and northern North Dakota. Winters in lowlands of Gulf States (Florida to Texas) and through eastern Mexico into Central America.

Habitat.—Woodlands and sapling woods; village shade trees; mesquites and elms along creek bottoms running north and south.

Local Haunts.—Shade trees in town and on campus of University of Texas; Shoal Creek valley at Pease Park and above State Street.

General Habits.—Usually observed singly, even when numbers are in a vicinity. Rather tame. Movements deliberate.

Feeding Habits.—Peering, like other vireos, under leaves and into blossoms, searching chiefly for caterpillars, other insects, and insect eggs.

Voice.—Song, a rich, varied, voluble warble, tender, beautiful, and flowing; a pretty trilled whistle; and a musical chatter.

Description.—Upper-parts, olive-greenish; top and sides of head bluish-gray, in sharp, conspicuous contrast to white eye-ring, space from eye to bill, throat, and under-parts, all of which are distinctly white. Two white wing-bars. Washed with dusky and yellowish on sides. Young, upper fore-parts grayish-brown. L. 5.50. W. 2.95. T. 2.15. B. from N. .29.

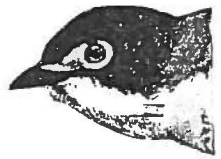
Field Marks.—Large and handsome for a vireo. Two distinct white wing-bars. *Eye-ring and space from eye to bill, white. Crown* and *sides of head bluish-gray.*

Popular Names.—Solitary Vireo; Northeastern Solitary Vireo; Eastern Blue-headed Vireo.

BLACK-CAPPED VIREO

Vireo atricapillus Woodhouse

Rather rare summer resident, more common for a few weeks after its arrival in spring; late March to late August or early September. In spring, March 21, 1920 (A); April 14, 1913 (B); April 18, 1915, pair (A); April 28, 1905, 1 male shot (B). In fall, August 26, 1915 (A); September 5, 1919 (A). *Recorded:* ABC[223]DEFGH[224]U.[225]



Bailey
BLACK-CAPPED VIREO

Geographical Distribution.—Very limited in range; from Southwestern Kansas southward-southwestward to central and western Texas, where it has been found eastward to Gainesville, Austin, New Braunfels, and Kerrville, and westward to Tom Green County and the Pecos High Bridge. Winters in southern Mexico.

Habitat.—Typically, scrub-oak ridges, ravines, and canyons. Hottest imaginable places on sterile ridges or backbones among peaks of the small mountains or limestone hills of central Texas, among clumps of scrub oak, cedar, broad-leaved deciduous bushes, and chaparral brush, scantily scattered among small mountain live oaks and shaded mountain Spanish oak thickets on steep, sterile, rocky slopes of peaks which break in endless strata down to the valleys below; scrub oak thickets; oak thickets along bottoms of dry ravines; vine-grown thickets on canyon walls.

Local Haunts.—Southeastern slope of Mt. Barker and eastern slope of Mt. Bonnell; hills adjacent to Barton canyon; hidden ravine, 300 yards west of Barton canyon, parallel with it and connecting first to right above Campbell Hole with second to right, which opens opposite Phoebe cave; Pease gorge and adjacent Pease north pasture, among mixed scrub oak, scrub elm, and mesquite bushes; western slopes of Lake Austin; slopes of Bull Creek valley.

General Habits.—Observed singly or in pairs. Very shy and quick, dodging in and out among thick foliage of bushes, and from one dense clump to another; alert, active, and energetic, hopping and flying briskly about, generally keeping close to cover of bushes. A typically Texan species, the voice of which rings loud in canyons. The male assists in incubation; female sits so close on nest when eggs are well-incubated that she can almost be touched.

Feeding Habits.—Feeds low among the dwarf shin oak and scrub oak or dwarf plum thickets on ridges and dry hillsides, searching for caterpillars, other insects, and their eggs.

Breeding.—May to early July, most commonly in June. Records: June 14, 1900, 4 fresh eggs (E); June 16, 1900, 4 fresh eggs (E). *Breeding recorded:* ABCE. Usually one, rarely two, broods.

Nest Location.—2 to 6, rarely 15, usually 4, feet from ground, suspended from horizontal forked twig of small scrub oak, live oak, Spanish oak, or elm bush or stunted tree, usually among low shin oaks and elms and dwarf plum thickets on dry hillsides near a stream, a habitat never frequented by the White-eyed Vireo; in tangled thickets of dewberry; in low trees on edge of thick mountain shrubbery; less commonly, in deep shady ravines where the White-eyed Vireo places its nests.

Nest Construction.—Cup-shaped, like all vireo nests, and somewhat similar in construction to the nest of the White-eyed Vireo. Composed of fine shreds and strips of bark, extra fine grasses, and catkins, firmly and thickly woven, and with plant down, a few fragments of leaves, and bits of rubbish mixed in. Exterior of nest covered with spider webbing and caterpillar silk and with bits and pieces of lichens, the latter often so

thickly placed as to give the nest the appearance of a ball of moss, not unlike the ball-moss, *Tillandsia recurvata*, which hangs all over trees of the area. Lined with small round grasses and the most delicate fiberous rootlets and bark fibers; never lined with wool.

Nest Building.—Nest begun immediately after arrival, and sometimes completed by middle April. Pair with half-completed nest in early July, 1900 (E).

Nest Measurements.—Outside, diameter 2, height 1.5. Inside, diameter 1.75, depth 1.50.

Eggs.—4, rarely 3, pure white, entirely unmarked, .71×.53.

Voice.—Song, varied, reminiscent of that of the White-eyed Vireo, but less emphatic and more of a gentle warble; somewhat like the song of the Bell Vireo, but much slower and more distinct, less of a helter-skelter roundelay; a subdued, low, sweet, persistent musical warble, neither hurried nor slow, as though the bird were making insistent efforts to pronounce its name: (1) *black-cap V;* (2) *b-cap vee-reeo;* (3) *bee-cap-vee-veereeor;* (4) *vee-vee-ree poo;* (5) *wick-kuh-poo;* (6) *wick-kuh-poo- chee-e-e-e;* (7) *black-cap;* (8) also interpreted as a loud, emphatic, liquid *there now, wait-a-bit* or *come here, right-now-quick.* First and second usually alternate at regular intervals; first and sixth end with a peculiar, fine, tinkling, bell-like quality which is very attractive. Sometimes the song is moderately loud and clear, at which times the resemblance to the song of the White-eyed Vireo is more apparent. Sings from arrival in March until mid-August, frequently from the nest after the manner of the Bell Vireo. A hoarse alarm-note.

Description.—Upper-parts, greenish or bright olive-green; crown and sides of head black, sharply contrasting with white eye-ring and stripe from eye to bill. Yellowish-white wing-bar. Under-parts white, tinted on sides with yellowish. Female, duller; slaty replaces black of head. Young, brownish-green above, dull buff below and on face; dull brownish replaces black of head. Bill slightly hooked. L. 4.56. W. 2.22. T. 1.90.

Field Marks.—Tiny, dainty, white-spectacled, black-capped little greenlet of the arid hill country. Top and sides of head black, distinct white ring around eye and from eye to bill.

WHITE-EYED VIREO

Vireo griseus griseus (Boddært)

Common migrant, and moderately common summer resident; latter March to late September. In spring, March 12, 1919 (A); March 18, 1916, 2 (G); March 23, 1905, tolerably common (B); March 25, 1905, 1 shot (B); March 25, 1921 (A); March 26, 1920 (A); March 28, 1915 (A); March 29, 1905, 1 shot (B); April 3, 1922 (A). In fall, September 27, 1921 (A); September 14, 1916, 4 (F). *Recorded:* ABCDEFGMN.

Geographical Distribution.—Eastern United States, north to Massachusetts, New York, and southeastern Nebraska; south to central Florida, the Gulf Coast, and central Texas; west to the Rocky Mountains. Winters in the Gulf Coast country from Georgia, South Carolina, and Texas southward through eastern Mexico into Central America.

Habitat.—Lower, bushy slopes of creek valleys; ravines, the bottoms of which are cool, shady, and dense with thick green dogwood and undergrowth; brushy ravines in woodlands; tangled thickets on creek slopes; thickety undergrowths; briary, swampy places on edges of woods; thick, bushy growths in low, swampy places.

Local Haunts.—Eastern slope of Mt. Barker; slopes of Barton, Bull, Dry, and Shoal creeks, commonest along Barton and Dry creeks, particularly near the Bull Creek road-crossing of the latter. In migrations, city shade trees and the campus of the University of Texas; slopes of Waller, Williamson, and Onion creeks and of Lake Austin.

General Habits.—Usually observed singly when seen at all; very commonly heard, but rarely ever seen. Moves restlessly about; shy and easily frightened. Young remain in the nest only about 7 days.

Feeding Habits.—Very similar to those of other vireos, except that this species usually confines its search to the leaves and twigs nearer the ground, in dense undergrowth, where it feeds on insects, their eggs, and larvae.

Breeding.—Middle April to middle June. Earliest: April 19, 1908, 4 fresh eggs (E). Latest: May 10, 1919, 4 fresh eggs (AB); occupied nests in early June. Two, possibly three, broods. *Breeding recorded:* ABEG.

Nest Location.—3 to 8 feet up, suspended from forked twig or from several outgrowing, nearly parallel twigs of bush or of small to medium-sized wafer-ash, dogwood, or hackberry, in damp thickets along deep and shady ravines, or on cool, shaded slopes near creeks.

Nest Construction.—Purse-shaped, semi-pensile structure, rather large for the size of the bird; composed of fine strips of bark, cedar bark pulp, paper, small leaves, plant down, green moss, bits of cocoons, and a few feathers; rim of nest covered with cobwebs, and the exterior sometimes decorated with lichens. Lined with fine grass seed stems, fine weed stems and rootlets.

Nest Measurements.—Outside, height 2.65 to 4. Inside, diameter 1.75, depth 2.12. Somewhat larger than nests of the Bell Vireo.

Eggs.—3 to 5, usually 4, white, sparingly marked with small specks of reddish-brown and dark purplish, .76×.56. Slightly larger than, but somewhat similar to, eggs of the Bell Vireo.

Voice.—Song, always emphatic, jerking, astonishingly loud and clear for so small a bird, sometimes slowly, though most frequently rapidly uttered; each note clear and distinct, with no effect of helter-skelter: (1) *chick-a-reer-chick;* (2) *chippity-burr-tuck;* (3) *chick-war-hee;* (4) *toop-too-wee-oo;* (5) *and-ter-who-are-you? are-you-eh?;* (6) *chip-chippity-burr-tuck-chip-chicker;* (7) *chuck-ter-who-are-you-eh?;* (8) *chick-chup, cha-a-ay;* (9) *cherr-chick-ar-chick;* (10) *cherr-chickery-chick;* (1) *quah-kaw-ke-kuh-ke-kuh—keh;* (12) *toop-e-too-wee-oo;* (13) *wheep-oo-weeo;* (14) *chip-who-weeo-chip;* also mimics the songs of other small birds. Sings commonly from arrival into midsummer, particularly in the cool hours of early morning.

Description.—Upper-parts, including upper tail-coverts, bright olive-green, somewhat washed with grayish; distinctly yellow forehead, from eye to bill, and ring around eye; iris of eye distinctly white; two distinct yellowish-white wing-bars. Throat white to whitish-gray; sides, and occassionally breast, washed with greenish-yellow or sulphur-yellow; belly white. Young, grayer; streak from eye to bill, white; iris of eye hazel; wing-bars buffy; flanks buffy. L. 5. W. 2.40. T. 2. Tars. .75. B. from Base .57; from N. .39.

Field Marks.—Narrow whitish wing-bars distinguish it from Red-eyed and Warbling Vireos. Whitish iris of eye, and white breast, these distinguish it from the Yellow-throated Vireo. *Distinct yellow face-patch,* covering forehead, eye-ring, and space from eye to bill. Bill quite hooked at tip.

Popular Names.—Northern White-eyed Vireo; Dogwood Vireo; Creek-bottom Vireo; Underbrush Vireo.

BELL'S VIREO

Vireo bellii bellii[226] Audubon

Very common summer resident, and commonest of the local vireos; late March to late september, rarely early October. In spring, March 26, 1919 (A); March 28, 1915 (A); March 29, 1920 (A); March 31, 1921 (A); April 11, 1915, second arrival (AF); May 7, 1912, 2 shot (B);

May 31, 1905, 2 shot (B); July 17, 1917, male shot (B). In fall, October 2, 1919 (A); September 27, 1921 (A); September 22, 1914 (A). *Recorded:* ABCDEFGH[227]IJKLMNOQW.

Geographical Distribution.—Down the plains country of middle United States, from Nebraska south to northeastern Mexico, east to northeastern Illinois and northwestern Indiana; west to the foothills of the Rocky Mountains; Great Plains, and less commonly the Mississippi Valley. Winters in Mexico and northern Central America.

Habitat.—Mesquite flats and mesquite prairie forests; tangled brush and brier patches in open country; mesquite thickets bordering open prairie or cotton fields; lines of bushes and trees along country roads and fence-rows between cultivated fields; brush fringing woods or roadsides; osage-orange or bois-d'arc hedges; orchards; plum thickets on prairie or on country hillside.

Local Haunts.—Mesquite along the broad open valley of the Colorado River, from Deep Eddy downstream; Pease north pasture; vacant town lots and blocks covered with mesquite growth.

General Habits.—Generally observed singly, and more easily observed than the other vireos, though in general it has the characteristic retiring habits of its family. Most common, on first arrival, in the newly-leaved trees along the river at town. The female stands up in her nest on hot summer days, and pants with her bill slightly open.

Feeding Habits.—Gleans from lower growth, particularly mesquite trees, insects and their larvae.

Breeding.—Late April to early July. Earliest: April 25, 1895, 4 fresh eggs (L). Latest: July 1, 1905, 4 fresh eggs (B); June 16, 1898, 4 slightly incubated eggs (E).[228] Characteristic, May 13, 1908, 4 slightly incubated eggs and 2 Dwarf Cowbird eggs (B). Incubation sometimes commences with laying of first egg. Two, rarely three, broods. *Breeding recorded:* ABCEGHIJLMNO.

Nest Location.—1.12 to 10, once 25, average 3, feet from ground, usually hanging by rim to end of low swinging or down-dropping fork in well-shaded thicket, nearly always in a low mesquite tree; occasionally in cedar elm, winged elm, Texas black-fruited persimmon, Mississippi hackberry; black willow, prickly ash; honey locust, or bois-d'arc bush or small tree, in thicket of pastureland or along roadside or fence-row; occasionally in vine in tangled brier thicket.

Nest Construction.—Pensile or semi-pensile, purse-shaped or cup-shaped structure, neat, compact, and smooth; composed of fine strips of cedar bark and other fiberous barks, strong and flexible plant fibers, plant down, bits of green leaves, bits of green grass stems, bits of paper, cobwebs, and spider webs; less commonly, nests contain fine hair-like grass-seed stems, horsehairs, bits of dead leaves, small weed stems, blades of grass, and bits of wool; rarely, tiny bits of twigs, rootlets, Indian tobacco weed, feathers, cast-off snake-skin, string, lichens, moss, bits of cotton, rags, and pieces of wasp nest. Brim covered with cobwebs; outside of nest ornamented or decorated with small rufous and white patches of web-like cocoon silk and occasionally with yellow retama blossoms. Lined with fine grass seed stems, horsehairs, and fine rootlets.

Nest Building.—Occasionally nests have false bottoms built over eggs of the Dwarf Cowbird, the birds preferring a second story to building a new home. Half-completed nests common, May 9, 1919 (B).

Nest Measurements.—Outside, top diameter 2.35 by 2.07; middle diameter 2.20 by 2.50 to 3.10; height 2.60. Inside, rim diameter 1.45 by 1.75, middle diameter 1.81 by 2.40, depth 1.37 to 2.15.

Eggs.—2 to 5, commonly 4, varying according to number of Dwarf Cowbird eggs which the nest contains; faint pinkish white (white when yolk has been removed), sparingly and irregularly dotted and speckled with dark umber-brown, rufous-brown, and black, particularly near the larger end, .68×.49.

Voice.—Song, a brisk, pleasing, rapid-fire, merry, jumbled, warbling, chattering *ter-wee-a-wee-a-wee-a-wee-a-wit,* alternating with a similar *too-weea-weea-weea-weea-skee,* thin, high-pitched, and dashing, brought to an abrupt close; frequently called "an indescribable sputtering." A tireless songster, continually singing on through the hottest part of the noonday, frequently as it incubates eggs in nest; many nests are located by following the song of the bird. Call, a harsh scolding, though not so harsh as similar calls of the White-eyed Vireo; uttered as bird moves about tree and bush in search for food. In presence of intruder, a short, exceedingly quick, scolding *too-weea-skee* or *ter-weea-wee.*

Description.—Upper-parts, brownish-olive, changing to olive-green on rump; tail and wings brownish, latter with 2 narrow, dull white wing-bars. Eye-ring and eye to bill, throat, and under-parts, white; under tail-coverts yellow; breast and sides washed with sulphur-yellow or greenish. L. 4.75. W. 2.10. T. 1.87. Tars. .73. B. from N. .29.

Field Marks.—One of the smallest and plainest of vireos. Slender and more grayish than the White-eyed Vireo; no bright yellow; no distinct black or slaty-blues on head, either in patches or lines. *Brighter olive-green on rump.* Two narrow whitish wing-bars, and distinct whitish eye-ring and space from eye to bill. Under tail- and wing-coverts yellow. Familiar, helter-skelter, merry, jumbled, warbling song, continually uttered from depths of mesquite thickets.

Popular Names.—Tom-tit; Greenlet; Mesquite Vireo; Warbling Vireo.

Remarks.—Named in honor of John G. Bell, Audubon's companion, who first discovered it near Black Snake Hills, May 4, 1843.

BLACK AND WHITE WARBLER

Mniotilta varia (Linnæus)

Rather uncommon migrant, and very rare summer resident. In migrations, middle March to early May; and late July to early, rarely middle, October. Spring, earliest, March 11, 1890 (D):[229] March 17, 1919 (A); March 29, 1914 (G); March 30, 1916, pair (J); March 30, 1921 (A); latest, April 18, 1915, pair (A), and May 7, 1916, 2 (G). Fall, July 20, 1890, arrived (D); September 7 to 20, 1916, 5 birds on 14th (FG); October 16, 1921 (A). *Recorded:* ABCDEFGJMN.

Geographical Distribution.—Eastern North America, from Newfoundland and central Canada southward over eastern United States to northern Georgia, central Alabama, Louisiana, and central Texas (supposed breeding in immediate vicinity of Texas Coast evidently based on early migrating young); local in Gulf States; west to South Dakota and central parts of Kansas and Texas, casually to Rocky Mountain foothills. Winters from Florida and southern Texas southward to northern South America.

Habitat.—Deciduous woodlands on lower flats along streams, on rocky slopes at bases of hills, and on high hillsides, especially where saplings, second growth, and underbrush are abundant. Less commonly, big timbered uplands of forest primeval. In migrations, scattered growth of small deciduous trees along creeks, and shade trees and shrubs of lawns, parks, and orchards in town.

Local Haunts.—In summer, Limestone Hill Area covering western part of the Region. In migrations, Shoal Creek valley, particularly open elm woodlands of Pease Park, and the valley above State Street; East Woods; wooded slopes and ravines bordering the broader, second valley of Colorado River, between Bouldin and Barton creeks.

General Habits.—Observed singly, in pairs, or in composite troupes with other warblers. Incessantly restless; in its habits it resembles the nuthatches to some extent, distinguished among warblers for its creeper-like habits, yet its progress is more jerky than nuthatch or creeper, for at each hop or hitch it almost invariably faces in a different direction. Female, flushed from nest, flutters painfully over ground in attempt to lead intruder away.

Migration.—Migrates at night. Arrives in central Texas much earlier than in the eastern part of the State or in the Mississippi Valley; moving northward after its arrival in spring, the bird moves along at about 20 miles a day from the Gulf of Mexico toward Canada, until it reaches its chosen spot for a summer home.

Feeding Habits.—In its search for food the bird flits actively from tree to tree; moves nimbly about twigs and smaller branches of woodland trees, or hangs from beneath twigs and branches; runs actively up trunks, under and over limbs, climbing easily and creeps up, down, and around trunks and stumps, searching rather superficially for tiny insects and their eggs and larvae.

Breeding.—Probably. Early April and May; begins nesting very early, and young are fully feathered by early July.

Nest Location.—On ground, or impression in or imbedded in ground; in woods; sheltered by stump, fallen log, base of tree or bush, fallen limbs, or rock on hillside.

Nest Construction.—Bulky but compact structure, sometimes more or less roofed over; composed of dead leaves, cedar bark, grapevine strips, grasses, moss, and rootlets; and lined with long hairs, fine rootlets, and occasionally downy feathers.

Nest Building.—April 8, 1916, pair observed picking up downy feathers and other pieces of nesting material (FG).

Eggs.—4 or 5, rounded oval and less pointed than most warbler eggs; white to creamy white, heavily speckled and spotted with reddish-brown, lavender, and chestnut, rather evenly marked all over, but with a more or less perceptible wreath about the larger end, .65×.53.

Voice.—Sings very little: thin, wiry, penetrating, but smooth-toned *ssee-wwee-ssee-wwee-see-wwee-ssee-wwee* or *wee-see wee-see wee-see wee see*, uttered neither rapidly nor slowly, with a slight emphasis on the second note of each of the four couplets; another variation, of single notes instead of couplets, *see-see-see-see* or *tse-tse-tse. te te;* another, *weachy, weachy, weachy, 'twee, 'twee, 'tweet.* Call, a rather weak *chip* or *tsip;* a thin *see-see-see*, uttered now and then; a small, rather sharp *pit* or *dzt*, occasionally prolonged to a rapid chittering, *dzt-dzt-dzt-dzt-dzt-dzt*, uttered as the bird creeps about trunks and larger limbs.

Description.—Back, rump, throat, breast, and sides black streaked with white; crown with two black stripes, one on either side of central white stripe; ear-patch black, bordered above and below with white; wings and tail blackish, edged with gray, with two diagonal white wing-bars; center of belly plain white. Female, fewer black streaks, and more brownish, particularly on rump and flanks. In fall, male, more white on breast and throat; female, brownish wash stronger everywhere. L. 5.30. W. 2.65. T. 1.90. B. .45 (from N. .37).

Field Marks.—Whole bird boldly, *conspicuously striped with clear* glossy *black and white.* No yellow anywhere. *Creeps.*

Popular Names.—Black and White Creeper; Striped Creeper; Creeping Warbler; Varied Creeping Warbler; White-poll Warbler.

Remarks.—Many are killed in migrations by striking the city light-towers of Austin during northers and storms.

PROTHONOTARY WARBLER

Protonotaria citrea (Boddaert)

Very rare migrant, early to middle April,[230] and early August to middle September. April 2, 1915 (A); April 16, 1919 (A); and September 20, 1914 (A). *Recorded:* AC.

Geographical Distribution.—Eastern United States, from Maryland, southern Michigan, and northeastern Nebraska, south to northern Florida, the Gulf Coast, and eastern Texas; west nearly to the Plains;

occurs most commonly along the valley of the Mississippi River and its tributaries. Winters from the southern tip of Mexico southward into South America.

Habitat.—Low, flat, swampy, overflowed woodland bottoms, where low trees, bushes, and stumps dot the stagnant waters; very partial to willow thickets on recent alluvial formations; woodland ponds dotted with trees and stumps; low river and creekside bottom woods thick with underbrush; abundance of willows or damp woods in the immediate vicinity of water.

Local Haunts.—Wooded valleys of creeks and the Colorado River east of the hills.

General Habits.—Observed singly or in composite troupes with other warblers. Shy, active, restless, noisy. Plays about the bushes and lower branches of trees and about dead stumps near the coffee-colored waters, particularly in wooded bottoms festooned with Spanish moss; brilliant and wonderful in its cool, gloomy, shaded haunts. Colors harmonize well with the yellow foliage of willows. Preens and suns itself among the upper branches of bottomland trees.

Flight.—Swift, firm, decided, and direct. In fall migration this species flies from northwestern Florida directly across the Gulf of Mexico to Yucatan, a straight flight of 900 miles, without a rest.

Voice.—Song, clear, very intense, high-pitched, ringing, penetrating, startling *peet, tsweet, tsweet, tsweet, tsweet, tsweet*, evenly uttered, strongly accented and growing stronger toward the last, at a distance sounding quite sandpiper-like; a strident, piercing *eh-wiss, eh-wiss, eh-wiss, eh-wiss*, varying toward *eh-weess;* a not particularly clear, scraping screeching whistle, *cher-wee-weet-weet-weet-weet-weet*, the first two notes low, the others high and at an even pitch, growing louder and more emphatic; rarely, a low, canary-like flight-song, uttered by the male. Sings at irregular intervals throughout the day. Call, *tschip*, quite similar to that of the Water-thrush.

Description.—Rich golden orange-yellow, quite bright about the head and breast, lighter on the belly; rather dark grayish wings, lower back, and tail, under side of the latter showing large white blotches from the white inner webs of the tail-feathers. Bill black, brownish in fall. Female, slightly duller, yellow paler, and with more white on belly. L. 5.50. W. 2.85. T. 1.85. B. .55 (From N. .42).

Field Marks.—Rich golden-orange color, brighter about head and breast, darker to dark-gray on wings, back, and tail. No wing-bars, but large white blotches on under surface of tail.

Popular Names.—Golden Swamp Warbler.

WORM-EATING WARBLER

Helmitheros vermivorus (Gmelin)

Very rare and irregular migrant; probably occurs only during the last three weeks in April, and from middle August to the last of September. April 16, 1920 (A); and September 14, 1916, 2 pairs and 3 singles (FG). *Recorded:* AFG.

Geographical Distribution.—Eastern United States, from Connecticut, Pennsylvania, northern Illinois, and southern Iowa, southward to Virginia, the South Carolina mountains, Tennessee, and southern Missouri, rarely to Alabama, Mississippi, and Louisiana; west almost to the Plains. During migrations, west to the Trans-Pecos country of western Texas. Winters in Central America, southern Mexico, the West Indies, and casually, Florida.

Habitat.—Open woods; bushy, brush-grown pastures; heavily-timbered bottom-lands; retired thickets in woods along water-courses; wooded hill-slopes of second-growth timber, particularly on dry hillsides; ravines; usually dense undergrowth, less commonly open ground.

Local Haunts.—Shoal Creek valley west of the University campus.

General Habits.—Observed singly and in composite troupes with other warblers. Slow, deliberate, retiring. Noted during fall migration, moving from tree to tree, gradually southward along creek valleys, from twelve to twenty-four hours ahead of distinct norther.

Feeding Habits.—Peers about bark and branches of low bushes and trees, or walks gracefully, deliberately about, carrying its tail jauntily over its back as it turns over leaves and bits of bark in its search for food among the dead leaves.

Voice.—Song, a perfectly monotonous trill, *che-e-e-e-e-e-e;* weaker than, but closely resembling, the trill of the Chipping Sparrow. Call, a sharp *chip* or *dzt.*

Description.—Back, tail, and wings, even olive-green. Head rich creamy olive-buff; two broad black stripes on crown, running back from each nostril, and narrow black stripe through eye, leaving buffy stripe down middle of crown and another over each eye. Cream-buff below, paler to whitish on throat and belly. Bend of wing yellow. Sexes alike. In fall, slightly more buffy. L. 5.50. W. 2.80. T. 1.97. B. .50 (from N. .39).

Field Marks.—Greenish above, creamy-buff below. *Two black and three light buff stripes on crown,* very conspicuous. Narrow black stripe through eye. No white bars or patches. Ground habits.

BLUE-WINGED YELLOW WARBLER

Vermivora pinus (Linnæus)

Very rare and irregular migrant; early April to middle May, and early September to early October. April 7, 1919 (A); April 2, 1921 (A); May 13, 1920 (A); and October 7, 1921 (A), and September 13, 1914 (A). *Recorded:* A.

Geographical Distribution.—Eastern United States, from Massachusetts, western New York, southern Michigan, and southeastern Minnesota, southward to Maryland, Kentucky, and northeastern Kansas, rarely to Georgia, Mississippi, and Oklahoma; west nearly to the Plains. In migrations, rare in southeastern United States south of Virginia and east of Louisiana. Winters from northern Mexico to northern South America.

Habitat.—Scrubby second-growths in clearings, on borders of woodlands, and on hillsides; undergrowth in woods, and occasionally the lower trees in dense woods.

Local Haunts.—Suitable localities across eastern half of the Region, west to the edge of the hills.

General Habits.—Occurs singly, in small loose flocks, and in composite troupes with other warblers. Slow, deliberate, creeper-like in its leisurely movements, occasionally hanging head downward like a chickadee. Partial to the smaller branches of trees.

Voice.—Song, a peculiar, lazy, wheezy, drowsy *sweee-chcee,* first inhaled, second exhaled; a double, rising and falling rendition, first a shrill, inhaled *zi-e-e-e-e-e-e-e,* followed immediately by an exhaled, buzzing *zwe-e-e-e-e-e-e,* quite drawling and locust-like; an insect-like *swee-e-e-e-e, chee, chee, chee, chee;* a less common *weee, chi-chi-chi-chci, chure, chee-chure,* accompanied sometimes by peculiar *kik* notes. Call, a weak *chip.*

Description.—Nape, back, and rump, bright olive-green; crown and under-parts uniform bright yellow; thin black line from bill to or through eye. Wings and tail bluish-gray; two distinct white wing-bars, and white spots on outer tail-feathers. Female, and male in fall, duller below, greener on crown; eye-stripe duskier in female. L. 4.85. W. 2.45. T. 1.85. B. .46 (from N. .33).

Field Marks.—*Yellow body* and crown; with *black line through eye,* narrow and thin. Slaty bluish-gray wings and tail, former with *two very distinct white wing-bars,* latter with large white spots.

Popular Names.—Blue-winged Warbler.

NASHVILLE WARBLER

Vermivora ruficapilla ruficapilla[231] (Wilson)

Uncommon and irregular migrant, occasionally common in spring; last week in March to second week in May, and first to middle of October. Spring of 1907, common, and specimens collected: April 21, 1; 23, 1; and 24, 2 (B). In fall, October 2, 1920 (A); 9 1921, 3 observed (A); and 17, 1915 (F). *Recorded:* ABF.

Geographical Distribution.—Eastern North America, from middle Canada southward over northeastern United States to New Jersey, Illinois, and Nebraska; more common in New England States. In migrations, rare and almost never observed in southeastern United States east of Texas. Winter in Mexico and northern Central America, uncommonly in northern South America.

Habitat.—Dry, somewhat barren patches covered with birches. Open or moderately brushy deciduous woodlands; young second-growths; chaparral; tree-bordered fields; mixed mesquite and elm growth on hillsides; brush, bushes, and small trees along roadsides and fence-rows between fields.

Local Haunts.—Suitable localities throughout the Region. Fence-row growth between Pease estate, Windsor road, and I. & G. N. railroad track; mesquite and elm hillsides in western Austin, particularly southern exposure slopes in area bounded by Sixth, Baylor, Ninth, and Blanco streets.

General Habits.—Occurs singly and in loose companies, in migration waves, southward just ahead of the northers in fall, northward in spring with the periodic appearance of bits of spring weather between cool spells south of the Region. Small, shy, very nervous, and restless.

Feeding Habits.—Gleans insects and their eggs and larvae from the twigs and leaves of bushes and the smaller trees, which it searches from the lower parts to the tops, clinging nimbly to small twigs; rarely, tips of tall trees.

Voice.—Song, lively, pleasing, frequently almost a rolling twitter; commonly two variations, the first softer and more of a whistle than the second: (1) *ke-tse, ke-tse, ke-tse, ke-tsepe chip,* or *ke-tsee, ke-tsee, ke-tsee, chip-ee-chip-ee-chip-ee-chip;* and (2) *k-chip, k-chip, k-chip, che-che-che-che,* sometimes rendered a thin *te-dum, te-dum, te-dum, te-dum, te-did-dle-te-dee!,* varying toward a lazy *ker-chip-chip-chip-cherr-wee-e-e,* ending in a short trill. A lively chippering now and then. Call, a characteristic, very small, sharp, dry, metallic *chip.*

Description.—Upper-parts, wings, and tail, olive-greenish, brighter on rump. Head ashy gray, with chestnut-crown-patch only partially concealed by grayish; conspicuous narrow white eye-ring. Throat, breast, and bend of wing, light yellow; lower belly whitish. Female, duller, paler; crown-patch smaller, frequently wanting. In fall, crown browner, breast tinged with brownish. L. 4.80. W. 2.35. T. 1.80. B. .36 (from N. .28).

Subspecific Characters.—Duller than its western relative, the Calaveras Warbler, *H. r. gutturalis* (Ridgway), of the high mountains from southwestern Canada and Idaho to northern California, migrating through western Texas, a form having brighter, more *yellowish* olive-green rump and greater wing-coverts, brighter yellow throat and breast, and more white on lower belly.

Field Marks.—*Gray head,* with *partially concealed chestnut crown-patch.* Bright yellow under-parts and throat. Inconspicuously colored, with no white patches or bars in wings or tail. *Dark gray sides of throat and head in sharp contrast to yellow throat.* Whitish eye-ring.

Popular Names.—Brown-capped Warbler; Birch Warbler; Eastern Nashville Warbler.

Remarks.—Wilson, who described this species, found three specimens near Nashville, Tennessee; almost unknown for a long time after, it has since grown more common in other sections.

ORANGE-CROWNED WARBLER

Vermivora celata celata (Say)

Uncommon migrant, and possibly rare in mild winters. In migrations, last week in March to first week in May, commonest between April 5 and 15; and late August to early November. March 28, 1919 (A); April 5 to 15, 1920, present and not uncommon (A); May 6, 1905, 1 shot (B); in fall, August 28, 1921 (A), and November 10, 1921 (A). *Recorded:* AB.

Geographical Distribution.—Central North America, from eastern Alaska southeastward into middle-eastern Canada, rarely in the New England States, and southward along the Rocky Mountains to New Mexico. In migrations, rare on the Atlantic slope from New Hampshire southward. Winters from South Carolina, the Gulf States, and south-central Texas (Kerr County) southward into Mexico.

Habitat.—Densely foliaged live oaks, and less commonly the water oaks and elms, in woodlands, groves, dooryards, and along quieter streets; larger, greener shade-trees in town; mountain rock cedars in cedar brakes.

Local Haunts.—City shade trees, vacant lots, the University campus, and cedar brakes in the hills; vacant lot at Baylor and Seventh streets.

General Habits.—Passes through the tree-tops in small composite troupes with other warblers; and hunts among the cedars with loose companies of Texas Plumbeous Chickadees, Sennett Black-crested Titmice, and Ruby-crowned and Golden-crowned Kinglets. Dainty and airy, continually stretching and darting.

Feeding Habits.—Searches for leaf-worms, and for tiny leaf and twig insects and their eggs and larvae.

Voice.—Song, a full, strong, moderately low-pitched, sweet, trilling *chee chee chee chw' chw',* rising and ending abruptly. Call, a sharp, characteristic *chip,* easily recognized after it has been heard several times; or, a sharp, persistent, repeated chippering, accompanied by restless moving of wings after the manner of a kinglet.

Description.—Head, back, and tail greenish olive-brown or plain, dull, dusky olive-greenish; tinged with grayish, especially on head, with paler yellowish stripe over eye to bill, dusky line through eye, and very obscure yellow eye-ring. Wing with grayish wing-bars and with bend yellow. Under-parts dull greenish-yellow, darker on breast, and obscurely streaked on throat and breast with dusky. Half-concealed, large, rich, brownish-orange or pale-chestnut-tinted orange crown-patch, color on base of feathers; more intense in male; concealed by grayish-olive feather-tips in winter, tips worn away in summer and basal color not absolutely concealed. Female, duller, with smaller crown-patch. In fall, both sexes duskier. L. 5. W. 2.40. T. 1.92. B. .40 (from N. .31).

Subspecific Characters.—Grayish olive-green upper-parts and pale olive-yellowish under-parts distinguish this form from the bright olive-green upper-parts and bright canary to olive-yellow under-parts of the more western Lutescent Warbler, *V. c. lutescens* (Ridgway), ranging from Alaska to Nevada and southern California, migrating along the

Rocky Mountains; and the Dusky Warbler, *V. c. sordida* (C. H. Townsend), of Santa Barbara Islands, California. It is smaller than the Rocky Mountain Orange-crowned Warbler, *V. c. orestera* Oberholser, and is much less yellowish above and below, the Rocky Mountain form standing midway in color between, but being decidedly larger than either this or the Lutescent race.

Field Marks.—Larger than the kinglets, with dull yellowish under-parts. No wing-bars. *Obscure* eye-ring distinguishes it from Ruby-crowned Kinglet, absence of definite head markings from Golden-crowned Kinglet. Obscurely streaked, dusky greenish-yellow under-parts distinguishes it from the rather similar Nashville Warbler.

Popular Names.—Eastern Orange-crowned Warbler; Eastern Orange-crown.

WESTERN PARULA WARBLER

Compsothlypis americana ramalinae[232] Ridgway

Uncommon migrant and very rare summer resident; middle March to middle October. Spring arrivals, March 13, 1890 (D)[233]; March 15, 1921 (A); March 18, 1893 (C); March 18, 1919 (A); March 19, 1915 (A); summer birds located, April 7, 1905, 4 singing and 2 shot (B), and May 8, 1905, tolerably common (B). Latest in fall, October 13, 1919 (A); October 17, 1921 (A). *Recorded:* ABCDEH[234]IN.

Geographical Distribution.—Middle United States, along the Mississippi Valley, from Michigan and Minnesota southward to Mississippi, Lousiana, and Texas; in Texas to Houston and Austin, and in a long narrow strip from there through Comal to Kerr Counties. Winters in Mexico and Central America.

Habitat.—Moist, humid localities and wet, swampy places, usually in deciduous, boggy woodlands over water or in mixed oak, elm, and old cedar on nearby slopes; always, however, only where the spreading, stunted trees are veiled with long, hanging, pale green tufts of *Usnea* or old-man's-beard moss, or where those and the gray Spanish moss or pendulous *Ramalina* lichens abound. Moist wooded river and creek bottoms. In migrations, deciduous shade-trees and ornamental trees of street and dooryard, and deciduous trees along rivers and creeks. Near the coast, found in mixed lowland bottom woods and in soft cypress swamps.

Local Haunts.—Williamson Creek bottoms, just above Manchaca road-crossing, where cedar elm and mountain rock cedar trees are more or less thickly hung with pale green *Usnea* or old-man's beard moss; also on wooded slopes edging the flattened, marshy, tree-grown bottom. Tall trees in creek bottom at Oatmanville. Top of bluff on north bank of Colorado River at eastern edge of the Region. Rather generally distributed during migrations, but distribution very limited and local in summer.

General Habits.—Observed singly and in pairs, except during summer, when the birds nest in rather loose communities due to restriction of their habitat. An exceedingly small, delicate, dainty, nervous little warbler; during migrations, more active and noisy on drizzly days. Occasionally found migrating in loose companies with other warblers. The restriction of its favorite *Usnea* moss-lichen to comparatively limited areas makes the bird seem very, very rare in summer, and also induces as many as a half dozen pairs to nest near one another, so that the species appears to be colonial in its favorite drowsy wooded swamps heavily fragrant with tropical and subtropical flowers.

Feeding Habits.—Moves about bushes, and from lowest limbs to the tops of the tallest trees, usually in the tree-tops, quietly searching for insects and their eggs and larvae; has a chickadee-like habit of feeding while hanging back downward.

Breeding.—Probably. Middle of April to the end of May.

Nest Location.—6 to 40, usually 15, feet from ground, placed in long, free-hanging beard of pale-green lichen-moss *(Usnea longissina* or *U. floridana)*, or in hanging streamers of Spanish moss, in cedars, cedar elms, or oaks in wooded, swampy river and creek bottoms or on nearby slopes; rarely placed in bunches of dead leaves or other rubbish caught in hanging branches during rise of waters.

Nest Construction.—Hanging, with entrance on side; composed almost entirely of Spanish moss or pale green lichen-moss, the bottoms of which are gathered, tucked up, and woven together; scantily lined inside with some plant down, thistle down, and a few grasses, rootlets, and animal hairs.

Nest Measurements.—Outside, diameter 2.75, height 2.87. Inside, diameter 1.50, depth 2.12.

Eggs.—3 to 5, usually 4, somewhat glossy, white to creamy-white, with a wreath of coarse, well-defined markings of reddish-brown, chestnut, and grayish tints about the larger end; .67×.48.

Voice.—Song, two variations, the commonest a fine, hissing, quavering, sibilant, weak, insect-like trill, *per-r-r-r-r-r-r-r-r-s-s-s-s-s-s-e-e-e-e-e-e-tt;* sometimes uttered as *chi-ir-r-r-r-r-r-r-r-r-ee-cheet* or *whu-hu-hu-hui-hui-he-e-e-e-e-e-e-e-e,* as though uttered through the teeth, generally beginning low, gradually rising in tone and pitch, and ending very emphatically. The second variation is more commonly heard in summer in southeastern Texas, rarely in central Texas; a quaint, thin, fine, drowsy, sleepy little sizzling *pe-tse, pe-tse, pe-tse, pe-see-see,* or *chip-er, chip-er, chip-er, chee-ee-ee-ee,* the first three couplets or double notes rather slow but growing louder, the last notes occasionally lower and slower, usually a higher, more rapid warble-trill. Sings during spring, less commonly during summer, from the tops of the tallest forest trees.

Description.—Upper-parts and sides of head bluish to bluish-gray, with triangular center of back yellowish or greenish-yellow. Eye to bill blackish; broken narrow white eye-ring, partly formed by white eyelid. Throat and breast clear yellowish, belly whitish; narrow, conspicuous, but delicate band across breast, brownish centered with bluish-black. Two conspicuous white wing-bars; small concealed white spots near corners of tail. Female duller; breast-band narrower, of lighter brown, lacking black. In fall, more greenish above, breast-band more obscure. L. 4.75. W. 2.30. T. 1.65. B. .38 (from N. .32).

Subspecific Characters.—Coloration similar to that of the comparatively large Northern Parula Warbler, *C. a. usneae* Brewster, of southeastern Canada and northeastern United States east of the Alleghenies south to interior Virginia; thus darker, richer, more intense coloration than the smaller, pale Southeastern Parula Warbler, *C. a. americana* (Linnæus), ranging from southeastern Illinois to Georgia and Alabama and from the coast of Maryland to Florida. Smaller (Male, W. 2.26, T. 1.61. Exp. C. .39; female, W. 1.98, T. 1.52, Exp. C. .39) than either the similarly richly-colored Northeastern Parula Warbler (Male, W. 2.39. T. 1.67, Exp. C. .39; female, W. 2.24, T. 1.58, Exp. C. .39) or the duller, larger-billed Southeastern Parula Warbler (Male, W. 2.30, T. 1.67, Exp. C. .42; female, W. 2.15, T. 1.56, Exp. C. .40), the male of which lacks the distinct dusky chest-band and conspicuous intermixed chestnut across breast, found in both the first two subspecies (Northeastern and Western Parula Warblers).

Field Marks.—Tiny size. Yellow back and throat. *Conspicuous narrow brownish chest-band.* Bluish color above. Two conspicuous white wing-bars.

Popular Names.—Yellow-backed Blue Warbler; Blue Yellow-backed Warbler.

Remarks.—Named *ramalinae* from a genus of crustaceous, pendulous lichens, very abundant in bottomland forests of the Mississippi Valley, and frequently even more abundant in favorite haunts of the Western Parula Warbler than *Usnea lichen-moss.* Numbers are killed during northers and storms in migration by striking the city light-towers in Austin.

YELLOW WARBLER

Dendroica aestiva aestiva[235] (Gmelin)

Tolerably common migrant, more common in spring than in fall; middle April to middle May, and early August to early October. In spring, earliest, April 7, 1921 (A); April 8, 1919 (A); April 10, 1912, 1 shot (B); April 11, 1907, 3 collected (X); April 12, 1920 (A); April 16, 1893 (C)[236]; April 18, 1915, 9 (A); latest, May 16, 1921 (A); May 14, 1920 (A); May 14, 1922, 4 (Wolfe); May 7, 1907, 1 shot (B); May 5, 1905, 5 shot, May 7, 1905, 1 shot (B); May 3, 1914 (G). In fall, earliest, July 24, 1921, 3 (A); August 22, 1915 (H); September 10, 1916, 2, and September 14, 1916, 5 (F); latest, October 7, 1921 (A); October 4, 1920 (A). *Recorded:* ABCDEFGHJLNPWX.

Geographical Distribution.—Eastern North America, from limit of trees in the Far North[235] southward to South Carolina, southern Missouri, northern New Mexico, and Nevada; west to eastern Alaska and the middle West (not including the Pacific Coast). Winters from southern Mexico to northern South America.

Habitat.—Close-growing willows skirting rivers and creeks in bottomlands; chaparral; mesquites on hillsides; elm shade trees in town; orchards, gardens, and parks; open or brushy woodlands and the edges of woods; fencerow trees and bushes along roadsides and between fields in open farming country; bushy brooksides.

Local Haunts.—Great trees and thickets of black willow along Deep Eddy and skirting the Colorado River at Austin; mesquite growth on flood plains of the Colorado, from Barton Creek down-stream; campus of the University; Barton Springs; Shoal Creek valley; shade trees on vacant lots and along quieter streets in Austin.

General Habits.—Quiet warblers observed singly and in pairs. Moves slowly, leisurely about among heavily-foliaged branches of the tree-tops. More active and noisy on drizzly days during the migrations.

Feeding Habits.—Gleans insects and their eggs and larvae from foliage; feeds along the edges of cotton fields in August and September, where it occasionally eats the cotton boll-weevil.

Voice.—Song, a loud, smooth, simple, pleasing, happy, lively, whistled *sweet sweet sweet sweet sweeter sweeter,* uttered with a descending intonation as the bird moves about among the foliage of the tree-tops; varies from *wechee, chee, chee, chur-wee* or *che-wee, che-wee, chewee* to *tsweet, tsweet, tsweet-tsee-tsee-tsee-tsee-tsee-tsee.* Call, *dzt* or a soft *chip.*

Description.—Entirely bright canary-colored or lemon-yellow, brighter on crown, the yellow dulled above with a very slight tinge of pale olive-greenish; darker on wings. Lightly but conspicuously streaked on breast and sides with chestnut or reddish-brown. Female, duller to grayish-yellow above, brighter below, on rump, and across wings in two yellowish wing-bars; no chestnut streaking below. L. 5.10. W. 2.50. T. 1.80. B. .40 (from N. .33).

Subspecific Characters.—This form of the eastern and middle parts of North America is distinguished from the Pacific Coast races by the more decidedly olive-greenish, less *yellowish olive-green,* upper-parts; less yellow upper tail-coverts; and broader chestnut streaks on breast and flanks, in the male.

Field Marks.—Completely bright lemon-yellow; no white anywhere. Slender bill. *Chestnut-streaked breast.* Song. Any individual, even

an obscurely marked olive young female, possesses typical *yellow tail-patches*, inner webs of nearly all tail-feathers being yellow.

Popular Names.—Summer Warbler; Slender-billed Wild Canary; Summer Yellow-bird; Golden Warbler; Wild Canary; Blue-eyed Yellow Warbler.

Remarks.—Many are picked up dead under the city light-towers of Austin following night storms during migrations.

BLACK-THROATED BLUE WARBLER

Dendroica caerulescens caerulescens (Gmelin)

Very rare and irregular migrant; third week in April to middle May, and third week in September to middle October. Spring, earliest, April 17, 1921 (A); latest, May 16, 1915 (AB). Fall, earliest, September 20, 1914 (A). *Recorded:* ABD.

Geographical Distribution.—Eastern North America east of the Mississippi River, from middle Canada south through northeastern United States to Connecticut, Pennsylvania, Michigan, and central Minnesota. In migrations, casually west to North Dakota, Colorado, and New Mexico. Winters from southern Florida through the West Indies, and casually through Central America into extreme northern South America.

Habitat.—Open mixed woodlands; dense, heavier undergrowth in dry deciduous woods or deep moist woods; bushes and small trees in elm, mesquite and cedar pasturelands; occasionally shade trees in quieter city residential sections.

Local Haunts.—Suitable localities west to the hills; pasturelands southwest of Austin, along the Oak Hill and Manchaca roadsides; occasionally shade trees in town.

General Habits.—Observed singly. Deliberate, but quite restless and difficult to observe, yet not shy. Flits about in bushes and the lower limbs of trees; rarely found in the higher parts of trees.

Feeding Habits.—Feeds on insects and their eggs and larvae, as do many other warblers.

Voice.—Song, considerable variation; usually a harsh, deliberate, husky, beaded, penetrating *we we z-z-z-z-z-z;* a plaintive, monotonous, insect-like *zwee-zwee-zwee-e,* uttered with an upward slide; an emphatic but languid *wher weeeee,* the last note of the two being slightly lower; a quick, weak, low-toned, insect-like, grating *bzzz, bzzz, bzzz, bzzz;* occasionally sounding *te zwee zwee zwee-e-e-e-e or twe twe twe z-z-z-z-z-z-z,* beginning faintly, but gathering force and growing louder as it progresses on an ascending scale, until a high, shrill end is reached; ranging to *hi-hi-hi-hi-hi-hi-hi, wheeee,* the first notes short and hurried, the last note high-pitched and long-drawn. Song uttered quite frequently during spring. Call, a sharp, recognizable *chip.*

Description.—Deep rich grayish-blue above. Black cheeks, throat, sides, and occasionally back and parts of tail-coverts. Wings and tail blackish, edged with blue; characteristic large white patch in wing, on bases of second to eighth primaries; and large white patches in corners of spread tail. Middle breast and belly white. Female, dull-colored, brownish to dusky olive-green with faint tinge of bluish; pale dull yellow on middle belly; pale stripe on side of head above eye. In fall, males slightly paler, with less intense colors; same markings as in spring, but upper-parts somewhat greenish edged, as in young males. L. 5.30. W. 2.50. T. 2. B. .35 (from N. .29).

Field Marks.—Clear and sharp black, white, and deep-blue colors in male, which has *black throat and deep blue back. Prominent white spot on wing* at base of primaries. Carries wings and tail partly spread, showing characteristic flashing white moons in wings and corners to tail. In hand, any plumage, bluish tone of tail-feathers.

Popular Names.—Black-throated Blue-backed Warbler; Northern Black-throated Blue Warbler; Black-throat Warbler.

HOOVER'S WARBLER

Dendroica coronata hooveri[237] McGregor

Common winter resident, third week in October to late April; commonest from last of November to late March, northward migration beginning with the breaking of winter in late February and being well under way by middle March. Earliest: October 16, 1921 (A); October 19, 1920 (A); October 22, 1916, 10 (G); seasonal records, December 25, 1916, 160 (F); January 5, 1913, 3 shot (B); February 10, 1907, numerous (S); February 25, 1905, 3 shot (B). Latest: April 18, 1915, 7 (A); April 26, 1920 (A); April 30, 1921, 2 (A). *Recorded:* ABCDEFGHJKLMNPSW.

