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THE AVIFAUNA OF SOUTHEASTERN COAHUILA, MEXICO

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TABLE OF CONTENTS

	Page
LIST OF TABLES	v
Chapter	
I. HISTORY OF COAHUILA ORNITHOLOGY	1
II. PHYSIOGRAPHY	12
III. CLIMATE	15
IV. VEGETATION	19
V. CONIFER ISLAND HABITAT	30
VI. AFFINITIES OF THE AVIFAUNA	34
VII. SEASONAL CYCLE OF THE BIRDLIFE	37
VIII. SPECIES ACCOUNTS.....	41
LITERATURE CITED	126

LIST OF TABLES

Table	Page
1. Characteristic Breeding Birds of Conifer Islands	32

THE AVIFAUNA OF SOUTHEASTERN COAHUILA, MEXICO

CHAPTER I

HISTORY OF COAHUILA ORNITHOLOGY

Early Explorations

The year 1853 and the United States-Mexican Boundary Survey marked the beginning of Coahuila ornithology. During the summer of that year Lieutenant D. N. Couch made numerous observations and collected specimens at several localities in southern Coahuila, including Saltillo, Agua Nueva, and General Cepeda (then Patos). These specimens were deposited in the United States National Museum and were briefly reported by Baird, Cassin and Lawrence (1858) and later by Baird (1859) and Salvin and Godman (1879-1904).

The second major contribution was that of E. W. Nelson and E. A. Goldman. One or both of these workers made four collecting trips into Coahuila. Two of these trips were to the southeastern part of the state. Together they worked near La Ventura, Gómez Farías, the Sierra Encarnación and Carneros from July 17 to August 17, 1896. From April 14 to May 12, 1902, they collected in the vicinity of Saltillo and in the Sierra Guadalupe. Specimens were deposited in the United States National Museum and many of these have been cited in the several volumes of the "Birds of North and Middle America" by Ridgway and Friedmann.

Recent Investigations

On January 29 and 30, 1938, G. M. Sutton, T. D. Burleigh and J. B. Semple passed through southern Coahuila via Saltillo and La Rosa to Parras and San Pedro. A brief visit was made to Diamante Pass, via Ramos Arizpe, on March 6. Specimens were distributed among the collections of the Carnegie Museum, Cornell University, the United States National Museum and G. M. Sutton. The collection was reported on by Sutton and Burleigh (1939).

T. D. Burleigh, G. H. Lowery, Jr., M. L. Miles and S. M. Ray collected in the Saltillo area from April 12 to 25, 1941. On April 22 they made a brief visit to desert country some 20 miles west of Saltillo. This was the first intensive work in southeastern Coahuila and remained the most complete study until the present investigation was completed. Specimens were deposited in the collections of Louisiana State University, the United States National Museum and G. M. Sutton. Results of this work were published by Burleigh and Lowery (1942). Miles subsequently collected near Saltillo in 1952, depositing the specimens at Louisiana State University.

Dean Amadon and several associates collected near Las Delicias, southwestern Coahuila, and Saltillo, southeastern Coahuila, from August 8 to September 12, 1946. Specimens were deposited in the American Museum of Natural History and were reported on by Amadon and Phillips (1947).

Field parties from the University of Kansas have briefly visited Coahuila on several occasions in recent years. Most of these visits were for mammals and relatively few birds were collected. Twenty-two workers have collected bird specimens in various parts of the state (Urban, 1959).

Specimens were taken in southeastern Coahuila during the following periods: November 17-19, 1949; "June," 1951; June 24-27, 1952; April 13-30, 1953; January 7-16 and April 9-10, 1954; July 5-7, 1955. These skins and skeletons were deposited at the University of Kansas and have been reported on by Van Hoose (1955), Hardy and Dickerman (1955), Packard (1957), and Urban (1959).

F. G. Evenden, Jr. visited southeastern Coahuila and adjacent Zacatecas from March 4 to 8, 1951 and made observations in the Saltillo area and near Providencia and Terminal, Zacatecas. Several of his sight records have been published (1952) but he collected no specimens.

The Present Study

I first visited southeastern Coahuila from December 24, 1957 to January 1, 1958. At this time I arranged for future work in the area and made brief collecting trips to Las Vacas and La Rosa and to the desert surrounding Saltillo.

On June 13, 1958, I returned to the area and set up headquarters at Rancho Las Vacas, a former hacienda in an intermontane valley south of Saltillo. Senores Ricardo Davila, owner of the ranch, and Guillermo Herrera, its present manager, provided comfortable quarters and were highly cooperative during my stay there. For two months I worked the mountains and high valleys in the immediate area intensively. A thorough knowledge of the breeding birds of this area later proved invaluable when I worked other ranges. Short collecting trips were made to the desert country surrounding Saltillo and several longer trips were made to the low country near San Antonio de las Alazanas and to the conifer-covered slopes to the

east and across the border in Nuevo León. On August 10 I returned to the United States.

I returned to headquarters at Rancho Las Vacas on September 19 and concentrated on the late nesting season and the fall migration. During this period heavy rains and impassable roads hindered travel to other areas. However, I was able to spend a week in the Sierra Guadalupe and to make several trips to the mountains east of San Antonio de las Alazanas. During late October and early November I made a special effort to collect series of taxonomically difficult forms in fresh plumage. By November 19 winter populations seemed stable and I returned to the United States.

On April 16 I returned to the area and found quarters in Saltillo. During periods of heavy rain, work was concentrated in the desert country surrounding Saltillo and nearby towns. Intensive work was continued near Las Vacas and Rancho El Diamante. Two visits, totaling 10 days, were made into Zacatecas to Concepción del Oro, Providencia, and the surrounding mountains. A brief exploratory trip