Geographical Distribution.—Western North America, breeding in Alaska and western Canada. Winters in Mexico and southwestern United States, north to California, New Mexico, and Texas.

Habitat.—City shade trees and shrubbery of dooryards; growth of bushes and small trees on vacant city lots; open deciduous or mixed cedar and elm woodlands along rivers and creeks and in upland pastures; cut-over woodlands and bushy second-growths; stubby, scrubby growths in old fields and pastures; mixed timber or bois-d'arc hedgerows, and Cherokee-rose tangles on roadsides.

Local Haunts.—Found throughout the Austin Region. Most commonly, shade trees and shrubbery of streets, parks, gardens, and dooryards in Austin; campus of the University; oak second-growth and saplings on northeastern edge of town; Wheeler's Grove and East Woods; mixed oak and cedar pasturelands between Austin and the Dam; borders of Lake Austin, Deep Eddy, and the lower part of Barton Creek; cypress trees along the river bank above Barton Creek.

General Habits.—Occurs usually in small, loose, irregular companies or troupes; rarely singly or in pairs. Very active, strong, and hardy. Darts out into space now and then, returning to its perch with a flirt of its tail as it utters its characteristic call-note.

Migration.—Travels leisurely. In fall, moves southward ten days or two weeks ahead of the Audubon Warbler, which associates with it during winter and spring. Observed commonly migrating northward during last week in March; and common along roadside fences on April 4, 1915 (A).

Feeding Habits.—Trim, graceful, and nimble in its hunt for insects, from the tree-tops down to the bushes and even on the ground. Hops about on moist ground and along edges of rain puddles, picking up minute insects washed down by the rain. Scours shade trees and the edges of clearings in loose troupes; sometimes the woodlands seem filled with diligent individuals, gleaning insect eggs and larvae, particularly from the cedars, elms, and oaks. Quite partial to bayberry or myrtle (*Myrica*) bushes, whence its name; the abundance of such berries usually foretell the abundance of Myrtle Warblers.

Voice.—Song, a thin, wiry, very high-pitched, twittering, broken, monotonous trill: *tswe, tswe, tswe, tswe, tswe, tswe,* quite sweet, but of a rather low, erratic character; first heard in spring about March 1. Call, a soft but loud, characteristic, staccato *tchep, tchip,* or *tchuck;* a deep-toned *psit;* or a sharp *chip,* deeper than that of other warblers; uttered with a flirt of the tail. In flight, *sweet,* with a rising inflection.

Description.—Plainly marked above and on breast and sides with bluish olive-gray, streaked with black and marked with white. Eye to bill black; eyelid and line over eye white, latter frequently interrupted

in front of eye. Throat white; yellow patches on sides of breast; rump bright yellow; yellow center to crown, rarely seen except in spring, beginning in March, when the bird molts and summer plumage is assumed by early April. White corners to tail (on three outer feathers) stand out in relief against dark plumage. Two white wing-bars. Female, more brownish; lighter streaked on breast. In fall, male less bright, more brownish. L. 5.65. W. 2.95. T. 2.22. B. .39 (from N. .32). Female smaller, W. 2.80, T. 2.20. Measurements usually greater than those given.

Subspecific Characters.—Similar to the Eastern Myrtle Warbler, *D. c. coronata* (Linnæus), of eastern North America, but with longer wings and tail—in eastern form, male, W. 2.87, T. 2.17, B. .36; female, W. 2.72—in both sexes, paler yellow rump in male, and lighter yellow rump and more grayish (less rufescent-brownish) in female; immature birds are usually darker, duller, less rufescent-brown above than similar plumages of the eastern bird. Many systematic ornithologists contend that the characters are not sufficient to distinguish the western from the eastern race, and too small and inconstant to warrant acceptance of the western race.

Field Marks.—Four distinct yellow spots or patches: (1) crown, (2) rump, and (3 and 4) one on each side of breast, latter sometimes obscure on young, brownish-backed females. *Conspicuous yellow rump, white rump*, and two white wing-bars. *White corners to tail* (on only two or three feathers on each side) as it flits back and forth. The white throat distinguishes it from the Audubon Warbler, which has a yellow throat and larger white corners to tail.

Popular Names.—Myrtle Bird; Yellow-rumped Warbler; Yellow-crowned Warbler; Winter Warbler; Yellow-rump; White-throated Yellow-rump; Hoover's Warbler.

Remarks.—Named in honor of Theodore J. Hoover of California, who collected the type specimens from which the race was described. Many are killed by striking the city light-towers in Austin during fall, winter and spring storms.

ROCKY MOUNTAIN AUDUBON WARBLER

Dendroica auduboni memorabilis[233] Oberholser

Very rare winter visitor, second week in October to end of March. Earliest: October 11, 1920 (A); January 14, 1905, 1 shot (B). *Recorded:* AB.

Geographical Distribution.—Interior western North America, from Saskatchewan and Alberta in southern Canada southward to southeastern New Mexico and northern Arizona, South Dakota, western Nebraska, and the Guadalupe Mountains of far-western Texas. Winters from the Rio Grande and central Texas southward to Central America.

Habitat.—Wooded pasturelands and slopes; tops of sycamore trees; open plains; orchards in valleys; shade and ornamental trees in town, about dooryards and along quieter streets. In the West, breeds in higher altitudes, moving down to the lowlands in winter.

Local Haunts.—Residential portions of Austin, particularly the hilly, southwestern part of the city; University campus.

General Habits.—Occurs by ones and twos in small, loose flocks or companies of the Western Myrtle Warbler numbering usually from 10 to 30, from which bird it is almost impossible to distinguish the present species except in the hand. In winter, a dull streaked bird, with markings faded and almost obsolete; in spring, brilliant, handsome in yellow-pointed plumage. Really a Myrtle Warbler of the West in appearance and pre-occupied habits. -

Feeding Habits.—Incessantly hunting, flying and darting back and forth erratically, snapping up insects, particularly gnats; or searching about the foliage and twigs of trees for insect eggs and their larvae or feeding on wild berries.

Voice.—Song, of the strong-songed warbler type; a short, feeble, but pleasing little warble, *chwee, chwee-chwee-ah, chwee*, opening toward the end. Call, a nervous *quip*, or the same characteristic *tchip* of its cousin, the Western Myrtle Warbler.

Description.—Upper-parts and cheeks, bluish-gray, streaked with black. Wings and tail black, edged with gray; large white patch on wing of male; white patch near each corner of the blackish tail (white on outer 4 or 5 feathers on each side). Crown, rump, throat, and spots on each side of breast, yellow. Breast blackish edged with gray; belly and flanks white, latter streaked with black. White spot on eyelid and white spot below eye, making broken white eye-ring. Female, rump paler, crown-patch and breast blacker. In fall and winter, male, grayish-brown above, indistinctly streaked; rump and tail unchanged; throat more buff, and crown patch partly concealed; yellow tuft on each side of breast. L. 5.70. W. 3. T. 2.30. B. .40.

Field Marks.—Similar to Myrtle Warbler, but *throat-patch bright yellow* (paler in fall and winter) instead of white; space between eye and bill even bluish-ash instead of clear white line on black; *four or five outer feathers on each side*, instead of only two or three, *marked* on inner webs with *white*.

Popular Names.—Yellow-throated Gray Warbler; Northern Audubon Warbler; Gray-browed Audubon Warbler; Audubon Warbler.

MAGNOLIA WARBLER

Dendroica magnolia (Wilson)

Rather scarce and irregular migrant, occasionally common in spring; last of April to third week in May, and middle September to third week in October. Fairly common in spring of 1905. 2 specimens collected May 5, 1 May 6 (B). Spring, earliest, April 21, 1919 (A); April 27, 1921 (A); latest, May 17, 1921 (A). Fall, earliest, September 13, 1916, 4 (FG), and September 14, 1916, 1 (F); latest, October 18, 1920 (A). *Recorded:* ABFG.

Geographical Distribution.—Eastern Canada and northeastern United States, southward to Massachusetts, northern Michigan, and Minnesota, and in the Allegheny Mountains south to Maryland and West Virginia; west to the Plains. In migrations, west to the eastern base of the Rocky Mountains. Winters from southern Mexico southward across Central America.

Habitat.—Willows and thickets along water courses; mesquite flats, particularly on vacant lots in town; scrub oak, mesquite-clad, and brushy hillsides and valleys; slopes overlooking streams; rarely shade trees in town.

Local Haunts.—East Woods; Shoal Creek valley; hilly slopes in western part of Austin, bounded by Sixth, Baylor, Ninth, and Blanco streets; mesquites on flood plains of the Colorado River below mouth of Barton Creek, particularly on south bank.

General Habits.—Usually observed by ones and twos, rarely in small loose companies or composite troupes. Very active, quick, and fidgety, fluttering considerably, spreading tail and showing broad basal band of white. During fall it commonly moves southward just ahead of a norther; in spring, usually observed on clear mornings just after sunrise, when trees and ground are still clad with dew, sparkling like tiny jewels in the sunlight.

Feeding Habits.—Searches from lower branches to the tops of the lower trees, snapping about after insects in newly-foliaged mesquites in flats and on the open, brushy slopes.

Voice.—Song, varying considerably, but full-voiced, double-syllabled, and softly-whistled; *whee-cho, whee-cho, whee-cho, whee-cho;* or *witchi, witchi, witchi, tit, witchi-tit, witchi-tit, witchi-tit,* first four deliberate and even, last three couplets hurried and higher-pitched; *wee-er, wee-er, wee-eer-eet;* less commonly, *weeto weeto weeeetee-eet,* or *witti witti wet weetee weetee wur;* occasionally, *ter-whiz wee-it.* Call, a characteristic, slightly metallic *'tlep, 'tlep,* and a less characteristic *chip.*

Description.—Crown and nape light bluish-gray; forehead, ear-patches and patch on back, black; rump yellow. White line over and behind eye; lower part of eye-ring white. Below, bright yellow, on throat, breast, and belly; breast and sides heavily streaked with black, streaks forming a conspicuous black band across chest. Conspicuous white patch in wing. Inner webs of tail-feathers marked white, forming partially concealed white bar across middle third of tail, slightly nearer base than tip; from below, tail appears white, broadly tipped with black. Female, paler; black replaced largely by grays and olive-grays; less clear white in wings. In fall and winter, crown and nape brownish, back more olive-green; two white wing-bars and whitish eye-ring; dusky band across yellow breast, streaks of black on sides. L. 5.10. W. 2.28. T. 1.90. B. .35 (from N. .30).

Field Marks.—Characteristic tail-pattern: *broad black terminal band with broad white subterminal band.* Rump yellow. Conspicuous *white patch in wing.* Brilliant black, yellow, and white colors. Yellow rump and white base or middle bar to broadly black-tipped tail appear quite different from the white-cornered tail seen in the flight of the Myrtle Warbler.

Popular Names.—Black and Yellow Warbler; Gray-crowned Yellow-rump; Spruce Warbler; Yellow-breasted Yellow-rump.

CERULEAN WARBLER

Dendroica cerulea (Wilson)

Very rare migrant; probably second and third weeks in April, and late July to end of September. Recorded: April 13, 1919 (A); July 20, 1919, 7 (A); September 27, 1921 (A). *Recorded:* A.

Geographical Distribution.—Southern edge of eastern Canada, southward across eastern United States to the mountains of Virginia and Tennessee, rarely to central Alabama, Louisiana, and northeastern Texas (Texarkana); east to the Alleghenies and the western parts of the Atlantic Coast States, west nearly to the Plains, to southeastern Nebraska and northeastern Texas. Winters in western South America.

Habitat.—Tops of the tallest forest trees; sycamores; rich mixed oak and hickory woods; river valleys and hillsides.

Local Haunts.—Shoal Creek valley; lower part of Barton Creek valley, near mouth; rarely, tall shade trees in town; East Woods.

General Habits.—Usually observed singly, rarely in small scattered companies. Flits about in the topmost branches of woodland trees, carrying tail high, and quite resembling the Chestnut-sided Warbler in its actions.

Migration.—Shuns the West Indies and the South Atlantic States, entering the United States in the Mississippi Valley on its way north from Central America.

Feeding Habits.—Gleans insects and their eggs and larvae from the foliage of tree-tops.

Voice.—Song, quite similar to the common one of the Parula Warbler, but louder and not so delicate of rendition: several single syllables uttered in a measured tone, followed by a trill, *tse, tse, tse, tse, tc-e-e-e-e-e-e-e-e-e-e-e-e,* rolling easily, quietly up the scale, occasionally closing with *tse-e-e-e-e-eep;* also rendered *zee, zee, zee, zee-ee-ee-eep;* rarely, a soft *burr-r-r-r.* Call, a *tchep,* quite like that of the Myrtle Warbler; also, a lisp.

Description.—Upper-parts and cheeks, bright cerulean-blue to light gray-blue, crown bordered by two blackish stripes, and back streaked with black. Wings, black edged with grayish-blue, with two broad white wing-bars; tail, black edged grayish-blue, with white spots or patches near tip. Under-parts white, with extremely narrow bluish-black or grayish-blue band across breast and streaks of grayish-blue on sides. Female, washed all over with grayish and greenish-yellow, with bluish tinges above and in tail; under-parts very pale yellowish; blackish line through and distinct light whitish or yellowish line over eye. In fall, male, more highly colored; incomplete breast-band. Young, more olive-green and yellowish-tinged. L. 4.50. W. 2.45. T. 1.70. B. .40 (from N. .31).

Field Marks.—Sky-blue above. White below, with blue breast-band. *Two broad* white wing-bars; white in tail, across near end. Duller female and young, identified by yellowish-white or *whitish line over eye.*

Popular Names.—Blue Warbler; Azure Warbler; Sky Warbler.

CHESTNUT-SIDED WARBLER

Dendroica pensylvanica (Linnæus)

Uncommon migrant; third week in April to middle May, and early September to first week in October. Spring, earliest, April 17, 1920 (A); latest, May 17, 1915 (A). Fall, September 2, 1921 (A); October 6, 1920 (A). *Recorded:* AB.

Geographical Distribution.—Eastern Canada, and northeastern United States south to northern parts of New Jersey and Ohio and eastern Nebraska, and south in the Allegheny Mountains to South Carolina and Tennessee; west to the Plains. Winters in Central America.

Habitat.—Brushy borders of woods; underbrush in open woods; higher parts of woodland trees; shade trees along quieter streets, and in dooryards.

Local Haunts.—Pease pastures; Shoal Creek valley; shade trees in Austin; campus of the University.

General Habits.—Occurs in scattered composite companies or troupes with other warblers, and frequently associates with the Plumbeous Chickadee. Restless, flitting from branch to branch, wings drooping and tail slightly raised. Usually sticks to the bushes and from lower limbs to tops of the smaller deciduous trees.

Migration.—Migrates through eastern Mexico; and, northward, occurs from northwestern Florida to Central Texas.

Voice.—Song, loud, frequently uttered; two variations, one quite similar to that of the Yellow Warbler, a whistled *wee-see, wee-see, wee-see, wee-chew,* or *te te te te meet you;* the other, *wee-chew, tit-a-wit-a-wit-a-wit-a-we chew;* next to last syllable, particularly of first variation, higher than other syllables.

Description.—Upper-parts greenish-yellow to olive-green, streaked with blackish; nape grayish. Forehead white, crown bright yellow. Under-parts white or whitish; broad band of chestnut along sides and flanks. Tail grayish-black, with partly concealed white corners. Distinct yellowish-white wing-bars fused somewhat to form whitish wing-patch. White patch on side of neck. Peculiar blackish, V-shaped mark prominent on side of head, point of V forward at base of bill, one arm back to black ear-patch and one running back along neck to chestnut of side. Female, duller, browner, less conspicuously marked with black

and chestnut. Young, upper-parts bright greenish-yellow; eye-ring white; wing-bars yellow; under-parts and cheeks grayish. In fall, male, bright yellowish olive-green; only a few spots and patches of chestnut on sides; sides of head gray, eye-ring white; otherwise similar to spring male. L. 5.15. W. 2.50. T. 2. B. .35 (from N. .29).

Field Marks.—Trim appearance. Deep chestnut in broad smear along sides and flanks. Yellowish wing-bars. *Bright yellow crown*, bordered with black. *Black < on side of head, inclosing large white patch.*

Popular Names.—Yellow-crowned Warbler.

BAY-BREASTED WARBLER

Dendroica castanea (Wilson)

Very rare migrant; first two weeks in May, and early September to early October. Spring, May 7, 1916, 4 (G); May 14, 1917 (B). Fall, September 27, 1921, 3 (A); October 6, 1921 (A). *Recorded:* ABG.

Geographical Distribution.—Eastern half of Canada, south to northern border of the United States, into northern Maine and the New Hampshire mountains. In migrations, west casually to Montana, South Dakota, and Texas. Winters in Panama and northern South America.

Habitat.—Tree-tops, less commonly brush. Open deciduous woodlands, particularly cedar elms and the mixed post oak and blackjack woods on upland rises and gravelly terraces.

Local Haunts.—City shade elms on lawns in Austin, particularly well-kept hillside lawns in the western-southwestern part of the city; upland gravel terrace oaks in and about the city; Zilker's pastures and edges of nearby hills.

General Habits.—This rather large warbler, adorned with dusky, moves about usually singly, less commonly in small companies, in the tops of deciduous trees.

Migration.—In spring, moves straight northward in flight from Central America to the lower end of the Mississippi Valley, west to the coast country of eastern Texas and nearly to central Texas, where it is rare.

Feeding Habits.—Quite active in hunting insects of the tree-tops.

Voice.—Song, a loud, liquid, almost inarticulate *tse-chee tse-chee tse-chee tse-chee*, quite similar to, but stronger and louder than, the song of the Blackburnian Warbler. Sings at daybreak as it moves about the tree-tops.

Description.—Crown, throat, upper breast, and sides, rich chestnut-brown. Face, forehead, and sides of head, black. Back, rump, wings, and tail, grayish streaked with blackish; white patches on under side of tail; two wing-bars and under-parts whitish or buffy-white. Large, light cream-buff patch on side of neck. Female, grayer, less blackish, indistinctly marked, with faint washes or patches replacing solid chestnut marks; black mixed in with chestnut of crown. In fall, male, more olive-greenish above and yellowish on wings; whitish below, with yellowish on throat, buffy on breast, and chestnut-brown on sides. L. 5.65. W. 2.90. T. 2.10. B. .40 (from N. .30).

Field Marks.—Black face. *Big bright-buffy spot at side base of neck.* Rich chestnut crown, throat, and breast. In fall, much resemble Black-poll Warblers, but more or less chestnut on sides; and young tinged below with buffy (instead of yellow, as in the young Black-poll).

BLACKBURNIAN WARBLER

Dendroica fusca (Müller)

Rare migrant; April to middle May, and second week in September to middle October. Spring, April 10, 1915 (A); April 4, 1919 (A); April 11, 1921 (A); May 14, 1917 (B). Fall, September 14, 1914 (A); October 2, 1920 (A); October 16, 1921 (A). *Recorded:* ABD.

Geographical Distribution.—Eastern Canada, south into northeastern United States as far as Connecticut, Michigan, Wisconsin, and Minnesota, and in the Allegheny Mountains to Georgia and South Carolina; west to the Plains. In migrations, casually west to Utah and New Mexico. Winters in northern South America, less commonly in Central America.

Habitat.—Deep primeval forests; high above the ground in big trees; mixed upland woods; heavier, older second-growths; lines of bushes and trees along fencerows of roadsides and between fields in open country; shrubbery and shade trees of lawns and parks.

Local Haunts.—Zilker's riverside pasturelands; edges of the hills; shade trees in Austin.

General Habits.—Usually observed singly, occasionally in mixed composite troupes with other warblers. Unusually beautiful, tropical in appearance, fluttering about conspicuously, or gracefully flitting about from branch to branch, singing now and then.

Feeding Habits.—Catches insects now and then as it flutters about or moves through the tree-tops; partial to winged insects.

Voice.—Song, a very thin, fine, smooth, deliberate, and languidly uttered *sissi-vit, sissi-vit, sissi-vit;* in spring, *wee-see-wee-see, tsee-tsee, tsee. tsee, tsee-tsee, tsee, tsee*, gradually ascending, until finally very shrill and fine; in summer, *wee-see -wee-see -wee-see (wee-see -ick)*; a hurried, sharply ascending series of crowded, explosive notes. Call, small and thin.

Description.—Black, streaked broadly with whitish. Throat and breast, sides of neck, spot on crown, and line over eye, beautiful flaming orange, brightest on throat, paler to yellow elsewhere. Eye to bill, black. Wings dark, with large white patch; tail dark, with white at base. Belly whitish; sides streaked with blackish. Female, and male in fall, duller to yellowish-orange colors; female with two white wing-bars instead of patch. L. 5.25. W. 2.60. T. 1.85. B. .38 (from N. .31).

Field Marks.—Beautiful black, streaked with whitish. *Throat and breast flaming orange. White webs show when tail is spread.* The duller young have *throat and line over eye buffy;* faintly-streaked brownish back; outer tail-feathers with basal half of outer web white.

Popular Names.—Orange-throated Warbler; Hemlock Warbler.

SYCAMORE WARBLER

Dendroica dominica albilora Ridgway

Uncommon migrant, and rare summer resident; occasionally locally common in spring; migrating from late March to early May, and early August to middle October. In spring, March 20, 1919 (A); March 21, 1920 (A); March 29, 1905, 1 shot (B); migrating, April 8, 16, and 18, 1905 (B); April 18, 1915 (A); May 8, 1921 (A). *Recorded:* ABCDEN.

Geographical Distribution.—Mississippi Valley in east-central United States, from West Virginia, western North Carolina, Ohio, southern Michigan, and southeastern Nebraska, southward to the Gulf Coast of Louisiana and eastern Texas; westward along streams into central Texas (Travis and Kerr counties). Winters usually from southern Mexico through Central America, rarely in the Rio Grande valley of Texas.

Habitat.—Cypress swamps and groves, or lines of cypress trees, particularly along river bottoms and the margins of larger creeks; topmost branches of tallest cypress, sycamore, pecan, and other big forest trees of the river bottoms, festooned with Spanish moss, and growing along the borders of streams and bayous.

Local Haunts.—Cypress trees along margin of Colorado River and along streams into the hill country; sycamores at the mouth of Barton

Creek; pecan trees on the banks of Shoal Creek at the foot of Rio Grande Street. During migrations, tall trees along Onion, Walnut, Barton, Waller, Williamson, and Shoal creeks; bushes and trees along fencerows between fields in the open country east of the hills.

General Habits.—Observed singly or in pairs, moving very slowly about in the tops of the trees, particularly the sycamores along streams, carefully keeping limbs and branches between itself and any chance observer. Movements very deliberate, sometimes stopping for several minutes, *creeping* along by small hops among upper branches, never on trunks or larger limbs; thus, in actions, strikingly different from most members of the warbler family. Usually keeps to the tops of the tallest trees; hops from one perch to another very slowly; occasionally comes down among the lower branches. Usually quiet, the song being uttered at wide intervals; however, at times in spring it may be heard almost constantly singing.

Feeding Habits.—Hugs branches and larger limbs of the tree-tops, searching over them and about twigs and leaves for tiny insects and their eggs, very much after the manner of the Pine Warbler; apparently dislikes to move on until every vein in a leaf or every bark-crevice on a twig has been examined carefully.

Breeding.—Probably; doubtless two broods; throughout April and May. *Breeding recorded:* B.

Nest Location.—12 to 35 feet, usually high up on horizontal limb or in fork of cypress, sycamore, elm, or pecan tree, generally near water; nest sometimes hidden by Spanish moss.

Nest Construction.—Usually compact, especially about the rim; composed of fine grasses, weed stems, and strips of bark, intermingled with plant fiber and down. Lined with a few hair-like filaments of moss, a few horsehairs and tiny feathers, and soft, cottony vegetable down.

Eggs.—3 to 5, usually 4, dull greenish gray-white; marked with distinct and clouded blotches, specks, and under-shell markings of lavender, purplish-gray, umber, and brownish-red; and sometimes even blackish spots; usually wreathed about the larger end, .70×.52.

Voice.—Song, starting low, growing higher, louder, and faster, each of the first four notes clear and distinct, the last notes almost a trill; song composed of two parts with an almost imperceptible rest (sometimes wanting) in between: first part of three clear, distinct notes, soft and low, the first two low-pitched, the third a fraction higher; first note of the second part louder and a trifle higher than third note of the first part, the song then rising higher and higher, growing faster and faster, into a cicada-like trill; at times suggestive of the song of the Pine Warbler, but much higher and shriller near end. Other songs are a soft, falling *se-wee, se-wee, se-wee, swee-swee-swee-swee*, last four notes uttered more rapidly, rising, but fainter, until at last indistinct; and a *twit, che-e, che-e, che-e, che-e, che-a*, the first abrupt, then a pause, the next four even, the last rising sharply; sometimes loud, ringing, and suggestive of the Indigo Bunting's song. The more eastern-southeastern form of this species sings a *tswee-tswee-tswee-see* or *tswee-tswee-tswee, tswee-see*, the last two rising and terminating abruptly. Sings commonly during migrations, at intervals of three or four minutes. Call, a rather lively chippering.

Description.—Upper-parts gray, to bluish-gray on back. Throat and upper breast yellow; eye to bill, cheeks, stripe on side of head and neck, forehead, fore-crown, and streaks along sides, black; small spot at middle forehead, line over eye, patch on side of neck, and belly, white. Two white wing-bars. Female, less black. In fall, both sexes, washed more brownish. L. 4.80. W. 2.60. T. 2. B. .45.

Subspecific Characters.—Similar to the Yellow-throated Warbler. *Dendroica dominca dominica* (Linnæus), of southeastern United States from Maryland to Florida; but bill smaller—Exp. C., male .47, female .46, instead of male .54, female .51, as in southeastern form—and white tail-patches averaging larger; line from eye to bill generally entirely white (perhaps slightly tinged with yellow), never strongly yellow as in the southeastern form.

Field Marks.—*Gray upper-parts. Yellow throat* and breast bordered by black. Black cheeks. No trace of bright yellow on *white stripe running from above eye to bill.* White patch on side of neck.

Popular Names.—Yellow-throated Warbler; Yellow-throated Gray Warbler.

Remarks.—One of the warblers most commonly picked up under city light-towers in Austin following night storms during migrations.

GOLDEN-CHEEKED WARBLER

Dendroica chrysoparia Sclater & Salvin

Moderately common summer resident, early March to late August; begins moving southward early in July. Spring, arrivals, March 8, 1919 (A); March 12, 1920 (A); March 23, 1905, tolerably common and one shot (BE); April 1, 1890 (D); definite records of occurrence, May 6, 1892, 1 shot (C); 1905 tolerably common throughout season, March 25, 4 shot; April 3, 2 shot; April 5, 1 shot; April 19, 1 shot; April 28, 1 shot (B); April 14, 1913, 2 shot (B); May 12, 1915, 5 (B); April, May, and June, 1882 (Nehrling). *Recorded:* ABCDEF (and Nehrling).

Bailey

GOLDEN-CHEEKED WARBLER

Geographical Distribution.—A certain small section in the Edwards Plateau country of central Texas, from San Antonio and Austin west to Kerr, Tom Green, and Concho counties, and rarely north to Bosque and McLennan counties; nowhere else in the world. Winters in Gautemala and on the highlands of southern Mexico. For years was thought to have a breeding range of only about 10 miles square in Comal County.

Habitat.—Always on flat slopes of cedar-clad limestone hills and on summits of canyon slopes and ridges: sterile, barren country, with scrubby older growth of mountain cedars, none too dense, occurring in isolated patches or clumps, the open spaces in between generally covered with shin-oak brush, live oak scrubs, and small mountain Spanish oaks. Never in ravines or gullies, even on hillsides, and never at base of hills near the water of rivers and creeks; never found nesting in dense cedar brakes. After nesting season, wandering family groups found in walnut thickets, particularly on dry canyon floors.

Local Haunts.—Quite local and limited in distribution by choice of habitat. Hill country west and northwest of the city of Austin; never observed east of the eastern line of hills. Southeastern slope of Mt. Barker; Mt. Bonnell; western slope of Lake Austin, midway between Dam and Mt. Bonnell; northern slope of Dry Creek valley at Bull Creek road-crossing; 10 miles up Lake Austin; 3 miles above Santa Monica Springs on Lake Austin; 4 or 5 miles up Bull Creek valley; 10 miles up Barton Creek valley.

General Habits.—The very beautiful male of this rare warbler is usually not shy, only on rare occasions very shy, but frequently allows close approach to his prominent perch on tops of the small trees. The duller female is extremely shy, and is seldom seen.[239]

Migration.—Little flocks of adult (three-year-old) males arrive about the second week in March, and from five days to two weeks later the female and immature birds appear (B); as far as observations go, none of these small flocks or loose troupes have been observed to contain

more than 6 birds. In June family groups wander about together over slopes and lower hillsides: early in July they scatter about in the hill woods and begin to disappear; by the end of July practically all of the birds have departed for the South, a few remaining now and then into August.

Feeding Habits.—Male very active, always on the alert for insects; hunts over the limbs and branches, and examines the foliage of trees 10 to 20 feet tall; sits motionless on a limb, usually a low but conspicuous perch, sallying forth and darting out flycatcher-fashion after insects flying past. Female hunts in the seclusion of thick foliage.

Breeding.—Earliest: May 1, 1913, 4 nestlings (B). Latest: May 21, 1901, 3 slightly incubated eggs (B). Begins nesting last of March (eggs reported March 10 in Comal County), with fresh eggs about second week in April; and found nesting into latter part of June. *Breeding recorded:* ABC.

Nest Location.—5 to 18, average 12, feet from ground, firmly fastened in perpendicular fork or upright crotch of main limb or formed by number of small, upright branches, well concealed, two-thirds of the way up main limbs of older-growth mountain rock red cedars on limestone hillsides in mountainous sections and at summits of canyon slopes; never in dense cedar brakes, usually in scant-foliaged cedars in isolated patches or clumps; occasionally in cedar elms and mountain live or Spanish oaks. Frequently overhangs woods road or trail, or found where foot of ravine widens out onto slope. Difficult to see because materials closely resemble limbs which hold it.

Nest Construction.—Externally, neatly and compactly composed chiefly of soft thick wide strips of fiberous cedar bark, wound round and round horizontally for almost the height of the nest, mixed sparingly with spider-web and cocoons, making the sides almost straight up and down; bottom woven in of cedar bark strips, fine grass-seed stems, a few weed-stalk fibers, plant down, a few bits of white cocoon, and a few small down feathers. Internally, cup smaller at mouth, enlarged down inside, and neatly lined all the way to the rim with very small grass-seed stems, tiny bits of hackberry leaves, a few horsehairs, bits of down, and roughly the lower third matted with very soft, downy feathers, particularly from the Gray-tailed Cardinal and the Texas Bob-white; rarely a few hairs used in lining.

Nest Building.—Nest building commences soon after the birds arrive.

Nest Measurements.—Outside, top diameter 2.50 to 2.60 by 2.75, middle diameter 3 by 3.15, height 2 to 2.25. Inside of cup, diameter at rim 1.50 to 1.62 by 1.78, middle diameter 2.10 by 2.20, depth 1.75 to 1.95.

Eggs.—3 or 4, usually 4, plain white or faint creamy white, with sometimes a slight gloss; splashed, chiefly around the larger end in a rather distinct wreath, with fine spots, specks, and tiny blotches of various shades of dark reddish-brown, chestnut, gray, lilac, and lavender, .66×.51. Dwarf Cowbird eggs frequently found with those of the Golden-cheek.

Voice.—Song, ventriloquistic, elusive, seeming to come from here, there, everywhere: *ter-wih-zeee-e-e-e, chy*, the first, second, and fourth notes short and soft, the third longest, most distinct, and with the shrill buzzing *z-z-z-z* quality of the Black-throated Green Warbler's song. Other observers have heard it as *tserr, weasy-weasy-tweah; cher-weasy, weasy, weah; tweah, tweah, twee-sy; twee-ah, eseah, eachy.* Sung by male from conspicuous perch atop a small tree near nest and hidden female; heard commonly in spring in the Golden-cheek habitat; males gradually stop singing when young have left nest. Call, chirping in migration; female, a soft, scolding *check, check, check* or *tick, tick,* uttered slowly, a note at a time.

Description.—Crown, upper-parts, throat, neck, upper breast, and side-markings, jet black. Cheeks, line over eye, and small stripe on front of crown, rich golden-yellow. Wings black, with considerable white; tail blackish, with two outer feathers largely white. Lower breast and belly white. Female, olive-green above, streaked on crown and back with black; less white in wings and tail. L. 5.10. W. 2.45. T. 2.05. B. .40.

Field Marks.—Beautiful black and white plumage. *Brilliant orange-yellow cheeks, cut through eye by blackish line.* Back black. Belly white, even in female and young, which at first glance resemble closely the Black-throated Green Warbler, a species without black in upper-parts and with yellowish belly in all plumage phases.

Popular Names.—Golden-cheek; Cedar Warbler.

BLACK-THROATED GREEN WARBLER

Dendroica virens virens[240] (Gmelin)

Moderately common migrant; last of March to middle May, and early August to early October. Spring, March 20, 1920 (A); March 22, 1921 (A); April 1, 1890, arrived (D);[241] April 18, 1915, pair (A); April 26, 1905, 1 shot (B); May 16, 1915, pair (A); May 20, 1919 (A). Fall, August 10, 1921 (A); September 20, 1914 (A); October 14, 1921 (A). *Recorded:* ABCDEK.

Geographical Distribution.—Eastern Canada, from Newfoundland, Alberta, southward into northeastern United States to New Jersey and Minnesota, and in the Alleghenies to South Carolina and Georgia; west to the Plains. Winters in Mexico and Central America.

Habitat.—Alluvial hardwood forests; rather open bottom woods; tree-tops, particularly in the freshly-green cedar elms of early spring; shade-trees in dooryards and along quiet streets. In summer home, prefers conifers; in migrations, rare west of heavy forests of Mississippi Valley.

Local Haunts.—Usually east of the hills; never in cedar country, but always among hardwoods. Cedar elm shade trees on University campus, in parks, and along streets in Austin; East Woods; Shoal Creek valley; Williamson Creek bottoms above Manchaca road-crossing; occasionally, lower part of Barton canyon.

General Habits.—Usually singly, less commonly in pairs, rarely in small scattered troupes. Rarely seen on account of its inconspicuousness. Active and restless, flitting about incessantly, playing about well up in the tree tops of oaks or elms, singing as it travels. Occasionally plays about lower limbs, when it seems not at all shy.

Feeding Habits.—Feeds on leaf-worms, spiders, beetles, flies, and eggs and larvae of various insects.

Voice.—Song, of considerable variation, but unmistakable; given by fits and starts, a rather thin, husky, buzzing, deliberate, lazy, delicious, bee-droning drawl; quiet, but full-voiced, clearly uttered, and heard for quite a distance: (1) *zee-zee-zee-zer-zee*, fourth note much lower than the even height of the others; (2) *pe-te-ze-too-zee;* (3) *trees, trees, murmuring trees;* (4) *cheese, cheese, a little more cheese;* (5) *sweer, sweerr, swi-ni-swee;* (6) *zee-zee, zee-ee-zee*, any one of these six versions imitated by whistling through the teeth, and by burring the one to three notes just preceding the last by humming and whistling simultaneously; (7) a variation not deliberate, *wi-wi-wi-wi-wi-wi-wi, wer-wee-e-e*, the last note highest. Last note of rapid song is emphatic. Call, a loud, full-toned *tsip;* a smaller *chip*, frequently running into a chippering. Sings commonly in spring.

Description.—Crown and back bright olive-green; throat and chest, black. Face and sides of head, and sometimes small spot on forehead, bright yellow, with wide dusky olive streak from bill through and below eye to ear. Belly white, washed with yellowish; sides streaked with black. Two conspicuous white wing-bars; inner webs of outer tail-feathers largely white. Female, duller, less white in wings and tail; breast black-spotted. L. 5.10. W. 2.40. T. 1.85. B. .40 (from N. .25).

Field Marks.—*Dark,* to blackish, *throat; bright yellow face,* so much of cheeks of male appearing yellow that whole head seems yellow. *Olive streak through eye. Back bright olive-green,* no black markings above. Large amount of *white in tail; outer web of outer feather largely white. Belly always washed with yellowish,* instead of white as in the Golden-cheeked Warbler.

Popular Names.—Black-throated Wood Warbler.

PINE WARBLER

Dendroica pinus pinus[142] (Wilson)

Uncommon and irregular winter visitor, early November to middle April; begins migrating out of the Region late in March. November 7, 1921 (A); December 18, 1912, 1 shot (B); February 7, 1904 (H); April 4, 1915, male (A); April 14, 1913, 1 shot (B). *Recorded:* ABDH.

Geographical Distribution.—Eastern United States, from southern Canada (local in New Brunswick and Saskatchewan) south to Florida, the Gulf Coast, and east-central Texas; west nearly to the Plains. Winters from Virginia and southern Illinois into northeastern Mexico.

Habitat.—During breeding season, only flat pine woods and pine barrens, keeping well to the middle and tops of trees except after rains and during winter. In migrations, cut-over and scrubby growth, orchards, edges of woodlands. In winter, in pines or, in central Texas, in or near cedar growth and cedar brakes, the nearest relative of the pine occurring in the Region.

Local Haunts.—Cedar slopes of Mt. Bonnell, crest of Deep Eddy cliffs, and hill-tops along west side of Lake Austin; bewildering tangle of trees and undergrowth on slope overlooking Deep Eddy, several hundred yards above Hidden Valley.

General Habits.—Generally singly, rarely in small companies or loose flocks; not at all shy.

Migration.—Sexes apparently migrate at different times, occurring together only in the coldest weather of mid-winter; females occur from November to February, males from December to April.

Feeding Habits.—Feeds on or near the ground, particularly after showers, searching about puddles of rain water under trees festooned with Spanish moss, feeding on tiny insects swept down from the trees. More or less arboreal in summer, very deliberate, sluggish, skulking, clinging to the bark and on twigs from the middle to the tops of trees, but never climbing, ever searching for insects about limbs and in crevices of bark on tree-trunks.

Voice.—Song, a rather slow, clear, sweet, even, simple, drowsy, moderately high-pitched, monotonous trill, or near trill of rapidly-repeated notes, low in tone, and usually uttered on an even scale, although sometimes becoming gradually louder for the first half and then softer for the last. Sings throughout winter. Call, a soft, lisping *chirp.* A rapid, incessant chippering during courtship and feeding of young.

Description.—Upper-parts dull yellowish-olive-green; under-parts dull greenish-yellow to bright greenish-yellow. Yellowish line over eye. Obscurely streaked on breast and on sides of throat and sides with dusky. Two whitish wing-bars; white patch on each side of tail near end (inner webs of two outer feathers). Female, more dusky olive with brownish tinge and less yellowish-green above; more dusky or soiled whitish below, very faintly tinged on breast with yellowish; no yellow above eye. Young, brownish above, and brownish-white on wing-coverts. L. 5.50. W. 2.80. T. 2.20. B. .42 (from N. .33).

Subspecific Characters.—Yellow on belly of male, smaller bill and feet, and longer wings distinguish this form from the two subspecies of Pine Warbler found on islands in the Bahamas.

Field Marks.—Comparatively large, rather dingy warbler. Two whitish wing-bars; and white patches on sides of spread tail near end. Song. The Yellow-throated Vireo has a brilliant yellow throat; the White-eyed Vireo, a stockier, hooked bill, quite different from the slender bill of the Pine Warbler; both have songs quite different from that of the Pine Warbler.

Popular Names.—Pine-creeping Warbler; Greenish Creeping-warbler.

PALM WARBLER

Dendroica palmarum palmarum (Gmelin)

Very rare and irregular migrant, probably occurring from late March to middle April, and from middle September to middle October. In fall, September 14, 1916 (F). *Recorded:* F.

Geographical Distribution.—Interior Canada, south into interior United States to northern Minnesota. In migrations, common west of the Allegheny Mountains, straying west to Montana, Colorado, and California; migrates along the Atlantic Coast, where it mingles with the eastern form, the Yellow Palm Warbler. Winters from southern Florida and the West Indies to Central America.

Habitat.—Open ground in pastures and open edges of woodlands; barren tracts of sparsely semi-open growth; dooryards, streets, and gardens in towns; bushy, tree-dotted pastures; roadsides and fence-rows; edges of marshy ground, where occasional willows and small bushes or clumps of palmetto are found.

Local Haunts.—Shoal Creek valley west of the University campus.

General Habits.—Occurs in loose composite flocks with other warblers, moving southward in fall just ahead of northers. Active and nervous, continually and conspicuously bobs or wags its tail, with methodical regularity. Usually keeps close to the ground, hopping about in bushes and low growth.

Voice.—Song, largely trills, sweet, clear, not loud, delicate, hesitant, and with a hint of brokenness; two commonly uttered, one slower and full-toned, the other quicker and thinner and heard rather generally during migrations; *tsee tsee tsee tsee,* with a distinct swell, marked by distinct syllables in the middle, each syllable near first and last having a half-double quality. Call, a fine *chip,* repeated frequently.

Description.—Cheeks and upper-parts olive grayish-brown, the latter obscurely streaked, becoming olive-green on the rump. Crown reddish-chestnut. Throat and distinct broad line over eye, pale yellow; dark line through eye. Below, yellowish-white, brighter yellow under tail-coverts; dusky on flanks and sides. Streaked, lightly above, distinctly below on throat and sides, with dark reddish-chestnut. Sharply defined white patches at corners of tail, tips of inner webs of two outer tail-feathers being white. Duller in fall and winter, streaked brown above; crown more brownish; whitish throat, eye-ring, and line over eye; suffused with yellow below, the streaks being blacker reddish-brown; yellowish upper and yellow under tail-coverts. L. 5.25. W. 2.60. T. 2.20. B. .40 (from N. .32).

Field Marks.—Under tail-coverts bright yellow. Tail continually flirted or wagged, in marked contrast to actions of other members of its

genus. Beautiful reddish-chestnut crown; bright yellow throat and stripe over eye. Greenish-yellow or dull yellow color.

Popular Names.—Redpoll Warbler; Dull Palm Warbler; Tail-tipper; Western Palm Warbler; Interior Palm Warbler.

OVENBIRD

Seiurus aurocapillus aurocapillus[243] (Linnæus)

Very rare migrant; second week in April to first week in May, and September to middle October. Spring, April 7, 1921 (A); April 12, 1915 (A); May 6, 1920. Fall, September 4, 1921 (A); October 28, 1919 (A). *Recorded:* A.

Geographical Distribution.—East of the Rockies, from the coldest north, almost at the limit of trees in Alaska, Hudson Bay, and Newfoundland,[243] southward over Canada and northern United States to Virginia, South Carolina, Georgia, Kansas, and Colorado; west to the base of the Rocky Mountains. Winters from central Florida, islands of the Louisiana coast, and western Mexico southward through Central America and the West Indies to northern South America.

Habitat.—Dry, rather open deciduous woodlands along small streams; woods and forests with more or less undergrowth; less commonly, low, swampy, heavily-undergrown forests.

Local Haunts.—East Woods and Wheeler's Grove on Waller Creek; Shoal Creek valley west of the University campus.

General Habits.—Occurs singly; a recluse usually not noticed, even in its summer home, but made conspicuous by its characteristic song, heard commonly in the northern woods. Usually found on or near the ground; when on the ground, it walks, stepping daintily about, instead of hopping.

Voice.—Song, softly at first, then chanted louder and louder, until it is a literal shrieking: teacher, *teacher, teacher,* TEACHER, TEACHER, sometimes rendered: shirtee, *shirtee, shirtee, SHIRTEE;* pe-chee, *pe-chee, pe-chee,* PE-CHEE; or *tee-chee—te-chee—te-chee—*TE-CHEE, the notes going off in pairs like a series of explosions, becoming louder with each syllable, the bird quivering on its perch on the limb of a shady tree and frequently rising into the air among the tree-tops; usually vibrating through the woods, though sometimes uttered softly, almost a whisper. Flight-song, uttered generally at night, particularly in the moonlight: a remarkable, wild, hurried outpouring of jumbled warbling notes, often concluded with the common song; uttered on the wing, from the tree-tops to high in the air, where the bird pauses on quivering, fluttering wings and begins to sing. Call, a sharp, small *cheep* or persistent *chip;* a deep-toned *chock;* during night migrations, a short *ks.*

Description.—Upper-parts, wings, and tail, brownish olive-green. Crown bright brownish-orange, margined with a black stripe on each side running from bill to nape. Under-parts white, heavily streaked on sides of throat and on breast with blackish; sides streaked with blackish; throat unspotted, but margined with black lines. Eye-ring white; no white bars in wings or patches in tail. Female, paler. In fall, both sexes, richer and browner. L. 6.20. W. 3. T. 2.20. B. .45 (from N. .35).

Field Marks.—Bright brownish-orange crown, margined on each side with black. No white in wings or tail. Large size for a warbler; *walking* habits. Song and call-notes.

Popular Names.—Golden-crowned Thrush; Wag-tail Warbler.

GRINNELL'S WATER-THRUSH

Seiurus noveboracensis notabilis Ridgway

Rather rare migrant; middle April to middle May, uusally first ten days in May, and again from last of August to first of September, rarely early October. Spring, April 16, 1915 (A); May 6, 1905, 1 shot (B); May 16, 1919 (A). Fall, August 10, 1915 (A); October 7, 1921 (A). *Recorded:* ABD.

Geographical Distribution.—Extreme northwest, from limit of trees in Alaska and western Canada southeastward into interior United States as far as northwestern Michigan and Nebraska, central Montana, and southwestern Canada. In migrations, moves through the Mississippi Valley and along the southern part of the Atlantic Coast; rare west of the Plains. Winters in West Indies and from Mexico into Northern South America.

Habitat.—Lower portions of trees and shrubbery, occasionally some distance from water, but usually in low places in woods, over water, or along the banks of small brooks; commonly dense willow thickets, as well as scattered willows and small oaks, along small streams; rarely wet, brushy woodlands; occasionally orchards and gardens.

Local Haunts.—Shoal Creek valley; mesquite and elm slopes in western part of residential section of Austin, particularly near Seventh and Baylor streets; Waller Creek valley above Wheeler's Grove.

General Habits.—Solitary in its habits, observed singly, walking sedately about or wading in the shallows of tiny ponds and the edges of small forest streams. Tail pumps up and down almost continually, accompanied by a springy motion of the legs; when it is not in motion, the tail is always held semi-erect.

Flight.—Swift and darting, from one thicket to another, or as the bird follows the course of a narrow wooded brook.

Voice.—Song, a high-pitched, loud, clear, swift, emphatic, bubbling, ringing, musical warbled whistle, *sweet sweet sweet chu-chu-wee-chu* or *quit-quit-quit-que-quewe-u,* brief and liquid, though loud, the first three syllables strongly accented, the latter half of the song shorter, quicker, and less distinctly uttered, the next to the last note of the run being higher than the others. Flight-song, less common, quicker and longer; a hurried, jumbled mixture of song and call notes, uttered as the bird flies just over or through the woods. Call, a characteristic, loud, sharp, steely, bell-like *chink* or *clink.*

Description.—Upper-parts, wings, and tail, uniform dark brownish-olive. Distinct, bold, buffy yellowish-white line along side of head over eye. Entire under-parts, including throat, pale buffy sulphur-yellow, heavily streaked with black; spotted or finely streaked even on throat. Sexes alike. L. 6.04. W. 3.10. T. 2.20. B. .52 (from N. .37).

Subspecific Characters.—Similar to the Eastern Water-thrush, *S. n. noveboracensis* (Gmelin), of eastern Canada and the northeastern United States (male, W. 3.03, Exp. C. .50; female, W. 2.86, Exp. C. .50; smaller, browner and more olivaceous above, more decidedly yellowish below, but larger and with longer bill (male, W. 3.05 and larger, Exp. C. .54; female, W. 2.98, Exp. C. .52); darker, less olive, more sooty above; and whiter, less pronouncedly yellow, under-parts and line over eye.

Field Marks.—Yellowish *throat finely streaked. Bold buffy* or dingy white *line* along sides of head *over eye.* Walks, and pumps tail. No wing-bars or tail-patches. Differs from Louisiana Water-thrush, *Seiurus motacilla* (Vieillot), of eastern United States, in yellower under-parts, smaller bill, and sharper-defined, darker, blacker streaks.

Popular Names.—Water Woodland Wagtail; Wag-tail Brook Warbler; Small Water-thrush; Small-billed Water-thrush; Grinnell's Water-thrush; Alaska Water-thrush.

Remarks.—Called Grinnell's Water-thrush after its discoverer, George Bird Grinnell.

KENTUCKY WARBLER

Oporornis formosus (Wilson)

Rare migrant and very rare summer resident, second week in April to third week in August; begins migrating southward in July, but stragglers migrating through from more northern climes may still be present in middle October. Spring, April 10, 1921 (A); May 3, 1919, pair (A). Fall, August 20, 1915 (A). *Recorded:* A.

Geographical Distribution.—Eastern United States, from Hudson Valley and southern parts of Pennsylvania, Wisconsin, and Nebraska, southward to northern Georgia, Alabama, Louisiana, and south-central Texas (San Antonio); west into the Plains. Migrates chiefly in the Mississippi Valley. Winters in southern Mexico and southward to northern South America.

Habitat.—Forest bottoms; heavy timber and dark damp woods with fairly heavy undergrowth; overgrown clearings and borders of woodlands; low, thick growth and patches of weeds in river bottoms; densely grown, well watered woods; dense, damp undergrowth in clearings, and on edges of dark, damp, heavily-timbered, heavily-shaded woodlands in bottoms along rivers and creeks.

Local Haunts.—Wheeler's Grove and East Woods on Waller Creek; Onion Creek bottoms; Williamson Creek bottoms near Manchaca road-crossing; Barton Creek valley just below Campbell Hole; ravines in edges of the hills.

General Habits.—Observed singly and in pairs; very shy and retiring, particularly during nesting season, when nest is quite easily deserted. Female slips quickly away from nest on approach of intruder, but bolder than male in appearing from undergrowth and scolding trespassers on its territory.

Feeding Habits.—Usually found on or near the ground; hops about from limb to limb in search of food, or walks about on the ground.

Breeding.—Probably. Middle May to end of June.

Nest Location.—On, or near, ground, under bush or weed-stalk, among roots of fallen tree, well concealed among ferns and weeds, or in dense underbrush; in wooded bottomlands, in open woods, or on brushy hillsides.

Nest Construction.—Nest very bulky, loose; composed of several outer layers of dead leaves, grapevine bark strips, an inner wall of weed stalks and grasses, and lined heavily with black rootlets or a few long black horsehairs.

Nest Building.—Male assists female in building nest.

Eggs.—4 or 5, white, sometimes very glossy; spotted, speckled, and rarely blotched with burnt-umber, cinnamon-rufous, and lilac-gray, usually massed heavier in a wreath at the larger end; rarely show under-shell markings, .73×.58.

Voice.—Song, earlier migrants whistle an incessant, clear, whistled *(che che che) peer-ry peer-ry peer-ry peer-ry;* breeding birds utter a loud, clear, musical, whistled *tur-dle, tur-dle, tur-dle; ter-wee-o, ter-wee-o, ter-wee-o;* or *ter-wheeter-wheeter-wheeter-wheeter,* sung persistently during nesting season and heard for over a 100 yards, on a still day for a 150, quite similar to one of the songs of the Carolina Wren but less ringing and lively, and uttered with a falling inflection. Call, a low-pitched *chuck,* not unlike that of the Phoebe. Alarm-note, a metallic *check, chuck,* or *chip.*

Description.—Upper-parts, wings, and tail, olive-green; no white in wings or tail. Crown, mixed ashy and black; space from eye to bill, side of head, and band at side of throat, black. Distinct yellow line over and behind eye. Entire under-parts bright yellow. Bend of wing yellow; outer web of outer primary, grayish. Female, and male in fall, black of crown and cheeks duller, browner, more olive-gray. L. 5.40. W. 2.65. T. 2. B. .45 (from N. .32).

Field Marks.—No white bars in wings or patches in tail. Walks, instead of hopping along as do most small birds. *Entire* under-parts yellow. May be mistaken for Maryland Yellow-throat, but distinguished by blackish crown and yellow line over eye, the Yellow-throat having space around eye and from eye to forehead black instead of yellow.

MOURNING WARBLER

Oporornis philadelphia (Wilson)

Not uncommon migrant; last week in April to third week in May, and middle August to middle September. In spring, April 26, 1921 (A); May 3, 1920 (A); May 5, 1905, 1 shot (B); May 19, 1890 (D)[214]; May 21, 1915 (A). In fall, August 17, 1915 (A); September 9, 1907, 1 shot (B); September 14, 1916 (FG). *Recorded:* ABDFG.

Geographical Distribution.—Southeastern Canada southward into eastern United States as far as Michigan and Minnesota and in the Allegheny Mountains to West Virginia; west to the Plains. In migrations, commonest from northern Alleghenies to Texas, particularly common in eastern Texas; rarely from Mississippi to North Carolina, or east of the Alleghenies. Winters in Central America and in northern South America.

Habitat.—Undergrowth, underbrush, and dense, swampy, thickets; mesquite flats; semi-open, brushy, elm-cedar-mesquite slopes and hillsides; hedge-rows and dense shrubbery in gardens; less commonly, taller deciduous trees.

Local Haunts.—Vacant lots and slopes in Austin, particularly between Blanco and Baylor streets in the western part of the city; Shoal Creek valley; Deep Eddy; hidden valley on south side of Colorado River at lower end of Deep Eddy; gardens in town; fence-row shrubbery and trees between fields and along road-sides northwest of town.

General Habits.—Usually observed in small flocks of from 3 to 10; or, in fall, in loose, composite flocks or troupes with other warblers, moving southward just ahead of a norther. Shy and quick-moving, hopping about like the Maryland Yellow-throat, either on the ground or near it in bushes or trees, perching on very low limbs, from which it sings.

Voice.—Song, a loud, ringing, full-voiced, gradually swelling whistle, *teo te-o te-o te-o we-se,* the last couplet distinctly accented and much higher pitched; or a *tse tse tse truey truey* or *'true, 'true, 'true, 'tru, 'too,* rising for the first three notes and falling for the last two, which are louder and fuller, first one or two notes being occasionally omitted; song, uttered commonly during spring migrations, rarely, if ever, in fall, shows distinct resemblance to that of the Maryland Yellow-throat and the Water-thrush. Call, a sharp *peenk.*

Description.—Upper-parts, wings, tail, and sides, greenish-olive or olive-green. Head, neck, and breast, ashy-gray or bluish-slate, becoming jet black on breast, where it meets deep yellow under-parts. Female, head, neck, and breast, grayish; browner on upper-parts, throat, and breast; inconspicuous, broken whitish or grayish eye-ring. In fall, browner crown, paler throat and breast. L. 5.60. W. 2.55. T. 2. B. .45 (from N. .32).

Specific Characters.—Closely resembles the MacGillivray Warbler, *O. tolmiei* (J.K.Townsend), a Rocky Mountains species of the western United States, migrating eastward through Gainesville and San Antonio in central Texas. Tail shorter (male 1.93, female, 1.84; never over

2.10), no white on eye-lid of adult, breast of male blacker; and incomplete whitish eye-ring of female and young. The MacGillivray Warbler has longer tail (male 2.19, female 2.05; usually over 2.10, frequently toward 2.50), adults with white spot on eye-lid, and females and immatures with white above and below eye; breast of male more grayish, never with distinct black patch.

Field Marks.—Distinct gray head and neck, becoming intense to jet black on breast, where it meets deep yellow of lower breast and belly. Blackish between eye and bill, instead of gray; *no white eye-ring*, and no white on eye-lid.

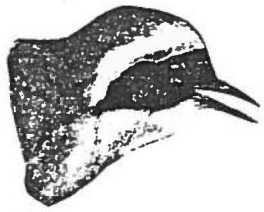
Popular Names.—Mourning Ground Warbler.

Remarks.—Named from its appearance of wearing crepe cape and hood, as if in mourning.

WESTERN YELLOW-THROAT

Geothlypis trichas occidentalis Brewster

Fairly common but irregular migrant; a few arrive early in spring, about the second week in March, occasionally common by the end of March, the bulk toward the end of April, and stragglers remaining until late May; in fall, first of September to the last of October. In spring, March 11, arrived (24, common), 1890 (D)[245]; March 13, 1921 (A); April 11, 1907 (X); April 18, 1915, common (A); April 23-24, 1907, 2 shot (B); April 26, 1905, 1 shot (B); April 28, 1914 (G); May 5, 1905, 1 shot (B); May 6, 1914 (F); May 21, 1915, 2 pairs (A). In fall, September 3, 1921 (A); October 28, 1915 (A); October 30, 1919 (A). *Recorded:* ABCDEFGJKLMNOPX.



Bailey
WESTERN YELLOW-THROAT

Geographical Distribution.—Interior western United States, from south-central Canada, south to western Texas, northern New Mexico, and southwest to northeastern Lower California; east to the Great Plains. Winters from the Mexican border southward into Mexico.

Habitat.—Open, wet, swampy, rank, grassy thickets; thickets, bushes, and weeds about creeks and ponds; damp brushy thickets; mesquite growth on vacant lots, hillsides, and valley slopes; borders of dense upland second-growth; fencerows of bushes and trees along roadsides and between plowed fields; edges of wet woodlands; underbrush and bushes along stream bottoms; clumps of honey-locust trees; in fall, upland clearings.

Local Haunts.—Rather generally distributed in suitable localities in and about Austin; Shoal Creek valley; Pease north and west pastures; fencerows northwest of State Insane Asylum grounds; vacant lots between University campus and Shoal Creek valley; University campus.

General Habits.—Usually observed singly or in pairs, though a small tract may contain a number of birds; active and nervous, continually hopping about from twig to twig or diving into the cover of underbrush. In its summer home the female, which alone incubates the eggs, is timid and shy; both birds suspicious at all times during migration.

Migration.—Occurs chiefly at night, as dead birds on ground under city light-towers in the morning after cold or stormy nights testify. Seems to fly above the housetops, from 50 to 100 feet from the ground, in extended flights.

Voice.—Song, a shrill, loud, clear, penetrating whistle, with a touch of hissing, *I beseech you, I beseech you, I beseech you; wreech-ity, wreech-ity, wreech-ity;* or *wee-tee-see-tee*, repeated in a series, with the accent on the third of each of the four notes; song usually increases in volume as it proceeds. Call, an impatient, quick-repeated *chack;* a short *chit, quit,* or *pit.*

Description.—Upper-parts, wings, and tail, olive-greenish, tinged with brownish-gray, particularly on hind-neck. Broad black mask across forehead, face, and side of head past eye; mask bordered on upper edge with broad line of grayish-white. Throat and breast continually bright orange-yellow, paler on belly, which, with sides, is generally washed with brownish; often continuous orange-yellow below, from chin to base of tail, with usually a small bit of buffy-whitish on belly. Bend of wing yellow. Female without black mask; more brownish on head. In fall, more grayish and brownish. L. 5.35. W. 2.28 (female 2.10). T. 2.20–(female 2). Exp. C. .45 (female .43).

Subspecific Characters.—Largest and most richly colored of the Yellow-throats. More gray above than the Northern Yellow-throat. Black mask with broad, nearly white (occasionally yellowish-tinged) upper-posterior border. Sides and wash on belly brownish. More continually orange-yellow below, from chin to tail.

Field Marks.—Small size, dainty appearance. No white patches or bars in short wings or rounded tail. Yellow under-parts. *Black-masked, like a tiny bandit.*

Popular Names.—Maryland Yellow-throat; Marsh Warbler; Black-masked Warbler; Bandit Warbler.

Remarks.—The most common of the warblers picked up dead under the city light-towers of Austin, especially at Eighth and Brazos streets, after night storms and northers during migrations.

NORTHERN YELLOW-THROAT

Geothlypis trichas brachidactyla[246] (Swainson)

Rather rare migrant, April and September. In spring, April 20, 1907, 1 shot (B); April 27, 1919, male (A). In fall, September 5, 1921 (A); September 20, 1914 (A). *Recorded:* AB.

Geographical Distribution.—Southeastern Canada and northeastern United States, from Newfoundland, Labrador, and northern Ontario west to northern Minnesota and central North Dakota, south to Nebraska, southeastern Kansas, northern Pennsylvania, and northern New Jersey. Winters in Central America, northward into West Indies and southern and eastern Mexico.

Habitat.—Cattail meadows; wet bushy tracts in lowlands or near woods; hedgerow thickets between fields and along roadsides; mesquite growth.

Local Haunts.—Vacant lots in town; Shoal Creek valley; edges of town, along country roadsides.

General Habits.—Observed singly; nervous but friendly, belieing his black robber's mask. Quite similar in habits to its larger, more richly-colored relative, the Western Yellow-throat.

Voice.—Song, a curious ringing whistle: (1) *wichity, wichity, wichity;* (2) *witchery, witchery, witchery;* (3) *rapity, rapity, rapity, rapity;* (4) *rap-pittit-ty, rap-pittitty, rap-pittitty;* (5) *wee-see-see -see wee-see-see -see;* (6) *what a pity, what a pity, what a pity, pit;* (7) *che-a-wee-a che-a-wee-a chee-a-wee-a;* (8) an emphatic *I beseech you, I beseech you, I beseech you.* A flight-song of hurried, jumbled song and call-notes, uttered as the bird flies up above the bush-tops. Call, a sharp *chip, chack, chit,* or *quit;* a reedy *chip* or *tsip;* a thin, scolding, wren-like, long-drawn snarl, *b-r-r-r-r-r-r-r.*

Description.—Similar to that of the Western Yellow-throat, with subspecific differences. W. 2.17 (female 2.04). T. 1.94 (female 1.84). Exp. C. .45 (female .42).

Subspecific Characters.—Smaller, duller than the Western Yellow-throat, and without broad white border along upper-posterior edge of black facial mask, the edging in this form being bluish-gray. Larger than the Maryland Yellow-throat, *G. t. trichas* (Linnæus), of middle Atlantic Coast from southern Pennsylvania through Maryland into Virginia and upper-parts of Georgia and the Carolinas; more greenish above; male, more brownish flanks, more extensive yellow on belly, and more whitish in the frontal band of gray; female, more greenish above and slightly paler than female, *G. t. trichas*.

Popular Names.—Northern Yellow-throat; Maryland Yellow-throat; Black-masked Warbler; Marsh Warbler; Bandit Warbler.

YELLOW-BREASTED CHAT

Icteria virens virens (Linnæus)

Common migrant, and rather common summer resident, becoming more common each year; second week in April to third week in September; begins moving southward in August. In spring, April 8, 1921 (A); April 13, 1920 (A); April 16, 1905, 1 shot (B); April 18, 1915, very common (A); April 24, 1905, 1 shot (B); April 25, 1922 (A); April 27, 1919 (B). In fall, September 14, 1916, 10 migrating (F); September 20, 1914 (A). Summer birds, July 18, 1915, 1 shot (A) and identified ("HCO"). *Recorded:* ABCDEFGIJMNPU.[247]

Geographical Distribution.—Eastern United States, from southern New England, Ontario in Canada, and Minnesota, southward to northern Florida, the Gulf Coast, and southeastern and central Texas; west to the Great Plains. Winters in Mexico to Central America.

Habitat.—Dense, briary, tangled undergrowth and almost impenetrable thickets in clearings, on uplands and slopes, occasionally in lower districts; bushy, tree-sprinkled pasturelands; brushy thickets with a few small trees.

Local Haunts.—Western hilly part of the Region and the semi-arid slopes of the narrow strip just east of the hills. Brushy hillside slopes of Mt. Barker, particularly southeastern side; Pease north pasture; edges of the hill country; slopes of Shoal, Dry, Bull, Bee, and Barton creeks.

General Habits.—Observed singly when seen at all; because of their shyness paired birds are rarely seen together. Extremely shy, avoiding observation; hence little known, although one of the largest, most conspicuous of warblers. Very noisy, much oftener heard than seen. Keen observation occasionally detects one of the birds at a distance, balancing atop some bush in the thicket or pumping in flight toward another bush. Female slips away from the nest when observer is still quite a distance away, and remains hidden in the thickets during his presence at the nest.

Migration.—Migrates slowly, usually keeping to the cover of thickets.

Feeding Habits.—Feeds on beetles and other insects, together with a few berries.

Flight.—For short distances only. Darts among thickets and from one bush to another in hurried, pumping flight. Flight movements are frequent with song: song usually uttered from topmost twig of the tallest of the small trees of the thicket; as the bird finishes, it launches itself slowly into the air, jerks itself about, wings held high and flapping slowly, legs dangling, and tail wagging extravagantly up and down, pumping as it slowly moves along, singing on its way or dropping back to its perch.

Breeding.—Earliest: May 6, 1915, 4 fresh eggs (A); May 17, 1915, 4 fresh eggs and 1 Dwarf Cowbird egg (B). Latest: June 13, 1916, 3 slightly incubated eggs (B). Probably nesting by the last week in April. *Breeding recorded:* AB.

Nest Location.—2 to 6, usually 3, feet from ground, generally well hidden in small, bushy or sapling hackberry, winged elm, cedar elm, or skunk sumac in small clearing in thicket, frequently among climbing vines or briers, among dense brush or undergrowth of hillsides and uplands.

Nest Construction.—Coarse, bulky, but rather compact structure of grapevine strips, cedar bark, leaves, dried grass, weed stems, leaf skeletons, and finer shreds of cedar bark. Occasionally unlined; usually lined with fine round grasses, grass stems, and grass seed stems.

Nest Measurements.—Inside, diameter, 2.75 to 3, depth 2.

Eggs.—4, rarely only 3, rather roundish ovate, clear white or pinkish-white, glossy, sparingly or faintly speckled and spotted, rarely with bold and well-defined markings, in the form of a wreath about the larger end, and a few reddish, cinnamon-rufous, and chestnut spots and lavender under-shell markings scattered at large over the entire surface, .90×.70.

Voice.—Song, slower and more emphatic than, but rather similar to, that of the Western Mockingbird; an admirable and experienced mimic, and a good vocalist. Commonly, *quoort-quoort! whee! whew-whew-whew!*, the first two notes slow and deep, the third high-pitched and interrogative, the last three emphatic and whistled; sometimes *whit! whee! whew! whit!*, a *so! ho! tut-tut-tut-tut-tut-tut*, a rapid *coc-coc-coc-coc*, a *skee-skee-skee-skee*, or perhaps a *cop! chick! cock! chack! co-co-co-co-co-co-co-co*, the first soft, the next three emphatic, the last emphatic. Sings from arrival until August, even at all hours of the night. Call, a harsh, nasal *chuck*, sometimes lengthened into *chuck-uck* or a rapid *chuck-uck-uck-uck-uck-uck;* an emphatic *chut-chut;* an intense, concentrated *kee-yuck; kut* or *skeow;* sputtering, cackling, and whistling notes.

Description.—Upper-parts, wings, and tail, olive-green. White line from base of bill back over eye; space from eye to bill black; white spot under eye. Throat and breast bright yellow; belly whitish. Ear-patches gray. Bill shining black, short, stout, prominently arched, unnotched, higher than broad at nostril. Female, duller. In fall, greener above, browner on flanks, with lighter, horn-colored to brownish bill. L. 7.40. W. 2.96. T. 2.90. Exp. C. .55 (from N. .41).

Subspecific Characters.—More olive-green upper-parts, shorter wing (male 3.02, female 2.93), tail (male 2.93, female 2.83), and shorter culmen or upper edge of upper mandible (male .55, female .53). The western form, the Long-tailed Chat, *I. v. longicauda* (Lawrence), ranging from the Canadian border to northern Mexico and from the Pacific east to the Plains and mid-western Texas, has grayer (gray, tinged olive-green) upper-parts; longer wings (male 3.11, female 3.06), tail (male 3.20, female 3.07), and bill slenderer and longer (Exp. C., male and female .57); instead of very short white line from lower mandible at side of throat, the white stripe is more extended, at least more than the anterior half of the malar region in the male being white and sometimes the white passing behind the ear-patches.

Field Marks.—Largest and one of the most brightly-colored of warblers. Olive-green above, but *bright yellow throat, breast, and upper belly.* Large size, short rounded wings, and long rounded tail. Large prominent bill. Prominent white line over eye. Pumping flight. Song and call-notes.

Popular Names.—Yellow Mockingbird; Short-tailed Chat.

HOODED WARBLER

Wilsonia citrina (Boddært)

Rather scarce migrant; late March to first week in May, and late September to third week in October. In spring, March 24, 1921 (A); March 29, 1914 (FG); April 4, 1908, 1 shot (B); April 18, 1915, 1 shot

(A); May 6, 1920 (A). In fall, September 24, 1914 (A); October 21, 1921 (A). *Recorded:* ABFGK.

Geographical Distribution.—Eastern United States, from Massachusetts, Wisconsin, and southeastern Nebraska, southward to Georgia, Alabama, and Louisiana; west nearly to the Plains. In migrations, across eastern Texas, west to Waco, Austin, and San Antonio. Winters in Mexico and Central America.

Habitat.—Well-watered woodlands; densely-grown, damp woods; city shade trees; thickets, undergrowth, and shrubbery on uplands and lowlands; low shaded woods with thick undergrowth; trees and bushes along fencerows along roadsides and between plowed fields in the open farming country.

Local Haunts.—Pease Park; University campus; city shade trees, particularly cedar elms, west of the University and near Blanco and Ninth streets; roadsides and fencerows northwest of Austin.

General Habits.—Usually observed singly or in composite flocks or troupes with other migrating warblers. The loveliest of all warblers, flitting from bush to bush, its bright yellow colors and black hood showing clearly at all times, the white outer tail-feathers being displayed in flight. As with others of the family during migrations, it is more active and sings more commonly on cloudy, drizzly days.

Migration.—Avoids the West Indies, and reaches its winter home by flying directly across the Gulf of Mexico.

Voice.—A gentle, easy, sweet, graceful, sliding, whistled *che-whee-whee-whee-a-wheer* or *che-rer, cheeaee, chi-de-ee,* which has been likened to a quickly uttered "*You must come to the woods or you won't see me*" (Chapman); a four-syllabled *tse-whip, tse-weeo* or *se-whit, se-wheer;* and *see-we-eo-tsip, tsip, see-we-eo,* with a dropping of the voice at the end. Rather quiet in fall. Call, a sharp, nervous, clear-cut, characteristic *cheep, chirt,* or *chip,* uttered with a flirt of the tail, revealing its white-marked feathers.

Description.—Upper-parts olive-green. Solid, jet-black hood covering back of head, nape, sides of neck, throat, and breast. Forehead, front of crown, and cheeks yellow; belly and sides yellow. Outer tail-feathers largely white, conspicuous in flight or when tail is flirted. Bill black in spring, brownish in fall. Female duller, more dusky; usually without black throat marks, but blackish marks on crown, sides of neck, and occasionally across breast; entire under-parts usually yellow. L. 5.60. W. 2.50. T. 2.25. B. .40 (from N. .31). Female smaller.

Field Marks.—Beautiful *bright yellow, with black hood* over back of head, all of neck, throat, and breast. Female, cheeks and entire under-parts yellow. *No wing-bars; outer tail-feathers largely white.*

WILSON'S WARBLER

Wilsonia pusilla pusilla (Wilson)

Fairly common but irregular migrant; first of April to middle May, and early August to late September. In spring, April 2, 1920 (A); April 5, 1921 (A); April 18, 1919 (A); May 2, 1890 (D)[245]; May 5, 1905, 2 shot (B); May 5, 1907, 1 shot (B); May 6, 1905, 1 shot (B); May 7, 1916, 6 (G); May 14, 1919 (A). In fall, August 6, 1915 (A); August 9, 1916 (G); August 10, 1916, 2 (G); September 14, 1916, 8 (F); September 24, 1916, 2 (F). *Recorded:* ABDFG.

Geographical Distribution.—Eastern Canada, from the limit of trees in the north southward to the Canadian border and into the United States at Maine, New Hampshire, and northern Minnesota. Migrates mainly along the Allegheny Mountains. Winters in southeastern Mexico and eastern Central America.

Habitat.—Bushes bordering woodland waters; mesquite flats, where its yellow colors harmonize well with flowers and leaves; elms and mesquites on hillside slopes; bushy growth along edges of woodlands; small deciduous second-growth along roadsides and fencerows; orchards; rarely city shade trees.

Local Haunts.—Slopes of Shoal and Waller creek valleys; mesquite and cedar-clad hillsides, among the semi-arid strip just east of the hills, avoiding the higher hills.

General Habits.—Occurs usually singly or by twos and threes, rarely in small companies of six or eight, or in composite troupes with other migrating warblers. Alert, active, restless, occasionally flitting tail up and down nervously.

Feeding Habits.—Wanders slowly through the underbrush, moving along north-and-south valleys; flits about in the upper and outer sections of trees after the manner of some of the flycatchers; darts out after passing insects and returns to his perch. Feeds largely on winged insects.

Voice.—Song, a ringing, rapid, bubbling warble, with a slight upward inflection and a final drop, *tsh, tsh, tsh, tshea,* or *zee-zee-zee-zee-e,* with a rising inflection on the final *e; chee-chee-chee,* followed by a trill. Song usually uttered from a perch, rarely during a short flight. Call, a quick, fine lisp; a low-toned, slightly-harsh *cheet.*

Description.—Upper-parts, wings, and tail, olive-green. Distinct, round, shining black cap of erectile feathers. Under-parts, forehead, and sides of head, including cheeks and line over eye, bright yellow, with orange-yellow tint to head and breast. Female, and male in fall, less black on crown. L. 4.40. W. 2.19 (female 2.11). T. 1.88. Exp. C. .33.

Subspecific Characters.—Smaller size, paler yellow of under-parts, and duller olive-green upper-parts distinguish this eastern form. Collection of additional specimens may add to the list of birds of the Region the Larger Pileated or Rocky Mountain Black-capped Warbler, *W. p. pileolata* (Pallas), breeding from Alaska southward through the mountains of western United States, west to eastern Oregon and California and east to the Chisos Mountains of far-western Texas, a form characterized by brighter, yellowish-olive-green upper-parts; brighter yellow under-parts; forehead a very intense almost orange, instead of yellow; and longer wings (male 2.26, female 2.18) and tail (male 1.97, female 1.90).

Field Marks.—Upper-parts olive-green. *Head and entire under-parts intense yellow. Black cap. No white in wings or tail.*

Popular Names.—Black-capped Yellow Warbler; Green Flycatching Warbler; Eastern Black-capped Warbler; Wilson's Warbler.

CANADIAN WARBLER

Wilsonia canadensis (Linnæus)

Very rare migrant; last of April and early May, and probably first of September to early October. In spring, April 21, 1919, male (A); May 5, 1920 (A). In fall, October 4, 1920 (A). *Recorded:* A.

Geographical Distribution.—Eastern Canada and northeastern United States, south to Connecticut and the central parts of New York and Minnesota, and down the higher parts of the Allegheny Mountains to North Carolina and Tennessee. Rare in migrations west to central Texas. Winters in northern South America, casually in Central America.

Habitat.—In summer home, deep, damp forests with rich deciduous undergrowth. In migrations, low, wet, swampy woods and lower growth; brushy borders of woodlands; post oak trees on gravelly uplands; orchards; rarely, shade trees in town.

Local Haunts.—Post oak trees in the northwestern part of the city; elm and oak shade trees near the University campus.

General Habits.—Observed singly; wide-awake, and lively.

Feeding Habits.—Expert at catching insects on the wing, darting after them and snapping them up like a true flycatcher; also gleans and picks insects from twigs and the under side of leaves.

Voice.—Song, full-voiced, loud, clear, sweet, liquid, rippling, varied, animated, vivacious, uncertain *t'le we, t'le we, t'le we, t'le we, t'l it wit* or *rup-it-che rup-i-chip-it*, suggestive of the song of a Goldfinch. Call, *chack*, with a characteristic tang and harshness.

Description.—Upper-parts, wings, and tail, mouse-gray, with black spot-markings on front of crown; wings and tail slightly browner. Under-parts bright yellow, paler to whitish in front of and around eye; black stripe under eye; striking necklace of thick black spots across lower throat and upper breast, dusky and less sharply defined in female and young. In fall, more greenish above; breast-spots less plain. Female duller. L. 5.60. W. 2.55. T. 2.12. B. .40 (from N. .31).

Field Marks.—Brightly colored. *Light clear gray above*, and *bright yellow below. No white in wings or tail.* Conspicuous *necklace of black spots* across breast.

Popular Names.—Canadian Flycatcher; Necklace Warbler; Canada Warbler; Spotted Canadian Warbler.

AMERICAN REDSTART

Setophaga ruticilla (Linnæus)

Scarce migrant; April and early May, and middle August to late September or rarely early October. In spring, April 2, 1919 (A); April 18, 1915, pair (A); May 6, 1905, 2 shot (B). In fall, August 17, 1915, 2 (A); September 24, 1916, 3 (FG); October 12, 1919 (A). *Recorded:* ABDFG.

Geographical Distribution.—From Newfoundland and Labrador southward over Canada and northern United States to North Carolina, Arkansas, central Oklahoma, Colorado, and Washington; west to the Rocky Mountains. Winters from central Mexico and the West Indies southward to northern South America.

Habitat.—More or less open, deciduous woodlands, particularly in sapling woodlands; mesquite trees along slopes and valleys of streams; fencerows in farming country; rarely vacant lots in town.

Local Haunts.—Mesquite growth on Colorado River flood plains, along Shoal Creek, and on slopes in western part of Austin; ragweed patches near Country Club.

General Habits.—Observed singly and in pairs, rarely in composite troupes with other migrating warblers. Graceful and animated, continually flitting and pirouetting, whirling and diving, and spreading wings and half-opening tail to show patches of flame. Whirls about with wings and tail outspread as it sings and dances from limb to limb, or darts up hither and thither.

Migration.—Migrates in company with other warblers, particularly the Yellow-throats and the Mourning Warbler.

Feeding Habits.—Feeds on insects, many of which it catches by darting out like a flycatcher; also feeds on seeds of the ragweed.

Voice.—Song, a thin, wiry, penetrating, somewhat retarded whistle: (1) *che che che che-wa;* (2) *tsee, tsee, tsee, tseat;* (3) *ser-wee, swee, swee-e-e;* (4) *ching, ching, chee;* (5) *we-see, we-see, we-ser;* (6) *zee-zee-zee*, with a sharp, unfinished ending; (7) a squeaky, monotonous *we-ez, we-ez, we-ez.* Occasionally the song is smooth and clear. Call, *tsip.*

Description.—Shining black. Sides of breast and flanks, band in wing, and basal half of tail, bright salmon-orange; tip half of tail, and central feather of basal half, black. Belly whitish. Female, olive-green and gray instead of black, yellow instead of orange. L. 5.40. W. 2.55. T. 2.15. B. .35 (from N. .27).

Field Marks.—*Black, with orange sides.* Salmon-*orange patch in wing* and band across base of tail. Female, yellow, replacing orange, olive-green and grayish replacing black.

Popular Names.—Orange-sided Black Warbler; Butterfly Warbler; Common Redstart; American Redstart; Northern Redstart.

AMERICAN PIPIT
COMMON PIPIT

Anthus spinoletta[249] *rubescens* (Tunstall)

Abundant migrant, and fairly common winter resident, particularly in milder weather; usually second week in November to middle April, common by the middle of November and bulk gone by end of March. In fall, October 11, 1914, 1 (A); November 3, 1919, 7 (A). January 7, 1905, 1 shot for identification (B). In spring, April 27, 1919, 10 (A). *Recorded:* ABCFGIJKMQW.

Geographical Distribution.—Arctic country, breeding in the Far North, from Greenland to Alaska, south into northern Canada, and down along the highest ridges of the Rocky and Sierra Nevada Mountains to California and New Mexico. Winters throughout the southern half of the continent, from Delaware, the Ohio valleys, and California southward to Central America.

Habitat.—Large open tracts of broomweed prairie; newly plowed fields along the edges of woods; stubblefields; country roadsides; flat, plowed, or cultivated fields in the open, farming country, particularly cotton and corn-stubble fields; grassy meadows and recently burned fields; small plowed fields in bottomlands, mud flats, and the water's edge along rivers and creeks; plains; wet prairies; vacant city lots and open lots on the outskirts of towns.

Local Haunts.—Open country to the north, east, and south of Austin; outskirts of town, and vacant lots in town; occasionally University campus; plowed fields along the second bottoms of the Colorado River; bits of sand and silt beach along the Colorado River, Shoal Creek, and the lower part of Barton Creek; Zilker's plowed fields along the south side of the Colorado River, west of Barton Creek; Sand Beach on the town side of the river.

General Habits.—Observed singly and by twos and threes, but most commonly in small bunches, loose companies, and flocks of from 5 to 30, less commonly in wintering flocks to 50 in number, or of migrating flocks numbering 100 to 500. These strange visitors from the Far North are usually seen after heavier rainfall in the drier country. They are very demure, and walk about or run hurriedly, with wagging head and tail. When disturbed, they rise with peculiar easy, undulating, wavering flight, uttering their soft *dee-dee*, mounting high in the air, hovering, and then darting back to earth.

Feeding Habits.—Feed in scattered flocks, walking or running about, never hopping as do the sparrows, searching for tiny insects, small seeds, small shells, and crustaceans.

Flight.—Light, airy, jumpy, irregular, scattered, as flock rises from short grass and broomweed prairies. Rising in wavering flight, undulating easily through the air, rising gradually higher and higher; flying for a short distance, wheeling, and returning to feeding ground.

Voice.—Rarely utters a note except when in flight. As it rises in the air, it utters a soft, faint, plaintive *dee-dee, dee-dee*, or *chee, chee! chee, chee! chee, chee!*, sometimes interpreted as *pi-pit! pi-pit!* or *pip-pit!*

pip-pit! Song, in more northern summer home, sung on wing at a height of about 200 feet in air, a vibrating, bell-like *che-whée, che-whée,* singing in ascent, the bird afterward dropping almost straight to the ground.

Description.—In fall, back and crown, dark olive-brown or warm grayish-brown, without noticeable streaks; throat, lores, line over eye, and lower side of head, pale buffy, unstreaked; under-parts buffy, breast and sides streaked with blackish or dusky. Wings blackish-brown, with two buffy wing-bars. Tail square or slightly forked, blackish, with outer feathers white. In spring, upper-parts paler, grayish; under-parts whitish just before spring molt, then shaded lightly to pinkish-buff, with narrower streaks. Hind-claw elongated, about as long as, or scarcely longer than, the toe to which it is attached. L. 6.50. W. 3.40. T. more than 2.62, usually 2.74, sometimes 3. B. .47.

Field Marks.—Peculiar wavering flight when it leaves ground; walks or runs, instead of hopping along on the ground as do sparrows, thus being more like the horned larks, which it resembles in structure and habits but from which it differs in structure of bill. Twitches or wags tail. Found in open country. *Two outer tail-feathers largely and conspicuously white, showing well in flight.* Double-syllabled call. Upper-parts unstreaked, even, grayish, with earth-colored backs; the Sprague Pipit is distinctly streaked. *Hind-claw about as long as remainder of toe.*

Popular Names.—Pipit; Tipit; Meadow Tipit; Meadow Pipit; Brown Lark; Skylark; Meadow Wagtail; Eastern Pipit; Louisiana Pipit.

SPRAGUE'S PIPIT

Anthus spragueii[250] (Audubon)

Very rare migrant; March, and probably during October and early November. March 3, 1920, 2 (A); March 19, 1920 (A); March 28, 1922, 1 (A). *Recorded:* AD.

Geographical Distribution.—Great Plains of the interior of North America, from southern Canada south to North Dakota, Nebraska, and western Montana. Winters from southern parts of Louisiana and Mississippi and the Lower Rio Grande Valley of Texas southward to middle Mexico.

Habitat.—More often the weedy, partially cropped fields, instead of the recently plowed or closely grazed pasturelands; occasionally vacant lots on the edges of towns.

Local Haunts.—Vacant lots and northern edges of Austin.

General Habits.—Usually observed singly or in pairs; rarely, if ever, assembles in flocks. In general habits resembles the Common Pipit.

Feeding Habits.—Weed seeds, grass seeds, and insects are commonly eaten by this bird.

Voice.—A single note, uttered at intervals as bird takes flight; much harsher than and quite different from the two-syllabled call-note of the Common Pipit. Song, in more northern summer home, loud, ventriloquistic, and very much like that of the English Skylark, sung at an altitude of about 500 feet above the ground, increasingly rapid and forceful, then fading away and stopping suddenly.

Description.—Upper-parts grayish-brown, widely margined with ashy-buff; wings browner, with two distinct bars; tail fuscous, the two outer pairs of feathers largely white. Under-parts white, tinged with buffy, with more buffy and a band of streaks across breast. In spring, more blackish marked above, less buffy below and with narrower chest streaks. L. 6.30. W. 3.30. T. less than 2.62, usually 2.40. B. .50.

Field Marks.—Size smaller, colors brighter, markings more distinct than in the Common Pipit; also back feathers grayish-brown to grayish-buffy, usually in striking contrast, blackish-brown streaks on buffy or ashy back, presenting *distinctly streaked or mottled back,* each feather being dark in the center and widely margined with ashy, corresponding feathers of the Common Pipit being plain. Yellowish-brown color. Harsh, one-syllabled call-note. Tarsus shorter than hind-toe and its claw, while in Common Pipit it is decidedly longer than hind-toe and claw; hind-claw decidedly longer than its toe, while in the Common Pipit the hind-toe and its claw are about equal.

Popular Names.—Missouri Skylark; Missouri Tit-lark; Sky Pipit; Great Plains Pipit.

Remarks.—Named in honor of Isaac Sprague, who first discovered it near Fort Union, Upper Missouri, June 9, 1843.

SAGE THRASHER

Oreoscoptes montanus (J.K.Townsend)

Rare migrant and winter resident, November to early April. November 18, 1921, 3 (A); January 24, 1915 (A); February 10, 1907, 2 seen and closely observed through a glass (S); April 18, 1915 (A); occasionally met with (Nehrling).[251] *Recorded:* ACS.

Geographical Distribution.—Western United States, from southern border of Canada south to east-central California, southeast to northern New Mexico, and east to western Nebraska. Winters from southern California and the hills of central Texas (Austin and San Antonio) southward into northern Mexico.

Habitat.—Western sagebrush plains and foothills. In winter, lowland valleys and semi-open hillside country with clearings interspersed among the thickets.

Local Haunts.—Rough country between Shoal Creek and the edge of the hills; thicket on summit of Mt. Bonnell; northwestern and southwestern edges of town.

General Habits.—Usually observed singly, rarely by twos and threes. Perches atop tall sagebrush or on telegraph pole.

Flight.—Extended, undulating.

Voice.—Song rich, little short of that of the true thrashers.

Description.—Upper-parts dull grayish-brown, indistinctly streaked. Under-parts whitish, to buffy on flanks and under tail-coverts, with sooty to brownish spots on breast and sides. Wings and tail about equally long, the wings with two narrow white wing-bars, the tail with white tips to inner webs of outer two to four feathers. Well developed rictal bristles. L. 8.50. W. 4.05. T. 3.28. B. .63.

Field Marks.—Appears to be a streaked, grayish-brown Mockingbird. *Big gray body. White corners to graduated tail.* Long, undulating flight.

Popular Names.—Sage Mockingbird; Mountain Mockingbird; Rocky Mountain Mockingbird.

WESTERN MOCKINGBIRD

Mimus polyglottos leucopterus (Vigors)

Very common permanent resident; locally migratory in colder parts of winter, withdrawing to sheltered localities and hence seeming less abundant during such seasons. February 5, 1913, 1 shot for identification (B). *Recorded:* ABCD[252]EFGH[253]IJKLMNOPQRSTWY (and Nehrling[257]).

Geographical Distribution.—Southwestern United States, from western Kansas, southern Wyoming, and central California, southward to the lower coast of Texas and into northern Mexico.

Habitat.—Rather open places and semi-open country, commonly everywhere except in cedar brakes and deep woods; most common about

dooryards, gardens, parks, and the residential districts of towns; fencerows, roadsides, and bushy pastures; vicinity of farmhouses and orchards, borders of woods and clearings, and oak mottes and mesquites on the prairie. In cold winter weather, lowland thickets and tall timber.

Local Haunts.—Everywhere in and about Austin and across the whole of the Region, less common in the hills on account of the many dense cedar brakes; campus of the University of Texas.

General Habits.—Friendly, living about human habitations in pairs or family groups, singing and playing about, guarding its home neighborhood against marauding cats and strangers. Sings from all manner of prominent perches, from tree-top to clothesline.

Feeding Habits.—Feeds on berries, insects, earthworms, and many varieties of wild fruits and seeds. A great many retire to secluded localities in winter, feeding on seeds in undergrowth and brush; others feed on the hackberries so common in town in winter.

Breeding.—April to July. Earliest: April 9, 1915, 3 fresh eggs (A); April 17, 1901, 4 fresh eggs (B); April 30, 1889, nearly fledged young (D); April 30, 1919, 4 nearly grown young (A). Latest: July 12, 3 eggs (D); July 3, 1916, 5 eggs (F); June 11, 1915, 4 slightly incubated eggs (A). Generally 2, rarely 3, broods, usually (1) last week in April and (2) last week in May. *Breeding recorded:* ABCDEFGHIJKLMNOPQWY.

Nest Location.—1 to 40, average 6, feet up in fork or crotch or on solid limb among small twigs, in tree or bush in pasture, along fencerow thickets, about farmhouses, or about dooryards; commonly in the cedar elm, winged elm, Mississippi and rough-leaved hackberries, mesquite, cedar, and live oak saplings; less commonly in wild vines, porch vines, mountain live oak, fragrant catsclaw, prickly pear thicket, prickly ash, gum elastic, Mexican persimmon, black willow, wild plum, and osage orange or bois-d'arc; rarely in hollow in top of cedar fence post, in brush piles, on stumps, or in corners of rail fences.

Nest Construction.—Bulky, but neatly and compactly built structure, composed usually of small twigs (generally dry oak twigs) and some Indian tobacco weed, or of thorny mesquite, prickly ash, crooked bush, or catsclaw twigs; rarely with strips of cedar bark, and occasionally with some Spanish moss, leaves, rags, grass, bits of cotton, oak blossoms, string, rootlets, feathers, horsehair, bark strips, paper, and other trash. Lined commonly with fine rootlets and horsehairs, occasionally with a few dried grasses and grass roots, pieces of weeds, oak blossoms, and bits of cotton and thistledown.

Nest Building.—Paired by March 1, and nest building usually commences during the latter part of March. Nests completed usually in from two to four days. April 6, 1919, nest begun, with about fifteen sticks interlocked (A). April 7, 1916, completed nest (G).

Nest Measurements.—Inside, diameter 3 to 3.75; depth 1.75 to 2.

Eggs.—3 to 6, average 4 to 5 for first set, 4 for second, pale green or greenish blue, marked about larger end with bold splotches and distinct spots of reddish-brown; vary considerably, from dark green ground-color with large chestnut blotches to very light green with an even distribution of small reddish specks, sometimes wreathed solidly about the larger end with reddish-brown; a gray-blue or bright blue, with freckles, to uniform brownish-looking, .98×.74, varying from .89×.69 to 1.16×.81.

Voice.—Most famous songbird of the United States, and our national songster; song usually low and sweet, but mocks nearly all the local and many of the migrant birds. Imitates the excited twittle of the Scissor-tailed Flycatcher, the song of the Wood Thrush, calls of the Roadrunner, the Southern Blue Jay, the Sennett Titmouse, the Chuck-will's-widow, the Howell Nighthawk, and countless others, even

the Migrant Shrike, the Blue-gray Gnatcatcher, and some of the smaller warblers; an individual bird frequently has as many as three dozen imitated songs. Utters each imitation two or three times, and then takes up another, which it treats in the same way; frequently such repetition is the only thing that distinguishes the imitation from the song mimicked, such mimicry tormenting the visiting bird student to distraction since it is always misleading him. Sings all the year, especially from late February to late October, with great fervor in daytime and all night, and with especial fervor on beautiful moonlight nights in spring and summer; sings commonly throughout the winter in mild weather. Song uttered from house-top, telephone pole, fence post, clothesline, or fence wire; the wings are lifted as the song becomes more intense and fervid, sometimes the bird even being carried off its feet, tossing itself into the air and pirouetting. Alarm-notes, very harsh and sharp.

Description.—Upper-parts ashy-gray to grayish-drab, with fuscous to blackish wings and tail, the latter long and slender, three outer feathers largely and distinctly white; white-tipped feathers in wing forming whitish wing-bars, with a large white patch in middle of wing conspicuous in flight. Under-parts soiled white. Sexes alike, the female with slightly smaller white areas in wings and tail. Nestling, grayish-brown above; white, spotted with fuscous, below. L. 10.25. W. 4.49. T. 4.95. B. .68.

Field Marks.—Long, slender, gray bird of medium size; long, rounded, blackish tail, the three outer feathers distinctly white; patches in wings conspicuously white in flight. Highly varied song and friendly habits. May be told from the similarly colored Migrant Shrike by longer tail, absence of striking black patch across face, larger wings, and slender and gently curving bill instead of a hooked bill.

Popular Names.—Mocker.

CATBIRD

Dumetella carolinensis (Linnæus)

Rather uncommon migrant, occasionally and irregularly tolerably common or even common; middle September to middle October, and third week in April to middle of May. In fall, September 13, 1919 (A); October 17, 1921 (A). In spring, April 18, 1915 (A); April 27, 1919, pair (Wolfe); April 30-May 4, 1922, common (A); May 6, 1905, 1 shot (B); May 6, 1914 (G); May 7, 1916, 4 (G); May 15, 1919 (A). *Recorded:* ABCD[234]GH.

Geographical Distribution.—Southern Canada and eastern United States, westward to northeastern Oregon, northeastern New Mexico, and northeastern Texas, the western limit following the eastern base of the Rocky Mountains; southward to northern Florida, the Gulf Coast, and northeast-central Texas (Harris County, rarely). In migrations, southward across eastern and central Texas, as far west as Concho County. Winters from Southern States southward across Mexico and Central America.

Habitat.—Clearings and thickets; shrubbery on the edge of streams; creek valleys, valley slopes, and gullies, where dense, rich growth of taller trees, undergrowth, and vines forms a cool shade; thick woods and dense thickets; edges of pasturelands. In its summer home, dooryards, gardens, and orchards.

Local Haunts.—Particularly common in wooded valley about Twenty-eighth Street, between North Guadalupe and Speedway; less common along brushy slopes of Shoal Creek valley, in brush along Walnut Creek, on brushy hillsides west of Austin, and on Waller Creek in East Woods and near the Country Club.

General Habits.—Usually observed singly, rarely a widely scattered company of as many as a dozen in a particularly fine habitat. On account of its retiring habits it is not frequently noticed; restless, almost continually pumping its tail. Though friendly and familiar in its more northern summer home, in the Austin Region the bird never seeks an elevated perch and rarely ventures out of the brush. Playful, jerking and crouching, tossing and spreading its tail, and fluffing its feathers.

Feeding Habits.—In autumn, feeds largely on wild fruits and berries; in spring, on ground beetles, ants, caterpillars, grasshoppers, and other insects.

Voice.—Song, an excellent, charming, soft *phut-phut-coquillocot*, uttered from the depths of thick shrubbery; mockingbird-like medleys. Calls, monotonous scolding notes and cat-like *mews, meows;* or harsh, strident, buzzing, but clear and distinct *nee* or *neeow*, like a cat.

Description.—Slaty-gray, darker to black on crown and tail. Under tail-coverts rich chestnut (occasionally spotted, rarely heavily marked, with slaty). Young, washed with brownish. L. 8.80. W. 3.60. T. 3.90. B. .65.

Field Marks.—Dark slaty or slaty-drab, nearly uniform in color. Black cap and tail, latter long and rounded at tip. *Rich chestnut-brown patch under tail.*

Popular Names.—Black-capped Thrush.

BROWN THRASHER

Toxostoma rufa (Linnæus)

Rather scarce winter resident, formerly rather common; late September or early October to middle April, not uncommon from middle November to late March. In fall, September 26, 1919 (A); September 29, 1916 (G); November 6, 1915 (F). In spring, April 22, 1915 (A); April 30, 1922 (A). *Recorded:* ACD[255]FGHJMW.

Geographical Distribution.—Great Plains and foothills of the Rocky Mountains, from Canada southward to northern Texas. Winters from middle western states southward into northern Mexico.

Habitat.—Undergrowth and thick brush along creeks and in ravines; woods and thickets with dense underbrush; thickets and brush rows along the edges of dry fields or the border of woods; hedgerows and low growth along fences; thickets in dry fields.

Local Haunts.—Brushy woods about the edges of the city; along the second bank of the Colorado River; slopes of Shoal and Waller creek valleys; thickets in uncultivated swales northeast of town; vacant lots grown with brush; edge of creek valley about Twenty-eighth Street, between Guadalupe Street and Speedway.

General Habits.—Generally observed singly, rarely in small family groups on its arrival in early fall. Very shy and retiring, suspicious, staying close to the ground in shelter of thickets and brush heaps. Active in moving about, rarely still.

Feeding Habits.—Seeks food on the ground, rustling about among and scratching in dry leaves in search of worms, beetles, and other insects hidden beneath them; also feeds on spiders, bugs, caterpillars, grasshoppers, small seeds, and fruits growing wild.

Voice.—Song, a loud, rich, resounding, Mockingbird-like melody, *drop-it, drop-it,—cover it up, cover it up—pull it up, pull it up,* sung from a conspicuous perch, generally among the upper branches of the trees; rarely heard in the winter home of the bird. This species does not mock as do others of the family. Call, a sharp, whistled *whèeu* or *wheuu;* a loud, sharp, unpleasant, harsh, kissing *smack.* Alarm-note, a sharp *click.*

Description.—Rich rufous-brown, rufous, or reddish-brown above and on wings and tail; under-parts white (to buffy in fall), heavily spotted and streaked with dark brown or blackish (except on throat and center of belly). Two indistinct whitish wing-bars; tail very long, wide, drooping. Bill long, slightly and gradually decurved near tip. Eyes yellow. Young, golden-brown on rump, fawn-colored spots on shoulders, thicker and darker spots on under-parts. L. 11.50. W. 4.20. T. 5.25. B. 1.04.

Field Marks.—Rich light brownish-red color. Large size; longer than Robin. Heavily spotted breast. *Long, rounded,* slightly widened *tail;* long decurved bill.

Popular Names.—Brown Thrush; Ground Thrasher; Brown Mockingbird; Thrush.

CURVE-BILLED THRASHER

Toxostoma curvirostris curvirostris (Swainson)

Very rare summer resident, late February to October. In spring, February 23, 1919 (A). In fall, October 23, 1920 (A). May perhaps occur in winter. *Recorded:* A.

Geographical Distribution. — Northern and northeastern Mexico northward across the Rio Grande Valley and the arid country into southeastern New Mexico and to south-central Texas, commonly as far as San Antonio, less commonly to Corpus Christi, Refugio, and Concho County; apparently working gradually northward in the track of the chaparral and mesquite, since it has recently appeared as far north as Austin.

Habitat.—Semi-open, cactus-covered uplands; thorn-brush and mesquite country; dry washes; sheltering brush piles and thickets. Never in cultivated country.

General Habits.—Tame and easily observed, occurring singly and in pairs. Travels in and through the thickest, thorniest cactus with the greatest of ease. Lives near the ground, mounting slightly higher to nest or to sing; perches on brush or roadside bushes, where it shows its characteristic inquisitiveness as it eyes passersby; sits close to the nest, since it is not easily frightened.

Feeding Habits.—Digs about in ground with short curved bill for seeds and subterranean insects.

Breeding. — Probably. One nest with four eggs, probably this species, though parents not seen; mile southwest by west of Austin, 1908 (A). Early March to early July. Two broods.

Nest Location.—3 to 8, rarely 13, feet up in mesquite, cholla cactus, prickly pear cactus, yucca, mistletoe in mesquite, or low thorny bush, in thickets or large clumps of prickly pear, rarely in open woods.

Nest Construction.—Composed of twigs or very thorny sticks and roots. Lined with grass and rootlets.

Eggs.—3 to 5, usually 4, light bluish-green, thickly covered with minute speckles and tiny specks of reddish-brown, 1.08×.78.

Voice.—Call very loud, liquid, two-syllabled.

Description.—Upper-parts light brownish-gray; throat whitish; breast and sides thickly spotted and clouded with gray; flanks buffy. Two narrow white wing-bars. Striking white tips to four outer pairs of tail-feathers. Sexes alike, with little variation throughout the year; sometimes the wing-bars and the spots on under-parts are not evident in worn summer plumage. Bill decidedly decurved. Eyes bright red. Tail long. L. 11. W. 4.35. T. 4.52. Exp. C. 1.20.

Field Marks.—Mockingbird-like, but paler and more grayish to pale grayish-brown, or plain earth-clay-colored, very obscurely spotted on breast. Long, downward-curving bill. Large-medium size, fairly stocky build. Short rounded wings, and long tail. In flight, whitish-colored tips to tail-feathers. At almost any distance, *bright red eyes.*

Popular Names.—Rio Grande Curve-billed Thrasher; Pale Curve-bill; Spotted Mocker.

ROCK WREN

Salpinctes obsoletus obsoletus[256] (Say)

Rather rare and irregular resident; usually more common in spring and fall, less common in summer, and very rare in winter. Specimens collected, January 17, 1913; January 30, 1913; and March 9, 1905 (B). Recorded: March 18, 1901 (B); March 23-24, 1905, tolerably common (B); May 17, 1919 (A); June 27, 1919 (A); October 17, 1919, fairly common (A). *Recorded:* ABCD[257]EFU.[258]

Geographical Distribution.—Large portion of the mainland of western United States, from southern Canada to northern Mexico, from the Pacific Coast east to western North Dakota, western Nebraska, nd western and northwestern Texas (east to the central districts near Austin and San Antonio). Winters in southern half of western United States and in northern Mexico.

Habitat.—Canyons, caves, and fissures of dry, rocky foothills; limestone quarries; rock slides and boulders of immense size, along canyons and valleys in the hills; rocky, boulder-strewn hillsides; bleak, wind-blown, rocky regions; canyons, caves, and fissures of plains country.

Local Haunts.—Boulder-strewn beds and slopes of canyon streams, principally Big Bee, Barton, and Bull creeks; slopes and gorges of Lake Austin about 10 miles above the city; Campbell Hole cliffs; Barton canyon above Phoebe cave; Barton valley, about 150 yards above Barton Springs; rocky river slope of Mt. Bonnell; Taylor's lime kiln; rock quarries northeast of Dam. Western half of the Region, east to Austin.

General Habits.—Quite uncommon, and usually observed singly, except in summer and fall, when it occurs in family groups; sticks close to the boulders in creek bottoms, rather than high up in cliffs as is the habit of the reddish-brown Texas Canyon Wren. Clambers and slinks about over rough-surfaced boulders, or makes short flights along the low face of some ledge; well protected because of its perfect limestone rock color; twists about, crawls along, bobs in and out under piles of rock and boulders, and disappears in crevices. Cocks its tail, and scolds in true wren fashion.

Feeding Habits.—Searches for beetles and spiders about boulders, in crevices, and about rocks in canyon bottom or limestone quarry.

Breeding.—Probably. Middle March to middle May, in pairs or small colonies. Two broods, the second one about the third week in April.

Nest Location.—3 to 20 feet up, in crevice, cranny, tiny cave, hole, nook, or pot-hole, in giant boulder, wall, cliff, or pile of limestone debris, or under boulder. Passage from nest to exterior, usually 7 to 10 long, almost always paved with pebbles or bits of rock, like a gravel walk from a doorway. Rarely in hollow stumps or about buildings.

Nest Construction.—Nest always placed on saucer-shaped foundation composed of numerous small flat stones, or limestone chips, rather thin, and about an inch or two across. Nest built of rather coarse sticks, weed stalks, dead grasses, and numerous fine rootlets. Fairly well cupped; heavily lined with grayish goathair or with soft grasses.

Nest Measurements.—Inside, diameter 2.75, depth 1.12.

Eggs.—3 to 7, commonly 5 to 7, pure white, finely specked with reddish-brown, usually about the larger end, .72×.52.

Voice.—Song, loud, whistling, varied, at times canary-like; *chick'-tree-e-e-e-e-e-e-e*, running into a trill (A); a slow, harsh, machine-like, unbird-like *kra-wee, kra-wee, kra-wee, kra-wee*, then faster; sung from boulder top or upper ledge.

Description.—Head and nape ashy, with a brownish wash, gradually blending on back from ashy to rufous (parts finely flecked with fine black and white dots) and then to brighter rufous on rump; tail dull rufous, graduated, banded near end with black, and broadly tipped with buffy-brown; back, middle tail-feathers and rump, barred. Wings dark gray, with darker bars, and a tinge of rufous on the tertials. Throat and breast grayish-white, latter usually finely speckled; shading to whitish belly; flanks brownish; under surface of tail striking, buffy-white, with conspicuous lateral bars of dark brown or black. Sexes alike, with little seasonal change, though birds are usually browner in worn summer plumage. Young, rusty gray above, and brownish on under tail-coverts. L. 5.70. W. 2.75. T. 2.25. B. from N. .50.

Field Marks.—A *pale-grayish*, whitish-colored wren, seemingly dipped in powdery limestone dust; *rump pale bright cinnamon. Distinct white line over eye.* Prominent fan-shaped tail, with pale cinnamon corners; *black crescent across tail* near end. Head fuller and rounder than that of the average wren. Not nearly so brown as generally supposed; more nearly the color of limestone. *Tail rounded, fan-shaped.*

Popular Names.—Pale Wren; Limestone Wren; Pale Canyon Wren; Boulder Wren; Rock Wren.

TEXAS CANYON WREN

Catherpes mexicanus polioptilus[259] Oberholser

Common permanent resident. Specimens collected, two on March 17, 1905; and one each on January 17, 1913; February 25, 1905; April 30, 1905; October 8, 1901; and December 18, 1912 (B). *Recorded: ABCD*[260] EFGHIJKLMNOPQRTU[261]WY.

Bailey LAF
CANYON WREN

Geographical Distribution.—Southwestern border of United States, from middle Texas (Stephens, Eastland, Bosque, Travis, and Bexar counties) west through New Mexico and Arizona to extreme southern California, southward into northern Mexico and Lower California.

Habitat.—Wild cliffs and great rock walls in canyons and the numerous side canyons of rivers and creeks intersecting the limestone hills; great rocky canyon walls along the Colorado River; old rock buildings in towns; lss commonly, about houses and barns.

Local Haunts. — Common in the city, about rough stone walls of buildings in both business and residential sections; sections; in canyons and about cliffs along the river; State Capitol building; campus of the University; Barton canyon, particularly Campbell Hole cliffs and canyon wall just below and west of Campbell Hole; Onion Creek, between McKinney Falls and Moore's crossing; Deep Eddy cliffs; Mt. Bonnell; Bee Creek, Western half of Region, east to city and east to McKinney Falls on Onion Creek.

General Habits.—Common in and about the city of Austin, and sings from the chimney-tops with the Western Mockingbirds and Texas

Long-tailed Wrens. Mrs. Florence[8] Merriam Bailey, observing this in Austin, said that "when they do, what cool, grateful canyon memories they awaken in the midst of the town! When heard afterwards on their own native canyon cliffs it seems impossible that they could ever sing in a city, their song is so attuned to the wild mountain fastnesses."[262] In the canyons west of the city one may certainly find the bird in its own element—a pygmy, perching on a fragment of a great frowning cliff over a gentle rivulet, peeking down for a moment, disappearing into crevices, reappearing to cling on the perpendicular rock, flying back and forth among small caves and pot-holes, moving along the ledges of cliff faces, ledges so high that the bird seems but a tiny brown speck with an even tinier white speck for his throat, yet his powerful little voice makes the canyon ring.

Breeding.—Middle March to late May. Earliest: March 14, 1916, eggs (FG); March 30, 1889, eggs hatching (D)[260]; April 3, 4, and 11, 1890, fresh eggs (D)[260]; April 3, 1913, 5 eggs, incubated about four days (B); April 4, 1916, 4 young (F); April 15, 1901, 6 fresh eggs (B). Latest: May 13, 1915, 4 young leaving nest (AB); May 24, 1905, 3 slightly incubated eggs (E). Season cycle: One pair in 1916, March 14, nest completed; April 4, young; April 19, 4 young out of nest, parents having commenced new nest before young were out of old one; May 29, second brood of 4 out of nest, and new nest begun shortly after; July 27, third brood of 4 young left nest. Two or three broods. *Breeding recorded:* ABCDEFGHILMNOP.

Nest Location.—4 to 90, usually 25, feet up from ground, firmly placed in well shaded place in convenient sized cranny, pot-hole, cave, or crevice, or on narrow shelf of rock under overhanging ledge, in face of perpendicular limestone cliffs or inaccessible canyon walls, generally in cool, shady place where water drips from overhanging ledge above. Rarely, in holes in cedar fence posts, eaves of outhouses and rafters of barns, crevices about rock buildings, cross-braces underneath houses and cabins, under cornices of verandas, and in chimneys of uninhabited houses; before abundance of the European House Sparrow, nested in mail boxes as commonly as does the Texas Long-tailed Wren.

Nest Construction.—Slightly flattened, open-topped nest of small sticks, finer twigs, weed stems and grass stems, and grass seed stems, built over with cobwebs, fine plant down, spider webs, thistle down, soft rabbit and squirrel hair, green moss, and green lichens; and occasionally horsehairs, tiny hair-like rootlets, bits of caterpillar cocoons, Indian tobacco, and green oak and hackberry leaves, cedar bark, small leaf-skeletons, chicken and Western Mourning Dove feathers, and cotton. Rim of nest gently rounded, and front of nest gently rounded outward and downward; heavily lined, and rim and front covered and felted, with thistle down; occasionally with wool, cotton, bits of cocoon silk, plant down, and downy feathers. One nest built entirely of cotton.

Nest Measurements.—Outside, diameter front to rear 4.50, diameter side to side 6 to 7.50, height about 3 or 4, depending on angle of slant of shelf or foundation. Inside, diameter 2.12 to 2.75, depth 1.30 to 2.

Eggs.—3 to 6, usually 5, ovate or rounded ovate, clear white, speckled with reddish-brown and lilac; of two types: (1) so minutely speckled with brown pin points as to appear immaculate at first glance, but seen on closer inspection to bear from a few to many hundreds of very tiny, almost infinitesimal specks about the larger end, scarcely marring the pure white of the background; and (2) more boldly speckled, but with fewer markings than eggs of the Texas Long-tailed Wren, the specks much darker and with little of reddish-brown effect, rarely forming a distinct, sharp wreath about the larger end, a common condition for eggs of the other species, .70×.52.

Voice.—Song, a series of from seven to twelve loud, clear, happy, vibrant, ringing, full rippling, musical, bell-like whistles, starting high and running and tripping rapidly down the scale; as a rule brought to a close with a thin, teasing, whining, characteristic flourish, *spee-yer, spee-yer, spee-yer,* or *spee-u-ee, spee-u-ee, spee-u-ee,* uttered at a much slower rate than the whistles. Song re-echoes from cliff to cliff, faintly repeated by the countless under-echoes of the canyon. Sings from late February to November; never too tired to whistle. Call, a clear, ringing, rather measured, slightly quickened *peupp, peupp, peupp, peupp, peupp,* each slightly lower in key and pitch than the last, but never approaching a trill.

Description.—Above light brown, shading to grayish-brown on head and to rusty-brown on tail, latter crossed by narrow black bars; upperparts speckled with blackish and white; throat and breast white, shading to dark rusty-brown on belly. Young, few if any white specks above; mottled with dusky. L. 5.80. W. 2.44. T. 2.14. Exp. C. .79.

Subspecific Characters.—Not clearly defined form like other races of the species, but a series of intermediates separated for convenience in naming so that the other races will stand distinct. Texas specimens are palest, those in Arizona darker, those in southern California darkest; the race is medium pale when compared to the other races; variously intermediate between two large Mexican races and the two smaller races of western United States, the more western race of each pair being the darker. The four distinct races are: (1) Mexican Canyon Wren, *C. m. mexicanus* (Swainson), of southern and central parts of the Mexican plateau, a large dark race; (2) Giraud Canyon Wren, *C. m. albifrons* (Giraud), of northeastern and east-central parts of the Mexican plateau, touching into the United States at the mouth of the Pecos River in Texas, a large, paler, more grayish race; (3) Common Canyon Wren, *C. m. conspersus* Ridgway, ranging across the middle western United States from Colorado and Wyoming across the arid deserts to California's southeastern border, a small, pale race; and (4) Dotted Canyon Wren, *C. m. punctulatus* Ridgway, of California, except southeastern and extreme southern portions, a small, dark race.

Field Marks.—Uniform rusty-brown. Sharply defined large white throat-patch. Back speckled with white. Tail rich brown, with about five narrow bars of black. Characteristic whistles.

Popular Names.—Cliff Wren; Whistling Wren; White-throated Wren; Brown Canyon Wren; Bugler; Intermediate Canyon Wren; Canon Wren.

CAROLINA WREN

Thryothorus ludovicianus ludovicianus (Latham)

Common permanent resident; nearly as common as the Texas Long-tailed Wren. Specimens collected, January 5, 18, and 30, 1913; February 20, 1913; and March 17, 1905 (B). *Recorded:* ABCD[263]EFGH[264] IJKLMNOPQRSTWY.

Geographical Distribution.—Eastern United States and the Gulf Coast, except Florida and the Lower Rio Grande (where it is replaced by other subspecies), north to Connecticut, southern Pennsylvania, and southeastern Nebraska; west to central Texas.

Habitat.—Heavily timbered bottomlands along creeks; all low wooded localities with dense underbrush in forest bottoms; wooded rocky stream banks and shaded ravines; partial to creek and river bottoms, wooded ravines, and brush along creeks; brush heaps, dense thickets, vine tangles, log piles and roots of trees, clearings in bottoms choked with fallen timber, and other low damp localities; borders along streams; undergrowths near water; deserted cabins and barns in lowlands; bottomlands along creeks and in all heavily wooded country.

Local Haunts.—Eastern half of the Region; and streamways in valleys in the hill country, where it is very scarce. East of the hills, brushy wooded river and creek valleys, in underbrush and brush along bottoms and slopes; gullies along the river. In the hills, among underbrush and debris along wooded bottoms of Colorado River, Deep Eddy and Lake Austin, Bull and Barton creeks.

General Habits.—Never found generally about human habitations, as are the House and Bewick Wrens. Continually, nervously active, bobbing and flitting its tail. In winter, seeks shelter of dense undergrowth and thickets in wooded ravines.

History.—For several years it was exceedingly abundant and breeding about the old railroad trestle, between the south end of the Colorado River railroad bridge at Austin and the Barton road-crossing, before the right-of-way was built up and graded to the rails. This old trestle, lifting the track about 12 feet above the flat river bottom, was built of old piles and timber from the temporary bridge erected during the construction of the present new iron-and-steel bridge. As soon as the new bridge was completed, the temporary bridge was torn down and the timbers were used to support the track across the bottoms. The Carolina Wrens nested in the old mortice-and-tenon holes which were everywhere about the supporting pillars—nested so commonly, in fact, that there seemed a wren nest in every other pillar.

Feeding Habits.—Feeds principally on insects.

Flight.—In going a short distance, the bird moves along with rapid wing-beats and a jerking motion of the tail.

Breeding.—Late February to late June. Earliest: February 26, 1907, 4 slightly incubated eggs (B); March 27, 1915, 5 fresh eggs (A); April 1, fresh eggs (D)[265]; April 15, 1917, 6 fresh eggs (B). Latest: June 26, 1901, 5 slightly incubated eggs (B). Two or three broods; height of breeding season, middle of April. *Breeding recorded:* ABCDEFGHIJLNOY.

Nest Location.—2 to 10 feet up, about old houses or in old sheds, rarely in holes in clay banks or hollows in trees; in eaves of porches, on rafters in houses and barns, crannies about houses and corn-cribs; shelves in barns and deserted houses; crevices in loose rock walls; in wren boxes, in tin cans, in old clothing hanging on nails in sheds, in hollow logs, and in pigeon-holes and tool-racks in blacksmith shops; shallow holes in perpendicular clay banks or sandy bluffs along creeks. (See remarks under History.)

Nest Construction.—Rounded and domed or almost domed, one side of the nest usually considerably tipped up and arched over eggs, with entrance on side. Rather bulky, composed largely of cedar bark strips; dead leaves of the cedar elm, hackberry, and agarita; and feathers; with some weed stems, grass stems, and tiny cedar twigs mixed in; and occasionally grass rootlets, broom straws, a small twig or two, Johnson grass, corn husks, pieces of paper, pieces of string or white cotton thread, cast-off snake-skin, cotton, horsehair, green moss, wool, rags, and leaf skeletons. Lined with horsehair, feathers, or very fine hair-like grass seed stems and rootlets.

Nest Building.—One pair built a nest and laid 5 eggs in eight days (A).

Nest Measurements.—Outside, front to rear, at base 5.25 to 7; at roof 2 to 3; width 6 to 6.25; height 3.50 to 4.10. Inside, front to rear 1.75 to 3; width 2.60 to 2.75; height 2.40 to 2.50.

Eggs.—4 to 6, usually 5; ground color rarely, if ever, pure white, but most frequently creamy-white or salmon-buff, usually well hidden by thick covering of specks and spots of reddish-salmon, brownish-pink, or cinnamon-rufous and lilac, rather than reddish-brown, forming a poorly defined wreath about the larger end; markings much larger, paler, and more generally scattered than those on other wren eggs; eggs rounder and larger than those of the Texas Long-tailed Wren, .74×.60.

Voice.—Fine singer. Song, loud, clear, rich, cheery, ringing, musical whistle; a steady, regular, continuous repetition, growing neither faster nor slower, and not of several different parts in the same rendition, as with the Gray-tailed Cardinal; neither Gray-tailed Cardinal nor Tufted or Sennett Titmouse songs are as ringing as those of the Carolina Wren, which they resemble; considerable variation: (1) *chip-er-ree, chip-er-ree, chip-er-ree, chip!;* (2) *tree, double-tree, double-tree, double-tree;* (3) *tea-kettle, tea-kettle, tea-kettle;* (4) *whittier, whittier, whittier, whittier;* (5) *whitt-yer, whitt-yer, whitt-yer;* (6) *chippery, chippery, chippery, chip;* (7) *whee-udee, whee-udee, whee-udee;* (8) *whee-udel, whee-udel, whee-udel;* (9) *sweet William, sweet William, sweet William.* Sings throughout the year, winter as well as summer, but more commonly in early spring. Call-notes: calls, with much rolling of the *r*'s, *terrp; tierrp-tier-r-p; chier-r-r; cheerrp; tieu u u;* a slower *tieur-r-r, tieur-r-r, tieur-r-r,* about a two-second interval between each; *cack; clack; clink;* clinking metallic rattles; musical trills and tree-toad-like *k-r-r-r-r-ings.* Scolds frequently, particularly when owls or crows are near.

Description.—Bright rufous-brown or rusty-brown above and back of eye, without bars or streaks, but concealed downy white spots on rump-feathers; wings and tail rusty-brown, distinctly barred with black in very fine lines; long, conspicuous buffy-whitish line over eye, separated from crown by indistinct black line; paler to brownish-cream-buff below, whitish on throat; occasionally few black bars on flanks. Long curved bill. Sexes alike, with little seasonal change; dingier above and more whitish below in worn summer plumage than in fall, when it gains deep buff or cinnamon under-parts. Young, more cinnamon above; crown blackish. L. 5.60. W. 2.35. T. 2.05. Exp. C. .65.

Field Marks.—Distinct light or white line over eye. Large size, and heavy build. Tail rather small, short, *not* fan-shaped. Rich cinnamon-brown colors, *tail same rich reddish-brown as back,* without white edges or corners.

Popular Names.—Big Brown Wren; Mocking Wren; Great Carolina Wren; Common Carolina Wren; Bottomland Wren; White-browed Wren.

TEXAS WREN

Thryomanes bewickii[265] *cryptus* Oberholser

Very common permanent resident, the most common of the wrens; appears to be more common during late summer and in fall, when in family groups with young of the year. Specimens collected, January 18, 1902; February 18, 1913; and March 9. 1905 (B). *Recorded:* ABCD[266]EFGH[267]IJKLMNOPKSWY.

Geographical Distribution.—Sonoran Subzone of the southern plains country, from northeastern Mexico northward across Texas (except extreme eastern and western portions) and Oklahoma to southern Kansas; more or less migratory in the northern part of its range.

Habitat.—Usually broken country, almost always near civilization, little patches of prairie and mesquite groves alternating with timber; old pastures dotted with brush heaps and lined with brush fences; cut-over woods; mesquite-chaparral-cactus country; thickets and beds of cactus in mesquite and cactus country; brush heaps and thickets along creeks; dense cedar brakes on the hills; along rather open creek valleys, on slopes and hills, and in semi-open country, but never in dense bottom woods or on extreme open country; about barns, de-

serted houses, wood piles and brush heaps. In winter, thickets on rugged slopes of river banks, among rocks and narrow ravines; less common in other localities.

Local Haunts.—Whole of the Region, especially common in and about the city of Austin; observed commonly on University campus.

General Habits.—The commonest local wren, a pair in nearly every garden in Austin. Very friendly, and found all about barns and human habitations. Unless pursued, the bird is usually more deliberate in its movements than either the House Wren or the Carolina Wren. Hops about, with long tail erect or even tilted over forward.

Feeding Habits.—Very fond of caterpillars, grasshoppers, and various other noxious insects.

Courtship.—Mated in February (D).[266]

Breeding.—Early March to middle June. Earliest: March 3, 1907, 7 fresh eggs (B). Latest: June 10, 1901, 5 slightly incubated eggs (B); June 14, 1915, 3 slightly incubated eggs (A); June 2, 1907, 7 heavily incubated eggs (E). Unusual: May 27, 1905, 6 fresh eggs from nest just left by first brood of young (B). Two or three broods; first set usually about March 30, second about May 7, third rarely laid. *Breeding recorded:* ABCEFGHIJLMNOPQWY.

Nest Location.—From 3 inches to 25 feet, usually 6 feet, above ground, in old woodpecker hollow in telegraph pole or dead tree or stump; natural cavity in mesquite or cedar elm tree; in boxed fence posts; about old sheds and barns, particularly those in the hill country or on the Rio Grande plain; nooks and crevices about old barns and deserted houses; in bird boxes, rural mail boxes, tin cans in bushes and trees, broken bottles on shelves in sheds, old clothing hanging from hooks or nails, ornamental tin cornices at eaves of houses, wooden eaves, and old cow-skulls in pastures; among tangled pads in prickly pear beds; rarely, old hats in sheds, old oriole and mockingbird nests, and similar localities.

Nest Construction.—Large, compact structure, top level and open above; composed of a mass of rubbish, principally cedar bark strips, small short sticks and twigs, dead leaves, bits of twine, and chicken feathers, with the occasional use of horsehair, cowhair, grass, weed stems, rootlets, oak blossoms, cast-off snake skin, cotton waste, leaf skeletons, spider webs, cobwebs, caterpillar cocoons, paper, and bits of corn husks. Cedar bark and twigs are usually interlocked and moulded into a strong, symmetrical nest with deep, well constructed cup. Lined warmly with soft, downy feathers and horsehair, and occasionally cow and rabbit hair, bits of fibers, cast-off snake skin, cotton, and oak blossoms; soft feathers of the Western Mourning Dove were found in three nests.

Nest Building.—Hunts in pairs in February through backyards, searching for nesting sites; undecided for several weeks, frequently commencing as many as four nests in a week (D).

Nest Measurements.—Any sort of cavity about 6 to 8 inches deep. Inside of nest cup, diameter 2, depth 1.50.

Eggs.—3 to 8, average 6; in 68 full sets there were 13 of 7 eggs each, 30 of 6 eggs, 17 of 5, 1 of 4, and 1 of only 3; clear smooth white, speckled with small reddish-brown dots, usually thicker and in the form of an indistinct wreath of reddish-brown, chestnut, lavender, gray, and purplish about the larger end; yolk gives egg pinkish appearance, which disappears when egg is blown, .65×.50.

Voice.—Song, a very metallic, sweet, pretty series of notes, rarely loud and clear or bold and ringing, but reminiscent of the song of the Western Lark Sparrow in its buzzing quality: (1) *pchew, perr, cheep-y cheep-y cheep-y cheep-y cheep, cheg-chee-chee-er-per-chee;* (2) *wheeo, wheeo, tee-er, tee-er, geet-deet-dee-dee-dee-deet*, rather measured; (3) *te-see, te-see, a-ker-r-r-r-r-r-r-r*, the latter part a low, metallic trill.

Unusually accomplished; on account of its varied songs and calls, this long-tailed little wren becomes a nuisance to the newcomer ornithologically inclined. Sings throughout the year, winter as well as summer; sings with head back, tail drooping. Calls: (1) *tchape*, the *a* as in *cape;* (2) *deek, deek, ti-deek;* (3) a continuous *chirp, chirp, chirp,* uttered with a flirt of the long tail; (4) a querulous *chee? chee? chee?;* (5) a soft, low *plit;* fussy, rarely silent, generally keeping up a lively chatter.

Description.—Above, dark brownish, rich warm brown, or dark cinnamon-brown, more rufous on rump, without bars or streaks, but with concealed downy white spots on rump; buffy-white line over eye; under-parts grayish-white; brownish on flanks. Long tail much darker than back, the central feathers grayish-brown or hair-brown; barred, particularly on the sides, with black; outer feathers black, tipped with grayish, and faintly barred with lighter; tail rounded or semi-graduated, instead of square as with the Carolina Wren. L. 5. W. 2.25. T. 2.22. Exp. C. .55.

Field Marks.—Tail fan-shaped, rounded at corners, which show white very prominently. Comparative absence of cinnamon. Primaries *not* barred. More slender, darker, smaller than the Carolina Wren; whitish stripe along side of head over eye, longer tail, and larger size, distinguish it from the Western House Wren. Long tail held up in air; central tail-feathers colored like back though barred with black, the outer black tipped with ashy-white.

Popular Names.—Jenny Wren; Long-tailed Wren; House Wren; Texas Bewick Wren; Baird Wren; Texas Wren; Long-tailed House Wren; Pasture Wren; Thicket Wren.

Remarks.—This species, the Bewick Wren, was first discovered October 19, 1821, 5 miles from St. Francisville, Louisiana, and was named by Audubon in honor of a wood engraver.

WESTERN HOUSE WREN

Troglodytes aedon parkmanii[268] Audubon

Uncommon migrant and winter resident, occasionally fairly common; middle October to early May[269]; migrating northward, last half of April. Specimen collected, January 20, 1905 (B). In fall, October 10, 1915 (F); October 13, 1916, 5 (F); October 15, 1916 (G); December 25, 1916, 7 (F). In spring, March 16, 1914 (F); April 4, 1915, migrating northward (A); April 11, 1915, 4 (AF); April 22, 1891 (D); April 25, 1920, common and singing (A and Wolfe). *Recorded:* ABD[270]FGK.

Geographical Distribution.—Western North America, from southern Canada southward to Lower California, southern Arizona, and southern Texas; eastward to southern Missouri and southern Iowa. Winters from California and Texas to middle Mexico.

Habitat.—Creek bottoms among thickets of brushwood; brushy slopes along streams or railroad embankments; brushy pastures near rivers; forests. In the North, about dwellings and edges of towns and villages.

Local Haunts.—Along Colorado River banks, brushy railroad embankments and edge of river flood plains where Barton road passes under I. & G. N. railroad track; mouth of Barton Creek; Shoal Creek valley; brushy river slope along cypress row, south side of river above Barton Creek.

General Habits.—Although familiar and friendly in the North during its breeding season, the House Wren is quite shy during its stay in the South. It is irritable of disposition, active, and nervous, always jumping here and there.

Voice.—Generally silent during its stay. Song, a characteristic loud, jolly, mellow, bubbling, gurgling, energetic, violent warble, uttered with

raised head, swelling throat, and lowered tail, from perch on fence or twig, a *chwee, chwee, tee-tee-tee-tee-tee-tee.* Not particularly musical. One heard singing, December 12, 1916 (B). An anxious scolding chatter; scolds with great vehemence, *zzt-zzt-zzt-zzt.*

Description.—Dull cinnamon olive-brown or quite reddish-brown, with rump and tail decidedly brighter and more reddish than back; wings, tail, sides, flanks, and under tail-coverts, thickly and distinctly marked with fine dark blackish bars; back and rump indistinctly barred, rump with concealed downy white spots; whitish or grayish-white below, lightly barred; flanks rusty. L. 4.75. W. 2.02. T. 1.80. B. .50.

Subspecific Characters.—Grayer than the Eastern House Wren, *T. ae. aedon* (Vieillot), of northeastern United States to Virginia and Kentucky, wintering in the Gulf States to eastern Texas and northeastern Mexico, flanks less rusty, bars above more distinct, black tail-bars rather apparently margined grayish to buffy along rear edge.

Field Marks.—Medium length, square-ended tail, with no white tips. Only wren with wholly *whitish under-parts* which has *no light line over eye.* Reddish-brown color, with much brighter, richer tail; no white across tip or along sides of tail.

Popular Names.—Jenny Wren (of Northern States); House Wren; Short-tailed Wren; Parkman House Wren; Pacific House Wren; Aztec Wren.

WINTER WREN

Nannus troglodytes[271] *hiemalis* (Vieillot)

Uncommon though fairly regular winter resident, October to first week in April; seen more commonly during March as it moves northward. In fall, October 3 and 23, 1915 (F); October 8, 1921 (A); October 15, 1916 (FG). In spring, March 7, 1915, migrating northward (A); April 1, 1914 (G); April 4, 1915 (AF). *Recorded:* ACFGI.

Geographical Distribution.—Eastern Canada and northeastern United States south to Massachusetts and Michigan, and down the Alleghenies to North Carolina; west to Alberta, Minnesota, and Wisconsin. Winters throughout eastern United States, south to Texas and northern Florida.

Habitat.—Tangled brush-heaps in mixed woodlands along creeks and in clearings in cut-over woods; thickets and patches of underbrush along creeks; wilder portions of country; stumps and fallen trees in woods; brush-heaps, rubbish, and rocks.

Local Haunts.—Eastern half of the Region, west to the base of the hills; commonest in East Woods on Waller Creek, and west of Austin towards the Dam.

General Habits.—A tiny, quiet, somber-colored, mouse-like wren, solitary in disposition, creeping very shyly in and about brush-piles and over old logs alongside streams and in edges of clearings, through tangled thickets and underbrush, and about stumps. When flushed from one brush-heap, it immediately darts into another; it peers slyly about, its stubby little tail cocked over its back. Its dark colors and quiet habits make it difficult to see.

Feeding Habits.—Searches diligently for worms and small white grubs living in the bark of trees.

Voice.—Song, tinkling, rippling, joyous, trilling, astonishingly loud and ringing for so small a bird. Calls, *quip-quap,* or an impatient *chimp, chimp.*

Description.—Upper-parts dark, nearly uniform brownish or cinnamon-brown; more brown on under-parts than other wrens, which are usually whitish; breast, belly, sides, and flanks, finely barred with black; back indistinctly barred; rump feathers with concealed downy white spots; very short tail and wings barred with blackish; line over eye and under-parts, cinnamon-buff. L. 4. W. 1.90. T. 1.25. B. .35.

Field Marks.—Smallest of all the wrens, plump, bob-tailed, mouse-like. Extremely short tail is carried high over back when bird is excited. Dark under-parts, *flanks and belly finely barred.*

Popular Names.—Bob-tailed Wren; Little Wren; Littlest Wren; Tiny Wren; Mouse-wren; Stump-tailed Wren; Lilliputian.

SHORT-BILLED MARSH WREN

Cistothorus stellaris (Nauman)

Rare migrant and winter visitor, middle October to end of March. Records: October 17, 1919 (A); November 7, 1915 (FG); January 22, 1920 (A); March 27, 1921 (A); March 28, 1921 (A). *Recorded:* AFG.

Chapman

SHORT-BILLED MARSH WREN

Geographical Distribution.—Eastern North America, from southern Canada southward to Delaware, Georgia, Indiana, Missouri, Kansas; west to the Great Plains. Winters from southern parts of New Jersey and Illinois southward to the Gulf Coast and southern Texas.

Habitat.—Damp, wet meadows; wet grassy marshes and wet grassy patches on the prairie; borders of marshes; heavily grass-grown ditches. Less confined to flooded areas than the Long-billed Marsh Wrens.

Voice.—Song (1) *chee-chut, chee-chut, chee-chut, chee-chut, chee-chut;* (2) *cha-cha, chat-ah-cha;* and (3) *chup-chup-chup-chup, chup, chup-chup-chup-p-p-r-r-r-r* or *chap—chap—chap—chap. chap chap-chap-chap-p-p-rrrr.* Call, alarm-note, clinking, similar to the sound made by striking two pebbles together.

Description.—Whole side of head buffy, line over eye not very distinct; upper-parts generally light, streaked with white, black, and orange-brownish-buffy; wings and tail barred. Under-parts, throat, and belly, white, unbarred; under tail-coverts and flanks, orange-brownish-buff, and somewhat broken band of same shade across chest. Bill much shorter than head. L. 4.25. W. 1.80. T. 1.65. B. .40; from N. .26.

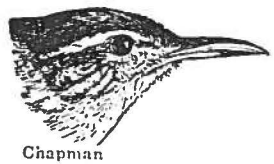
Field Marks.—Distinguished from Long-billed Marsh Wrens by its shorter bill; *blackish-and-white-streaked crown;* or its *entire upper-parts streaked* brownish. Small size, yellow-brown color, short bill, and short tail. Back and crown distinctly streaked lengthwise with shades of light and dark.

Popular Names.—Yellowish-brown Marsh Wren; Striped Marsh Wren; Marsh Wren.

PRAIRIE MARSH WREN

Telmatodytes palustris iliacus Ridgway

Rare migrant; September, and from end of February to middle April. In fall, September 25, 1921 (A). In spring, February 26, 1919 (A); March 22, 1919 (A); April 24, 1922 (A). *Recorded:* A.



Chapman

LONG-BILLED MARSH WREN

Geographical Distribution.—Plains and prairies of the central North in Canada, south to the central Mississippi Valley. Winters from the western Gulf Coast of Florida to the Gulf Coast of Texas (Brownsville and Corpus Christi) and Mexico.

Habitat.—Flooded marshes, in thick vegetation over water 1 to 3 feet deep; along creeks, rivers, and sloughs; marshy ground covered with tall, rank grass; weed patches; tall reeds and cat-tails; overflow weadows.

Local Haunts.—Weedy patches along Shoal Creek; marshy, weedy patches along I. & G. N. railroad northwest-by-west of Austin: marshy

patches along edges of Colorado River; marshy spots along Waller Creek northeast of University campus.

General Habits.—Shy, skulking, suspicious, sneaking in and out of dense marsh vegetation. Nervous and excitable, darting into cover at first alarm; bobs and flourishes tail, or holds tail erect, sometimes even bent forward over back. Migrates at night, high in the air, in the daytime remaining close in shrubbery and rank weeds. In its more northern summer home it nests in colonies.

Feeding Habits.—Very fond of insects.

Voice.—Very noisy songster. Song, a mechaniccal, music-box round of *clatter, clatter, clatter, clatter;* rippling, bubbling, gurgling, as bird rises into air over marsh growth. The bird sways as it sings from a bent bull-rush stem.

Description.—Unstreaked olive-brown crown, marked on sides of crown with black; distinct white line over eye. Back blackish, with several distinct lengthwise broad streaks of white; remainder of back cinnamon-brown; wing-coverts plain; short tail, with middle feathers narrowly, outer feathers broadly, barred. Whitish throat, pale cinnamon-brownish sides and flanks, and dusky to buffy under-parts; under tail-coverts rarely barred. Bill slender, slightly curved. L. 5.25. W. 2.06 (female 1.96). T. 1.72 (female 1.59). Exp. C. .57 (female .55).

Subspecific Characters.—Slightly larger than the Long-billed Marsh Wren, *T. p. palustris* (Wilson), of southeastern Canada and northeastern United States to the Potomac Valley and Virginia coast and west to the Plains, wintering from southern New Jersey to Florida and the Gulf Coast and into Mexico; more rufescent; conspicuously deep cinnamon or cinnamon-buff flanks; and russet-brown coloration of back. The Long-billed Marsh Wren, W. 1.99 (female 1.88), T. 1.63 (female 1.52), Exp. C. .58 (female .56), is darker, duller; less reddish in color of upper-parts; flanks wood-brown. Tail-coverts usually not distinctly (if at all) barred with darker, whereas the Western March Wren or Interior Tule Wren, *T. p. plesius* Oberholser, of the interior West and the Rocky Mountain plateau from Canada to Colorado, New Mexico, and northeastern California, wintering from Oregon southeastward to central Texas (Waco and San Antonio) and south into northern Mexico, has the tail-coverts usually distinctly barred with darker; also the Western Marsh Wren, W. 2.13 (female 2.05). T. 1.83 (female 1.76), Exp. C. .56 (female .53), is similar to the Long-billed Marsh Wren, but paler above, grayer below, has middle tail-feathers quite heavily barred, and upper and lower tail-coverts barred; other than possessing barred tail-coverts, the Western Marsh Wren is not unlike the Prairie Marsh Wren, but the brown is paler and less reddish, the middle tail-feathers are more distinctly barred, and the flanks are conspicuously different in being a light grayish-brown or wood-brown instead of bright buffy-cinnamon or tawny-buff. Collection of specimens through the season at Austin will undoubtedly add the Long-billed Marsh Wren and the Western Marsh Wren to the local list.

Field Marks.—Distinguished from the Short-billed Marsh Wren by its long bill, distinct white stripe over eye to side of neck; *upper-parts generally dark; crown unstreaked* blackish-brown; *streaks of white on blackish back.* Short tail.

Popular Names.—Marsh Wren; Dark Marsh Wren; Streaked-backed Marsh Wren; Plain-capped Marsh Wren; Long-billed Marsh Wren.

BROWN CREEPER

Certhia familiaris americana Bonaparte

Uncommon and irregular winter visitor, sometimes abundant; middle October to middle April, generally moving northward during the last half of March. Numerous all winter, 1915-1916 (FG); October 11, 1920 (A); November 7, 1915, 2 (F); March 12-18, 1917, common (B); April 18, 1915 (F). *Recorded:* ABCDFGHW.

Geographical Distribution.—Eastern North America, from southern Canada south to Massachusetts and eastern Nebraska, and down the ridge of the Allegheny Mountains to North Carolina. Winters in eastern United States, south to northern Florida, the Gulf Coast, and central Texas.

Habitat.—Woodlands and groves, particularly on valley slopes; shade trees in dooryards and parks; rarely in cedar brakes in the hills.

Local Haunts.—East Woods; old streets; in dooryards about Seventh and Rio Grande streets and on the West Austin hills; Walsh Addition, on east bank of Lake Austin just north of Dam; post oak pastures west by northwest of Austin; underbrush in cedar and live oak woods along Waller Creek; open woodlands on gravelly terraces east of University campus; large timber outside city.

General Habits.—Occurs in small scattered companies of from three or four to a score. A restless, inconspicuous little bird, supporting, propping, or bracing itself against the bark of trees with its stiffened tail-feathers; starting at the foot of a tree, creeping near-sightedly upward, around and around tree trunks; gradually working, it winds its spiral way, until it reaches the top, as high as it can go; then suddenly dropping down in a sweeping glide to the base of another tree and beginning all over again—endlessly repeating the process. So closely does its plumage blend with the bark on tree-trunks that, when it is quiet, the bird is practically invisible.

Feeding Habits.—Slowly and patiently searches in crevices of bark for tiny insects, eggs, and larvae.

Voice.—Call, a tiny, thin, fine, squeaky *screep;* a high, sibilant *ts* or *tseep;* a long, sibilant *ziiit-t-t;* a very faint trill. Song, in northern coniferous forests, soft and plaintive, pure and tender, falling, rising, and falling, of four notes.

Description.—Back mottled brown (fuscous and orange-brownish-buff), and streaked with white; rump uniform reddish-brown or pale rufous. Cream-buff band through most of wing-feathers. Long tail, pale grayish-brown; partly stiffened and sharply-pointed. Under-parts whitish. L. 5.60. W. 2.55. T. 2.60. B. .62.

Field Marks.—Small size. Tree-creeping habits. Appearance, brown, much mottled and streaked. Rather long, somewhat pointed tail, used as brace. Long, sharp, slender, down-curving bill. Easily distinguished from other tree-creeping birds by having prevailing color closely matching the bark.

FLORIDA WHITE-BREASTED NUTHATCH

Sitta carolinensis carolinensis[272] Latham

Very rare resident, distinguished only in summer.[273] *Recorded:* A.

Geographical Distribution.—Southeastern United States, north to North Carolina, Kentucky, southern Illinois, and southeastern Missouri; west to eastern and east-central Texas (breeding at Giddings, Lee County). Summer birds in eastern part of Austin Region mark western limit of the range.

Habitat.—Forests of large trees, generally on uplands.

Local Haunts.—Large forests in eastern part of Austin Region, marking western edge of sandy post oak, blackjack country; large timber along the Colorado River near extreme eastern part of Region.

General Habits.—Similar to those of the Northeastern White-breasted Nuthatch, from which it can be distinguished only by season or on careful examination.

Breeding.—Probably. Last of March to early May.

Nest Location.—2 to 60 feet up in tree or stump, in natural cavity or hole or in old hollow of the Southern Downy Woodpecker.

Nest Construction.—Composed of dry leaves, grass, moss, fur, soft-felted materials, chicken feathers, and hair.

Eggs.—5 to 8, somewhat long and pointed, creamy-white or white with faint pinkish tinge, speckled and spotted with reddish-brown and with tinges of purple, rather thickly and evenly, but thickest near larger end, .77×.56.

Voice.—Similar to that of the Northeastern White-breasted Nuthatch.

Description.—See that of the Northeastern White-breasted Nuthatch.

Subspecific Characters.—Similar to Northeastern White-breasted Nuthatch, *S. c. cookei* Oberholser, but slightly smaller; wing-coverts more narrowly tipped with gray (little or no whitish); and female with black crown and nape as in the male. L. 5.50. W. 3.44 (female 3.40). T. 1.76. Exp. C. .73 (female .71).

Field Marks.—Same as those for Northeastern White-breasted Nuthatch.

WHITE-BREASTED NUTHATCH

Sitta carolinensis cookei Oberholser

Rather uncommon and irregular winter visitor, occasionally common; middle November to middle April. In fall, November 14, 1915, 3 (F). In spring, April 16, 1919, 7 (A). *Recorded:* ABCFGHN.

Geographical Distribution.—Southeastern Canada and northeastern United States, south to Virginia, Ohio, Illinois, Kansas, and central-northern Texas (breeding specimens at DeLeon); west to the Dakotas. Southward in winter to the Gulf Coast.

Habitat.—Tree-trunks; tall trees in open woodlands; mixed upland woods; dead tops of trees; orchards, shade trees in town.

Local Haunts.—Elm trees on Pease Park slopes of Shoal Creek valley; medium sized timber in Walsh Addition near Dam; tall trees in open woods along Waller Creek, particularly East Woods and Wheeler's Grove; shade trees in neighborhood of University, at Seventh and Rio Grande streets, and in western part of the city.

General Habits.—Friendly little birds, not at all shy; moving about usually in companies of four or five birds, frequently associated with Plumbeous Chickadees, Sennett and Eastern Tufted Titmice, Brown Creepers, Western Myrtle and Audubon Warblers, Ruby-crowned and Golden-crowned Kinglets, and even Southern Downy Woodpeckers. At first glance this bird appears to be a small woodpecker; but, unlike any woodpecker, it climbs upside-down as well as right-side-up. Perches and swings on limbs; hangs to the bark; as with other nuthatches, in balancing and digging, it does not make use of its tail, which is not stiff like that of the Brown Creeper or a woodpecker.

Feeding Habits.—Moves up and down tree-trunks and around branches, upside-down, sideways, or in any direction, searching the bark and leaves for tiny insects and their eggs, or for grubs and ants. Secures its name, nuthatch, from its habit of wedging nuts into crevices and hatching or opening them with its chisel bill.

Voice.—Unmistakable, either a contented or a loud and vigorous *hank, hank,* or *yank, yank,* varying to *onk, onk,* or *henk-ah, henk-ah;* a low *quank,* uttered now and then; a nasal *pr-r-aap.* In spring, and on the approach of spring, it becomes more noisy; in late winter and early spring, a rolling *onk, onk, onk, onk,* many times repeated; a peculiarly monotonous, mirthless tenor, *hah-hah-hah-hah-hah;* a nasal, laughing *ya—ha-ha-ha-ha;* in early spring, a whistled *chee-o;* a conversational twitter.

Description.—Sides of head, neck, all of throat, and under-parts, white; crown, back of head, and nape, shining black; upper-parts, blue-gray. Wings bluish-gray, marked on inner secondaries with black, and coverts and quills tipped with white. White corner-patches and blue-gray middle-feathers to black tail. Washed on lower belly and under tail with pale reddish-brown. Bill straight and sharp, for chiseling; tongue, hard, barbed, and pointed. Feet strong.

Subspecific Characters.—Larger than Southeastern White-breasted Nuthatch, *S. c. carolinensis* Latham; lighter under-parts; female, blue-gray or plumbeous suffusion veiling black on pileum of female's head. L. 6. W. 3.62 (female 3.51). T. 1.85 (female 1.80). Exp. C. .76 (female .71).

Field Marks.—Short, squat, compact little bird, with almost no neck or tail, the latter short and square. Quiet plumage. Long thin bill. Frequently upside-down in climbing. Larger size, and *whole side of head and neck whitish,* with no black stripe through eye on middle of white cheek, distinguishes this species from other Nuthatches.

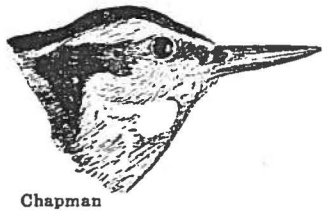
Popular Names.—Devil Downhead; Tree Mouse; Yank.

Remarks.—The inclusion of this form and the Slender-billed Nuthatch in Schutze's list of breeding birds of Central Texas was based on Singley's statement that both forms were resident in Lee County, immediately east of the Austin Region.

RED-BREASTED NUTHATCH

Sitta canadensis Linnæus

Uncommon irregular winter visitor, at times moderately common; more abundant during severe winters; early November to early April. In fall, November 7, 1915 (F); November 8, 1919, 5 (A). In spring, April 11, 1915 (A); March 16, 1916 (F); fairly common in February and March, 1908 (B); abundant during spring migration of February, 1914, moving northward March 3 (F). *Recorded:* ABDFGH.



Chapman

RED-BREASTED NUTHATCH

Geographical Distribution.—Canada and the northern United tates, south to Massachusetts, Michigan, and Minnesota; down the Allegheny Mountains to North Carolina, and down the Rockies and Sierra Nevadas to New Mexico, Arizona, and California. Winters from southern Canada southward across the whole of the United States to the Gulf Coast and Lower California.

Habitat.—Large or medium sized timber on wooded slopes overlooking river flood plains; partial to pine trees, particularly those bearing cones.

Local Haunts.—Pease Park; Wheeler's Grove; small wooded ampitheaters along south side of Barton road, east of Barton Creek; hilly residential section in the western part of Austin; rough country between Austin and the Lake Austin Dam, particularly from Shoal Creek to I. & G. N. railroad track and from Third Street north to Pease Park.

General Habits.—Occurs in loose, widely scattered companies, three or four birds often seen together in one tree, and frequently six or eight in sight at once. More northern-dwelling than the Northeastern White-breasted Nuthatch, with which it occurs in winter.

Feeding Habits.—Creeps about trees, diligently searching the bark for food.

Voice.—Call, *tai-tai-tait* or *yna-yna-yna*, sharp and nasal, sounding like a tiny tin horn or penny trumpet; a nasal *aap*, drawling, higher pitched, finer, and more nasal than calls of the White-breasted Nuthatches, and without the *r* sound.

Description.—Back bluish-gray; shining black crown, and distinct shining black stripe through eye and down side of neck, separated from black of the crown by a broad white line over eye. Wings plain, without white tips to wing-coverts or black markings to secondaries. White corner-patches and bluish-gray middle feathers to short black tail. Throat white; breast and under-parts reddish or orange-brownish-buff. Female paler below, and with head markings bluish-gray instead of black. L. 4.50. W. 2.70. T. 1.60. B. .55.

Field Marks.—Distinct black stripe through eye along side of head, conspicuous against white cheek; blue-gray stripe on cheek of female. Brownish-red breast. Characteristic calls. Decidedly smaller than White-breasted Nuthatch, which is somewhat similar but which does not have the reddish breast nor the conspicuous cheek-stripe.

Popular Names.—Devil Downhead; Canada Nuthatch.

TUFTED TITMOUSE

Baeolophus bicolor (Linnæus)

Scarce winter resident, fairly common at rare intervals; extremely rare summer resident, though not observed during most breeding seasons. Records, January, February, and March, 1915, fairly common (A); February 10, 1907 (Howell); March 31 ,1915, 3 (A); June 16, 1919, 1 shot from family party of 5 (A); September 23 to October 4, 1902, common (R); October 13, 1915 (F); December 17, 1920 (A). *Recorded:* ABCDFGH[247]IRS.

Chapman
EASTERN TUFTED TITMOUSE

Geographical Distribution.—Eastern United States, from New Jersey, Ohio, and Nebraska south to Forida, the Gulf Coast, and central Texas (Austin). In winter, moves slightly southward, becoming more common in the southern part of its range; in Texas, southward to San Antonio in winter.

Habitat.—Woodlands, particularly those of post oak with a few blackjack and live oak mixed in; rarely, timbered alluvial bottoms filled with Atlantic Forest vegetation.

Local Haunts.—East Texas Timber Belt, reaching Austin by way of the post oak woods on the upland gravel terraces of the Colorado River, west to the edge of the hills; gravelly oak terraces overlooking east rim of Shoal Creek valley several hundred yards south of State Street; hilly, elm-dotted dooryard at 610 Baylor Street. In winter, cedars and elms on slopes of Shoal Creek valley; hackberry shade trees in town. Not found in western half of the Region.

General Habits.—Observed singly and in pairs, and in small family groups in summer. Not shy, and easily approached. Much more migratory than the Sennett Black-crested Titmouse, a small per cent of the birds wandering in winter beyond the bounds of the breeding range.

Breeding.—March to early May. Earliest: March 20, 1909, 6 fresh eggs (B). Latest: March 30, 1901, 7 slightly incubated eggs (B); June 16, 1919, family party of 5, fully feathered (A); date lost, family of 2 adults and 5 or 6 young, parents feeding young, at Six-mile Lake (B). *Breeding recorded:* ABH.

Nest Location.—4 to 15 feet up in deserted woodpecker hollow, usually in decayed tree or stump, in natural cavity in live oak, post oak, or blackjack; and in bird boxes.

Nest Construction.—A saucer-shaped, loosely constructed pile of rubbish in bottom of cavity; a thick foundation of green moss, a superstructure of short hair, Johnson grass, cedar bark, moss, leaves, strips of bark fiber, lichens, sheep wool, cowhair, straw, cast-off snake skin, hemp strings, and rags, and a lining of fur or cotton.

Nest Measurements.—Cavity about 12 inches deep.

Eggs.—4 to 8, white to creamy white, with spots and specks of light reddish-brown and pale cinnamon, principally at larger end, .70× .52, considerable variation.

Voice.—Very noisy, continually calling; tones frequently nasal. A low *kerry-kerry-kerry-kerry;* commonest, a clear, loud, whistled *whii-hii-hii-hii-hii*, or *wheh-whuh-whuh-whuh-whuh;* commonly, a loud, clearly whistled, monotonous *pe-to, pe-to, pe-to,* or *Peter, Peter, Peter, Peter,* sometimes repeated almost indefinitely, never growing faster as with the whistle of the Gray-tailed Cardinal; a slow *whe, whe, whe, whe, whe* or *de-de-de-de,* louder, hoarser, and more nasal than similar notes of the Plumbeous Chickadee; a low-toned *pitty, pitty, pitty;* a low conversational *chippy chippy chippy;* commonly, *day-day-day-day-dait;* a low *peto-peto-peto-daytee-daytee;* a merry *heedle-dee-dle-dee-dle-dee!;* hoarse *dee-dee-dee* notes.

Description.—Entire upper-parts, wings, and tail, blue-gray, the basal half of outer web of outer tail-feather nearly white. Eye to bill, white; throat and under-parts white or whitish, dirtier on throat; sides brownish-cinnamon or rufous-chestnut. Head with distinct gray crest; forehead or frontlet black or rusty black. Sexes alike. Nestlings without black frontlet, but forehead gray like crest. In winter, back tinged with olive-brown. Bill black; feet lead-color. L. 6. W. 3.10. T. 2.70. B. .45.

Plumage Peculiarities.—Specimens formerly referred to a race called the Texas Tufted Titmouse, *B. b. texensis* Sennett, characterized by paler upper-parts and a rusty forehead, are not considered separable from this form.

Field Marks.—Gray body, paler to whitish below, and rusty on sides. Black forehead. Conspicuous long gray crest, of same color as back.

Popular Names.—Gray-crested Titmouse; Tit; Crested Tomtit; Crested Titmouse; Tufted Titmouse; Gray Titmouse.

SENNETT'S TITMOUSE

Baeolophus atricristatus sennetti Ridgway

Fairly common permanent resident, apparently strictly non-migratory. The prevailing form of titmouse in the Austin Region. *Recorded:* ABCDEFGH[275]IJKMNOPSTWY.

Geographical Distribution.—Central and central-southern Texas, from Tom Green and Concho counties east to the Brazos River, and from Young County south to Nueces and Bee counties. The true Black-crested Titmouse, *B. a. atricristatus* (Cassin), ranges from the Rio Grande Valley southward.

Habitat.—Woodlands along creeks; scrub oaks and cedars on hillsides; oak groves or mottes in open or semi-open country; city shade trees; ravines, gullies, and canyons among the hills; oak-clad crests of hills; telegraph poles along railroad rights-of-way.

Local Haunts.—Trees along Barton and Bull creek canyons and along Shoal Creek valley; oak sapling woods about edges of Austin; city shade trees; telegraph poles along I. & G. N. railroad track between Austin and Camp Mabry; usually in residential district of town,

or along hill canyons. More common through whole of western half of the Region, rare in eastern half.

General Habits.—Fluffy, friendly, jaunty little birds, observed singly and in pairs, occasionally in family groups in summer and loose companies in winter. Individuals doubtless never wander more than ten miles from site of nest where they were hatched. Becomes attached to one locality; one pair nested for six consecutive years in a hollow of an old persimmon tree.

Breeding.—March to June. Earliest: March 17, 1907, 6 slightly incubated eggs (B); April 9, 1915, four nestlings, one week old (A); April 27, 1919, 4 well-grown young (B). Latest: June 8, 1909, 6 heavily incubated eggs (A); June 6, 1908, 5 eggs, incubated 3 or 4 days (B). Two broods, about March 31 and about April 25. *Breeding recorded:* ABCEFGHJOWY.

Nest Location.—3 to 22, average 10, feet up in hollow branches, ends of dead limbs, cedar posts, old stumps, deep cracks, natural cavities, holes in trees, and deserted woodpecker hollows; commonest in hollows in live oaks, next commonest in fence posts and bird boxes, then boxed fence posts, elms, hackberries, cedars, telephone poles, and post oaks. Occasionally on top of old Western Mockingbird nest in well sheltered tree.

Nest Construction.—A mass of rubbish composed of cowhair, rabbit fur, green lichens, cedar bark, green moss, cotton, feathers, and oak blossoms; and occasionally small bits of inner bark and bark fiber, grass, wool, soft down, leaves, rootlets, a stick or two, hemp string, tissue paper, onion skins, and felting materials. Lined with soft short cowhair, rabbit fur, opossum hair, wool, cotton, and occasionally horsehair, soft down, feathers, and snake skin. Pieces of cast-off snake skin usually placed in nest. Bottom of cavity frequently filled to depth of 2 or 3 to 6, rarely 36 (E), inches with green moss.

Eggs.—4 to 7, usually 6 (in 25 typical sets, 5 were of 7, 12 of 6, 5 of 5, and 3 of 4); usually smaller and more pointed than eggs of the Eastern Tufted Titmouse, more distinctly and clearly marked with fewer spots, darker and sharper, of purple, lilac, and brown; varying from .61 to .74 by .49 to .58, average .67×.51.

Voice.—Quite similar to that of the Eastern Tufted Titmouse, but a cheery, abbreviated *Pete,' Pete,' Pete,' Pete';* a series of monotonous whistles, *hew, hew, hew, hew, hew, hew. hew, hew;* a whistled *tseee ep;* a rasping, scolding *eck-eck.*

Description.—Upper-parts plain gray; forehead white or smoky-brown; crest black; under-parts white. Female, crest sometimes duller. Young, upper-parts slaty-gray washed with olive; sides washed with brownish; crest mixed with ashy. L. 5.80. W. 2.90. T. 2.70.

Subspecific Characters.—Larger than the true Black-crested Titmouse, *B. a. atricristatus* (Cassin), of the Rio Grande Valley and northeastern and eastern Mexico; forehead in both sexes more often tinged with rusty; crest feathers in female more often tipped with gray; upper-parts clearer gray.

Field Marks.—Long, black crest, sharp and distinct against gray back, and rusty-brown (rarely whitish) forehead, distinguish this bird from the Eastern Tufted Titmouse with its black forehead and gray crest. Female with less black in crest.

Popular Names.—Tomtit; Tit; Crested Tomtit; Crested Titmouse; Black-crested Titmouse.

PLUMBEOUS CHICKADEE

Penthestes carolinensis agilis (Sennett)

Fairly common permanent and regular resident; appears to be more common during winter because of its preference for civilization at that season. Specimens collected through January and February are all of this race. *Recorded:* ABCDEFGH[270]IJKLMNOPQRSWY.

Geographical Distribution.—From Beeville, Texas, north across the eastern half of Texas and eastern two-thirds of Oklahoma to southeastern Kansas; east to northwestern and southwestern Louisiana, intergrading in southeastern Louisiana with the Southern or Carolina Chickadee.

Habitat.—Wooded creek valley slopes and stream-bottom woods; quieter parts of town; upland woods; more or less open country, particularly edges of woods, pastures near houses, and railroad rights-of-way where telegraph poles and fence posts are old enough to permit of easy digging; open woodlands and damp woods; quiet dooryards. In winter, in dooryards and along streets in and about town; open woodlands, particularly of oak.

Local Haunts.—Across the whole of the Austin Region. Edges of Austin; shade trees in residential section, and campus of the University; telegraph poles along I & G. N. northwest and west of town; slopes and crests of canyons in the hills.

General Habits.—Observed singly or in pairs in spring, family groups in summer, and generally small bands in fall and winter. A shy, restless little acrobat, hopping from limb to limb in a very unconcerned way, nimbly performing twirls and feats that would strike professional jealousy to the heart of a trained circus gymnast. Whistles and calls cheerfully, happily, to himself as he moves about.

Feeding Habits.—Flits from twig to twig in tireless search for plant lice; picks insect eggs and larvae from beneath leaves and in crevices of the bark.

Breeding.—March to June. Earliest: March 18, 1909, 6 fresh eggs (B); March 29, 1895, 8 fresh eggs (L); April 19, 1905, young several days old (B); April 27, 1919, 6 young just out of nest (B). Latest: June 4, 1901, 3 fresh eggs (B). Two broods occasionally, though usually only one (F); first about March 22, second about April 18. *Breeding recorded:* ABCEFGHJLOWY.

Nest Location.—1 to 23, commonly 10, feet from ground, generally in natural cavities in dead elm, Chinaberry, Spanish oak, live oak, post oak, or blackjack tree or stump; in broken tops of leaning stumps or trees in decayed limbs; in old woodpecker hollows of telegraph pole or fence post; in decaying posts of barbed-wire fences along edges of woodlands; hollow iron hitching posts in town; bird boxes about farmhouses and town homes.

Nest Construction.—Composed of such warm materials as fine strips of bark (particularly of the cedar), soft green mosses, cowhair, plant fiber, wool, and feathers, with occasionally some rabbit fur, cotton, plant down, straw, bits of string, grass, horsehair, thistle down, and small buds. Lined with soft short cowhair, rabbit hair, plant down, and occasionally soft wool, plant fiber, cotton, and feathers. Bottom of cavity filled with a good deal of green moss and occasionally with some cedar bark.

Nest Building.—Although in eastern Texas the Texas Plumbeous Chickadee digs its own cavity the larger part of the time, commonly selecting roadside fence posts along edges of woodlands, still in central Texas it is seldom found nesting in a hole of its own, apparently occasionally forced to do so because of scarcity of natural cavities and woodpecker holes in the hill country west of Austin. Building nests, March 13, 1914 (G), and March 8, 1916 (G).

Nest Measurements.—Depth of hollow, 7 to 10, average 9.

Eggs.—3 to 8, commonly 6, white or whitish, sparingly to heavily marked, chiefly at larger end, with spots and specks of light brown, chocolate, lilac, and purplish, among which cinnamon predominates, .57×.46.

Voice.—Quite unlike that of the northern Chickadees; a much higher pitched and more hurriedly uttered *chickadee-dee-dee-dee*, characteristic of the Southern species, frequently running into *chick-a-dee-dee-dee-dee-dee-dee-dee; tweesee-dee-dee-dee-dee;* a clearly whistled *pseé'-a-dee;* a low plaintive *tswee-dee-tswee-dee*, of four tremulous whistled notes, in sharp contrast to the two clear, ringing notes, *te-derry*, of the Northern birds; a low *sick-a-dee;* a short *chick-a-da;* a clearer *my watcher key, my watcher key;* a series of *day-day-day* or *dee-dee-dee-dee* notes.

Description.—Back plumbeous to ashy-gray or pale lead-color; under-parts and sides of head and neck, whitish, washed on sides with rusty; no white edging to greater wing-coverts. Top of head and nape, and large throat-patch, shining black. L. 4.60. W. 2.30. T. 2.04. B. .31.

Subspecific Characters.—Larger, paler, and with whiter under-parts than the Southern or Carolina Chickadee, *P. c. carolinensis* (Audubon), which ranges from central New Jersey and central Missouri south to northern Florida, the Gulf Coast, and southeastern Louisiana.

Field Marks.—Diminutive. Dull ashy lead color above. White or whitish cheeks. Though larger than the Southern Chickadee, it is decidedly smaller than the Black-capped Chickadee, *P. atricapillus* subspecies, of the North, forms of which winter south to the Gulf Coast and to southern Texas (Texas Chickadees about 4.75, Long-tailed Chickadee 5.25 to 5.50); absence of white margins on wing-coverts; less white on outer vanes of wing and tail feathers; under-parts paler; call-notes absolutely different. *Black cap and black throat-patch.*

Popular Names.—Chickadee; Black-capped Tit; Black-capped Chickadee; Black-capped Titmouse; Plumbeous Chickadee; Southern Chickadee.

VERDIN

Auriparus flaviceps flaviceps (Sundevall)

Extremely rare resident. *Recorded:* ABH.[277]

Geographical Distribution.—Borderland of southwestern United States, from California to southern Texas, south into northern Mexico, north into Nevada and southern Utah; in Texas, Brownsville to Dimmitt County, north to Caldwell and Travis counties.

Habitat.—High, dry country where thorns are thickest, where chaparral and cactus form the growth, away from tall timber and frequently miles from water of any sort, of which they seem to be independent. Bushy mesquite valleys preferred to open deserts; mesquite thickets; upland chaparral country.

Local Haunts.—Scrub oak and chaparral growth on high points of Pease north pasture, west of Shoal Creek about even with Twenty-fifth Street; uplands overlooking Bee Caves or Turkey Foot road, about 200 yards northwest of Delaney ranch-house, a plateau about midway between Campbell Hole and the Deep Eddy cliffs.

General Habits.—Shy, inconspicuous, and retiring in disposition, rarely ever seen because of its habit of slipping from thicket to thicket, always keeping out of sight; difficult to find; even when less shy, the bird flits from bush to bush without attracting attention. Occasionally it comes forth in all its daintiness, its neatness, its compact plumage, active, bobbing about, sputtering, and scolding like a kinglet; in breezy weather, it sticks to twigs on bushes whipped most violently about by the wind. The nests, several of which are usually near each other in a sort of scattered colony, are familiar long before the birds are seen. The bird is easily flushed from the nest when the eggs are fresh, and takes care not to approach observer, remaining hidden in nearby chaparral bushes and thickets, noisily chippering and

scolding; frequently deserts nest if it is but touched; when the eggs are heavily incubated, however, it is sometimes difficult to flush the female, and sometimes she sticks to the nest until poked with a finger. Sleeps in old nests at night, particularly in winter, always building new ones for egg-laying purposes.

Feeding Habits.—Dainty and graceful, feeding on berries, wild fruits, and a few insects, picking its food to pieces with much skill.

Breeding.—Early March to May. A number of old nests found in the Austin Region. *Breeding recorded:* ABH.

Nest Location.—4 to 6, rarely 9, feet from ground in small bush or scrub sapling mountain live oak in thicket; on the outside of thorny bushes of the desert, edge of chaparral thicket, or margin of thorny thicket; nest placed near top, at end of small horizontal limb, safe from climbing animals, in exposed position, typically among thick short leaves of stunted live oak, usually on about three horizontal parallel twigs.

Nest Construction.—A fine example of bird architecture: a round ball or retort-shaped structure, with stunted neck pointing from top or front downward at an angle of 45 degrees, compactly woven, well roofed, and well cupped inside, with a deep rim against the inside of the entrance to prevent the eggs rolling out. Composed outside of small thorny twigs; deeper parts built of tiny grass seed stems and tops, tiny weed seed stems, tiny smooth twigs, and a more general mixture of smaller pieces, principally a few leaves, a few tiny pieces of weed stems, and occasionally short bits of hay; woolly and sticky fibers and weeds bind the nest together, and the whole structure is well interwoven with cobwebs and spider webbing, with some plant down and thistle down used to block up crevices; the nest is so firmly built and so well protected by its outside covering of tiny thorny twigs that it lasts through all sorts of weather for several years. Inside, first lined with spider webs, forming a very thin coat which covers the cup-bottom; then lined with a coat of small grass leaves and bits of dead leaves; then an inner coat of plant down, thistle down, spider webbing, bits of silk-like cocoons, and a number of tiny soft bird feathers, on which the eggs rest.

Nest Building.—Nesting material is gathered in immediate vicinity of nesting site. In late fall or early winter, generally about December, both sexes build or reconstruct nests, to the lining adding feathers and hair to make the nest warmer; the inside of the entrance of these nests does not have a deep rim, as in the breeding nests; these nests are used throughout the winter as night roosts, probably only a single bird occupying a nest.

Nest Measurements.—Spherical nest mass about 9 by 5 or 6 in diameter. Cavity nearly spherical, about 1.5 in diameter. Solid part of nest proper, outside, length 4.25, width 3.25, height 3; inside, front to rear, 2.75, depth of cupped bottom .60. Entrance, diameter, side to side 1.19, top to bottom 1. Overhang of roof over entrance, compact for .80, straggling for 2 more.

Eggs.—3 to 6, commonly 4, rarely more; bluish or greenish-white, speckled with reddish-brown, chiefly around the larger end, .71×.49.

Voice.—Song, astonishingly loud for so small a bird. A faint lisping note, heard through the brush. Calling and twittering in chasing one another. A plaintive alarm-note, uttered when its nest is in danger.

Description.—Upper-parts, grayish; head bright yellow, duller to olive on crown, brighter to orange on forehead, more even on neck and chest; under-parts, whitish. Pointed wings, decidedly longer than tail; shoulder-patch reddish-chestnut. Female, less yellow, which is duller. Young, brownish above; no yellow or chestnut. Nearly straight little bill. L. 4.30. W. 2. T. 1.90.

Field Marks.—Diminutive size (one of the tiniest of birds) and short tail. Olive-gray, paler below. *Deep chestnut patch across shoulder of wing. Head and neck yellow* or grayish-gold.

Popular Names.—Yellow-headed Bush-tit; Yellow-headed Titmouse.

GOLDEN-CROWNED KINGLET

Regulus regulus[278] *satrapa* Lichtenstein

Not uncommon winter resident, but irregular, occasionally fairly common or even abundant for a short while; early November to early April; more common during spring, after late February, when it is migrating northward. In fall, October 17, 1915 (F); November 3, 1919 (A). In spring, specimens collected February 15 and 22, 1905 (B); March 8, 1914 (F); April 18, 1915 (A); April 20, 1922 (A). *Rcorded:* ABCDEFGHKL.

Chapman

GOLDEN-CROWNED KINGLET

Geographical Distribution.—Eastern North America, from the Arctic south into northern Canada, to Michigan and New York, and in the higher mountains, down the Alleghenies to North Carolina and the Rockies to New Mexico and northern Arizona. Winters from southern Canada southward across the eastern United States to northern Florida, the Gulf Coast, and northeastern Mexico.

Habitat.—Underbrush of side hills; the shelter of evergreens in winter, most commonly the cedars on or near the hills; most slender twigs of shade trees and ornamental trees in parks, along city streets, and in dooryards; elms on wooded slopes; in migrations, larger woodlands.

Local Haunts.—Cedars on the slopes of Shoal, Waller, and Williamson creeks; rather irregular throughout the hills; campus of the University in migrations.

General Habits.—Rarely seen singly, generally in small loose companies or troupes, which frequent the smaller twigs and tops of cedar, elm, or oak trees, from which the birds suddenly dart forth, returning to the tips of a branch, where they hang on quivering wings and pick off minute insects. Dainty little bird, not shy, but nervous and quick-moving, frequently twitching its wings nervously. With its thick coat of feathers well fluffed out, the bird can stand the severest winters.

Voice.—Song, dainty, ascending *ti-zee, ti-zee, ti-zee, tit-tit-tit*, sibilant and falling rapidly at the end; or, *tzee, tzee, tzee, tzee, ti, ti, ter, ti-ti-ti-ti*, rising at first with fine, high-pitched, somewhat faltering notes, and then falling away in a short, rapid, rather explosive warble; occasionally, a thin, rapidly-uttered *teet-ee-tee*. Call, most commonly heard, a fine, high, penetrating *ti-ti*, barely distinguishable even to practiced ears; very thin, sweet, warbler-like call-notes, sometimes uttered with variations to make a song: (1) a sibilant *tsee-tsee-tsee-tseet;* (2) *tseer, tseer, tseer;* (3) *tit-tit-tit-tit-tit-tit-tit;* (4) a high *te-deek-deek*, or *ti-deek, ti-deek;* (5) a hard little *paeu*. A wren-like *cack*.

Description.—Upper-parts grayish-olive to olive-green; wings and slightly-forked tail, fuscous, margined with olive-green. Bright crown-patch yellow, margined all around by black line, edged by white line: distinct thin whitish forehead line, and whitish stripe over eye; white stripe below eye; two whitish wing-bars. Under-parts dull white, pale, dingy. Yellow crown of male centered with flaming reddish-orange. L. 4. W. 2.18. T. 1.80. B. .28.

Field Marks.—Tiny size: two whitish wing-bars. Penetrating call, heard for some distance. Bright-*crown-patch of yellow* or yellow-and-orange. Even the young have a *distinct white line over eye.*

Popular Names.—Golden-crowned Wren; White-browed Kinglet.

RUBY-CROWNED KINGLET

Corthylio[279] *calendula calendula* (Linnæus)

Fairly common migrant and winter resident, sometimes abundant; middle October to middle, rarely end, of April; bulk, late October to late March. In fall, September 27, 1921 (A); September 23 to October 4, 1902, few (R); October 15, 1916 (G); November 14, 1914 (A); December 18, 1912, specimens collected (B). In spring, February 20, 1913, and 25, 1905, specimens collected (B); March 17, 1905, collected (B); March 22, 1914, migrating (G); April 18, 1915, 3 (A); April 21, 1907, collected (B). *Recorded:* ABCDEFGHIJKMOR.

Geographical Distribution.—Canada, parts of Alaska, and down the Rocky Mountains to central New Mexico, southern Arizona, and southern California. Winters from Virginia, Iowa, and southwestern Canada southward over the United States and Mexico to Central America.

Habitat.—Cedar, oak, and elm trees and undergrowth along streams, in bottoms, along slopes between creeks and nearby fields, in woodlands and thickets, and on uplands; woodlands, orchards, and hedgerows. More generally distributed as to habitat than the Golden-crowned Kinglet.

Local Haunts.—Found throughout the Region: huge oak trees in and about town; shade trees in Austin, particularly the hackberries along quieter streets; University campus; taller trees along the Colorado River and along Onion, Williamson, Waller, Shoal, and Barton creeks.

General Habits.—Most commonly observed singly or in pairs, though occasionally in small irregular companies or troupes; active, tame little fellows, generally sticking to the tree-tops or terminal twigs, nervous in actions, and resembling a tiny chickadee as it flits hither and thither, apparently always on the move. Has a habit of lifting its wings nervously. Flutters under leaves and spray tips, very much after the manner of a hummingbird. The ruby crown-patch is exhibited in rare moments of high excitement.

Voice.—Song is one of the most famous among all bird songsters: a low but penetrating warble, beginning with a slow, regular, and rather high-pitched *see-see-see-see*, breaking suddenly into a much lower-scaled *ticu-tieu-tieu-tieu*, somewhat merged in an intricate warbling, and suddenly brought to a close by several high-pitched *te* notes, the whole song given as *see, see, see, see, tieu-tieu-tieu-tieu-te-te-te;* all in all, a sweet, helter-skelter, flute-like little melody, full of soft mellow liquid warblings, incredibly loud for so small a bird, and heard for several hundred yards. A rolling *who-be-you? who-be-you?* Calls, a wren-like *cack* or *tzchek;* a wren-like chatter. Singing with great ardor in late October (F); begins singing in spring commonly with the third week in March, and noisily singing everywhere by the end of the month.

Description.—Plain grayish olive-green above, brighter on rump, darker to an olive-green margined with fuscous on wings and on tail, the latter slightly forked since the middle feathers are shortest; two narrow whitish wing-bars. Under-parts soiled whitish, slightly tinged with buffy. In male, partly concealed feathers in center of crown, bright red, can be erected a quarter-inch above other head feathers. L. 4.40. W. 2.25. T. 1.85. B. .29 (from N. .21).

Field Marks.—Tiny size, much smaller than any warblers. Plain olive-greenish (fading to soiled whitish below), with distinct, conspicuous, well marked whitish eye-ring. Plain crown, without yellow or orange, without stripes of black or white, without black edges. No bright yellow below; no conspicuous white blotches in tail. Twitches or flirts wings nervously; wren-like scolding. Female and young, warbler-like, but first primary or quill short, measuring barely an inch in length.

Popular Names.—Ruby-crowned Wren; Ruby-crowned Warbler; White-spectacled Kinglet; Larger Ruby-crowned Kinglet.

BLUE-GRAY GNATCATCHER

Polioptila caerulea caerulea (Linnæus)

Common, and at times abundant, migrant; tolerably common summer resident; rare and irregular winter resident. Usually arrives March 14 to 16, common by March 24, and abundant through first week in April. In fall, migrating in September (F); tolerably common September 23 to October 4, 1902 (R); usually last seen first or second week in October: October 10, 1915, 3 (F); December 22, 1915, 1 (G); January 6, 1920, 1 (A). In spring, March 17, 1916 (G); March 17 to 29, 1905, tolerably common and migrating, one collected on March 29 (B); March 14, 1915 (A); March 16, 1920, 3 (A); March 16, 1922 (A); March 18, 1921 (A). *Recorded:* ABCDEFGH[230]IJKLMNORTWY.

Geographical Distribution.—Middle and southern portions of the United States, north to New Jersey, Michigan, and eastern Nebraska, rarely into Ontario, Canada; south to central Florida, the Gulf Coast, and southern Texas; breeding summer resident in the central Texas limestone hills. Winters in Mexico and Central America, rarely along the southern border of the United States, to northern Florida, the immediate Gulf strip, and central Texas.

Habitat.—Upland oak woods and timbered ravines; live oak pasturelands on hilltops and plateau remnants in hilly country and along creeks. In migrations, trees of dense foliage along streamways; upper branches of large, rather densely-foliaged forest trees and lower hillsides; forests of large trees.

Local Haunts.—Mountain Spanish oaks on Campbell Hole flat in Barton canyon; west side of Shoal Creek, opposite Twenty-fourth Street; oak-covered hill-tops between Austin, Mt. Bonnell, and the Dam; hills northwest of Mt. Bonnell; hills back of Deep Eddy. In summer, found only west of Austin and in the hill country, particularly in oak trees on hillsides and along hill canyons. In migrations, slopes and crests of Shoal Creek valley; Military Hill in western part of Austin; Mt. Barker; edges of Lake Austin; rocky slopes of Onion and Barton creeks; in and about town.

General Habits.—Very active and restless, quick in its movements, flitting and darting about, flipping its tail from side to side. Generally observed singly and in pairs, though family parties are common in summer and loose companies occur during migrations. During migrations, it is found everywhere along the creeks, on the ground, in bushes and trees, on fences, along edges of clearings and woodlands, on brush-heaps; at such times it is not at all shy, alighting on roadside broomweeds alongside a woodland road, a few feet from the observer, eyeing him ascant, resembling for all the world a tiny mockingbird except that it is more bluish than grayish in its colors. In summer, at the beginning of the nesting season, each pair seems to select a certain definite bit of territory as its home grounds, and holds such territory against all comers, both of its own kind and also against even larger birds which may approach its nest. Flits and hops about in the thickets of slender mountain live oak and Spanish oak saplings and trees, scolding and calling back and forth. In general, its habits resemble those of its cousins, the kinglets. After the young birds have left the nest, the family party wanders over hillsides.

Feeding Habits.—Food consists chiefly of insects, many of which it catches on the wing.

Breeding.—April to June. Earliest: April 23, 1905, 5 fresh eggs (E); April 24, 1905, 4 nearly hatched eggs (B); April 25, 1905, 4 ten-day-old nestlings (E). Latest: June 2, 1917, 4 fresh eggs and 1 egg of the Dwarf Cowbird (B); June 12, 1895, eggs (L); June 13, 1915, birds caring for one young Dwarf Cowbird about eight days old (ABF). Unusual record: May 9, 1905, 2 eggs incubated about three days, and 3 eggs of the Dwarf Cowbird (B). *Breeding recorded:* ABCEFHLMNOW.

Nest Location.—9 to 50, usually 15, feet from ground, generally in eastern or mountain live oak trees with lichen-covered limbs, in mountain Spanish oak, black gum, or hackberry; firmly placed in fork or crotch or saddled on limb, generally in big eastern live oak, usually on the edge of a clearing.

Nest Construction.—The most beautiful nest of any bird, always deeply cupped, with high, delicate, but compact walls, much smaller at the mouth than down inside; and so thickly and neatly covered outside and over the rim with lichens (bits a third to a fourth inch in diameter), sometimes with the dark under-surface of the lichen exposed, though usually with the whitish or pale buffy-grayish side out, as to give the nest a mottled appearance which renders it invisible at a short distance, resembling a knot on the limb on which it is placed. Composed of leaf stems or petioles, plant fiber, spider webs, plant down, fine strips of grapevine bark, inner bark of trees, bits of fine grass and grass seed stems, thistle down, bits of gray and brown plant down from the under surface of leaves, very fine rootlets, tiny feathers, cedar bark, and pieces of cocoons; thickly coated on the outside and held together in the weaving of the nest with spider webs. Lined with woolly substances, soft buffy-white plant down, tiny grass seed stems, small bits of lichens and bark fiber, grass rootlets, horsehair, and tiny feathers.

Nest Building.—Painstakingly skillful, both male and female participating in the nest building, the male usually bringing the material to the female, which weaves, stamps, and winds it into the nest. Begins building in the last week of March the nest which must contain eggs the second week in April. Birds with nest location selected, April 4, 1915 (A); nest nearly completed, April 5, 1905 (B); building nest, April 27, 1919 (L).

Nest Measurements.—Outside, diameter 2.25 to 2.50; height 2.50. Inside, top diameter 1.20 to 1.40; middle diameter 1.70 to 2.05; depth 1.33 to 1.65. Thickness of rim .30 to .60.

Eggs.—3 to 5, usually 5 (fewer when Dwarf Cowbird lays in nest), very pale greenish or bluish-white, speckled and spotted with chestnut and brown, usually around the larger end, .59×.45.

Voice.—Song, rarely heard, a low, pleasant, exquisite, warbling ditty, preceded by an introductory note or two, and beautifully finished: *zee-u, zee-u, ksee-ksee-ksee-ksee-ksee-ksu*, occasionally cut short, frequently only a note or two, *pseety-pseet-ee* or *pse-chety* or only a short *tse;* song has been likened to *tsang, tsang, here I am, here I am.* Sings from arrival to early June, particularly common about the nesting site. Call, a distinctive, thin, twanging, humming (1) *speee*, (2) *speeng*, (3) *sping*, or (4) *ting*, heard for quite a distance, resembling the sudden ting of a stringed instrument or the hum of a .22 rifle bullet; a mouse-like call; a mournful chirping; a scolding *spee-spee-spee* or *spee-spee-spee-chuh-chuh;* calls and scolds from arrival to early July.

Description.—Upper-parts blue-gray; wings edged with grayish, the secondaries edged with white; middle tail-feathers black, outer ones white. Under-parts, dull grayish-white. Male, narrow forehead and line over eye, black. Female, more brownish bluish-gray, without black on forehead or over eye. Young, upper-parts washed with cinnamon. L. 4.65. W. 2.10. T. 2.05. B. .40.

Field Marks.—Tiny size; slender, dainty, and beautiful. Blue-gray upper-parts, fading to grayish-white under-parts. Black wings (showing white in flight) and tail, the latter long and slender, with outer feathers conspicuously white in flight.

Popular Names.—Eastern Gnatcatcher; Sylvan Flycatcher.

TOWNSEND'S SOLITAIRE

Myadestes townsendii[231] (Audubon)

Rare and irregular winter visitor, early November to middle April. In fall, November 7, 1921 (A). In spring, April 5, 1905, 3 together, 2 of them collected (B); April 18, 1915, pair (A). *Recorded:* ABF.

Geographical Distribution.—Western North America, from Alaska and Canada south in the mountains to California, Arizona, New Mexico, and northern Mexico; east to the Black Hills; said to breed at Saragossa in western Texas. Winters from southern Canada and Montana southward and southeastward to Kansas and central Texas; accidental in the East.

Habitat.—Cedar brakes; bases of hill slopes; deep ravines; small clearings. Breeds in the high mountains; in winter, moves down to lower hills and valleys.

Local Haunts.—Western sloping sides of Bull Creek valley, about 400 yards from the creek and a mile and a half from the Colorado River; deep ravine along southeast side of Mt. Bonnell; Pease gorge.

General Habits.—Shy and retiring, generally observed singly, rarely in pairs or three or four together. It stops and struts now and then while feeding on the ground, raises its wings up and down like a butterfly, and shows its two light-ochre wing-bars. Perches on dead branches; alights on the ground; legs rather weak. Runs along on the ground, halts, runs along, halts, very much after the manner of a robin.

Feeding Habits.—Feeds about on the ground among mountain rock cedars, eating cedar berries; commonest when there are large numbers of these berries, on which it feeds almost exclusively in winter.

Voice.—Not heard to sing or make a note of any kind while in the Region. Song, low, uttered at evening; at other times louder, ringing, strong, and clear.

Description.—Uniform brownish-gray, paler below; white eye-ring; two narrow whitish bars on wing, and buffy or yellowish-brown patch hidden in wing; formed by rusty-colored bases of primaries; tapering tail-feathers, the outer pair mostly whitish. Short, deeply cleft, flattened bill. Young, spotted with buff over body. L. 8.60. W. 4.60. T. 4.40.

Field Marks.—Appears to be a small, dark, stocky, meek-looking mockingbird, but with yellowish-salmon or orange patches in wings, plainly visible in flight.

Popular Names.—Yellow-winged Mockingbird; Small Mockingbird.

Remarks.—First specimen shot by Captain Brotchie at Fort George, Astoria, given to Mr. Townsend, and by him to Audubon.

WOOD THRUSH

Hylocichla mustelina (Gmelin)

Scarce migrant and winter resident[232]; in migrations, last week in March to third week in April, and October to late November; reported as common winter visitor in the early '90s (D). In fall, October 11, 1921 (A); November 5, 1916, 7 (G); November 26, 1916 (G). In spring, April 15, 1919 (A); March 24, 1922 (A). *Recorded:* AD[233]G.

Geographical Distribution.—Eastern United States, from southeastern Canada and southern South Dakota south to northern Florida, Louisiana, and northeastern and eastern Texas (breeding at Houston and Sherman); west to western Kansas. Winters commonly from southern Mexico into Central America, rarely north to the lower Gulf Coast of the United States.

Habitat.—Low, thick, damp, swampy, deciduous forests and bottomland woods; thickets along creeks, bayous, and rivers; rarely, upland woods. In migrations, rarely into city parks, gardens, and well shaded lawns.

Local Haunts.—East Woods.

General Habits.—Though rather difficult to observe, it is not nearly so difficult of approach as the Veery; sings from the deep shade of tree-tops, or from a low limb 10 to 20 feet up in shady sapling woods.

Feeding Habits.—Frequently scratches among dead leaves for food; lives on a mixed diet of insects, seeds, and berries, and especially fond of ants, beetles, and thousand-legs.

Voice.—A pure, clear, sweet, liquid tinkling, calm and peaceful, even mournful, but rapturous, beginning–flute-like first and then turning bell-like, *twirili-tee e e e e e e e e;* sounding *a-o-lee e e e e e e* to one observer; *a-olle-e-e-e-e-e-e* to a second; *uoli-a-e-o-e-e-e-e* to a third; *uoli-a-e-o-li-noli-nol-aeolee-lee!* to a fourth; and perhaps interpreted as *come to me-e-e-e-e-e-e-e-e-e-e;* the long-drawn, bell-like ending gives the bird one of its common names. Call-notes: a liquid *quirt;* a shrill *tsee-tsee;* a more characteristic, sharp *pip-pip* or *pit-pit,* often heard during night migrations; a low *tut-tut.* When alarmed, a loud, rapid, anxious *pit-pit-pit-pit,* like the striking of large pebbles together.

Description.—Upper-parts bright cinnamon-brown, brightest to golden-brown on head, duller to pale olive-brown on tail and its upper-coverts; eye-ring and space from eye to bill, whitish; under-parts white, thickly marked (except on throat and middle belly), even on sides and well up under wings, with large round or heart-shaped black spots in irregular rows running from front to back. Young, streaked buffy on crown, washed brownish-yellow on breast. L. 8. W. 4.30. T. 3. B. .68.

Field Marks.—Bold breast markings. Large size for a thrush, and stocky build. *Pure white breast* with numerous large, conspicuous, dark brown, or *bold black spots, round* or heart-shaped. Tawny or bright cinnamon-brown back; *brighter, golden-brown head;* duller, olive-brown tail.

Popular Names.—Bellbird; Song Thrush; Golden-headed Thrush; Spot-breast Thrush; Woodland Thrush.

WILLOW THRUSH; WESTERN VEERY

Hylocichla fuscescens salicicola Ridgway

Rare migrant; middle April to middle May, and second week in September to third week in October. In fall, September 13, 1919 (A); October 19, 1921 (A). In spring, May 17, 1919, 2 (A). *Recorded:* ABF.

Geographical Distribution.—Western North America, from southern part of Canada southward to central Iowa, northern New Mexico, Nevada, and Oregon; east to the Dakotas and Minnesota. East during migrations to Wisconsin, Indiana, Illinois, and Mississippi, migrating down the Mississippi Valley. Winters in northern South America.

Habitat.—Low, wet woodlands with rather dense undergrowth; low brush, and brushy ravine slopes; willow thickets, and other localities near water; not found in heavy timber.

Local Haunts.—Thickets along the eastern edge of Lake Austin, between the Dam and Mt. Bonnell, and between Austin and the Lake; willow thickets along the river at town; Shoal Creek valley; Waller Creek near the University campus.

General Habits.—Rarely seen; shy and retiring, the most difficult of thrushes to observe. Lives close to the ground, retiring into woodlands in daytime; migrates commonly by night, uttering its querulous whistle as it passes overhead.

Feeding Habits.—Spends much of its time on the ground hunting for ants, caterpillars, and similar insects, and for wild fruit and berries.

Voice.—Song, a weird, strange, ventriloquistic, bleating, ringing, mellow, repeated monotone whistle, *vee-r-r-r-hu* or *vee-r-r-y*, blending alto and soprano, repeated eight or nine times without a pause; *taweel-ah, taweel-ah, twil-ah, twil-ah*, descending in trills; *wee-te-a-wee, te-a-wee, te-a-wee: wee-te-a-wee, te-a-wee, te-a-wee: wee-te-te-a-wee, te-a-wee, te-a-wee;* a slightly descending, melodious *to-whe-u-whe-u-whe-u;* a quiet, whistled *whee-ough.* Day calls, a sharply, clearly whistled *pheeu, wheeoo, whee-eur*, or *whee-you*, the first note higher; a softer *too-whee*, first note lower, or *wheew-whoit.* A series of unmusical cacking notes. Night migration calls, a clear, softly-modulated, mellow whistle.

Description.—Upper-parts pale, dull cinnamon-brown, uniform from head to tail; under-parts, white on belly, sides, and center of throat, the sides having only a faint tinge of grayish; a few small faint brown or dusky wedge-shaped markings on upper breast and sides of throat and neck, which are tinged with pale creamy-buff. L. 7.65. W. 4. T. 3.15. B. .57.

Subspecific Characters.—Slightly darker than the Eastern Veery, *H. f. fuscescens* (Stephens), of southeastern Canada and northeastern United States to Michigan and northern Georgia, also wintering in South America.

Field Marks.—Small trim thrush. *Uniform cinnamon-brown upper-parts. Sides almost white*, no heavy spotting. *Very faint dusky spots on upper breast*, which at a short distance has a buffy or dull yellowish appearance. Querulous night migration whistle.

Popular Names.—Veery; Western Wilson Thrush; Tawny Thrush; Pale-breasted Thrush.

GRAY-CHEEKED THRUSH

Hycocichla minima[284] *aliciae* (Baird)

Rare migrant; late April to middle May, and late September through October.[285] In spring, April 27, 1919 (A); May 16, 1922, 3 (A). In fall, September 26, 1921 (A). *Recorded:* A.

Geographical Distribution.—Breeds in extreme North along northern edge of limit of trees, from northwestern Alaska eastward into Ungava and Newfoundland, north of the St. Lawrence River. Migrates into eastern United States, west to Montana, Kansas, and Texas, and along the eastern coast of Central America. Winters in northern South America.

Habitat.—Thickets along streams; timbered ravines adjoining lowlands; borders of woods, and thickets in cut-over woods; willow thickets; hedges and thickets along fencerows and in open places.

Local Haunts.—Wooded Creek along south side of Aldridge Place; Waller Creek bottom woods; Shoal Creek.

General Habits.—Very shy and retiring, and liable to be overlooked even when present in astonishing numbers.

Voice.—Song, *wee-o-wee-o-tit-ti-wee-o!* ringing and flute-like, quite similar to that of the Veery, but final note rising abruptly and with emphasis. Calls: a low *cluck;* a whistled *phew;* a harsh, nighthawk-like note; a rarely heard *pip* or *peenk.*

Description.—Upper-parts uniform olive or grayish-olive. Sides of head gray. Under-parts, white on middle of throat and belly; so faintly buffy on breast, sides, and sides of throat, as to be almost white, richer to cream-buff in fall, and spotted with triangular and half-round black marks. Whitish eye-ring; grayish between eye and bill. Darkening well up on sides to brownish ashy-gray. L. 7.60. W. 4.10. T. 3.10. B. .53.

Field Marks.—Large thrush, with broad square tail, and long legs. Larger than Hermit or Willow Thrushes. *Uniform olive above;* gray below, with no strong buff on breast or sides of throat, which are practically white. *Whitish eye-ring. Grayish blotch in front of eye.* An olive-backed, gray-cheeked thrush: the somewhat similar Olive-backed Thrush is slightly smaller and has eye-ring, cheeks, and sides of head distinctly buffy.

Popular Names.—Northern Gray-cheeked Thrush; Gray-faced Thrush.

OLIVE-BACKED THRUSH

Hylocichla ustulata swainsoni (Tschudi)

Rare migrant; middle April to middle May, and late September to late Oltober.[286] In fall, September 20, 1919, 2 (A) October 3, 1915 (G); October 24, 1915 (G). In spring, April 16, 1922 (A); April 24, 1919 (A); May 17, 1919, 3 (A). *Recorded:* AG.

Geographical Distribution.—From Alaska and Newfoundland south into northeastern United States as far as Massachusetts, Michigan, Colorado, Nevada, and eastern Oregon, and down the Alleghenies to West Virginia. Winters from southern Mexico southward across Central and South America.

Habitat.—Timbered ravines; wooded banks bordering bottomlands; woodland undergrowth and the edges of woods; dense cedar brakes; tangled hedgerows.

Local Haunts.—Waller Creek cedar slopes; brushy-thicket, heavily wooded draws in the hills.

General Habits.—Not shy, but secluded and little seen. Migrates in spring in small, silent bands, easily escaping observation. In fall, passes overhead moving southward, uttering its characteristic call-note; in the daytime feeds under cover with other migrants.

Feeding Habits.—Searches on and near the ground for caterpillars and similar insects, and for hackberries and stretchberries.

Voice.—Song, in its summer home, loud, beautiful, ringing, energetic, bubbling, with a strong close instead of fading out like the song of the Hermit Thrush. Calls, a subdued *plup* or *whit;* a loud, metallic note; alarm-note, a rather harsh, high-pitched *puk! puk!*, quite different from the liquid, mellow calls of other thrushes.

Description.—Upper-parts uniform olive, with grayish or brownish tinge; whole throat and breast strongly tinged with a deep, bright buff, spotted with dusky, half-round spots on breast and sides and with wedge-shaped spots on sides of throat; sides brownish ashy-gray; middle belly white. Cheeks, space from eye to bill, and eye-ring, conspicuous deep creamy-buff or tawny. L. 7.15. W. 3.95. T. 2.85. B. .53.

Subspecific Characters.—Upper-parts distinctly olive in cast, where the western variety, Alma Thrush, *H. u. almae* Oberholser, from the Yukon Basin down the Rockies to Utah and Nevada, is distinctly more brownish above and on sides, with a brown tail; the other western subspecies, Monterey Thrush, *H. u. oedica* Oberholser, ranging from interior southern Oregon south to California, has upper-parts distinctly hair-brown, with only a light tint of green.

Field Marks.—Uniform color of head, back, and tail distinguishes this species from the Wood and Hermit Thrushes; its striking eye-ring and more spotted breast from the Willow Thrush; and its *deep-buff-tinted throat* and breast, and *tawny cream-buff side of head* (eye-ring, cheek, and space from eye to bill), from the Gray-cheeked Thrush.

Popular Names.—Swainson Thrush; Tawny-cheeked Thrush; Olive-backed Thrush; Buff-breasted Thrush; Buff-throated Thrush.

HERMIT THRUSH

Hylocichla guttata faxoni[287] Bangs and Penard

Fairly common migrant and winter resident; early October, rarely late September, to early April; begins moving northward late in February. In fall, September 28, 1914, unusually early bird (A); October 7, 1919 (A); December 18, 1912, 1 collected (B); December 19, 1915, 3 seen and 2 specimens collected (B). In spring, April 9, 1921 (A); April 14, 1922 (A). *Recorded:* ABCDFG.

Geographical Distribution.—Eastern Alaska and eastern Canada south to the New England States, Maryland, and Michigan. Winters from southern New England and the Ohio Valley south to Florida, the Gulf Coast, and Texas (to Concho and Kerr counties and Fort Clark).

Habitat.—Brush and underbrush in woods, along creek bottoms, and on creek slopes; dense shrubbery along margins of bottomland woods; brush heaps along streams; shrubby roadsides; secluded woodlands and thickets; small-mouthed, deep, dark, brush-covered ravines and valleys in hills.

Local Haunts.—Brushy, wooded hills and crests above Pease Park; thickets in Pease Addition, along the Windsor road; ravines in face of Deep Eddy cliffs; slopes of divide between Barton Creek and Colorado River; slopes of Shoal and Waller creeks.

General Habits.—Not shy, but retiring, rarely venturing into the open. Upon alighting on a low branch of a tree, it almost always tilts its reddish-cinnamon tail slowly up and down.

Feeding Habits.—Feeds on the ground in sheltered places, taking to thickets and underbrush at least alarm; usually perches among low branches, making short flights from perch to perch, feeding near the ground. Feeds largely on flies, ants, weevils, and similar insects, and on wild berries.

Voice.—Song, rare, very fine, heard in more northern summer home; rendered at twilight, pure, sweet, well-modulated, clear, tranquil, spiritual, serene; a bell-like Angelus given by John Burroughs as *Oh, spheral, spheral! oh, holy, holy!* Call, a single, low, soft *chuck* or *cluck.* In night migrations, a soft, nasal *ter* or *per,* somewhat resembling the call of the Eastern Bluebird.

Description.—Upper-parts, exclusive of rump and tail, uniform olive-brown; rump and tail deep pale rusty or bright reddish-brown or cinnamon-brown, sharply contrasting with darker, uniform upper-parts. Eye-ring buffy whitish. Throat and breast slightly tinged buffy, marked with black spots, wedge-shaped on sides of throat, large and round on breast; sides brownish ashy-gray; middle of belly white. L. 7.10. W. 3.55. T. 2.75. B. .50.

Field Marks.—Small size. Dark roundish breast-markings run into lines on a faint bluish-white or buffy background. Jerking or slight lifting of tail on alighting. *Bright reddish-brown tail,* contrasting sharply with duller olive-brown back and crown.

Popular Names.—Short-tailed Brown Thrush; Little Thrush; Bright-tailed Thrush; Red-tailed Thrush.

AMERICAN ROBIN

Turdus migratorius migratorius Linnæus

Common but irregular migrant and winter resident, abundant in some years, scarce in others; gradually becoming scarcer; late October to middle April; common by middle November, begins moving northward in late January or early February, and majority gone by first of April.

In fall, October 24, 1915, 20 (G); October 26, 1919, 7 (A). Winter movements, December 15 to 18, 1916, 1000 to 1500 present (B); December 25, 1916, more than 5000 (F); January, 1908, specimen collected (X); January 10-20, 1919, very abundant in town (A); February 21, 1915, specimen collected (A). In spring, March 18, 1916, 1000 moving northward (B); April 18, 1915 (A). *Recorded:* ABCD[288]EFGHIJKLMNOPQSWXY.

Geographical Distribution.—Northwestern Alaska, Newfoundland, and Canada, south into the northeastern United States as far as New Jersey, Ohio, Kansas, and southeastern Wyoming, and down the Allegheny Mountains to North Carolina. Winters from New Jersey and central Kansas south to Florida, the Gulf Coast, and northeastern Mexico, west to central Texas.

Habitat.—Cut-over woods; brush, saplings, and woods along streams; cedar brakes in the hills; wooded slopes and pasture flats; timbered ridges of the blackland prairies; sapling oaks on the crests of wooded slopes; large hackberry trees in the bottoms, and shade hackberries in the city; protection of thick evergreens in colder winter. In the North, lawns and orchards.

Local Haunts.—Whole of the Region, particularly common in the cedar brakes in the hill country; ridges north and northeast of town; edges of town; thick hackberry trees along wide, peaceful streets in Austin; University campus; pecan grove at Barton Springs; Pease pastures; Shoal Creek valley and Pease Park; mixed woods between city and Lake Austin.

General Habits.—In winter congregates in small companies or flocks, which rove about in search for food and roosting places; occasionally in immense flocks, usually during migrations. From tree to tree they go, an endless, shifting, gliding procession, one squad moving on only to be replaced a moment later by another. Restless during rainy weather, flying from one tree to another. The Robin army camps in the cedar-clad hills west of Austin, the greater majority remaining in the thousands of hills through the day and feeding on cedar berries and similar drupes and seeds; others, and particularly immense numbers when food is scarce in the hills, rise into the sky just before dawn and move eastward: just as day begins to break, they flutter and fall like so many delicate snowdrops out of the white morning mists of the sky and settle in the tops of trees along the thickly-wooded valleys of parallel, south-flowing Shoal and Waller creeks, which move one on either side of Austin to where they meet the Colorado River that marks the southern edge of the city; as the day brightens, the Robins venture forth from these two ribbon-like valleys, spreading over the city in small droves, thickly populating the hackberry trees; the birds begin to drift into their roosts between 3:30 and 4 o'clock of the winter afternoons, from all directions, in larger and larger numbers until dark.

Migration.—The first migrants arriving stick close to underbrush along creek valleys. As their numbers increase and food becomes scarcer, they move up to the surrounding country, to the edges of town, and finally into town. In spring, the flocks, in which the Robin migrates and winters, move northward, beginning song and mating.

Feeding Habits.—Feeds in great numbers on cedar berries in brakes in the hill country; comes into town for food when cedar berries in the hills have been cleared up, when the crop is small, or when the weather is severe, particularly about mid-January, feeding on hackberries and on myrtle and holly berries; particularly fond of mistletoe berries, and feeds on Chinaberries until so drunk it falls out of trees onto the ground. Thousand or more feeding on hackberries at mouth of Barton Creek, December 15-18, 1916 (B). One collected in January, 1908 (X), contained a snake in oesophagus and gizzard. In spring, feeds on crickets, grasshoppers, and other injurious insects.

Voice.—Song, a loud, cheery carol, *cheerily-cheerup, cheerily-cheerup;* occasionally sings in mild winters, though usually a half-suppressed song; begins to sing as it leaves in spring. Calls: a soft, ventriloquistic *kwee-kwee-kuk* or *kwee-kwee-kuk-kuk-kuk;* a sharp, clear, high, sparrow-like *chiepp;* a short *tut-tut,* with a jerk of the tail; rapid, rather explosive *puck-puck-puck-puck-puck,* with a jerk of the tail at each syllable; *skeek-skeek;* a clear *tee-urp;* a Bluebird-like *tee-dee-loop;* birds call and chuckle among themselves as they feed.

Description.—Upper-parts grayish slate-colored, darker on tail and wings, with wing-margins lighter. Head black, and front part of back usually clouded with black; distinct broken white eye-ring (white spots above and below eye); throat streaked black and white. Breast bright reddish-brown, to white on middle of lower belly. White corners to blackish tail, usually on inner web of outer feather. Immature female, less black on head, slightly paler below. Nestling, black spots on back and under-parts. In fall, less black about head, and reddish-brown breast broken with white. Bill yellowish. L. 10. W. 5.10. T. 3.95. B. .86.

Subspecific Characters.—Larger (W. over 4.90, T. over 3.80), darker, and richer than the Southeastern Robin; wing and tail longer. White corner-patches in tail distinguishes this bird from the Western Robin. Back blotched with black in adults.

Field Marks.—Medium-large, slate-colored bird, with reddish-brown breast and white lower-belly. Blackish head, disconnected white eye-ring, and black-and-white-streaked throat. *Distinct white corners to tail.*

Popular Names.—Robin Redbreast; Migratory Thrush; Eastern Robin.

WESTERN ROBIN

Turdus migratorius propinquus Ridgway

Scarce winter resident, November to March. March 20, 1920, specimen collected (A). *Recorded:* A.

Geographical Distribution.—Western North America, from southeastern Alaska and central Montana, east to the eastern base of the Rocky Mountains, and south to southern California and northern Mexico. Winters from southern British Columbia south to northern Central America; east in Texas as far as Kerrville and Boerne, scarce to Austin and the Balcones Escarpment, and rare east to Corpus Christi in migrations.

Habitat.—Robin roosts in the hills; brushy, sapling, cut-over woods on ridges, slopes, and pasture flats, and along creeks and about the edges of town.

Local Haunts.—Cedar brakes and valleys in the hills west of Austin; ridges and slopes of the hills; canyon valleys; sapling and cut-over woods on the edge of Austin; hackberry shade trees along the quieter streets in Austin; campus of the University.

General Habits.—Shyer, more timid, and more nervous than Eastern Robins, since it breeds in mountain wilds rather than about dooryards as do those birds. Hides in brush on approach of observer, and shakes tail nervously.

Feeding Habits.—Feeds abundantly on grasshoppers and the large black crickets which are so injurious in droves at certain times; also very fond of ants and caterpillars. In winter, feeds largely on cedar berries, and on hackberries, Chinaberries, mistletoe berries, and small wild fruit.

Voice.—Sings less than the eastern bird, but occasionally whole flocks carol at daybreak. Song and call-notes quite like those of the eastern bird.

Description.—Upper-parts slaty-gray; head and hind-neck black, sharply contrasting with the gray of the back; wings and tail black, outer feather of latter without distinct white spot near tip (often no white); under-parts rufous. Female, paler, duller. Young, paler, head and neck gray. Winter, more brownish above, white edgings below. L. 10.50. W. 5.45. T. 4.10. B. .90.

Subspecific Characters.—Slightly larger than the two eastern Robins, and paler, with no black markings on back. *Little or no white* at corners of tail.

Field Marks.—Similar to Northeastern and Southeastern Robins, but practically *no white at corners of tail.*

Popular Names.—Big Robin; Pale Robin; Gray-back Robin; Black-tailed Robin.

SOUTHERN ROBIN

Turdus migratorius achrusterus (Batchelder)

Very rare winter resident, probably November to March. Record, January 12, 1916, specimen collected (B); November 30, 1922, 3 shot (A). *Recorded:* AB.

Geographical Distribution.—Southeastern United States, from Maryland and southern Illinois south to South Carolina, northern Georgia, and northern Mississippi. Winters south to the Gulf Coast and Florida and west to central Texas at Austin.

Habitat.—Formations typical of southern parts of the Carolinian Life Subzone; live oak timber; dooryards; city shade trees; lawns; cut-over woods; edges of woodlands; wooded stream valleys.

Local Haunts.—In and about the edges of Austin; city dooryards and lawns; shade trees; campus of the University of Texas.

General Habits.—Similar to those of the Northeastern Robin.

Description.—Similar to the Northeastern Robin, with subspecific differences.

Subspecific Characters.—Lighter, duller, and smaller than the Northeastern Robin. W. 4.80. T. 3.60.

Field Marks.—Smaller size, and paler duller colors, distinguish it from the Northeastern Robin. White markings at corners of tail distinguish it from the Western Robin.

Popular Names.—Southern Robin; Least Robin; Little Robin; Little Pale Robin.

BLUEBIRD

Sialis sialis sialis[289] (Linnæus)

Common migrant and winter resident, November to March; not uncommon summer resident; more common in migrations; less common in coldest weather of February, and hottest weather of midsummer. *Recorded:* ABCDEFGHIJKLMNPQSWY.

Geographical Distribution.—Eastern North America, from central Canada south to central Florida, the Gulf Coast, and southern Texas; west to the Great Plains and uncommonly to the base of the Rocky Mountains. Winters in middle and southern United States, north to the southern parts of New York and Illinois.

Habitat.—Roadside fence posts and telegraph poles, particularly along country roads and railroad tracks, usually where old woodpecker and chickadee hollows are common; gardens, orchards, and the edges of woodlands; trees along fence lines; pastures with rail fences; semi-cultivated lands; neighborhoods fairly thinly settled, with farmhouses and dwellings scattered about. In winter, trees in clumps, edges of town, edges of woodlands, and clearings in woods; along railroads and country roads.

Local Haunts.—East of the hills, rarely into the hills; San Antonio road south of Austin; I. & G. N. railroad track between Austin and Mt. Bonnell; residence district of town; University campus; Colorado River valley.

General Habits.—Very domestic and friendly. Female frequently has to be pulled from her hollow, refusing to leave her eggs. After the nesting season the birds remain in small, roving family groups and wander along edges of woods and about weedy pastures. Observed commonly perching on fence and telegraph wires along roadsides, railroads, and edges of woods. Occurs in loose flocks, usually from 8 to 15 birds, occasionally more, in fall and winter. Sharp frosts in November drive them southward; severe winter weather kills many; they are rare for several years following every unusually hard winter.

Feeding Habits.—In fall, loose companies stay around weedy pastures where grasshoppers, crickets, and similar insects are common; particularly fond of caterpillars. In winter, feeds on hackberries, mistletoe in timber, and other berries in bottomlands.

Courtship.—Paired on January 20, 1905 (B).

Breeding.—Early March to middle June. Earliest: March 11, 1907, 5 eggs, one-third incubated (E); April 12, 1905, 3 nests, each with 5 newly-hatched young (B). Latest: June 16, 1907, 4 eggs, about half incubated (E). Two broods. *Breeding recorded:* ABCEFGHJLMNWY.

Nest Location.—3 to 18, average 7, feet up, in old woodpecker hollow in fence post, telegraph pole, or dead stump of tree; in natural cavity of post oak or cedar elm; or in bird-box placed in tree. Alongside railroad, roadside, or street in town; less commonly, edge of woodlands.

Nest Construction.—Old hollow; nest in bottom, composed of small quantity of dead or dried grass, a few strips of bark, a bit of weed, and rarely some hair; occasionally scantily lined with rootlets, horsehair, and feathers.

Nest Measurements.—Depth of cavity, 4 to 16, diameter 4.50 to 6.

Eggs.—3 to 6, usually 5, pale azure blue or bluish white, rarely whitish, unspotted, .79×.61.

Voice.—Soft, happy, low-pitched, liquid warble, *cheerie-cheerie;* varying from *cheerie-peerie* and *cher-ey lew* to *kew-ie* or *kew-ie pe-yew* and *tru-ulee or tu-ree-a-lee;* sings from late February to June or July, and rarely to the fall northers of September or early October. Another, quite different from its liquid warbling, an amusing chuckling and rattling. Rattling chatter when angry or frightened. Fall call-notes, soft, sad, and gentle *tur-wee, tur-wee;* a rapid conversational *chit-ik, chit-ik.* Cheery call-notes, *per-pert-pert* or *chi-ti-tit.*

Description.—Upper-parts bright blue, darker on wings and tail; throat, breast, and sides, deep cinnamon-rufous or reddish-brown; belly white. Female, paler; more grayish above, but with rump, tail, and wings azure blue. Nestling, fuscous margins to breast feathers, whitish spots on back. In fall, male, upper-parts tipped rusty. L. 6.70. W. 3.90. T. 2.60. B. .60.

Field Marks.—Bright blue upper-parts, and cinnamon breast—sky above and earth below.

Popular Names.—Chestnut-breasted Bluebird; Common Bluebird.

MOUNTAIN BLUEBIRD

Sialia currucoides (Bechstein)

Rare and irregular winter visitor, at times common for a day or two; December to March, though generally about mid-February. Records: December 5, 1920 (A); January 24, 1915, 3 (A); February 9, 1916 (G); February 18, 1921, 4 (A); March 13, 1922 (A). *Recorded:* ACGJ.

Geographical Distribution.—Western North America, from Alaska down across western Canada and the mountains of western United States

to Arizona, New Mexico, and northern Mexico; east to western Nebraska and North Dakota. Winters from California and Colorado east-southeastward and southward to Kansas, Oklahoma, middle Texas (Gainesville, Austin, San Antonio, and Corpus Christi), and northern Mexico.

Habitat.—Open country; meadows near hills; arid country and limestone hills.

Local Haunts.—Slopes of Mt. Barker; willows along Deep Eddy, and hills overhanging Deep Eddy; hills near Austin Dam; along I. & G. N. railroad track west of Austin, between Shoal Creek and the hills.

General Habits.—The most beautiful and exquisitely-colored of the bluebirds. Occurs singly and in flocks, usually small though sometimes in numbers; moves about in family companies. Appears in these comparative lowlands usually during very cold weather or during the rare snowstorms and accompanying freezes, which remain for several days.

Feeding Habits.—Hovers a few feet from the ground as it searches for insect food, which for it consists largely of crickets, grasshoppers, weevils, cicada locusts, and ants. In winter, feeds principally on the mistletoe and hackberry.

Flight.—Poises for a few seconds on rapidly beating wings, and then flies ahead in undulating swoops.

Description.—Bright cerulean or azure blue all over, shading to a light purplish-blue above; paler below, to pale greenish-blue. Female, smaller, duller body, brownish-gray to bluish-fawn below; wings and tail bright blue; larger than female Eastern Bluebird. Young, wings and tail blue; but body brownish-gray, streaked with white. In winter, male, duller above and below, produced by dull brownish feather-tips. L. 7.30. W. 4.70. T. 3.

Field Marks.—Bright blue all over, more greenish-blue or purplish-blue on back. No chestnut on breast.

Popular Names.—Arctic Bluebird; All-blue Bird; Western Bluebird.

CLASSIFICATION AS TO SEASON OF APPEARANCE

Permanent Resident	Winter Resident	Winter Visitant	Regular Migrant	Irregular Migrant	Summer Resident	Summer Visitant	Migrant	Postnuptual Migrant	Accidental Visitant
				American Eared Grebe					
	Pied-billed Grebe			Pied-billed Grebe					
				Loon					
				Herring Gull					
				Ring-billed Gull					
									Laughing Gull
				Franklin's Gull					
									Forster's Tern
				Common Tern					
				Least Tern					Least Tern
				Black Tern					
					Water-Turkey; Anhinga				
							Double-crested Cormorant		
		Mexican Cormorant							

				White Pelican					
									Brown Pelican
		American Merganser; Buffy-breasted Merganser							
		Red-breasted Merganser							
	Hooded Merganser			Hooded Merganser					
	Mallard; Green-Head						Mallard; Green-head		
	Red-legged Black Duck	Red-legged Black Duck							
	Gadwall						Gadwall		
	Baldpate						Baldpate		
	Green-winged Teal						Green-winged Teal		
	Blue-winged Teal				Blue-winged Teal		Blue-winged Teal		
							Cinnamon Teal		
	Shoveller						Shoveller		
	American Pintail						Ameri Pintail		
					Wood Duck				

Permanent Resident	Winter Resident	Winter Visitant	Regular Migrant	Irregular Migrant	Summer Resident	Summer Visitant	Migrant	Postnuptual Migrant	Accidental Visitant
	Redhead						Redhead		
	Canvasback						Canvasback		
	Lesser Scaup Duck						Lesser Scaup Duck		
	Buffle-head						Buffle-head		
							Ruddy Duck		
							Lesser Snow Goose		
							American White-fronted Goose		
							Canada Goose		
							Hutchins' Canada Goose		
						White-faced Glossy Ibis		White-faced Glossy Ibis	
									Jabiru
					Least Bittern		Least Bittern		
	Ward's Heron				Ward's Heron		Ward's Heron		
								American Egret	

					Little Blue Heron			Little Blue Heron	
					Green Heron		Green Heron		
						Black-crowned Night Heron	Black-crowned Night Heron		
						Yellow-crown'd Night Heron	Yellow-crown'd Night Heron		
			Whooping Crane						
			Sandhill Crane						
			Virginia Rail						
			Sora Rail						
		Yellow Rail							
				Purple Gallinule				Purple Gallinule	
			Florida Gallinule		Florida Gallinule				
	American Coot		American Coot		American Coot				
				Wilson's Phalarope					
				American Avocet					
				Black-necked Stilt				Black-necked Stilt	
		American Woodcock							

Permanent Resident	Winter Resident	Winter Visitant	Regular Migrant	Irregular Migrant	Summer Resident	Summer Visitant	Migrant	Postnuptual Migrant	Accidental Visitant
	Wilson's Snipe			Wilson's Snipe					
				Pectoral Sandpiper					
				White-rumped Sandpiper					
			Least Sandpiper						
				Western Sandpiper					
			Greater Yellow-legs						
			Lesser Yellow-legs						
			Western Solitary Sandpiper						
			Upland Plover						
	Spotted Sandpiper		Spotted Sandpiper						
	Long-billed Curlew		Long-billed Curlew						
			American Golden Plover						
Killdeer									
	Mountain Plover			Mountain Plover					
			Ruddy Turnstone						

Texas Bob-white									
		Buff-bellied Scaled Quail							
Attwater's Prairie Chicken									
Rio Grande Wild Turkey									
							Passenger Pigeon		
Western Mourning Dove									
Mexican Ground Dove									
Inca Dove									
Turkey Vulture									
Black Vulture									
				Swallow-tailed Kite	Swallow-tailed Kite				Swallow-tailed Kite
			Mississippi Kite		Mississippi Kite				
	Marsh Hawk								
	Sharp-shinned Hawk			Sharp-shinned Hawk					
Cooper's Hawk									
Harris' Hawk									

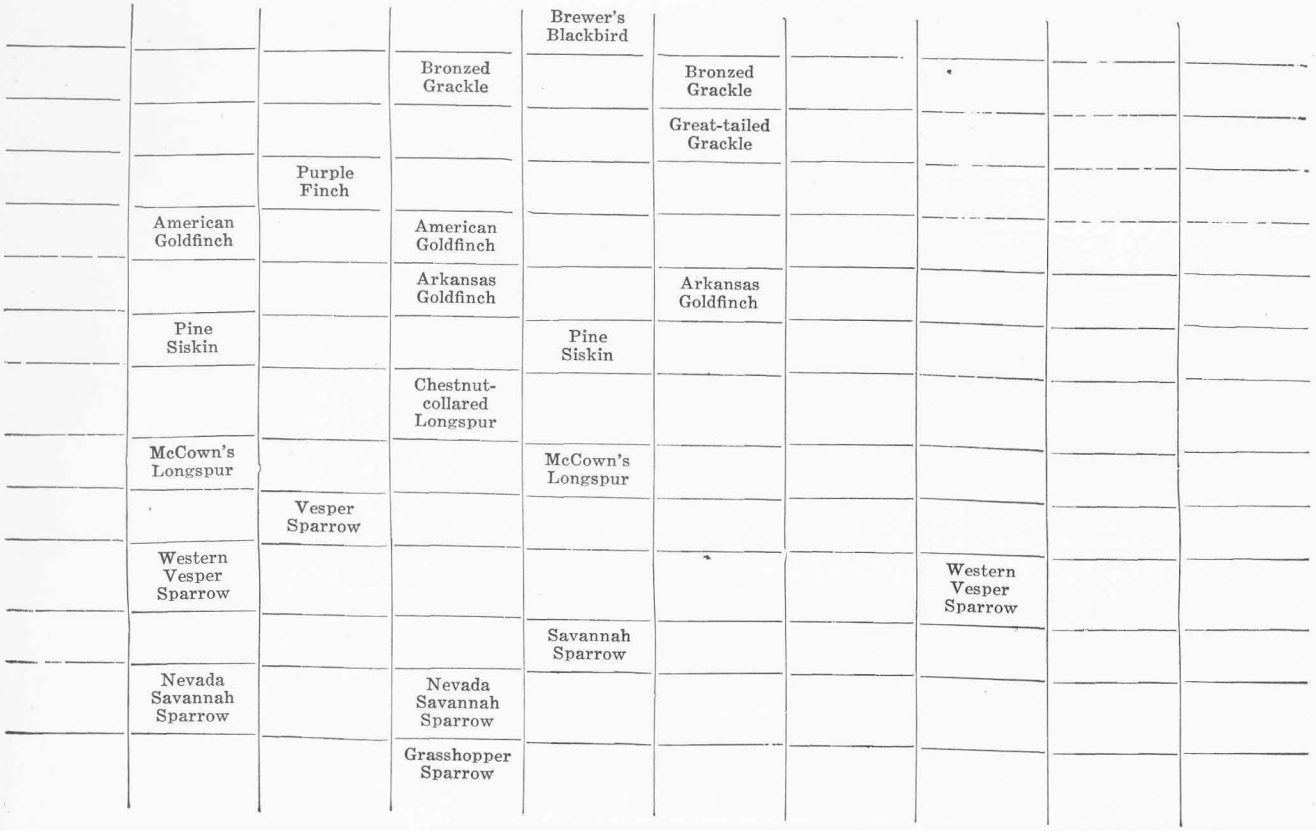
Permanent Resident	Winter Resident	Winter Visitant	Regular Migrant	Irregular Migrant	Summer Resident	Summer Visitant	Migrant	Postnuptual Migrant	Accidental Visitant
Red-tailed Hawk									
		Western Red-tailed Hawk							
Florida Red-shouldered Hawk									
			Swainson's Hawk						
	Broad-winged Hawk		Broad-winged Hawk						
		American Rough-legged Hawk							
									Bald Eagle
									Prairie Falcon
		Duck Hawk							
		Pigeon Hawk	Pigeon Hawk						
	American Sparrow Hawk					American Sparrow Hawk			
Audubon's Caracara									
						American Osprey; Fish Hawk			
American Barn Owl									
			American Long-eared Owl						
	Short-eared Owl		Short-eared Owl						

Texas Barred Owl									
Hasbrouck's Screech Owl									
Western Great Horned Owl									
Western Burrowing Owl									
Roadrunner									
					Yellow-billed Cuckoo				
			Black-billed Cuckoo						
Belted Kingfisher									
								Texas Kingfisher	
		Hairy Woodpecker							
Southern Downy Woodpecker									
Texas Woodpecker									
	Yellow-billed Sapsucker								
Pileated Woodpecker									
					Red-headed Woodpecker				

Permanent Resident	Winter Resident	Winter Visitant	Regular Migrant	Irregular Migrant	Summer Resident	Summer Visitant	Migrant	Postnuptual Migrant	Accidental Visitant
Red-bellied Woodpecker									
Golden-fronted Woodpecker									
					Flicker				
	Northern Flicker								
	Red-shafted Flicker								
					Chuck-Will's-widow				
			Whippoorwill						
					Poorwill				
			Howell's Nighthawk		Howell's Nighthawk				
				Chimney Swift					
	Ruby-throated Hummingbird		Ruby-throated Hummingbird		Ruby-throated Hummingbird				
			Black-chinned Hummingbird		Black-chinned Hummingbird				
			Scissor-tailed Flycatcher		Scissor-tailed Flycatcher				
			Kingbird		Kingbird				

			Arkansas Kingbird						
			Northern Crested Flycatcher		Northern Crested Flycatcher				
					Ash-throated Flycatcher				
	Phoebe		Phoebe		Phoebe				
			Say Phoebe						
			Olive-sided Flycatcher						
					Wood Pewee				
			Yellow-bellied Flycatcher						
			Acadian Flycatcher; Green-crested Flycatcher		Acadian Flycatcher; Green-crested Flycatcher				
			Little Flycatcher						
				Least Flycatcher					
									Vermilion Flycatcher
		Prairie Horned Lark							
Florida Blue Jay									

Permanent Resident	Winter Resident	Winter Visitant	Regular Migrant	Irregular Migrant	Summer Resident	Summer Visitant	Migrant	Postnuptual Migrant	Accidental Visitant
Southern Crow									
			Bobolink						
	Cowbird		Cowbird						
					Dwarf Cowbird				
				Yellow-headed Blackbird					
	Red-winged Blackbird		Red-winged Blackbird						
					Rio Grande Red-winged Blackbird				
	Meadowlark								
		Rio Grande Meadowlark							
	Western Meadowlark		Western Meadowlark						
					Orchard Oriole				
			Baltimore Oriole						
					Bullock's Oriole				
			Rusty Blackbird						


Brewer's Blackbird
Bronzed Grackle
Bronzed Grackle
Great-tailed Grackle
Purple Finch
American Goldfinch
American Goldfinch
Arkansas Goldfinch
Arkansas Goldfinch
Pine Siskin
Pine Siskin
Chestnut-collared Longspur
McCown's Longspur
McCown's Longspur
Vesper Sparrow
Western Vesper Sparrow
Western Vesper Sparrow
Savannah Sparrow
Nevada Savannah Sparrow
Nevada Savannah Sparrow
Grasshopper Sparrow

Permanent Resident	Winter Resident	Winter Visitant	Regular Migrant	Irregular Migrant	Summer Resident	Summer Visitant	Migrant	Postnuptual Migrant	Accidental Visitant
					Western Grasshopper Sparrow		Western Grasshopper Sparrow		
					Western Lark Sparrow		Western Lark Sparrow		
	Harris' Sparrow						Harris' Sparrow		
	White-crowned Sparrow								
	White-throated Sparrow								
	Chipping Sparrow						Chipping Sparrow		
				Clay-colored Sparrow					
	Field Sparrow				Field Sparrow		Field Sparrow		
							Western Field Sparrow		
	Slate-colored Junco			Slate-colored Junco					
	Montana Junco								
	Black-throated Sparrow		Black-throated Sparrow		Black-throated Sparrow				
					Cassin's Sparrow				
Rock Sparrow									

	Song Sparrow								
	Dakota Song Sparrow								
	Lincoln's Sparrow						Lincoln's Sparrow		
	Swamp Sparrow						Swamp Sparrow		
	Fox Sparrow						Fox Sparrow		
	Chewink; Towhee						Chewink; Towhee		
	Arctic Towhee								
				Green-tailed Towhee					
Gray-tailed Cardinal									
							Rose-breasted Grosbeak		
					Blue Grosbeak				
					Indigo Bunting		Indigo Bunting		
					Texas Painted Bunting		Texas Painted Bunting		
					Dickcissel; Black-throated Bunting		Dickcissel; Black-throated Bunting		
	Lark Bunting			Lark Bunting					

Permanent Resident	Winter Resident	Winter Visitant	Regular Migrant	Irregular Migrant	Summer Resident	Summer Visitant	Migrant	Postnuptual Migrant	Accidental Visitant
							Scarlet Tanager		
					Summer Tanager		Summer Tanager		
					Purple Martin		Purple Martin		
							Cliff Swallow		
					Lesser Cliff Swallow				
					Barn Swallow		Barn Swallow		
					Tree Swallow		Tree Swallow		
					Bank Swallow		Bank Swallow		
					Rough-winged Swallow		Rough-winged Swallow		
	Cedar Waxwing						Cedar Waxwing		
	Migrant Shrike								
	White-rumped Shrike								
					Red-eyed Vireo		Red-eyed Vireo		
							Warbling Vireo		

					Yellow-throat'd Vireo				
							Blue-headed Vireo		
					Black-capped Vireo				
					White-eyed Vireo		White-eyed Vireo		
					Bell's Vireo				
					Black and White Warbler		Black and White Warbler		
							Prothonotary Warbler		
				Worm-eating Warbler					
				Blue-winged Yellow Warbler					
				Nashville Warbler					
		Orange-crowned Warbler					Orange-crowned Warbler		
					Western Parula Warbler		Western Parula Warbler		
							Yellow Warbler		
				Black-throated Blue Warbler					

Permanent Resident	Winter Resident	Winter Visitant	Regular Migrant	Irregular Migrant	Summer Resident	Summer Visitant	Migrant	Postnuptual Migrant	Accidental Visitant
	Hoover's Warbler								
		Rocky Mountain Audubon Warbler							
				Magnolia Warbler					
							Cerulean Warbler		
							Chestnut-sided Warbler		
							Bay-breasted Warbler		
							Blackburnian Warbler		
					Sycamore Warbler		Sycamore Warbler		
					Golden-cheeked Warbler				
							Black-throated Green Warbler		
		Pine Warbler							
				Palm Warbler					
							Ovenbird		
							Grinnell's Water-thrush		

					Kentucky Warbler		Kentucky Warbler		
							Mourning Warbler		
				Western Yellow-throat					
							Northern Yellow-throat		
					Yellow-breast'd Chat		Yellow-breast'd Chat		
							Hooded Warbler		
				Wilson's Warbler					
							Canadian Warbler		
							American Redstart		
	American Pipit; Common Pipit						American Pipit; Common Pipit		
							Sprague's Pipit		
	Sage Thrasher						Sage Thrasher		
Western Mockingbird									
							Catbird		
	Brown Thrasher								

Permanent Resident	Winter Resident	Winter Visitant	Regular Migrant	Irregular Migrant	Summer Resident	Summer Visitant	Migrant	Postnuptual Migrant	Accidental Visitant
					Curve-billed Thrasher				
	Rock Wren				Rock Wren				
Texas Canyon Wren									
Carolina Wren									
Texas Wren									
	Western House Wren						Western House Wren		
	Winter Wren								
		Short-billed Marsh Wren					Short-billed Marsh Wren		
							Prairie Marsh Wren		
		Brown Creeper							
					Florida White-breasted Nuthatch				
		White-breasted Nuthatch							
		Red-breasted Nuthatch							
	Tufted Titmouse								

Sennett's Titmouse									
Plumbeous Chickadee									
Verdin									
	Golden-crown'd Kinglet								
	Ruby-crowned Kinglet						Ruby-crowned Kinglet		
	Blue-gray Gnatcatcher				Blue-gray Gnatcatcher		Blue-gray Gnatcatcher		
		Townsend's Solitaire							
	Wood Thrush						Wood Thrush		
							Willow Thrush; Western Veery		
							Gray-cheeked Thrush		
							Olive-backed Thrush		
	Hermit Thrush						Hermit Thrush		
				American Robin					
	Western Robin								
	Southern Robin								

Permanent Resident	Winter Resident	Winter Visitant	Regular Migrant	Irregular Migrant	Summer Resident	Summer Visitant	Migrant	Postnuptual Migrant	Accidental Visitant
	Bluebird						Bluebird		
		Mountain Bluebird							

Popular Name.	*Scientific Name.*	*Describer.*
American Eared Grebe	*Colymbus nigricollis californicus*	(Heermann)
Pied-billed Grebe	*Podilymbus podiceps podiceps*	(Linnæus)
Loon	*Gavia immer immer*	(Brünnich)
Herring Gull	*Larus argentatus argentatus*	Pontoppidan
Ring-billed Gull	*Larus delawarensis*	Ord
Laughing Gull	*Chroicocephalus atricilla atricilla*	(Linnæus)
Franklin's Gull	*Chroicocephalus franklinii*	(Richardson)
Forster's Tern	*Sterna forsteri*	Nuttall
Common Tern	*Sterna hirundo hirundo*	Linnæus
Least Tern	*Sternula albifrons antillarum*	(Lesson)
Black Tern	*Chlidonias nigra surinanensis*	(Gmelin)
Water-turkey; Anhinga	*Anhinga anhinga*	(Linnæus)
Double-crested Cormorant	*Phalacrocorax auritus auritus*	(Lesson)
Mexican Cormorant	*Phalacrocorax vigua mexicanus*	(Brandt)
White Pelican	*Pelecanus erythrorhynchos*	Gmelin
Brown Pelican	*Pelecanus occidentalis occidentalis*	Linnæus
American Merganser; Buffy-breasted Merganser	*Mergus merganser americanus*	Cassin
Red-breasted Merganser	*Mergus serrator*	Linnæus
Hooded Merganser	*Lophodytes cucullatus*	(Linnæus)
Mallard; Green-head	*Anas platyrhyncha platyrhyncha*	Linnæus
Red-legged Black Duck	*Anas rubripes rubripes*	Brewster
Gadwall	*Chaulelasmus streperus*	(Linnæus)
Baldpate	*Mareca americana*	(Gmelin)
Green-winged Teal	*Nettion carolinense*	(Gmelin)
Blue-winged Teal	*Querquedula discors*	(Linnæus)
Cinnamon Teal	*Querquedula cyanoptera*	(Vieillot)
Shoveller	*Spatula clypeata*	(Linnæus)
American Pintail	*Dafila acuta tzitzihoa*	(Vieillot)
Wood Duck	*Aix sponsa*	(Linnæus)
Redhead	*Nyroca americana*	(Eyton)
Canvasback	*Aristonetta valisineria*	(Wilson)
Lesser Scaup Duck	*Fulix affinis*	(Eyton)
Buffle-head	*Charitonetta albeola*	(Linnæus)
Ruddy Duck	*Erismatura jamaicensis*	(Gmelin)
Lesser Snow Goose	*Chen hyperborea hyperborea*	(Pallas)
American White-fronted Goose	*Anser albifrons gambelli*	Hartlaub
Canada Goose	*Branta canadensis canadensis*	(Linnæus)
Hutchins' Goose	*Branta canadensis hutchinsii*	(Richardson)
White-faced Glossy Ibis	*Plegadis guarauna*	(Linnæus)
Jabiru	*Jabiru mycteria*	(Lichtenstein)
Least Bittern	*Ixobrychus exilis exilis*	(Gmelin)
Ward's Heron	*Ardea herodias wardi*	Ridgway
American Egret	*Casmerodius albus egretta*	(Gmelin)
Little Blue Heron	*Florida caerulea caerulea*	(Linnæus)

Popular Name.	*Scientific Name.*	*Describer.*
Green Heron	*Butorides virescens virescens*	(Linnæus)
Black-crowned Night Heron	*Nycticorax nycticorax naevius*	(Boddaert)
Yellow-crowned Night Heron	*Nyctanassa violacea*	(Linnæus)
Whooping Crane	*Limnogeranus americanus*	(Linnæus)
Sandhill Crane	*Megalornis canadensis mexicana*	(Müller)
Virginia Rail	*Rallus virginianus*	Linnæus
Sora Rail	*Porzana carolina*	(Linnæus)
Yellow Rail	*Coturnicops noveboracensis*	(Gmelin)
Purple Gallinule	*Ionornis martinicus*	(Linnæus)
Florida Gallinule	*Gallinula chloropus cachinnans*	(Bangs)
American Coot	*Fulica americana americana*	Gmelin
Wilson's Phalarope	*Steganopus tricolor*	Vieillot
American Avocet	*Recurvirostra americana*	Gmelin
Black-necked Stilt	*Himantopus mexicanus*	(Müller)
American Woodcock	*Rubicola minor*	(Gmelin)
Wilson's Snipe	*Gallinago delicata*	(Ord)
Pectoral Sandpiper	*Pisobia maculata*	(Vieillot)
White-rumped Sandpiper	*Pisobia fuscicollis*	(Vieillot)
Least Sandpiper	*Pisobia minutilla*	(Vieillot)
Western Sandpiper	*Ereunetes mauri*	Cabanis
Greater Yellow-legs	*Totanus melanoleucus*	(Gmelin)
Lesser Yellow-legs	*Totanus flavipes*	(Gmelin)
Western Solitary Sandpiper	*Tringa solitaria cinnamomea*	(Brewster)
Upland Plover	*Bartramia longicauda*	(Bechstein)
Spotted Sandpiper	*Actitis macularia*	(Linnæus)
Long-billed Curlew	*Numenius americanus americanus*	Bechstein
	Numenius americanus occidentalis	Woodhouse
American Golden Plover	*Pluvialis dominica dominica*	(Müller)
Killdeer	*Oxyechus vociferus vociferus*	(Linnæus)
Mountain Plover	*Podasocys monatnus*	(J. K. Townsend)
Ruddy Turnstone	*Arenaria interpres morinella*	(Linnæus)
Texas Bob-white	*Colinus virginianus texanus*	(Lawrence)
Buff-bellied Scaled Quail	*Callipepla squamata pallida*	Brewster
Attwater's Prairie Chicken	*Tympanuchus americanus attwateri*	Bendire
Rio Grande Wild Turkey	*Meleagris gallopavo intermedia*	Sennett
Passenger Pigeon	*Ectopistes canadensis*	(Linnæus)
Western Mourning Dove	*Zenaidura macroura marginella*	(Woodhouse)
Mexican Ground Dove	*Chaemepelia passerina pallescens*	Baird
Inca Dove	*Scardafella inca*	(Lesson)
Turkey Vulture	*Cathartes aura septentrionalis*	Wied
Black Vulture	*Coragyps urubu urubu*	(Vieillot)
Swallow-tailed Kite	*Elanoides forficatus forficatus*	(Linnæus)
Mississippi Kite	*Ictinia misisippiensis*	(Wilson)

Popular Name.	*Scientific Name.*	*Describer.*
Marsh Hawk	*Circus cyaneus hudsonius*	(Linnæus)
Sharp-shinned Hawk	*Accipiter velox*	(Wilson)
Cooper's Hark	*Accipiter cooperii*	(Bonaparte)
Harris' Hawk	*Parabuteo unicinctus harrisi*	(Audubon)
Red-tailed Hawk	*Buteo borealis borealis*	(Gmelin)
Western Red-tailed Hawk	*Buteo borealis calurus*	Cassin
Florida Red-shouldered Hawk	*Buteo lineatus alleni*	Ridgway
Swainson's Hawk	*Buteo swainsoni*	Bonaparte
Broad-winged Hawk	*Buteo platypterus platypterus*	(Vieillot)
American Rough-legged Hawk	*Buteo lagopus sanctijohannis*	(Gmelin)
Bald Eagle	*Haliæetus leucocephalus leucocephalus*	(Linnæus)
Prairie Falcon	*Hierofalco mexicanus*	(Schlegel)
Duck Hawk	*Rhynchodon peregrinus anatum*	(Bonaparte)
Pigeon Hawk	*Tinnunculus columbarius columbarius*	(Linnæus)
American Sparrow Hawk	*Cerchneis sparveria sparveria*	(Linnæus)
Audubon's Caracara	*Polyborus cheriway audubon*	Cassin
American Osprey; Fish Hawk	*Pandion haliaetus carolinensis*	(Gmelin)
American Barn Owl	*Tyto alba pratincola*	(Bonaparte)
American Long-eared Owl	*Asio otus wilsonianus*	(Lesson)
Short-eared Owl	*Asio flammeus flammeus*	(Pontoppidan)
Texas Barred Owl	*Strix varia helveola*	(Bangs)
Hasbrouck's Screech Owl	*Otus asio hasbroucki*	Ridgway
Western Great Horned Owl	*Bubo virginianus pallescens*	Stone
Western Burrowing Owl	*Speotyto cunicularia hypugæa*	(Bonaparte)
Roadrunner	*Geococcyx californianus*	(Lesson)
Yellow-billed Cuckoo	*Coccyzus americanus americanus*	(Linnæus)
Black-billed Cuckoo	*Coccyzus erythropthalmus*	(Wilson)
Belted Kingfisher	*Streptoceryle alcyon alcyon*	(Linnæus)
Texas Kingfisher	*Chloroceryle americana septentrionalis*	(Sharpe)
Hairy Woodpecker	*Dryobates villosus villosus*	(Linnæus)
Southern Downy Woodpecker	*Dryobates pubescens pubescens*	(Linnæus)
Texas Woodpecker	*Dryobates scalaris symplectus*	Oberholser
Yellow-bellied Sapsucker	*Sphyrapicus varius varius*	(Linnæus)
Pileated Woodpecker	*Phlæotomus pileatus pileatus*	(Linnæus)
Red-headed Woodpecker	*Melanerpes erythrocephalus erythrocephalus*	(Linnæus)
Red-bellied Woodpecker	*Centurus carolinus*	(Linnæus)
Golden-fronted Woodpecker	*Centurus aurifrons*	(Wagler)
Flicker	*Colaptes auratus auratus*	(Linnæus)
Northern Flicker	*Colaptes auratus luteus*	Bangs
Red-shafted Flicker	*Collaptes cafer collaris*	Vigors
Chuck-will's-widow	*Antrostomus carolinensis*	(Gmelin)
Whippoorwill	*Setochalcis vocifera vocifera*	(Wilson)

Popular Name.	*Scientific Name.*	*Describer.*
Poorwill	*Phalænoptilus nuttalii nuttallii*	(Audubon)
Howell's Nighthawk	*Chordeiles minor howelli*	Oberholser
Chimney Swift	*Chaetura pelagica*	(Linnæus)
Ruby-throated Hummingbird	*Archilochus colubris*	(Linnæus)
Black-chinned Hummingbird	*Archilochus alexandri*	Bourcier & Mulsant)
Scissor-tailed Flycatcher	*Muscivora forficata*	(Gmelin)
Kingbird	*Tyrannus tyrannus tyrannus*	(Linnæus)
Arkansas Kingbird	*Tyrannus verticalis*	Say
Northern Crested Flycatcher	*Myiarchus crinitus boreus*	(Linnæus)
Ash-throated Flycatcher	*Myiarchus cinerascens cinerascens*	(Lawrence)
Phoebe	*Sayornis phoebe*	(Latham)
Say Phoebe	*Sayornis sayus*	(Bonaparte)
Olive-sided Flycatcher	*Nuttallornis borealis*	(Swainson)
Wood Pewee	*Horizoups virens*	(Linnæus)
Yellow-bellied Flycatcher	*Empidonax flaviventris*	(W. M. & S. F. Baird)
Acadian Flycatcher; Green crested Flycatcher	*Empidonax virescens*	(Vieillot)
Little Flycatcher	*Empidonax traillii brewsteri*	Oberholser
Least Flycatcher	*Empidonax minimus*	(W. M. & S. F. Baird)
Vermilion Flycatcher	*Pyrocephalus rubinus mexicanus*	Sclater
Prairie Horned Lark	*Otocoris alpestris praticola*	Henshaw
Florida Blue Jay	*Cyanocitta cristata cristata*	(Linnæus)
Southern Crow	*Corvus brachyrhynchos paulus*	(Howell)
Bobolink	*Dolichonyx oryzivorus*	(Linnæus)
Cowbird	*Molothrus ater ater*	(Boddaert)
Dwarf Cowbird	*Molothrus ater obscurus*	(Gmelin)
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*	(Bonaparte)
Red-winged Blackbird	*Agelaius phoeniceus predatorius*	(Wilson)
Rio Grande Red-winged Blackbird	*Agelaius phoeniceus megapotamus*	Oberholser
Meadowlark	*Sturnella magna magna*	(Linnæus)
Rio Grande Meadowlark	*Sturnella magna hoopesi*	Stone
Western Meadowlark	*Sturnella neglecta neglecta*	Audubon
Orchard Oriole	*Icterus spurius*	(Linnæus)
Baltimore Oriole	*Icterus galbula*	(Linnæus)
Bullock's Oriole	*Icterus bullockii bullockii*	(Swainson)
Rusty Blackbird	*Euphagus carolinus*	(Müller)
Brewer's Blackbird	*Euphagus cyanocephalus cyanocephalus*	(Wagler)
Bronzed Grackle	*Quiscalus quiscula aeneus*	Ridgway
Great-tailed Grackle	*Megaquiscalus major macrourus*	(Swainson)
Purple Finch	*Carpodacus purpureus purpureus*	(Gmelin)
American Goldfinch	*Astragalinus tristis tristis*	(Linnæus)

Popular Name.	*Scientific Name.*	*Describer.*
Arkansas Goldfinch	*Astragalinus psaltria psaltria*	(Say)
Pine Siskin	*Spinus pinus pinus*	(Wilson)
Chestnut-collared Longspur	*Calcarius oratnus*	(J. K. Townsend)
McCown's Longspur	*Rhynchophanes mccownii*	(Lawrence)
Vesper Sparrow	*Pooecetes gramineus gramineus*	(Gmelin)
Western Vesper Sparrow	*Pooecetes gramineus confinis*	Baird
Savannah Sparrow	*Passerculus sandwichensis savanna*	(Wilson)
Nevada Savannah Sparrow	*Passerculus sandwichensis nevadensis*	Grinnell
Grasshopper Sparrow	*Ammodramus savannarum australis*	Maynard
Western Grasshopper Sparrow	*Ammodramus savannarum bimaculatus*	Swainson
Western Lark Sparrow	*Chondestes grammacus strigatus*	Swainson
Harris' Sparrow	*Zonotrichia querula*	(Nuttall)
White-crowned Sparrow	*Zonotrichia laucophrys*	(J. R. Forster)
White-throated Sparrow	*Zonotrichia albicollis*	(Gmelin)
Chipping Sparrow	*Spizella passerina passerina*	(Bechstein)
Clay-colored Sparrow	*Spizella pallida*	(Swainson)
Field Sparrow	*Spizella pusilla pusilla*	(Wilson)
Western Field Sparrow	*Spizella pusilla arenacea*	Chadbourne
Slate-colored Junco	*Junco hyemalis hyemalis*	(Linnæus)
Montana Junco	*Junco oreganus montanus*	Ridgway
Black-throated Sparrow	*Amphispiza bilineata bilineata*	(Cassin)
Cassin's Sparrow	*Peucæa cassinii*	(Woodhouse)
Rock Sparrow	*Aimophila ruficeps eremoeca*	(N. C. Brown)
Song Sparrow	*Melospiza melodia melodia*	(Wilson)
Dakota Song Sparrow	*Melospiza melodia juddi*	Bishop
Lincoln's Sparrow	*Melospiza lincolnii lincolnii*	(Audubon)
Swamp Sparrow	*Melospiza georgiana*	(Latham)
Fox Sparrow	*Passerella iliaca iliaca*	(Merrem)
Chewink; Towhee	*Pipilo erythrophthalmus erythrophthalmus*	(Linnæus)
Arctic Towhee	*Pipilo maculatus arcticus*	(Swainson)
Green-tailed Towhee	*Oberholseria chlorura*	(Audubon)
Gray-tailed Cardinal	*Richmondena cardinalis canicauda*	(Chapman)
Rose-breasted Grosbeak	*Hedymeles ludovicianus*	(Linnæus)
Blue Grosbeak	*Guiraca caerulea caerulea*	(Linnæus)
Indigo Bunting	*Passerina cyanea*	(Linnæus)
Texas Painted Bunting	*Passerina ciris pallidior*	Mearns
Dickcissel; Black-throated Bunting	*Spiza americana*	(Gmelin)
Lark Bunting	*Calamospiza melanocorys*	Stejneger
Scarlet Tanager	*Piranga olivacea*	(Gmelin)
Summer Tanager	*Piranga rubra rubra*	(Linnæus)
Purple Martin	*Progne subis subis*	(Linnæus)
Cliff Swallow	*Petrochelidon albifrons albifrons*	(Rafinesque)

Popular Name.	*Scientific Name.*	*Describer.*
Lesser Cliff Swallow	*Petrochelidon albifrons tachina*	Oberholser
Barn Swallow	*Hirundo rustica erythrogastris*	Boddaert
Tree Swallow	*Iridoprocne bicolor*	(Vieillot)
Bank Swallow	*Riparia riparia riparia*	(Linnæus)
Rough-winged Swallow	*Stelgidopteryx serripennis serripennis*	(Audubon)
Cedar Waxwing	*Bombycilla cedrorum*	Vieillot
Migrant Shrike	*Lanius ludovicianus migrans*	W. Palmer
White-rumped Shrike	*Lanius ludovicianus excubitorides*	Swainson
Red-eyed Vireo	*Vireosylva olivacea*	(Linnæus)
Warbling Vireo	*Vireosylva gilva gilva*	(Vieillot)
Yellow-throated Vireo	*Lanivireo flavifrons*	(Vieillot)
Blue-headed Vireo	*Lanivireo solitarius solitarius*	(Wilson)
Black-capped Vireo	*Vireo atricapillus*	Woodhouse
White-eyed Vireo	*Vireo griseus griseus*	(Boddaert)
Bell's Vireo	*Vireo bellii bellii*	Audubon
Black and White Warbler	*Mniotilta varia*	(Linnæus)
Prothonotary Warbler	*Protonotaria citrea*	(Boddaert)
Worm-eating Warbler	*Helmitheros vermivorus*	(Gmelin)
Blue-winged Yellow Warbler	*Vermivora pinus*	(Linnæus)
Nashville Warbler	*Vermivora ruficapilla ruficapilla*	(Wilson)
Orange-crowned Warbler	*Vermivora celata celata*	(Say)
Western Parula Warbler	*Compsothlypis americana ramalinæ*	Ridgway
Yellow Warbler	*Dendroica aestiva aestiva*	(Gmelin)
Black-throated Blue Warbler	*Dendroica caerulescens caerulescens*	(Gmelin)
Hoover's Warbler	*Dendroica coronata hooveri*	McGregor
Rocky Mountain Audubon Warbler	*Dendroica auduboni memorabilis*	Oberholser
Magnolia Warbler	*Dendroica magnolia*	(Wilson)
Cerulean Warbler	*Dendroica cerulea*	(Wilson)
Chestnut-sided Warbler	*Dendroica pensylvanica*	(Linnæus)
Bay-breasted Warbler	*Dendroica castanea*	(Wilson)
Blackburnian Warbler	*Dendroica fusca*	(Müller)
Sycamore Warbler	*Dendroica dominica albilora*	Ridgway
Golden-cheeked Warbler	*Dendroica chrysoparia*	Sclater & Salvin
Black-throated Green Warbler	*Dendroica virens virens*	(Gmelin)
Pine Warbler	*Dendroica pinus pinus*	(Wilson)
Palm Warbler	*Dendroica palmarum palmarum*	(Gmelin)
Ovenbird	*Seiurus aurocapillus aurocapillus*	(Linnæus)
Grinnell's Water-thrush	*Seiurus noveboracensis notabilis*	Ridgway
Kentucky Warbler	*Oporornis formosus*	(Wilson)
Mourning Warbler	*Oporornis philadelphia*	(Wilson)

Popular Name.	*Scientific Name.*	*Describer.*
Western Yellow-throat	*Geothlypis trichas occidentalis*	Brewster
Northern Yellow-throat	*Geothlypis trichas brachidactyla*	(Swainson)
Yellow-breasted Chat	*Iceria virens virens*	(Linnæus)
Hooded Warbler	*Wilsonia citrina*	(Boddaert)
Wilson's Warbler	*Wilsonia pusilla pusilla*	(Wilson)
Canadian Warbler	*Wilsonia canadensis*	(Linnæus)
American Redstart	*Setophaga ruticilla*	(Linnæus)
American Pipit; Common Pipit	*Anthus spinoletta rubescens*	(Tunstall)
Sprague's Pipit	*Anthus spragueii*	(Audubon)
Sage Thrasher	*Oreoscoptes montanus*	(J. K. Townsend)
Western Mockingbird	*Mimus polyglottos leucopterus*	(Vigors)
Catbird	*Dumetella carolinensis*	(Linnæus)
Brown Thrasher	*Toxostoma rufa*	(Linnæus)
Curve-billed Thrasher	*Toxostoma curvirostris curvivostris*	(Swainson)
Rock Wren	*Salpinctes obsoletus obsoletus*	(Say)
Texan Canyon Wren	*Catherpes mexicanus polioptilus*	Oberholser
Carolina Wren	*Thryothorus ludovicianus ludovicianus*	(Latham)
Texas Wren	*Thryomanes bewickii cryptus*	Oberholser
Western House Wren	*Troglodytes aedon parkmanii*	Audubon
Winter Wren	*Nannus troglodytes hiemalis*	(Vieillot)
Short-billed Marsh Wren	*Cistothorus stellaris*	(Nauman)
Prairie Marsh Wren	*Telmatodytes palustris iliacus*	Ridgway
Brown Creeper	*Certhia familiaris americana*	Bonaparte
Florida White-breasted Nuthatch	*Sitta carolinensis carolinensis*	Latham
White-breasted Nuthatch	*Sitta carolinensis cookei*	Oberholser
Red-breasted Nuthatch	*Sitta canadensis*	Linnæus
Tufted Titmouse	*Baeolophus bicolor*	(Linnæus)
Sennett's Titmouse	*Bacolophus atricristatus sennetti*	Ridgway
Plumbeous Chickadee	*Penthestes carolinensis agilis*	(Sennett)
Verdin	*Auriparus flaviceps flaviceps*	(Sundevall)
Golden-crowned Kinglet	*Regulus regulus satrapa*	Lichtenstein
Ruby-crowned Kinglet	*Corthylio calendula calendula*	(Linnæus)
Blue-gray Gnatcatcher	*Polioptila caerulea caerulea*	(Linnæus)
Townsend's Solitaire	*Myadestes townsendii*	(Audubon)
Wood Thrush	*Hylocichla mustelina*	(Gmelin)
Willow Thrush; Western Veery	*Hylocichla fuscescens salicicola*	Ridgway
Gray-cheeked Thrush	*Hylocichla minima aliciae*	(Baird)

Popular Name.	*Scientific Name.*	*Describer.*
Olive-back Thrush	*Hylocichla ustulata swainsoni*	(Tschudi)
Hermit Thrush	*Hylocichla guttata faxoni*	Bangs & Penard
American Robin	*Turdus migratorius migratorius*	Linnæus
Western Robin	*Turdus migratorius propinquus*	Ridgway
Southern Robin	*Turdus migratorius achrusterus*	(Batchelder)
Bluebird	*Sialia sialis sialis*	(Linnæus)
Mountain Bluebird	*Sialia currucoides*	(Bechstein)

FOOTNOTES

BAILEY, FLORENCE MERRIAM
[1]1902. The Scissor-tailed Flycatcher in Texas. The Condor, Vol. IV, No. 2, March-April, 1902, pp. 30-31.
1916. Meeting Spring Half Way. The Condor, Vol. XVIII, No. 4, July-August, 1916, pp. 151-155; No. 5, September-October, 1916, pp. 183-190; No. 6, November-December, 1916, pp. 214-219. Austin notes on pp. 152-153, for one day, April 10, 1900.

BAILEY, FLORENCE MERRIAM
[2]1915. Handbook of Birds of the Western United States. Fourth Edition. See p. 445: An account of the Canyon Wren singing from housetops in the city of Austin.

BENEDICT, H. Y.
[3]1914. The Geography of Texas: Physical and Political; a textbook by Dr. Frederic William Simonds of the University of Texas. Notes relating to common Texas birds, pp. 67-72, by Dr. Benedict. Revised Edition.

HOWELL, ARTHUR H.
[4]1907. The Relation of Birds to the Cotton Boll Weevil. Bull. No. 29, Biol. Surv. See pp. 16, 17: Reference to the occurrence north to Austin of the Great-tailed Grackle, and east to Austin of the Bullock's Oriole.

KOFAHL, HARRY J.
[5]1903. The First Occurrence of the Kingbird in Austin during the Breeding Season. Condor, Vol. V, No. 3, May-June, 1903, p. 81. Notes on a pair found breeding on the outskirts of the city in May and June, 1902.

MONTGOMERY, THOMAS H., JR.
[6]1906. The protection of Our Native Birds. Bull. No. 79, Scien. Series No. 3, Univ. of Texas, October 1, 1906, pp. 1-30.

NEHRLING, HENRY
[7]1893. Our Native Birds of Song and Beauty, Vol. I. See pp. 38 and 227: Record of the occurrence of the Sage Thrasher and Golden-cheeked Warbler in the Austin Region, observed personally by Professor Nehrling.

NEHRLING, HENRY
[8]1896. Our Native Birds of Song and Beauty, Vol. II. See pp. 151-152: Record of the occurrence of the Cassin's Sparrow in the Austin Region, observed personally by Professor Nehrling.

OBERHOLSER, HARRY C.
[9]1898. A revision of the wrens of the genus *Thryomanes* Sclater. Proc. U. S. Nat. Mus., 21, 421-449.
[10]1904. A revision of the American great horned owls. Proc. U. S. Nat. Mus., 27, 177-192.
[11]1911. A revision of the forms of the ladder-backed woodpecker (*Dryobates scalaris* Wagler). Proc. U. S. Nat. Mus., 41, 139-159, pl. 12.

OBERHOLSER, HARRY C.
[12]1911. A revision of the forms of the Hairy Woodpecker (*Dryobates villosus* Linnaeus). Proc. U. S. Nat. Mus., Vol. XL, pp. 595-621. See p. 602: Reference to the occurrence of the Southern Hairy Woodpecker in the Austin Region.
[13]1912. A revision of the forms of the Great Blue Heron (*Ardea herodias* Linnaeus) Proc. U. S. Nat. Mus., 43, 531-559.

OLDRIGHT, CHARLES D.
[14]1890. Inca Dove at Austin, Texas. O. & O., Vol XV, No. 1, January, 1890, p. 15.

OLDRIGHT, CHARLES D.
1890. The Thrushes. Ornith. and Oologists' Semi-annual, II, 2, 1890, pp. 32-35. A report on the thrushes of Travis County.

OLDRIGHT, CHARLES D.
[15]1893. The Wrens of Travis County, Texas. Science, XXII, 1893, pp. 15-16. Nesting and other habits.

PERRY, ELTON, JR.
[16]1916. Mourning Dove. Photographed in Texas. Female Western Mourning Dove incubating eggs in nest in cedar trees on slope of Mount Barker, northwest of Austin. Bird-Lore, Vol. XVIII, No. 3, May-June, 1916, p. 171.
1916. Howell's Nighthawk Sitting on Its Eggs. Gravel beds at Austin, Texas. Bird-Lore, Vol. XVIII, No. 5, September-October, 1916, p. 293.

PERRY, ELTON, JR.
1916. Mourning Dove on Nest. Photograph in Bull. Univ. of Texas, Dept. of Extension, 1916: No. 57, October 10, 1916, p. 8.
1916. Nest of Mourning Dove. Photograph in Bull. Univ. of Texas, Dept. of Extension, 1916: No. 57, October 10, 1916, p. 12.

PERRY, ELTON, JR.
1916. Howell's Nighthawk Sitting on Its Eggs. An excellent photograph of the bird taken on the gravel beds at Austin by Dr. Perry. Bird-Lore, Vol. XVIII, No. 5, September-October, 1916, p. 293. Full page.

PERRY, ELTON, JR.
[17]1917. Nest and Eggs of Western Lark Sparrow at Austin, Texas. The Oologist, Vol. XXXIV, No. 2, February 15, 1917, p. 34.
1917. Nest and Eggs of Bob-white. Photograph in Bull. Univ. of Texas, No. 1748, August 25, 1917, p. 11.

PERRY, ELTON, JR.
1917. Nest and Eggs of Scissor-tailed Flycatcher, Austin, Texas. The Oologist, Vol. XXXIV, No. 2, February 15, 1917, p. 27.

PERRY, ELTON, JR.
[18]1918. Photograph of nest and four eggs of the Yellow-breasted Chat with one egg of Dwarf Cowbird. *Cf.* The Book of Birds, National Geographic Society, Washington, D.C., p. 61.

PERRY, ELTON
[19]1919. Concerning the Black-throated Bunting of This Locality. The Oologist, Vol. XXXV, No. 5, May 1, 1919, p. 82.

SCHUTZE, ADOLPH E.
[20]1902. The Summer Birds of Central Texas. Published by the author at Austin, Texas, October, 1902, pp. 1-26, 8 ills. Contains numerous records of the occurrence in summer and nesting of certain birds in the Austin Region and surrounding counties in central Texas.

SCHUTZE, ADOLPH E.
[21]1903. A Few Notes from Texas. The Condor, Vol. V, No. 3, May-June, 1903, p. 81. Breeding notes on Western Mourning Dove, Red-bellied Woodpecker, and Scissor-tailed Flycatcher in Austin Region; and Texas Bob-white, Bullock Oriole (listed as the Baltimore Oriole), and Texas Wren (called Baird Wren), in Caldwell County.

SCHUTZE, ADOLPH E.
[22]1904. Nesting Habits of the Caracara. Condor, Vol. VI, No. 4, July-August, 1904, pp. 106-108, 1 ill. An account of the occurrence and habits of the Audubon Caracara in the Austin Region and adjacent country in central Texas.

SCHUTZE, ADOLPH E.
1904. The Texas Kingfisher at New Braunsfels, Texas. The Condor, Vol. VI, No. 6, November-December, 1904, p. 172.
1904. The Inca Dove in Central Texas. The Condor, Vol. VI, No. 6, November-December, 1904, p. 172.
1904. The Destruction of Bird Life by Light Towers. The Condor, Vol. VI, No. 6, November-December, 1904, pp. 172-173.

TALLICHET, J. H.
[23]1892. A Day in Texas Woods. Orn. and Ool., Vol. XVII, No. 7, July, 1892, pp. 106-108, double column. Running account of all-day field trip, May 7, 1892, from the campus of the University of Texas to Bull Creek and return.

TAYLOR, W. S.
[24]1914. Nature Study and Agriculture for the Rural Schools of Texas. Bull. No. 361, Extension Series No. 61, University of Texas, Austin, September 25, 1914. By Professor Taylor and Charles Herman Winkler, M.A., pp. 1-73.

TAYLOR, W. S.
[25]1916. The Mourning Dove. Bull. of Univ. of Texas, Dept. of Extension, 1916, No. 57, October 10, 1916, pp. 1-19, 4 ills. A plea for the protection of the Mourning Dove during the first and last parts of the breeding season by shortening the hunting season in Texas. Discusses the distribution, habitat, and habits of the dove, from notes contributed by various Texas observers; two photos by Dr. Elton Perry, Jr., and one by W. H. Warren.

TAYLOR, W. S.
[26]1916. Cruelty in Early Killing of Doves. Houston Post, Houston, Texas, Auto Section, p. 4, Sunday, October 1, 1916. Account of finding dove nests in August at Austin, Texas, and a plea for late opening of hunting season.

TAYLOR, W. S.
[27]1917. The Bobwhite. 26 pp. 7 ills. University of Texas Bulletin No. 1748: August 25, 1917.

TAYLOR, W. S. AND WARREN, W. H.
[28]1917. Bird-Lore's Seventeenth Christmas Census. Austin, Texas (west from town on mesquite prairie, south of town on Colorado River, and in cedar brakes along Barton Creek). December 25, 1916; total, 60 species, 12,253 individuals. "We doubt these three thrushes (Wood Thrush, 1; Gray-cheeked Thrush, 1; Olive-backed Thrush, 2), especially the Gray-cheeked, as they winter so far south of the United States.—Ed. (of Bird-Lore)." These were undoubtedly dissimilar subspecific forms of the Hermit Thrush which winter in the region; Meadowlark records refer to the Western Meadowlark; Arkansas Goldfinches recorded were probably Eastern Goldfinches, which are common winter birds; Loggerhead Shrike should be Migrant Shrike; Sprague's Pipit should be common American Pipit; Chicadee refers to Plumbeous Chicadee.—GFS. Bird-Lore, Vol. XIX, No. 1, January-February, 1917, pp. 35-36.

WARREN, W. H.
[29]1916. Young (mourning) doves in nest near Austin, September 10 (1915). Found starved to death in nest six days later. Mother bird had been shot by a gunner. Photograph in Bull. Univ. of Texas, Dept. of Extension, 1916; No. 57, October 10, 1916, p. 16.

GREBES AND LOONS
[30]Genus *Colymbus* of Linnaeus, type *C. cristatus* selected legitimately for the first time by Baird, Brewer, and Ridgway in 1884. Gray's designation of type in 1855 referred back to the 1735 edition of Linnæus, which antedated the starting point of zoological nomenclature (1758), and it cannot therefore be considered. *Colymbus* is thus retained for the Grebes, and cannot be used for the Loons, which remain genus *Gavia* Forster.

PIED-BILLED GREBE
[31]The type or mainland form is placed on subspecific basis to distinguish it from the island race of the West Indies, the Antillean Pied-billed Grebe, *P.p. antillarum* Bangs, although Todd, 1916 Carnegie reports, sets forth reasons for its rejection.

LOON
[32]*Gavia immer elasson* Bishop, 1921 (smaller than *G. i. immer*), ranges in summer in interior North America, from northern California, North Dakota, northern Iowa, and Wisconsin, north to British Columbia; common in lakes, ponds, and sloughs of Turtle Mountain and Devil's Lake, North Dakota; winters chiefly on the coast of California, north to Oregon, south to Lower California; rarely on Atlantic coast from Maine to Florida; Gulf of Mexico(?), and may possibly occur in the Austin Region during migrations. For three pages of comparative measurements of the two forms, see Auk, 1921, pp. 368-370.

HERRING GULL
[33]Consideration of *Larus thayeri* Brooks, 1915, of the Arctic north and northwest wintering chiefly along the Pacific coast of North America, as a geographical race of *Larus argentatus*, places the type on a subspecific basis. Dr. Jonathan Dwight, Jr., the world's authority on gulls, has shown complete intergradation. *Larus vegæ* Palmen, 1887, of the Arctic coasts of Siberia, migrating to Alaska and rarely to California, similar to the Herring Gull but with darker back, is also considered a subspecies of *L. argentatus*. If the American bird is held distinct from the European, as doubtless will be done on fuller investigation, the name *L. a. smithsonianus* Coues, 1862, will be resurrected to cover the American race, since *argentatus* represents the European race, found but occasionally in northeastern North America. The American bird is decidedly larger in average, and usually has the white spot of the outermost primary divided in two. In the Austral Avian Record for 1923 Mathews and Iredale indicate that *L. argentatus* must become *L. varius*.

LAUGHING and FRANKLIN'S GULL
[34]Genus *Chroicocephalus* Eyton, 1836, based on valid and distinguishable characters, is recognized for the hooded gulls; see Ridgway's Birds of North and Middle America, VIII, 564, for details; includes the following species contained in *Genus Larus* of the Check-List:

Chroicocephalus atricilla (Linnæus).
franklinii (Swainson & Richardson).
philadelphia (Ord).

[35]Subspecies of *L. atricilla* of Check-List. There is a smaller race in the Antilles and Bahamas.

[36]Mathews and Iredale, discussing, in the pages of The Austral Avian Record, numerous neglected works which they have studied very carefully, show that *C. franklinii* (Richardson), 1831, becomes *C. pepixcan* (Wagler), 1831, becausee of equal pertinence and earlier date in the same year. This species is given as *Larus franklini* in the Check-List.

COMMON TERN

[37]An extralimital subspecies places the type form on a subspecific basis. See Auk, 1916, 99.

LEAST TERN

[38]Subgenus *Sternula* Boie, 1822, of Check-List, is now recognized by many authorities as being of generic rank. Becomes *Sternula albifrons antillarum* Lesson, because it is found to be only subspecifically distinct from *Sternula albifrons* (Pallas). Recognition of *S. a. browni* (Mearns), 1916, as being a valid race for the Pacific coast from California to Peru, limits the range of this form to the Atlantic coast of America.

BLACK TERN

[39]*Hydrochelidon nigra surinamensis* of Check-List. *Hydrochelidon* Boie, 1822, is antedated by *Chlidonias* Rafinesque, Feb. 21, 1822; type by monotypy, *C. melanops* Rafinesque which is the same as *Sterna surinamensis* Gmelin. Ridgway holds that *Chlidonia*, previously used as genus in zoology, invalidates *Chlidonias* Rafinesque, which he also rejects because it was published in a newspaper, though many foreign journals of equal insignificance are given recognition.

BROWN PELICAN

[40]Treatment of the larger, more brownish, reddish-couched California Brown Pelican as a subspecies of *Pelecanus occidentalis* Linnaeus, places the type form on a subspecific basis.

AMERICAN MERGANSER; BUFFY-BREASTED MERGANSER

[41]Considered but subspecifically distinct from *Mergus merganser* Linnaeus, of Europe.

MALLARD; GREEN-HEAD

[42]*Anas platyrhyncha* Linnaeus is identifiable and does not give way to the later name *Anas boschas* Linnaeus. *Anas platyrhyncha conboschas* Brehm, 1831, is now recognized as a valid subspecies; the type form is placed on subspecific basis.

[43]Cooke, Wells W., Distribution and Migration of North American Ducks, Geese and Swans. Biol. Surv. Bull. 26, 1906, p. 24 (based on Tallichet records).

RED-LEGGED BLACK DUCK

[44]Subspecies of *A. rubripes* of Check-List, separated because of recognition of Brown-legged Black Duck, *A. rubripes tristis* Brewster, 1909, of northeastern United States and southeastern Canada, wintering south to the Gulf of Mexico. Both forms should occur in the Region, and specimens should be collected.

BLUE-WINGED TEAL

[45]Schutze, 1902, p. 25. "Resident." Also, small flocks observed in summer on the Colorado River.

[46]Stanley Clisby Arthur of Louisiana kept a specimen of the Southern Blue-winged Teal, proposed by Kennard, 1919, October issue of the Auk, in a flying cage with other waterfowl; it possessed the peculiar white line over the eye as a continuation of the characteristic white crescent of the species, together with a conspicuous white patch on the nape of the neck, where the two white side-neck lines converged with each other. In the spring of 1918 this drake emerged from eclipse plumage with less conspicuous white line and nape-patch; in the fall of 1918 it lost line and patch and never regained them. See Auk, 1920, pp. 126-127.

AMERICAN PINTAIL

[47]*Dafila acuta* (Linnaeus) becomes, by recognition of the American subspecies, *D. a. tzitzihoa* (Vieillot), 1816, instead of *D. a. americana* (Bonaparte), a later name and both applicable to the same form. The American race is larger than the Eurasian race, the Old World Sprig or Pintail, *D. a. acuta* (Linnæus), and the male has a longer tail. Accepted A. O. U. Check-List, by Eighteenth Supplement .

WOOD DUCK

[48]Schutze, 1902, p. 25: Rare resident. Also recorded by Singley. Schutze's report of the breeding in this Region was based on Singley's Lee County record.

REDHEAD DUCK

[49]*Marila americana* (Eyton) of the Check-List. Subgenus *Nyroca* Fleming was considered to be of generic rank; *Nyroca americana* then considered to be only of subspecific rank and near *Aithyia ferina* (Linnaeus) of Europe, described at an earlier date. *Aythya* Boie is invalidated by *Aethya* Dum., but *Aithyia* Gloger is tenable by virtue of having an additional syllable and thereby becoming a different word, complying with the rules of nomenclature. The American bird therefore becomes *Aithyia ferina americana* (Eyton). See the discussions of Dr. Oberholser. Proc. Indiana Acad. Science, 1920 (1921), p. 105, etc., and Millais, British Diving Ducks, I. 1913, p. 14.

CANVASBACK

[50]*Marila valisineria* (Wilson) of Check-List, becomes *Aristonetta valisineria* (Wilson) by recognition of the Subgenus *Aristonetta* Baird as having the importance of a genus.

LESSER SCAUP DUCK

[51]Regarded as only subspecifically different from *Marila marila* (Linnaeus), 1761, the Greater Scaup Duck, which ranges in the more northern parts of North America, the two wintering southward more or less together in Florida, along the Gulf Coast to southern Texas, and in southern California. Dr. Oberholser and many other specialists now recognize the Genus *Fulix* Sundevall; see Proc. Indiana Acad. Science, 1920 (1921), pp. 106-108. The Lesser Scaup Duck becomes, therefore, *Fulix marila affinis* (Eyton).

LESSER SNOW GOOSE

[52]*C. h. hyperboreus* (Pallas) should be *Chen hyperborea hyperborea* (Pallas), the feminine and the original spelling. Hartert and others have expressed the opinion that the Blue Goose, *C. caerulescens* (Linnaeus), is only a color phase of this same race, and insist that the proper name of this species is that of the Blue Goose, merging the two species. The weight of opinion of careful investigators is that the two forms are valid and distinct species and should bear separate names.

AMERICAN WHITE-FRONTED GOOSE

[53]The proper spelling, as the original use of the name shows, is *gambelli*. Examination of a large series of birds, and study of the literature, has led H. S. Swarth and Harold C. Bryant to conclude that two perfectly distinct races of the White-fronted Goose exist in North America, a fact overlooked or refuted by the majority of investigators; they claim that discrepancy of size in certain individuals in the past has caused doubt as to the validity of the race *gambelli*, as to whether it is distinct from the type form *albifrons* of the Old World. They point out that the larger birds are based on *gambelli*, while the smaller and by far the more common is true *albifrons*, hitherto considered only a straggler in Greenland. Dr. Oberholser and other investigators believe that *gambelli* is the only true form recognized through North America at large.

HUTCHINS' GOOSE

[54]*B. c. hutchinsi* of Check-List, corrected to retain original spelling.

JABIRU

[55]Cooke, Wells W., Distribution and Migration of North American Herons and Their Allies. Biol. Surv. Bull. No. 45, 1913, p. 24.

AMERICAN EGRET

[56]*Herodias egretta* (Gmelin) of the Check-List. Genus *Herodias* Boie, type *Ardea garzetta* Gmelin by subsequent designation of Gray in 1841, becomes a synonym of genus *Egretta* Forster, and is not available for use with the present species. The earliest available generic name is *Casmerodius* Gloger, 1842, the type of which by subsequent designation of Sharpe in 1898 is *Ardea egretta* Gmelin: see Opinion 62, International Commission of Zoological Nomenclature, March, 1914. The American bird is now considered only subspecifically distinct from the European *C. a. albus* (Linnaeus), which ranges into Africa and central Asia, and which is characterized by long tarsus and comparatively short dorsal plumes. The birds ranging from China and Japan to Australia, through the Malay Archipelago, are known as *C. a. timoriensis* (Lesson); they are characterized by shorter tarsus and shorter dorsal plumes. The American birds are smaller than the European, but have longer dorsal plumes, reaching 100 mm. or more beyond the end of the tail and measuring in their length between 420 and 500 mm.; they are larger than the Malay Egret, and have a decidedly longer train. Since none of these differences are constant, and since colors of bill and legs are too variable, the American bird must stand as a subspecies of the earlier-named European form, and must bear the name *Casmerodius albua egretta* (Gmelin).

LITTLE BLUE HERON

[57]Placed on subspecific status by the recognition of the Central and South American bird as *F. c. caerulescens* (Latham), which also occurs in the West Indies.

GREEN HERON

[58]Schutze, 1902, p. 25.

WHOOPING CRANE

[59]*Grus americana* of Check-List. Recent investigation has shown this bird to be generically distinct from other American cranes; genus *Limnogeranus* Sharpe, 1893, recognized by Brasil in 1913 to include the Whooping Crane, is available for use. Our bird becomes, therefore, *Limnogeranus americanus* (Linnaeus).

SANDHILL CRANE

[60]*Grus mexicana* of Check-List becomes *Megalornis canadensis mexicana* (Müller), since genus *Grus Pallas*, 1766, is a synonym of the earlier genus *Psophia* Linnaeus, 1766, because *Psophia crepitans*, a South American relative of the Cranes, is by monotypy the type of *Grus*. The next available name is *Megalornis* Gray, 1841. Differs from the Little Brown Crane, *Grus canadensis* (Linnaeus), only in larger size; since measurements of wing, tail, tarsus, and bill have been found to inter-grade between the two, and since the Little Brown Crane was described first, the Sandhill Crane must stand as a subspecies of the Little Brown Crane.

FLORIDA GALLINULE

[61]*Gallinula galeata* (Lichtenstein) of the Check-List becomes *Gallinula chloropus cachinnans* Bangs, 1915, since it is considered subspecifically distinct from *G. c. galeata*, now confined to the southeastern part of South America, and from *G. c. centralis* Miller & Griscom, 1921, of Nicaragua. At the same time all of the American races are considered only subspecifically distinct from the Moor-hen, *G. chloropus* (Linnaeus) of the Old World. Accepted by the A. O. U., Supplement to the Check-List.

AMERICAN COOT

[62]See Schutze, 1902, p. 25. This form is placed on a subspecific basis by recognition of *F. a. grenadensis* Riley, 1916, described from Grenada, tropical America.

AMERICAN WOODCOCK

[63]*Philohela* Gray must give way to the earlier valid name *Rubicola* Jameson, 1831; our bird becomes *Rubicola minor* (Gmelin), accepted by the A. O. U., Eighteenth Supplement to the Check-List.

WILSON'S SNIPE

[64]*Gallinago* Koch must give way to the earlier and equally pertinent generic name *Capella* Frenzel, 1801. The characters of the American bird are found to intergrade at every point with those of the European Snipe, *Capella gallinago* (Linnaeus), 1758; since the American bird was not described until 1825, it must stand as a subspecies of the European form, although Dr. Oberholser has pointed out that the characters of the American bird are more constant and stable than those of its Old World relative, leading to the suggestion that the European bird has developed from the American basic stock. Our bird becomes *Capella gallinago delicata* (Ord).

PECTORAL SANDPIPER

[65]Genus *Pisobia* Billberg, 1828, is antedated by genus *Erolia* Vieillot, 1816, of which the type is *Tringa ferruginea* Brun. (*Erolia variegata* Vieillot, a later name). Our bird becomes *Erolia maculata* (Vieillot), 1819, earlier than *E. pectoralis* Say, and not preoccupied by the so-called "*Tringa maculata*" of Linnaeus, since no such combination appears in the writings of Linnaeus.

WHITE-RUMPED SANDPIPER

[66]The change of the generic name from *Pisobia* to *Erolia*, as discussed under the reference to the Pectoral Sandpiper, results in the new combination, *Erolia fuscicollis* (Vieillot), for this bird.

LEAST SANDPIPER

[67]Becomes *Erolia minutilla* (Vieillot), because of priority of generic name *Erolia*, as indicated under reference to the Pectoral Sandpiper, and the recognition by Hartert (1916) and others of *P. damacensis* of the Check-List as a subspecies of *E. minutilla*: many ornithologists hold *E. subminuta* Middendorff to be another subspecies, though many others consider the three specifically separate.

GREATER AND LESSER YELLOW-LEGS

[68]There has been a great deal of discussion of recent years about the systematic position of these two birds and their relationships to each other and their near relatives. Mathews expressed himself in 1913 as being of the opinion that the Greater Yellow-legs was generically inseparable from the Greenshanks of Europe, and included them both in the genus *Glottis;* the genus *Hiornis* Kaup, 1829, was considered valid for the Lesser Yellow-legs. Ridgway in 1919 considered these birds generically distinct from their European relatives, considered the two American forms strictly congeneric, and proposed for them the genus *Neoglottis*. The British Ornithologists' Union in 1921 held that both were to be included with numerous other species in the genus *Tringa*. They are for the present perhaps safest considered in the genus *Totanus* Bechstein, 1803, until further and more careful investigation.

WESTERN SOLITARY SANDPIPER

[69]*Helodromas solitarius cinnamomeus* of the Check-List becomes *Tringa solitaria cinnamomea* (Brewster), since, during fixation of Linnean types by the International Commission, the type of *Tringa* Linnaeus, 1858, was found by tautonymy to be *Tringa ochropus* Linnaeus, the Green Sandpiper of Europe, generically inseparable from the Solitary Sandpipers of North America.

LONG-BILLED CURLEW

[70]Tallichet, 1892, p. 107; observed one on May 6, 1892, on a marshy pool northwest of Austin.

[71]*N. a. occidentalis* Woodhouse, 1852, originally described as a separate species, is recognized by Dr. Oberholser (Auk, 1918, pp. 188-195) and other authorities as a tenable subspecies; Dr. Oberholser points out that the supposed Michigan breeding record of the typical form, *N. a. americanus*, is unreliable, and restricts the eastern limit of the breeding range to southern Wisconsin and northern Illinois. Dr. Grinnell, in the Condor for January-February of 1921, asserts his belief that the differences between the "supposed two races of the Long-billed Curlew are not worthy of recognition."

AMERICAN GOLDEN PLOVER

[72]*Charadrius dominicus dominicus* of the Check-List becomes *Pluvialis dominica dominica* (Müller), following a fixation of Linnaen types by the International Commission, which held that the generic name *Charadrius* was properly applicable to the Ring-necked Plovers, leaving the genus—*Pluvialis* Brisson, 1760, as the first tenable name for the Golden Plovers.

KILLDEER

[73]The type form is placed on a subspecific basis by recognition of the Peruvian Killdeer, *O. v. peruvianus* Chapman, 1920, breeding along the central Pacific coast of South America, and the West Indian Killdeer, *O. v. rubidus* Riley, 1909, both of which are much smaller than the North American race, although the Peruvian form can be distinguished in postnuptial plumage from both by the greater extent of rusty margins on the upperparts, particularly on the lesser and median wing-coverts.

[74]Schutze, 1902, p. 1.

MOUNTAIN PLOVER

[75]Many authorities consider that this species is not generically separable from the type of the genus *Eupoda* Brandt.

TEXAS BOB-WHITE

[76]Taylor, W. S. The Bob-White. U. of T. Bull. No. 1748, Aug. 25, 1917, pp. 1-26. General habits.

[77]Schutze, 1902, pp. 1-2.

BUFF-BELLIED SCALED QUAIL

[78]Subspecies of *Callipepla squamata* of Check-List, the type form of which is now restricted to Mexico by the recognition of a distinct race for Arizona, New Mexico, western Texas, and adjacent districts; originally named as the Arizona Scaled Quail, *C. s. pallida* Brewster, 1881, but only recently accepted as valid, Eighteenth Supplement to the Check-List.

RIO GRANDE WILD TURKEY

[79]Schutze, 1902, p. 25.

PASSENGER PIGEON

[80]Proper name is *Ectopistes canadensis* (Linnaeus), 1766, that name being based on the female Passenger Pigeon and having page priority over the *Columba migratoria* of Linnaeus, based on the male.

WESTERN MOURNING DOVE

[81]Though described as early as 1852, this subspecies was not finally accepted as valid until 1912, in the Sixteenth Supplement to the Check-List; there is also a race *Z. m. caurina* Ridgway, recognized for the Pacific Northwest.

[82]Taylor, W. S. The Mourning Dove. U. of T. Bull. 1916: No. 57, October 10, 1916, pp. 1-19. General habits.

[83]Schutze, 1902, pp. 2-3.

[84]Schutze, The Condor, vol. 5, no. 3, May-June, 1903, p. 81. Nesting in the old nest of Audubon's Caracara.

INCA DOVE

[85]Schutze, 1902, p. 25; 1904, p. 172.

[86]Ridgway, Robert. The Birds of North and Middle America. Bull. U. S. Nat. Mus. No. 50, part VII, 1916, p. 391.

[87]Oldright, Chas. D. 1890a, p. 15.

TURKEY VULTURE

[88]This name should stand unless it is conclusively proven, as Kirke Swann contends, that Linnaeus described the North American Turkey Vulture instead of the South American form as generally considered: if the type of *C. a. aura* (Linnaeus) came from Vera Cruz, Mexico, then it is probable that the name *C. a. septentionalis* Wied will have to be dropped.

BLACK VULTURE

[89]Since the type of the genus *Catharista* Vieillot proves to be *Vultur aura* Linnaeus, *Catharista* becomes a synonym of *Cathartes*, the genus for the Turkey Vulture, and is not available for the Black Vulture, the earliest tenable generic for which is *Coragyps* Geoffrey, 1853, with *Vultur urubu* Vieillot as the type. There is a smaller form, *C. u. brasiliensis* (Bonaparte), in Central and South America. Our bird becomes, therefore, *Coragyps urubu urubu* (Vieillot).

[90]Kirke Swann points out that the name for the North American Black Vulture should be *Coragyps atratus atratus* (Bartram), 1791.

[91]Schutze, 1902, pp. 3-4.

SWALLOW-TAILED KITE

[92]*Elanoides forficatus yetapa* Bonn. & Vieill., 1823, Paraguay and Venezuela. Swann, Auk, 1921, p. 363, says that "The adults of this scarcely separable form seem to average a trifle smaller than those of the typical form; wing 373 mm. (smallest male) to 433 mm. (largest female)."

[93]Schutze, 1902, p. 25; listed as summer resident.

MISSISSIPPI KITE

[94]*Ictinia mississippiensis* of Check-List, corrected to retain original spelling.

[95]Tallichet, 1892, p. 107.

[96]Schutze, 1902, p. 25.

MARSH HAWK

[97]*C. hudsonius* of Check-List, now considered a subspecies of *C. cyaneus* of Europe, with which it intergrades. *Circus cyaneus hudsonius* (Linnaeus).

COOPER'S HAWK

[98]*A. cooperi* of Check-List, corrected to retain original spelling. Schutze, 1902, p. 25. Listed as resident.

HARRIS' HAWK

[99]Schutze, 1902, pp. 4-5. Because of the lack of literature and by reason of white rump-patch, mistaken for Sennett's White-tailed Hawk and name *Buteo albicaudatus sennetti* Allen applied to it.

FLORIDA RED-SHOULDERED HAWK

[100]Referred to *B. l. alleni* Ridgway, of Check-List, though described by Dr. L. B. Bishop as a new subspecies, the Auk, XXIX, 2, April, 1912, pp. 232-233, *B. l. texanus*, from Corpus Christi, Texas, a form confined to the southern tip of Texas and Northeastern Mexico.

[101]Schutze, 1902, p. 4.

BROAD-WINGED HAWK

[102]Subspecies of *Buteo platypterus* of Check-List, to distinguish North American mainland type from island races of West Indies.

[103]Burns, The Wilson Bulletin, Nos. 76-77, p. 193.

[104]Schutze, 1902, p. 25.

AMERICAN ROUGH-LEGGED HAWK

[105]Genus *Archibuteo* Brehm not considered trenchantly separable from Genus *Buteo* Lacepede Oberholser, Auk, XXXVI, July, 1919, pp. 420-421. Hartert, 1912, p. 115.

[106]Genus *Archibuteo* of Check-List, characterized by having tarsi completely feathered on front and sides, now found to intergrade with and be inseparable from Genus *Buteo* having unfeathered tarsi. Oberholser, Auk, 1919, pp. 420-421.

PRAIRIE FALCON

[107]*Falco mexicanus* Schlegel of Check-List. *Hierofalco* Cuvier, recognized as genus by British Orn. Union, and by various American systematists.

FALCON

[108]Genus *Falco Linnaeus* of Check-List, including the Peregrine Falcon or Duck Hawk, the Prairie Falcon, the Pigeon Hawk, and the Sparrow Hawk, is almost universally held in need of revision, differences of generic value being found to exist between its various subgenera; the three following subgenera, therefore, are considered of generic rank to cover, respectively, the Prairie Falcon, the Pigeon Hawk, and the Sparrow Hawk:

Hierofalco Cuvier; recognized by Australia and the B. O. U.

Tinnunculus Vieillot; recognized by Mathews of Australia.

Cerchneis Boie; recognized by Mathews of Australia, and by Chapman and the late C. B. Cory of America.

DUCK HAWK

[109]Subgenus *Rhynchodon* Nitzsch of Check-List recognized by Mathews as of generic rank.

PIGEON HAWK

[110]*Falco columbarius columbarius* Linnaeus of Check-List.

AMERICAN SPARROW HAWK

[111]*Cerchneis* Boie recognized as genus by Chapman, Oberholser, etc.

[112]*Falco sparverius sparverius* Linnaeus of Check-List. Schutze, 1902, p. 25.

[113]*Cerchneis* Boie. Raised to generic rank. (Cf. Chapman, Bull. Amer. Mus. Nat. Hist., XXXIV, May 27, 1915, pp. 372-382). It includes the following forms of the genus *Falco*:

359.1. *Cerchneis tinnunculus* (Linnaeus).
360. *Cerchneis sparveria sparveria* (Linnaeus).
360a. *Cerchneis sparveria phalaena* (Lesson).
360b. *Cerchneis sparveria peninsularis* (Mearns).
360c. *Cerchneis sparveria paula* (Howe and King).
361. *Cerchneis sparvioides* (Vigors).

AUDUBON'S CARACARA

[114]Subspecies of *Polyborus cheriway* (Jacquin) of Check-List, the North American Caracara being found larger, heavier-billed, and more brownish than the blackish bird of South America, Cassin's old name being revived for our bird.

The bird of northern South America, *P. c. cheriway* (Jacquin), is much more intensely black, has shorter and more feeble bill, and is smaller throughout.

Polyborus cheriway auduboni Cassin. Audubon Caracara; North American Caracara.

Geographical Distribution—From northern Lower California, Arizona, central Texas, Florida, and Cuba, south to Panama.

[115]Schutze, 1920, p. 5, and Condor.

AMERICAN OSPREY; FISH HAWK

[116]Schutze, 1902, p. 25.

AMERICAN BARN OWL

[117]*Aluco pratincola* (Bonaparte) becomes *Tyto alba pratincola* (Bonaparte), American Barn Owl, because considered only subspecifically distinct from the European typical race, *Tyto alba*. (Cf. Hartert, Vogel palaarkt. Fauna, Heft VIII, (Band II, 2), August, 1913, p. 1039.) For changes of the generic name *Aluco* to *Tyto*, cf. the 17th Supplement to the A. O. U. Check-List ('The Auk,' XXXVII, No. 3, July 14, 1920, p. 444).

[118]Schutze, 1902, p. 26.

AMERICAN LONG-EARED OWL

[119]*Asio wilsonianus* (Lesson) of Check-List, now considered subspecies of *Asio otus* Linnaeus), 1758. Hartert, VIII, II, 2, August, 1913, p. 987.

Very closely related, alike in size and build; the darker, more confusedly mottled upper surface, the more heavily barred posterior lower parts, are found by Dr. Hartert and Dr. Oberholser to be inconstant differences, a few examples of one type overlapping a few of the other, indicating the subspecific relationship of the two; the European bird has, as a result of individual variation, four color phases, (1) a light ochraceous, *Asio otus wilsonianus* (Lesson). (2) a dark ochraceous, (3) a light gray, and (4) a dark gray phase, characteristics of the American form (darker upper-parts, with less indication of striping, its blackish areas more confusedly mottled; the more heavily streaked breast and more heavily barred posterior lower parts; the less conspicuous ochraceous suffusion of upper and lower surfaces) being more striking when compared to light ochraceous phase, a few of the dark phase being well-nigh indistinguishable.

SHORT-EARED OWL

[120]*Asio flammeus* (Pontoppidan) of Check-List, placed on subspecific status by description of numerous neotropical races. Three neotropical races, A. f. breviauris (Schlegel), A. f. bogotensis Chapman, and A. f. sanfordi Bangs, from respectively southern South America, Bogota Savanna, and Falkland Islands.

[121]*Strix varia albogilva* Bangs becomes again *Strix varia helveola* (Bangs) (*Syrnium nebulosum helveolum* Bangs, Proc. New Engl. Zool. Club, I, March 31, 1899, p. 31; "Corpus Christi, Texas"), because the latter name is now considered not preoccupied by *Strix helvola* Lichtenstein. (Cf. Oberholser, "The Auk," XXXVI, No. 2, April 8, 1919, p. 283). (Eighteenth Sup. to A. O. U. Check-List).

HASBROUCK'S SCREECH OWL

[122]*Otus asio hasbroucki* Ridgway. Hasbrouck's Screech Owl. Bull. U. S. Nat. Mus., No. 50, part VI, April 8, 1914, p. 694 ("Palo Pinto County, Texas"). New subspecies. Range: central and north central Texas.

[123]Schutze, 1902, p. 6.

WESTERN GREAT HORNED OWL
[121]*Bubo virginianus occidentalis* Stone. Pale Horned Owl. *B(ubo). virginianus occidentalis* Stone, "The Auk," XIII, No. 2, by April 9, 1896, p. 156, in text ("Mitchell Co., Iowa"). Revived as a subspecies. (Cf. Ridgway. Bull. U. S. Nat. Mus., No. 50, part VI, April 8, 1914, p. 743). Range: western United States from Minnesota and Montana south to Kansas and Utah.
[122]Schutze, 1902, p. 25.

WESTERN BURROWING OWL
[123]*S. c. hypogaea* of Check-List, corrected to retain original spelling.
[124]Schutze, 1902, p. 25.

ROADRUNNER
[125]Schutze, 1902, pp. 6-7.

YELLOW-BILLED CUCKOO
[126]Schutze, 1902, p. 7.

BLACK-BILLED CUCKOO
[127]*C. erythrophthalmus* of Check-List.

TEXAS KINGFISHER
[128]*Chlorocerule* Kaup. raised to generic rank. (Cf. Ridgway, Bull. U. S. Nat. Mus., No. 50, part VI, April 8, 1914, p. 421; Miller, Bull. Amer. Mus. Nat. Hist., XXXI, September 12, 1912, pp. 266-287; 304-311). The only North American form is: 391. *Chlorocerule americana septentrionalis* (Sharpe).

HAIRY WOODPECKER
[129]Oberholser, H. C., A Revision of the Forms of the Hairy Woodpecker, *Dryobates villosus* (Linnaeus). Proc. U. S. Nat. Mus., 40. No. 1840, p. 602.
[130]Schutze, 1902, p. 26.

TEXAS WOODPECKER
[131]*Dryobates scalaris sumplectus* Oberholser, Texas Woodpecker. Proc. U. S. Nat. Mus., XLI, June 30, 1911, p. 155. ("Mouth of Nueces River, Texas"). Revised as a subspecies. (Cf. Ridgway, Bull. U. S. Nat. Mus., No. 50, part VI, April 8, 1914, p. 257). Range: northeastern Mexico, through middle Texas to southeastern Colorado. (Eighteenth Sup. to A. O. U. Check-List).
A subspecies closely related to *D. s. cactophilus* of Check-List Supplement, The Auk, XXIX, 3, July, 1912, p. 383; formerly referred to *D. s. bairdi* of Check-List, now confined to Mexico; considered a perfectly valid subspecies. Oberholser backed by Ridgway in restricting true *bairdi* to Mexico.
[132]Schutze, 1902, pp. 7-8.

PILEATED WOODPECKER
[133]Dresser, p. 469.

RED-HEADED WOODPECKER
[134]Western Red-headed Woodpecker, described by Oberholser, 1919; see Canadian Field-Nat., XXXIII, September, 1919, pp. 48-50.
"The name *Melanerpes erythrophthalmus* is apparently a lapsus calami for *Melanerpes erythrocephalus* and there is no other evidence that the author intended to describe a new species or subspecies. The name *Melanerpes erythrophthalmus* does not occur in the index but the species is duly entered there as *Melanerpes erythrocephalus*." (Oberholser).
Dwight, Auk, 1920, p. 145, claims nomenclatural casuistry, disregarding the question of whether the race is valid or not, but charges that the name selected had been used purely inadvertently in a local list, as is admitted by the describer, Oberholser. Credit should not, then, be given to first user, but to describer.

RED-HEADED WOODPECKER
[135]Schutze, 1902, p. 8.

RED-BELLIED WOODPECKER
[136]Schutze, 1902, p. 8.

CHUCK-WILL'S-WIDOW
[140]Schutze, p. 9.

WHIPPOORWILL
[141]*Antrostomus vociferous vociferous* (Wilson) of Check-List, placed in new genus *Setochalcis* Oberholser, 1914, to separate it from the Chuck-will's-widow. Bull. U. S. N. M. No. 86, 1914, p. 11.

POORWILL
[142]*Phalaenoptilus nuttallii nitidus* Brewster. Eliminated, because regarded as a color phase of *Phalaenoptilus* nuttallii nuttallii (Audubon). (Cf. Ridgway, Bull. U. S. Nat. Mus., No. 50, part VI, April 8, 1914, pp. 548-552). (Eighteenth Sup. to A. O. U. Check-List).

HOWELL'S NIGHTHAWK
[143]Subspecies of *C. virginianus* (Gmelin) of Check-List, over which *C. minor* (Forster), 1771, holds priority.
[144]New subspecies, described by Oberholser, Bull. U. S. Nat. Mus., No. 86, 1914, p. 57; formerly referred to *C. v. henryi* of Check-List. *Chordeiles virginianus* (Gmelin), 1789, of Check-List, is antedated by *Chordeiles minor* (Forster), 1771, hence this race becomes *C. minor howelli*.
[145]Schutze, 1902, p. 9. Records listed under Western Nighthawk are referable to this form.

RUBY-THROATED HUMMINGBIRD
[146]Schutze, 1902, p. 10. All nests recorded in this publication are those of the Black-chinned Hummingbird.

SCISSOR-TAILED FLYCATCHER
[147]Schutze, 1902, pp. 10-11.
Schutze, A. E. A Few Notes From Texas. The Condor, V, 3, May-June, 1903, p. 81.
Schutze, A. E., The Destruction of Bird Life by Light Towers. The Condor, VI, 6, November-December, 1904, p. 173.
[148]Bailey, Florence Merriam. The Scissor-tailed Flycatcher in Texas. The Condor, IV, 2, March-April, 1902, pp. 30-31.

KINGBIRD
[149]Subspecies of *T. tyrannus* of Check-List.
[150]Kofahl, H. The First Occurrence of the Kingbird in Austin During the Breeding Season. The Condor, V, 3, May-June, 1903, p. 81.
There is a form restricted to Florida. Vexator Bangs, April, 1898, Vol. XV, p. 178.

NORTHERN CRESTED FLYCATCHER
[151]Description of a peninsular race, *M. c. residuus* Howe, 1912, from Florida, places the mainland form on subspecific basis.
[152]Schutze, 1902, pp. 11 and 25. Birds referred to Mexican Crested Flycatcher undoubtedly belong to this form.

ASH-THROATED FLYCATCHER
[153]Schutze, 1902, p. 25.

WOOD PEWEE
[154]Schutze, 1902, pp. 11-12.

LITTLE FLYCATCHER
[155]*E. trailli trailli* of Check-List, subspecific name found to belong to eastern rather than western race, as used in Check-List. New name, *E. T. brewsteri*, proposed for western race of Check-List.
E. t. alnorum becomes synonym of *E. t. trailli*, the "Traill Flycatcher" of the West being left without name, *E. t. brewsteri* Oberholser, 1918, is proposed. Ohio Journ. Science, Jan. 1918, 93. Type locality, Cloverdale, Nevada.

PRAIRIE HORNED LARK
[156]Bird-Lore, XX, 5, September-October, 1918, pp. 348-349. Migration records from Austin, by Tallichet.

FLORIDA BLUE JAY
[157]Examination of numerous specimens of Blue Jays by Dr. Oberholser has shown that the Florida race extends its range to include South Carolina, type locality of *C. cristata cristata* (Linnaeus), which thus becomes the name of the southern bird, the name *C. c. florincola* being relegated to synonymy because of its later date and by reason of its being applicable to the same race. Auk, Vol. 37, No. 1, January, 1921, pp. 86-89.
[158]Schutze, 1902, p. 12.

SOUTHERN CROW
[159]*Corvus brachyrhynchos paulus* Howell. Southern Crow. Proc. Biol. Soc. Wash., XXVI, October 23, 1913, p. 199 ("Bon Secour, Alabama"). New subspecies. Range: southeastern United States (except Florida), north to the District of Columbia and southern Illinois, and west to eastern Texas.
[160]Schutze, 1902, pp. 12-13.

COWBIRD
[161]Schutze, 1902, p. 13, records this form as a breeder, but his statement was not based on specimen collected.

DWARF COWBIRD
[162]Schutze, 1902, pp. 13-14.

RED-WINGED BLACKBIRD
[163]*A. p. phoeniceus* of Check-List, a name found to belong properly to the Florida race and hence replacing the name *floridanus*, which becomes obsolete. See Mearns, Edgar A., Proc. Biol. Soc. Wash., 1911, p. 227.
A. p. predatorius (Wilson), 1811, the earliest available name.

RIO GRANDE RED-WINGED BLACKBIRD
[164]Hitherto referred to the Vera Cruz Red-winged Blackbird, *A. p. richmondi* Nelson; but found to be larger and less brownish, and separated as a race by Dr. Harry C. Oberholser, of the U. S. Bureau of Biological Survey. The Wilson Bulletin, XXXI, 1, March, 1919, pp. 20-23.
[165]Schutze, 1902, p. 14.

RIO GRANDE MEADOWLARK
[166]Schutze, 1902, p. 26. Record of "Meadow Lark: Resident, common," refers to wintering Western Meadowlarks and summering Rio Grande Meadowlarks.

WESTERN MEADOWLARK
[167]Placed on a subspecific status by recognition of Northwestern Meadowlark, *S. n. confluenta* Rathbun, 1917, from the coastal regions of British Columbia, Washington, and Oregon.

ORCHARD ORIOLE
[168]Schutze, 1902, pp. 14-15.

BULLOCK'S ORIOLE
[169]Subspecies of *I. bullocki* of Check-List, placed on subspecific status by description of extralimital subspecies.
[170]Schutze, 1902, p. 15. Given as Baltimore Oriole, based on erroneous identification.
Howell, Arthur H. The Relation of Birds to the Cotton Boll Weevil. 1907. Biol. Surv. Bull. No. 29, p. 16. "This is a western species, occurring as far east in Texas as ..... Austin." Mr. Howell states that, on search of the Survey's files, he fails to find the record on which this statement was based; doubtless it was from Schutze data.

BREWER'S BLACKBIRD
[171]*Euphagus cyanocephalus minusculus* Grinnell, 1920, ranging in California, places other form on a subspecific basis. Condor, p. 153.

BRONZED GRACKLE
[172]Schutze, 1902, pp. 15-16. Records listed under Purple Grackle are also referable to this form.

GREAT-TAILED GRACKLE
[173]Schutze, 1902, p. 16. Records listed as Boat-tailed Grackle are referable to this form.
[174]Howell, Arthur H. The Relation of Birds to the Cotton Boll Weevil. Biol. Surv. Bull. 29, p. 17.

ARKANSAS GOLDFINCH
[175]Oldright, Charles D. Wilson Quarterly, p. 84. Rare breeder, though he has never found a nest.

PINE SISKIN
[176]Subspecies of *Spinus pinus* of Check-List.

McCOWN'S LONGSPUR
[177]*R. mccowni* of Check-List, corrected to retain original spelling.

NEVADA SAVANNAH SPARROW
[178]Accepted as subspecies, Sixteenth Supplement to Check-List, The Auk, XXIX, 3, July, 1912, p. 384.

WESTERN GRASSHOPPER SPARROW
[179]Schutze, 1902, p. 17.

WESTERN LARK SPARROW
[180]Oldright, Charles D. Full notes on nesting, nests, eggs, broods, nesting dates. pp. 73-75. Wilson Quarterly, etc.
[181]Schutze, 1902, p. 17.

WHITE-CROWNED SPARROW
[182]Schutze, 1902, p. 26. Listed, through error, as summer resident.

FIELD SPARROW
[183]Oldright, Charles D. Wilson Quarterly, 76-78, full report on nesting period, nesting, nests, and eggs in Travis County.

MONTANA JUNCO
[184]*J. hyemalis montanus* of Check-List, closely related to *Junco oreganus*, now considered a distinct species.
Regarded as species by Ridgway: considered hybrid by Dwight, 1918, Bull. A. M. N. H., 38, Art. 9, p. 269., and unworthy of recognition by name.
Proper name is *Junco Oreganus Montanus*.

BLACK-THROATED SPARROW
[185]Oldright, Charles D. Wilson Quarterly, p. 84, rare summer resident.
[186]Schutze, 1902, pp. 17-18.

CASSIN'S SPARROW
[187]*P. cassini* of Check-List, corrected to retain original spelling.
[188]Oldright, Charles D. Wilson Quarterly, p. 84, common in summer in mesquite thickets.
[189]Strecker, John K. The Birds of Texas. Baylor University Bulletin, XV, 1, January, 1912, p. 50. "The writer has personally observed this species in ..... Travis ..... and Matagorda Counties."
[190]Nehrling, Vol. II, pp. 151-152.

ROCK SPARROW
[191]Strecker, 1912, p. 50. "The writer has observed this species in Burnet and Travis Counties."
[192]Tallichet, J. H. Orn. & Ool., 17, 7, July, 1892, p. 108.

LINCOLN SPARROW
[193]*M. lincolini lincolni* of Check-List, corrected to retain original spelling.

GREEN-TAILED TOWHEE
[194]Genus *Oreospiza* Ridgway, 1896, of Check-List, preoccupied by *Oreospiza* Keitel, 1857, becomes Genus *Oberholseria* Richmond, 1915. (Described Proc. B. S. of W. 28, Nov. 29, 1915, p. 180). Proposed in its place.

GRAY-TAILED CARDINAL
[195]Genus *Cardinalis* Bonaparte, 1838, is untenable for the Cardinal because of being preoccupied by Genus *Cardinalis* Jarocki, 1821, based on the Scarlet Tanager, thus becoming a synonym of Genus Piranga Vieillot, 1807. Genus *Richmondena* Mathews, (Aust. Avian Record, Vol. 3, No. 6, June 25, 1918, p. 145), is therefore proposed for the Cardinal.
[196]Oldright, Wilson Quarterly, 80-81, full report on nesting period, nesting, nest-building, nests, and eggs from Travis County.
[197]Schutze, 1902, p. 18.

ROSE-BREASTED GROSBEAK
[198]*Zamelodia* Coues becomes *Hedymeles Cabanis* [Museum Heineanum, I, 1851, after October 23, p. 152; type, by subsequent designation (Gray, Cat. Gen. and Subgen. Birds Brit. Mus., 1855, p. 71), *Loxia ludoviciana* (Linnaeus)] because Hedymeles is now not considered preoccupied by *Hedymela* Sundevall. (Cf. Oberholser, 'The Auk,' XXXVI, No. 1, January 5, 1919, p. 115). The two species of this genus are:
595. *Hedymeles ludovicianus* (Linnaeus).
596. *Hedymeles melanocephalus* (Swainson).

BLUE GROSBEAK
[199]Oldright, Charles D. Wilson Quarterly, 83, rare.
[200]Schutze, 1902, p. 26.
[201]Strecker, 1912, p. 52.
[202]Bailey, H. B. Wilson Bull., 1918, p. 91.

INDIGO BUNTING
[203]Schutze, 1902, p. 18-19.
[204]Oldright, Charles D. Wilson Quarterly, 82, says it breeds rarely in Travis County.

TEXAS PAINTED BUNTING

[205]Subspecies of *Passerina ciris* of Check-List, held by many authorities to be too close to the eastern form to warrant recognition. See Auk, XXIX, 3, July, 1912, p. 386.
[206]Bird-Lore, 1911, p. 249.
[207]Schutze, 1902, p. 19.
[208]Oldright, Charles D. Wilson Quarterly, 82. Found nesting as early as May 15. Nests and eggs described.

DICKCISSEL

[209]Schutze, 1902, p. 19.
[210]Perry, Oologist.
[211]Oldright, Charles D. Wilson Quarterly, 82-83. Breeding abundantly, nests and eggs described. Breeding as early as May 1.

SCARLET TANAGER

[212]*P. erythromelas* of Check-List, changed to conform in gender with generic name. Species name *olivacea* has priority.
Tanagra olivacea Gmelin, 1789, has priority over P. erythromelas.

SUMMER TANAGER

[213]Schutze, 1902, pp. 19-20.

PURPLE MARTIN

[214]Bird-Lore, XX, 2, March-April, 1918, p. 150.
[215]Schutze, 1902, p. 20.
Schutze, A. E. The Destruction of Bird Life by Light Towers. The Condor, VI, 6, November-December, 1904. pp. 172-173.

LESSER CLIFF SWALLOW

[216]*P. albifrons tachina* of Check-List, specific name *albifrons* having priority over *lunifrona*.
[217]Bird-Lore, XIX, 6, Novembr-December, 1917, pp. 320-321.
[218]Schutze, 1902, p. 20.

BARN SWALLOW

[219]*Hirundo erythrogastra* Boddaert of Check-List, now considered only subspecifically distinct from the Common European Swallow, *Hirundo rustica*.

BANK SWALLOW

[220]Description of extralimital subspecies—*R. r. indica* Whistler, 1916, etc.—places the type on a subspecific basis.
Riparia riparia ijimae (Lönnberg) of Eastern Asia. Very dark, almost blackish upper-parts; very dark pectoral band; very pale feather-edges of scapulars, lower back, rump, and upper tail-coverts stand out in characteristic marked contrast to dark ground color. It has been found that, while most of the American specimens are quite like Old World examples of true *riparia* occasionally in a large series a few will approach this form.
Riparia riparia plumipes Zarudny from Russian Turkestan. See Auk, 1916, 346.

CEDAR WAXWING

[221]Bird-Lore, XX, 3, May-June, 1918, p. 221.

MIGRANT SHRIKE

[222]Schutze, 1902, p. 26. Included in summer list because it was observed in mid-August, one of the summer months.

BLACK-CAPPED VIREO

[223]Tallichet, 1892.
[224]Schutze, 1902, p. 26.
[225]Strecker, 1912, p. 56.

BELL'S VIREO

[226]*V. belli belli* of Check-List, corrected to retain original spelling.
[227]Bird-Lore, XI, 3, May-June, 1909, p. 119.
Schutze, 1902, pp. 20-21. Records for the Warbling Vireo are also referable to this species.
[228]Reed, Chester A. North American Birds Eggs. 1904. See p. 288.

BLACK AND WHITE WARBLER

[229]Cooke, Wells W. Distribution and Migration of North American Warblers. Bull. 18, Biol. Surv., 1904, p. 21.

PROTHONOTARY WARBLER

[230]Cooke, Wells W. Distribution and Migration of North American Warblers. Bull. No. 18, Biol. Surv., 1904, p. 23.
Schutze, A. E. The Summer Birds of Central Texas. 1902. p. 26. This Austroriparian breeding bird of the Mississippi bottom lands has been recorded in numerous volumes as reaching at Austin the extreme southwestern limit of its breeding range. These records are all based on Schutze's record, following the finding of a peculiar nest and small eggs of the Carolina Wren in the overflowed bottoms at Austin.
Chapman, Frank M. Warblers of North America, 2nd ed., 1914, p. 55. Summer range given as extending southwest to include "eastern Texas" (Gainesville and Austin). "We have no authentic record for the Prothonotary Warbler summering at Austin."

NASHVILLE WARBLER

[231]*V. rubricapilla rubricapilla* of Check-List. Vermivora ruficapilla (Wilson), 1811.
Sylvia ruficapilla Wilson, 1811, not preoccupied by *Sylvia ruficapilla* Latham, 1790, which is not an original description but merely a nomenclatural combination.

WESTERN PARULA WARBLER

[232]Subspecies formerly referred to *C. a. usneae* of Check-List.
[233]Cooke, Wells W. Distribution and Migration of North American Warblers, p. 47.
[234]Schutze, 1902. p. 26.

YELLOW WARBLER

[235]*Dendroica aestiva amnicola* Batchelder, 1918, in a general way darker than the typical form.
[236]Cooke, Wells W. Distribution and Migration of North American Warblers. 1904. P. 55.

HOOVER'S WARBLER

[237]*Dendroica coronata hooveri* McGregor. Hoover's Warbler. Bull. Cooper Ornith. Club, I, No. 2, March 15, 1899, p. 32 ("Palo Alto, California"). Revived as a subspecies. (Cf. Swarth, Univ. Calif. Publ. Zool., X, No. 1, February 13, 1912, p. 68; Oberholser, 'The Auk,' XXV, No. 4, October 16, 1918, p. 465). Range: western North America from Mackenzie and Alaska south to central British Columbia and Alberta, and in winter to Lower California and Vera Cruz, Mexico.
(Eighteenth Sup. to A. O. U. Check-List).

ROCKY MOUNTAIN AUDUBON WARBLER

[238]Dr. Oberholser recognizes four races. *D. a. goldmani* Nelson is found in Guatemala; *D. a. nigrifrons* Brewster, so far as the United States is concerned, is restricted to the Huachuca Mountains of Arizona. He has divided *auduboni* of previous authors into two forms; the more Eastern is described as new, *D. a. memorabilis* Oberholser, 1921, with type from Ward, Colorado. See p. 243, Ohio Jour. Science, May, 1921, XXI, No. 7.

GOLDEN-CHEEKED WARBLER

[239]For admirable accounts of the Warblers and their habits see Dr. Frank M. Chapman's *The Warblers of North America*.

BLACK-THROATED GREEN WARBLER

[240]Subspecies of *D. virens* of Check-List, type form placed on subspecific basis by description of *D. v. waynei* O. Bangs, 1918, a duller form with smaller bill, found in South Carolina.
[241]Cooke, Wells W. Distribution and Migration of North American Warblers. 1904. p. 89.

PINE WARBLER

[242]*Sylvia pinus* Wilson, 1811, earlier name than *vigorsi* of Audubon, is valid description, not invalidated by *Certhia pinus* Linnaeus, with which it has been frequently confused and which really named the Blue-winged Warbler. Wilson's name was dropped because of confusion, and Audubon's later name has for a number of years been applied.
Subspecies of Check-List form, *D. vigorsi*.

OVENBIRD

[243]*Seiurus aurocapillus furvior* Batchelder, 1918. In a general way darker than the typical race.
Placed on subspecific status by recognition of *S. a. furvior* Batchelder, 1918, from New Foundland.

MOURNING WARBLER

[244]Cooke, Wells W. Distribution and Migration of North American Warblers. See p. 114.

WESTERN YELLOW-THROAT

[245]Cooke, Wells W. Distribution and Migration of North American Warblers. See p. 118.

NORTHERN YELLOW-THROAT
[246]A valid subspecies, formerly referred to *G. t. trichas* of Check-List. First described in 1838, and recently reinstated.

YELLOW-BREASTED CHAT
[247]Strecker Bull., p. 60.

WILSON'S WARBLER
[248]Cooke, Wells W. Distribution and Migration of North American Warblers. See p. 127.

COMMON PIPIT
[249]*A. rubescens* of Check-List, now considered subspecies of *A. spinoletta* of Europe, since individual variation has been found to overlap distinctions.
Taylor, W. S. Christmas Census, Bird-Lore, 1917, p. 35; the 36 birds listed as Sprague Pipits, observed on December 26, 1916, were undoubtedly the Common Pipit.

SPRAGUE'S PIPIT
[250]*A. spraguei* of Check-List, corrected to retain original spelling.

SAGE THRASHER
[251]Nehrling, Vol. I, p. 38.

WESTERN MOCKINGBIRD
[252]Oldrigrt, Charles D. O. & O. Semi-Annual, pp. 32-35. Full reports on occurrence and habits. Nesting, etc.
[253]Schutze, 1902, p. 21-22.

CATBIRD
[254]Oldright, Charles D. O. & O. Semi-Annual, p. 32. Occurrence and habitat.

BROWN THRASHER
[255]Oldright, Charles D. O. & O. Semi-Annual, pp. 32-35. Report on occurrence and habits.

ROCK WREN
[256]*Salpinctes obsoletus proximus* Swarth. San Martin Rock Wren. *Salpinctes guadeloupensis proximus* Swarth, The Condor, XVI, No. 5, September 15, 1914, p. 215 ("San Martin Island, Lower California"). Recognized as a subspecies of *Salpinctes obsoletus*. (Cf. Oberholser, 'The Auk,' XXXVI, No. 3, June 28, 1919, pp. 407, 408). Range: San Martin Island, Lower California.
(Eighteenth Sup. to A. O. U. Check-List).
[257]Oldright, Charles D. Science, p. 16. Occurrence at Austin.
[258]Strecker, 1912, p. 62.

TEXAS CANYON WREN
[259]Subspecies closely linked to *C. m. conspersus* of Check-List, from which it is considered distinct.
[260]Oldright, Charles D. Science, p. 15. Full account of occurrence and habits.
[261]Strecker, 1912, p. 63.
[262]Bailey, Florence Merriam. Handbook of Birds of the Western United States. Houghton, Mifflin Company. Fourth Edition, revised, 1915, p. 415.

CAROLINA WREN
[263]Oldright, Charles D. Science, p. 15. Occurrence and habits.
[264]Schutze, 1902, p. 26.

TEXAS WREN
[265]*T. bewicki cryptus* of Check-List, corrected to retain original spelling.
[266]Oldright, Charles D. Listed as Baird's Wren, *T. b. murinus*. Occurrence and habits.
[267]Schutze, A. E., 1902, p. 22. Records for Bewick's and Baird's Wrens are referable to this form.

WESTERN HOUSE WREN
[268]*T. a. parkmani* of Check-List, corrected to retain original spelling.
[269]Schutze, 1902, p. 22. Records for the House Wren in this report are referable to the Carolina Wren, the common "House" Wren of the South.
[270]Oldright, Charles D. Science, pp. 15-16. Occurrence and habits.

WINTER WREN
[271]*N. hiemalis hiemalis* of Check-List, now considered a subspecies of *N. troglodytes*. Oberholser, Proc. Nat. Mus., 1919, pp. 223-236.

FLORIDA WHITE-BREASTED NUTHATCH
[272]*S. c. atkinsi* of Check-List, now reduced to synonymy because earlier *S. c. carolinensis* has been found to apply to the same form. (See H. C. Oberholser, Auk, 34, 2, April, 1917, pp. 181-185).
[273]Schutze, 1902, p. 26. Included in Schutze's report on J. A. Singley's statement that the race was found in Lee County, on the eastern edge of the Austin Region. The Slender-billed Nuthatch was, for a like reason, listed in Schutze's report.

TUFTED TITMOUSE
[274]Schutze, 1902, p. 23.

SENNETT'S TITMOUSE
[275]Schutze, 1902, p. 23.

PLUMBEOUS CHICKADEE
[276]Schutze, 1902, listed Long-tailed, Carolina, and Plumbeous Chickadees as breeding summer residents in Central Texas, naming the last as the prevailing form: the other two were recorded on variations of birds, nests, and eggs, which are now known to fall within the Plumbeous race, pp. 23-24.

VERDIN
[277]Schutze, 1902, p. 26. Listed as rare summer resident.

GOLDEN-CROWNED KINGLET
[278]*R. satrapa satrapa* of Check-List, now considered only subspecifically distinct from the European Golden-crowned Wren, *R. regulus, of Europe.*
Regulus regulus satrapa Lichtenstein.

RUBY-CROWNED KINGLET
[279]*Regulus calendula calendula* of Check-List. *Corthylio.* Cabanis. 1853, recognized as genus by Miller, 1915, basal half of hind-toe sole-pad longer than rest of toe (instead of shorter, with subtruncate end sharply contrasting with narrow terminal end of toe, and reticulated with about a dozen prominent polygonal sections, as in true *Regulus*); longer tarsi, larger and wider bill, absence of head-stripe and uniform olive-green crown of female.

BLUE-GRAY GNATCATCHER
[280]Schutze, 1902, p. 26.

TOWNSEND'S SOLITAIRE
[281]*M. townsendi* of Check-List.

WOOD THRUSH
[282]One recorded on December 25, 1916 (F), in Bird-Lore, 1917, p. 36, possibly refers to one of the forms of the Hermit Thrush.
[283]Oldright, Charles D. O. & O. Semi-Annual, pp. 32 and 35. Report on occurrence and food.

GRAY-CHEEKED THRUSH
[284]*Turdus aliciae* Baird, 1858, and its subspecies *Hylocichla aliciae bicknelli* Ridgway, 1882, are antedated by *Turdus minimus* Lafresnaye, 1848, a name applicable to *bicknelli.*
[285]One recorded for December 25, 1916 (F), in Bird-Lore, 1917, p. 36, was undoubtedly one of the forms of the Hermit Thrush.

OLIVE-BACKED THRUSH
[286]Two recorded for December 25, 1916 (F), in Bird-Lore, 1917, p. 36, undoubtedly refers to some form of the Hermit Thrush.

HERMIT THRUSH
[287]*Turdus pallasii* Cabanis, 1847, is a substitute name for *Turdus guttatus* Cabanis, 1845-1846, which Cabanis himself considered preoccupied, and which in itself was not an independent name but merely a new combination with *Turdus*, based on *Muscicapa guttata* Pallas; the two names of Cabanis are, therefore, synonyms of the Alaskan form of the Hermit Thrush, leaving the Eastern Hermit Thrush without a name. Later names being preoccupied or indefinite, the new name, *H. g. faxoni* Bangs & Penard, was suggested in 1921, Auk, p. 433.
H. g. pallasi of Check-List.

AMERICAN ROBIN
[288]Oldright, Charles D. O. & O. Semi-Annual, pp. 32 and 35. Occurrence, habitat, flight, and feeding habits.

BLUEBIRD
[289]New subspecies, *S. s. episcopus* Oberholser, 1917, described from northeastern Mexico and southern Texas. Type from Santa Engracia, Tamaulipas, Mexico. Proc. Biol. Soc., Wash., 30, Feb. 21, 1917, p. 27.

DICTIONARY OF ORNITHOLOGICAL TERMS AND PHRASES

Ordinary readers will come across technical words and terms that will require explanation. Perhaps all are not included, since it is impossible to incorporate all useful definitions in the text proper.

A

Abundant.—Very common; plentiful; teeming; approximately 25 or more a day may be seen by an observer.

Acute.—Sharp-pointed.

Adult.—A mature, full-grown bird, which has attained final plumage.

Albino.—An animal having a deficiency of pigment in the skin supplying colors to the hair or feathers; in birds, white largely replacing the ordinary plumage colors.

Altricial.—Pertaining to birds whose young are reared in the nest and fed by the parents.

Analogy.—General, superficial resemblance, without structural agreement.

Anal region.—The region about the anus, posterior opening of the alimentary canal, just beneath the base of the tail.

Analysis.—Definition of species, genera, or higher groups, by tabular, antithetical arrangement of diagnostic characters, divided and subdivided under appropriate headings.

Angle of Chin.—The forward projection of space between the two halves or rhami of the lower jaw.

Anterior.—Forward, or in front of.

Antithesis.—An apposition of words or phrases setting forth contrasted diagnostic characters by which members of two or more groups or species may be distinguished from each other.

Apex.—The tip or point of a thing.

Aquatic.—Pertaining to the water; aquatic birds are either 'Waders' or 'Swimmers.'

Arboreal.—Pertaining to trees; tree-inhabiting.

Arid.—Dry; barren; parched with heat.

Armpit.—That spot on the side of the body beneath and behind the point of wing attachment, hidden by the folded wing.

Ashy.—A bluish-gray color, about the shade of wood ashes.

Association.—A union of plants and animals in a type of habitat conducive to the best interests of all. Tracts of land having relatively uniform conditions of environment. For example, the Golden-cheeked Warbler belongs to the Rock Cedar Association of the Limestone Hill Faunal Area of the Lower Sonoran Subzone, while the Southern Pileated Woodpecker belongs to the Wooded Bottoms Association of the Louisianan Faunal Area of the Austroriparian Subzone of the Lower Austral Zone.

Atrophy.—The shrinkage, obliteration, or wasting away of an organ or part of an organ.

Attenuated.—Tapering; growing gradually narrower toward free end, though not necessarily sharply pointed.

Auriculars.—The feathered area which conceals a bird's ears.

Austroriparian.—The moist lowland coastal country along the southern border of the Lower Austral Life Zone.

Avifauna.—The bird life of a region, locality, or section; Avian Fauna.

Axillaries.—A tuft of feathers growing from the armpit; more or less distinct, elongated, graduated, usually soft feathers.

B

Band.—A broad cross mark of color with regular, nearly parallel edges; a broad bar; a still wider strip than a band is called a zone.

Bar.—A narrow cross mark of color.

Barred.—With cross bands of distinct color.

Barring.—Numerous fine narrow cross-marks of color.

Basal Color.—The solid, even background color of bird or egg, on which there are certain other markings, more or less conspicuous, sometimes even hiding the ground color.

Base.—The root, origin, or point of attachment of a structure.

Belly.—Under-surface of body near hinder part, between the breast and the anal region, and bounded by the sides.

Belt.—A broad band of color across belly or lower breast.

Bend of the Wing.—Foremost angle of the closed wing; the wrist-joint angle.

Bevy.—A flock of Bob-whites or quails.

Bibliography.—Condensed history of the literature, or published writings, relating to a subject.

Binomial.—Named by two terms or words. In the **Binomial System** of Nomenclature, proposed by Linnaeus in 1758, and adopted by scientists throughout the world, each species of plant or animal life bears two names, the first generic, the second specific.

Biology.—The science and study of living things; includes Zoology and Botany.

Blotching.—More or less irregular, indistinct spotting of color.

Blunt ovate.—Rather shortened egg-shape, though with one end still slightly more pointed than the other.

Boat-shaped.—In tails, the arrangement of feathers opposite to that of the domestic hen; the middle lines of a boat-shaped tail meet below in a keel, the outer edges being elevated.

Bounding flight.—Flight not straightforward, but undulating, up and down, like the waves of the sea, with stronger accent on the upward motion.

Breast.—A large space across the lower part of a bird's body, in front of the abdomen or belly, and extending to the level of the bend of the wing.

Breast-band.—A rather broad, distinct, crosswise bar of color, on the lower part of the body, between the throat and the abdomen.

Bristles.—Small, hair-like feathers.

C

Call-note.—A short, simple call or cry, commonly uttered by a bird; more definitely, a note used to call to another of its kind.

Cap.—The top of a bird's head, used when such top is of a distinct color.

Capsular.—Shaped more or less like the gelatine capsule of the pharmacy.

Carnivorous.—Flesh eating.

Cere.—The naked skin membrane in which the nostrils of a bird are situated, as for instance that of doves and certain hawks.

Character.—The peculiar quality, or sum of qualities, plumage, marks, or structures by which a bird is distinguished from every other bird; those marks which characterize a species; peculiarities available for diagnosis of a genus or higher group.

Cheek.—A part of the side of the head, rather indefinitely used, but generally taken to mean the malar region, or feathered portion of the lower jaw.

Chest.—That part of the body inclosed by the ribs and the breastbone.

Chin.—The extreme front part of the throat region, usually that portion lying between the lateral branches of the lower jaw.

Chin-mask.—A patch of conspicuous, usually dark color hiding the chin region.

Clannish.—Closely united, or disposed to associate with its own kind.

Colony.—A community of social animals living rather closely together, and more or less isolated from others of the same species.

Common.—Usual; ordinary; often met with; familiar; 10 of a kind may be met with by an observer in a day.

Compact.—Firm, dense, and closely united; used with reference to plumage, and to flocks of birds.

Composite flock.—A flock of birds containing individuals of two or more different species.

Compressed.—Pressed together, or forced into narrow compass.

Confluent bars.—Indistinct bars more or less running together.

Conical bill.—A bill somewhat cone-shaped, as among the sparrows and finches.

Covey.—A family of Bob-whites, or young with or without the parents.

Crest.—A tuft of feathers on top of the head.

Crown.—That portion of the top of the head lying between the forehead and the occiput, or back part of the skull.

Crustacean.—An animal of the zoological class **Crustacea**, with jointed body and external shell, built like a crayfish, crab, shrimp, or lobster.

Culmen.—Ridge or upper edge of the upper mandible (Maxilla).

Cycle.—A complete course of operations of a given kind, returning unto its original state and beginning another such course of operations.

D

Deciduous.—Temporary and shed periodically; refers to the leaves of trees, horns of deer, and the nuptial plumes of certain birds.

Decurved.—Bent downward in a regular manner.

Depressed.—Broader than higher; flattened.

Diagnosis.—A condensed descriptive statement of the essential characters, exclusively applicable to a group in classification, as to a species, a genus, or higher group.

Dichromatic.—Existing in two different phases of plumage coloration, not caused by sex, age, or season; examples, the red and gray phases of the Screech Owl, and the blue and the white-and-bluish forms of adult Little Blue Herons

Distal.—Extremity, or toward or at the tip.

Distribution.—Natural geographical range of a species or other group.

Diurnal.—Active in the day-time, reposing at night.

Domed.—Swollen upward and outward like a dome or cupola.

Dorsal.—Pertaining to the back or upper parts.

Double-rounded.—Said of a tail, the middle and outer feathers of which are shorter than those between.

Down.—Small, soft feathers, with no web, covering nestlings and growing in between and under true feathers of adult birds.

Downy.—Clad with down; having the nature of down.

Dry-preening.—To trim or dress with the beak, particularly after a "dust-bath" or rolling and fluffing of feathers in the dust.

Dusky.—A rather dark, indefinite, neutral color.

E

Ear Coverts.—The patches of feathers covering the ear openings.

Eared.—Furnished with tufts of feathers that in appearance suggest ears of mammals.

Ear-tufts.—Erectile tufts of feathers on side of crown or forehead, such as those found in certain owls.

Ecology.—The study of the interrelationships of members of the plant and animal kingdoms, their activities economics, and social relations; the relations of plants and animals to one another and to the outer world.

Edge of wing.—Anterior or front border of wing, between attachment to body and outer primary.

Elliptical-oval.—Much longer than the usual egg-shape, with ends nearly of equal curvature; midway between the form of an ellipse and that of a hen's egg.

Emarginate.—Used to describe a tail slightly forked, with middle feather shorter than others, or a quill showing sudden narrowing or cutting away of web; when spread, end of tail becomes even.

Embryo.—In ornithology, developing young bird inside egg shell.

Equal-ended.—Rounded alike at each end, as with elliptical, fusiform, oval, or spherical eggs.

Erectile.—Capable of being raised, as certain crests and ear-tufts of birds.

Even tail.—A tail which, when closed, is square-cut or straight across at tip; when opened, or spread out sidewise, end forms semi-circle.

Eye-ring.—A distinct color difference involving the skin or feathers immediately around the eye.

Extensile.—Capable of being greatly extended or lengthened; said of the tongue of certain birds.

Exposed Culmen.—The ridge, or upper outline of the upper mandible of the bill, where not covered with feathers.

Extinct.—A species that has died out; without a survivor; no longer living or active.

Extirpated.—Wholly destroyed or eradicated by the hand of man.

F

Facial disk.—A rather definite arrangement of feathers about the face of a bird to form a frame for the eyes and bill, as in the case of the Barn Owl.

Family.—A systematic group, standing in scientific classification midway between Order and Genus; a group of closely related genera.

Fauna.—The animal life of a region.

Faunal area.—A section of country more or less irregular in shape, differing from other sections upon conditions of atmospheric humidity. When a number of plants are limited in distribution by greater or less degrees of atmospheric humidity, they are said to occupy the same faunal area. Example, the dry, arid Limestone Hill Faunal Area, or Fauna, involving portions of both Upper and Lower Sonoran Life Zones.

Field marks.—Conspicuous, distinctive markings, easily oserved in the field, by which birds may be identified; characteristic actions or habits by which an animal may be identified in life.

Filaments.—Slender, thread-like fibers.

Filoplume.—A thread-like feather.

Flora.—Plant life of a region.

Flush.—To start up suddenly; to cause to start up and fly; to cause a bird to leave its nest suddenly and fly away.

Forehead.—The front part of the top of the head, from the edge of the bill to the crown.

Fore-parts.—The front parts of the body, including head, neck, and upper breast.

Forficate. — Deeply forked; example, tail of Swallow-tailed Kite.

Frontlet.—The extreme front or lower part of the forehead, next to the bill, as for instance in the Golden-fronted Woodpecker, which has a golden-yellow frontlet.

Fuscous.—A rather indefinite dark brown color.

G

Gape.—Opening of the mouth.

Genus.—A systematic group, standing in scientific classification above species and below family; a group of closely related species.

Geographic variation. — Modification of form, size, or coloration of individuals of a widely-distributed species in different localities, caused by influences of difference in food, climate, temperature, humidity, etc., resulting in geographical races which, through isolation or splitting of range by natural barriers, eventually may produce different species.

Globular.—Globe-shaped; having the shape of a globe or sphere.

Gorget.—An ornamental throat patch, usually distinguished by texture or color, as the gorget of hummingbirds.

Graduated tail.—Middle feathers longest, the remainder successively shorter as they approach the outer tail feathers.

Greater wing-coverts.—Series of wing-coverts which overlap base of secondaries; same as secondary coverts.

Gregarious.—Assembling or associating in flocks.

Grooved.—Furrowed or cut with a depressed channel.

Ground-color.—Used, chiefly in oölogy, to describe the prevailing color of the general surface.

H

Habitat.—The region or locality inhabited by a species.

Habits.—Customs or practices, acquired by frequent repetition, with increased facility for performance; the regular, normal actions of the bird in feeding, breeding, migrating, and living through its life-cycle.

Histology.—Minute anatomy.

Homology.—Alike in structure, structural affinity, as opposed to the superficial resemblance of analogy.

Hooded.—Head conspicuously different in color from remainder of plumage.

Hover.—To move the wings so as to remain suspended in the air; to hang on the wing, fluttering, in the air; to move to and fro near a place, threateningly or watchfully.

Humid.—Damp or moist.

Hybrid.—An intermediate form between two species caused by interbreeding; progeny produced by mating of two distinct species.

Hypothesis.—Presumption to account for something not understood, which though reasonable, is not based on facts; see "Theory."

I

Identification.—The determination of a species or subspecies to which a given specimen belongs.

Immature.—A bird which has not yet attained its full growth and adult plumage.

Incubation.—Act of a bird sitting on eggs to produce necessary temperature to hatch them; in oölogy, refers to degree of development of embryo caused by incubation, or length of time eggs have been incubated.

Insectivorous.—Feeding upon insect-life.

Intergrades.—To merge from one to another gradually through a series of forms or kinds, varying only with related differences.

Intermediates.—A specimen intervening between others of a series; said of a specimen bearing characters of one subspecies and some characters of another.

Iridescent.—Tints or changeable colors varying with different inclinations to light.

Iris.—Circle, usually colored, surrounding black pupil of eye.

Irregular.—Not according to rule; not normal; unnatural; erratic.

J

Jaw-line.—Used generally to indicate a mark of distinct color on the lower part of the side of the head, generally running back from the base of the lower mandible.

L

Labored flight.—Flight that shows effort; laborious, distressed, keeping up with difficulty.

Lamellae.—Thin plates or scales; usually used to indicate particular construction of the edge of a bill.

Lateral.—Toward or on the side of a thing.

Lesser wing-coverts.—Tract of feathers forming patch between anterior border of middle wing and middle coverts.

Life zone.—When a number of plants and animals are limited in distribution by greater or less degree of temperature, especially during the reproductive season, they are considered as occupying the same life-zone.

Lining of Wing.—Used to refer, collectively, to under wing-coverts.

Llano Estacado.—Spanish for "Staked Plains," the name given the plains of northwestern Texas after they had been surveyed or staked off; said, also, because of the stake-like flower-stalks of the Spanish dagger, which occurs on such plains.

Lobate. — Furnished with lobes, or membraneous flaps, as the toes of coots and grebes.

Lobes of toes.—The membraneous flaps along the sides of toes which assist in swimming.

Loose companies.—Not dense, close or compact flocks, but rather unorganized, irregular troupes of birds.

Lores.—The space between the eyes and the bill of a bird.

M

Malar region. — A usually distinct, well-defined area on the side of the lower jaw, extending backward from the horny covering of the lower mandible; usually feathered.

Mandible.—One of the two divisions of the beak or bill of a bird; ordinarily used to refer to lower jaw.

Mantle.—Part of the upper plumage distinguished from other parts of the body by peculiar and uniform color, suggesting mantle thrown over the back; usually restricted to back, scapulars, and wings. Especially distinguishable among the gulls.

Marbled.—A confused blending of irregular spots and streaks; suggesting the variegation of marble; distinctly varied with irregular markings, more definite than in clouding.

Marine.—Pertaining to the sea.

Maxillary.—Referring to the jaw, usually the upper one, sometimes called upper mandible.

Median.—Along the middle line; used in referring to a stripe on top of the head.

Melanism. — Replacement of normal plumage colors with black or dusky color, resulting from excess of black or dark pigment.

Metallic.—Used in referring to colors having brilliant appearance; for instance, feathers with bluish, greenish, or bronze sheen.

Migrant.—A bird which migrates or passes periodically from one region or climate to another for feeding or breeding. And, as applicable to a given region, a bird whose stay is brief, fleeting, or for but a short time, passing through during the migratory seasons in spring and fall while on its way north in spring and south in fall; a species which summers north of the region and spends the winter to the south, not found in the region in winter or summer.

Migration.—Change of abode at regular periods, usually caused by seasonal changes in climate, resulting in a moving southward in fall on approach of cold weather and moving northward in spring on approach of warm weather; irregular or erratic migration is caused by necessity for locating new food supply. Warblers, orioles, tanagers, and vireos are examples of the first class, or periodical migrants; the Passenger Pigeon, the Cedar Waxwing, and the robins, examples of erratic or irregular migrants.

Molt.—The periodic shedding of old feathers for new.

Monograph. — A special treatise or thesis upon a given subject, which has been exhaustively investigated.

Morphology.—Science of structure and form, used as a basis for homology.

Mottled.—Marked with different colors in a blotchy manner.

Moustaches.—A conspicuous stripe on each side of the head beneath the eye.

Mouth-edge.—Edges of the opening between upper and lower mandibles of a bird's bill, particularly parts edged with flesh or feathers.

N

Nape.—Upper portion of hind-neck.

Nasal tufts.—Tufts of feathers or hair at the nostrils.

Natural Classification.—See Classification.

Neck-tufts.—Special patches of feathers on the side of the neck, as in the Prairie Chicken.

Nidification.—Nest-building and nesting habits.

Nocturnal.—Seeking food or moving about during the night.

Nomenclature.—The system of Latin and Greek names applied to the various groups and species of birds, and other animals, by scientific ornithologists and other biologists.

Nuchal.—Referring or pertaining to the neck.

Nuptial.—Referring to the breeding or mating and its season.

Nuptial plumes. — Highly ornamental feathers, worn only during breeding season, such as aigrettes of egrets and herons, and certain filamentous crest feathers of cormorants.

O

Oblong.—Elongate; longer in one direction than another.

Obscure. — Inconspicuous, shaded, clouded, shadowy, indistinct.

Occipital band.—A band of conspicuous color across the back of the head.

Occiput. — Back of head, between crown and nape.

Occurrence. — An incident or event, generally unexpected; used to indicate the season of a bird's appearance and residence in a region, and the regularity of such appearance.

Ochraceous.—A brownish-orange or intense buff color.

Oesophagus.—That part of the alimentary or food-canal connecting the bird's mouth-cavity with its stomach or gizzard.

Omnivorous.—Feeding or eating indiscriminately, upon anything that can be eaten.

Oologist.—One versed in oölogy, or the science of bird eggs, comprising a knowledge of their size, shape, coloring, number, etc.

Oology.—The science of bird eggs.

Opaque. — Impervious to light rays; not transparent.

Order.—A systematic group of families, closely related, and possessing characteristic peculiarities which distinguish them from groups of other families; in scientific classification, a group midway between class and family.

Ornithologist.—One skilled in ornithology; a student of ornithology; one who describes birds.

Ornithology. — The science of birds, comprising a knowledge of their form, structure, classification, habits, and uses.

Ornithotomy.—Anatomy of birds.

Outer primaries.—The long quills or flight feathers toward the front of a bird's wing in flight, toward the ventral surface in the folded wing.

Outer tail-feathers. — Generally used to point out conspicuous difference between the side feathers of the tail and those in the center.

Outer web.—The web of a feather farthest away from the central line of the body; the web between the outer and middle front toes on the foot of a bird.

Oval.—Equal-ended; both ends of similar contour.

Ovate.—One end more pointed than the other.

Ovoid.—Egg-shaped, with one end more pointed than the other.

P

Palmate. — Three front toes fully webbed.

Parasite. — In ornithology, a bird which obtains its food by robbing other birds; in oölogy, a species which deposits its egg in the nest of another species, and which itself performs none of the duties of incubation or rearing of young, forcing the host species to rear its offspring.

Passerine.—Pertaining to the Order Passeres, or perching birds.

Pectoral band.—A band across the breast; generally of a rather noticeable difference in color.

Pendulous. — Hanging or swinging downward; overhanging.

Pensile.—Hanging or suspended, as the hanging nests of certain birds.

Perching.—Lighting or resting on the twigs of plants, with three toes in front and one behind.

Periscope. — An optical instrument used on submarines to permit of a view out over the water when the boat is submerged.

Permanent resident.—A bird which both nests and finds its food throughout the year in a given region.

Phalanx.—A segment or joint in the toe; plural, phalanges.

Phase.—One of the two forms of plumage of a dichromatic species, as the gray phase of the Screech Owl.

Physiology.—Science of bodily functions.

Pileum. — The cap or whole top of head, from bill to nape, including forehead, crown, and occiput.

Pinnate. — Furnished with wing-like tufts of elongated feathers on side of neck.

Pin-tailed. — Central tail feathers elongated and very narrowly tapering to a point.

Plumage.—The general feathering of a bird's body.

Plumbeous.—A deep bluish-gray color, like tarnished lead.

Plumula.—Down-feather.

Pointed-ovate.—An egg with one end more distinctly pointed than is usual with an average egg.

Polyandrous. — The possession by a female of more than one mate at the same time.

Postnuptial migrant.—A bird which, before its fall migration to the South, wanders irregularly after the breeding season is over. For example, many herons and ibises nest in the coastal swamps and marshes of southeastern and southern Texas; immediately after their nesting season they wander inland in a northwesterly direction, frequently following the rivers upstream.

Posterior.—Used in indicating points on the body, particularly the hind parts; those parts toward the tail or back end of the body.

Pot-hunter.—One who hunts for the kitchen pot, for food; generally one who recognizes no standards of sportsmanship in hunting, but who secures his birds any way he can; one who shoots sitting birds grouped together.

Powder-down feathers. — Matted patches of peculiar, imperfect greasy feathers, usually growing on interspaces between tracts of true feathers; found most generally in herons.

Praecocial.—Having the faculty of running about and feeding immediately after emerging from the egg shell, as the young of the domestic hen.

Preen.—To dress or trim the feathers with the beak.

Primary.—Any one of the quills attached to the outer- or hand-joint of wing.

Primary coverts. — Series of stiff feathers overlying basal portion of primaries, with which they correspond in graduation.

Primary tips.—The extremities or tips of the quills or flight-feathers.

Pteryla.—A feather tract, or area on the skin of a bird on which feathers grow.

Pterylosis.—Distribution of plumage on skin.

Ptilosis.—Plumage.

Q

Quills.—The larger wing feathers.

R

Race.—Subspecies or nascent species, or species in the forming, which cannot be named as distinct species, no matter how great the difference between them and others within the same species, because of the existence of intermediates or regular lines of gradation; divided into two kinds, geographical and local races, the former occupying extensive geographical areas, the latter limited areas.

Ragged.—Of rough or uneven edges or surface.

Range.—The region throughout which an animal naturally lives.

Rare.—Unusual; seldom met with or occurring; not frequent; one or two observed by an observer only occasionally.

Recurved.—Bent or curved upward in a regular manner.

Regurgitate.—To throw up or cast out of the stomach.

Resident.—A bird found regularly in a region all the year round; also used to indicate spring and summer residents, when used with the seasonal names.

Rictal bristles.—Hairs which form a bristly moustache line along the back corner of the mouth.

Rookery.—The breeding place of gregarious birds.

Rostrum.—The beak.

Rounded ovate. — Rather shortened egg-shape.

Rudimentary.—Imperfectly developed; development only begun.

Rufescent.—Reddish or tinged with reddish-bronze.

Ruff-feathers.—A collar or modified or elongated feathers on or about the neck.

Rufous-brown.—A reddish-brown or brownish-red.

Rump-patch.—A more or less conspicuous patch of different color on the upper surface, between the back and the base of the tail.

S

Sauropsida. — A great, primary or basis group of vertebrate animals comprising birds and reptiles.

Scaly.—Used in referring to plumage marked with thin black crescents, giving it the appearance of being scaly; also, the arrangement of plates or scales on the tarsus.

Scapulars.—Feathers of the scapular or shoulder blade region.

Scarce.—At some time previous the species was common, but at the present time it occurs in diminished numbers.

Secondaries.—The long quill feathers which grow on the forearm, and which, when the wing is spread, form a continuous row with the primaries.

Secondary coverts.—The greater wing coverts; row of feathers which overlie the basal portion of the secondaries.

Semi-graduated.—Cuneate; used in referring to a tail with central feathers longer than those on each side, which become gradually shorter and shorter toward the outside.

Semi-pendant.—Partially hanging, but braced for its upper part; used in referring to certain nests, such as those of the vireos.

Semi-pensile.—Half suspended, as with the nest of certain of the orioles.

Semi-terrestrial. — Spending a large part of the time on the ground.

Serrate.—Saw-toothed.

Shaft.—The mid-rib of a feather, particularly that of a quill or flight-feather.

Shoulder-patch.—A patch of distinctive color on shoulder or bend of closed wing.

Sign.—Any character of figure used to denote a word: ♂ male; ♀ female; o young; ? doubt; ! certainty; and, in synonymy, > more than, and < less than.

Sociable.—Companionable and friendly; capable of being united in one company.

Species.—The aggregate or mass of individuals, genetically related, all bearing characteristic features which distinguish them from all other similar masses of individuals.

Speculum.—A bright-colored or mirror-like patch or area on or comprising the secondary wing feathers of many ducks.

Spike-tail. — Having the tail-feathers stiffened and pointed, or with the central tail-feathers much longer and narrower than the others.

Straggler.—A bird that strays out of its usual range, or straggles or departs from the proper range or course of its spring or fall migrations, and whose presence in the region is accidental.

Streak.—A narrow stripe or longitudinal mark of color.

Stripe.—A broad streak or longitudinal mark of color.

Subspecific character.—The distinctive markings, measurements, and other points by which a given subspecies is distinguished from all other forms of the same species.

Subspherical.—Almost rounded, though slightly longer one way than the other.

Subterminal band.—A band of distinctive color across the tail, near the free end or tip, which is usually the same color as the main body of the tail.

Subtropical.—Pertaining to or designating the regions bordering on the tropics, the warmest belt around the world.

Summer resident.—A bird that spends the summer in a region, arriving from the south in the spring and departing to the south in the fall; not found in winter. Usually taken to mean a bird which nests in the region.

Summer visitor.—A species which wanders after its breeding season, coming into the region from its breeding grounds to the south or southeast.

Synonym.—A generic or specific name unavailable for use in natural history nomenclature by reason of its having been proposed as such name subsequent to another name which applies to the same genus or species, whichever the case may be; there are several other reasons why such names become unavailable.

Synonymy.—In the study of a genus or species, the collection of synonyms which have been applied to such genus or species.

Synopsis. — A short, comprehensive treatment of a subject, using only leading points.

T

Tail-base.—That region on the body of a bird to which the tail is attached.

Tail coverts.—Feathers which overlap the upper and lower surfaces of the base of the long tail feathers of a bird.

Tail-spines.—The free-tips of shafts of the tail-feathers, sticking out beyond the feather-vane, as in the tails of certain swifts.

Tarsal.—Pertaining to the tarsus, that portion of the leg and foot of a bird connecting the "heel" with the base of the toes.

Tarsus.—The division of the bird's leg below the tibia, or drumstick, and to the end of which the toes are attacked.

Tawny.—The color of tanned leather.

Taxidermist.—A preparateur or preserver of the skins of animals imitating in such preparation their appearance in life.

Taxidermy.—The art of preparing the skins of animals in imitation of their appearance in life and preserving them.

Taxonomy.—Science of classification.

Teleology. — Science of adaptation, used as a basis for analogy.

Terminal.—Situated at the free end of extremity.

Thumb-marks.—Small spots of conspicuously different color, usually white against a dark ground, shaped like a thumb-print or a half thumb-nail.

Tolerably common.—Common in moderate numbers only; about 5 may be seen by an observer in a day.

Transient visitant.—Same as "Migrant." See "Migrant."

Trinomial. — A name composed of three terms designating a variety or geographical or local race of a species; a generic name, a specific name, and a subspecific name.

Trough-shaped.—Depressed or boat-shaped, with walls rising on either side, as in cattle-trough; used in describing the tails of certain birds.

Tuft.—A small cluster of elongate, flexible feathers.

Type.—The type of a species is the specimen from which the species was originally described; the type of a genus is the species which is named as the standard for that genus, or from which description of generic characters have been taken; the type form of a higher group is that which answers best to the diagnosis for such group.

Typical.—Agreeing closely with diagnosis of characters distinguishing a group, genus, or species.

U

Uncommon.—Not common, but occurs too frequently to be rare; 1 or 2 may be seen by an observer in a day.

Under-parts.—The entire under-surface of a bird's plumage from chin to under-tail-coverts, inclusive.

Under tail-coverts.—The feathers immediately beneath the base of the tail.

Upper-parts.—The entire upper surface of a bird's plumage, from forehead to tail, inclusive.

V

Vane.—The whole of a feather except the stem.

Variety.—Often, though erroneously, applied to subspecies or geographical races. When properly used, an individual or a series of individuals which differ by irregular and unusual variation from the normal type of form or coloration for the species, for instance, various breeds of domesticated animals.

Vinaceous.—A soft, delicate, brownish or wine-colored pink, or delicate brownish-purple color.

Visitor. — A bird not resident in a given region at any season, but which appears there at regular or irregular intervals for a limited period; as, a winter visitor.

W

Web.—Either one of the lateral wing-like halves of the vane of a feather, exclusive of the shaft.

Webs of toes.—The skin-like membrane extending from toe to toe in the feet of certain birds, such as ducks and geese.

Wing bar.—A band or strip of color across the base of the wing, formed by the tips of the secondaries. There are usually two wing-bars on each wing of the species which have them.

Wing-bend.—The anterior point of the folded wing, corresponding to the bend of the wrist of man.

Wing-coverts. — The small feathers covering the base of the flight feathers (primaries, secondaries, and tertials) both on outer and inner surface of the wing.

Wing-expanse.—The extent of the expanded wings, stretched out to each side of body.

Wing-lining.—The small feathers or under-coverts on the inner or under surface of the wing itself.

Wing-patch.—A conspicuous patch of color, situated at the tips of the greater wing-coverts on the wing.

Winter resident.—A bird that spends the winter in a region, arriving from the north in fall and going north in spring; not found in the region in summer, but nests in regions farther north.

Winter visitant.—A bird that may visit a region at irregular intervals during winter, or which may straggle as far south as the region at rare times during many years, perhaps driven south by unusually severe winter weather.

Z

Zone.—A band or strip on the earth's surface, which, through distance from the equator, altitude, temperature, and winds, has become the habitat of certain plants and animals found in no other strip of different characteristic. Also used to designate a broad band of color in a bird's plumage; usually completely encircling the body on which it lies, such as the tail of a bird.

Zoology.—Natural history of animals.

LIST OF USEFUL BOOKS ON BIRDS

General Works

American Ornithologists' Union. Check-List of North American Birds. Third Edition (1910). 430 pp., 2 maps. $2.75. Address: Dr. Jonathan Dwight, Jr., 134 West 71st Street, New York City.

Apgar, Austin Craig. Birds of the United States East of the Rocky Mountains. 1893. American Book Company, New York City. $2.

Bailey, Florence Merriam. Handbook of Birds of the Western United States. Fourth Edition (1915). 570 pp., 36 plates, 601 text figures. Houghton, Mifflin & Company, Boston, Massachusetts. $3.50.

Bailey, Vernon. Biological Survey of Texas. North American Fauna No. 25, Bureau of Biological Survey, U. S. Department of Agriculture. 1905. Supt. of Pub. Doc., Washington, D. C. 50 cents.

Beebe, Charles William. The Bird: Its Form and Function. 1906. 496 pp., ills. Henry Holt & Company, New York City. $3.50.

Bendire, Charles Emil. Life Histories of North American Birds. 2 vols.: Vol. I, 1892, 414 pp.; Vol. II, 1895, 508 pp. Smithsonian Institution, U. S. National Museum. Detail report on the Land Birds, through the Icteridae.

Chapman, Frank Michler. Handbook of Birds of Eastern North America. Revised Edition (1914). 530 pp., 1 map, 15 plates, 136 text figures. D. Appleton & Company, New York City. Cloth. $3.50; pocket ed. flex. mor., $4.

Chapman, Frank Michler. Color Key to North American Birds. Revised Edition (1912). 356 pp., upward of 800 Color Drawings. Doubleday, Page & Company, Garden City, New York. $2.50.

Chapman, Frank Michler. The Warblers of North America. Second Edition (1914). 300 pp., 24 full-page Colored Plates of all the Warblers, many half-tones. D. Appleton & Company, New York City. $3.

Cooke, Wells Woodbridge. Bird Migration in the Mississippi Valley. Bull. No. 2, Biological Survey. 1888. 313 pp.

Cooke, Wells Woodbridge. Distribution and Migration of North American Warblers. Bull. No. 18, Biological Survey. 1901. 142 pp. Supt. of Pub. Doc., Washington, D. C. 10 cents.

Cooke, Wells Woodbridge. Distribution and Migration of North American Ducks, Geese, and Swans. Bull. No. 26, Biological Survey. 1906. 90 pp. Supt. of Pub. Doc., Washington, D. C. 10 cents.

Cooke, Wells Woodbridge. Distribution and Migration of North American Shore Birds. Bull. No. 35, Biological Survey. 1910. Supt. of Pub. Doc., Washington, D. C. 20 cents.

Cooke, Wells Woodbridge. Distribution and Migration of North American Herons and Their Allies. Bull. No. 45, Biological Survey.

Coues, Elliott. Key to North American Birds. Fifth Edition (1903). 2 vols., 1152 pp., 200 ills. Dana Estes & Company, Boston, Massachusetts. $12.50. Valuable reference key to the birds of North America.

Davie, Oliver. Nests and Eggs of North American Birds. Fifth Edition, Revised (1900). 527 pp., 274 ills. David McKay, Philadelphia, Pennsylvania. $2.25.

Dugmore, Arthur Radcliffe. Bird Homes: The Nests, Etc., of Land Birds Breeding in the Eastern United States. 183 pp., numerous full-page ills. Doubleday, Page & Company, Garden City, New York. $2.

Herrick, Francis Hobart. Home Life of Wild Birds. Revised Edition (1905). 255 pp., ills. G. P. Putnam's Sons, New York City. $2.

Mathews, Ferdinand Schuyler. Field Book of Wild Birds and Their Music. 1904. 262 pp., ills. G. P. Putnam's Sons. $2.50.

Reed, Chester Albert. North American Birds' Eggs. 1904. 356 pp., many full-sized, photographic ills. of eggs of N. A. Birds. Doubleday, Page & Company, Garden City, New York. $2.50.

Reed, Chester Albert. Bird Guides. Oblong, postcard size. Doubleday, Page & Company. Part I, Water Birds, Game Birds, and Birds of Prey East of the Rockies; 250 pp., 230 ills. in color; flex. leath. cover, $1.25. Part II, Land Birds East of the Rockies; 197 pp., many ills.; flex. leath. cover, $1.

Ridgway, Robert. The Birds of North and Middle America. Bull. No. 50, U. S. National Museum, Washington, D. C. Issued in Parts, publication as yet unfinished. Part I, 1901; II, 1902; III, 1904; IV, 1907; V, 1911; VI, 1914; and VII, 1916.

Weed, Clarence Moores, and Dearborn, Ned. Birds in Their Relations to Man. A Manual of Economic Ornithology for the United States and Canada. With bibliography. 1903. 380 pp., ills. J. B. Lippincott Company, Philadelphia, Pennsylvania. $2.50.

Periodicals

Auk, The. Quarterly journal of the American Ornithologists' Union. Vol. 500 pp., half-tone ills. $3 per year. Address: Dr. Jonathan Dwight, Jr., 134 West 71st Street, New York City. American ornithology.

Bird-Lore. Bimonthly magazine of the Audubon Societies. Vol. 400 pp., 12 col. plates, numerous half-tones. $1 per year. D. Appleton & Company, New York City. United States ornithology.

Condor, The. Bimonthly magazine of the Cooper Ornithological Club. Vol. 250 pp., numerous half-tones. $1.50 per year. Address: Hollywood, California. Ornithology of the Western United States.

Oologist, The. Monthly. Vol. 160 pp., half-tone ills. 50 cents per year. Editor: R. M. Barnes, Lacon, Illinois.

Wilson Bulletin. Quarterly magazine of the Wilson Ornithological Club. Vol. 225 pp., half-tone ills. $1 per year. Address: Oberlin, Ohio. Mississippi Valley Ornithology.

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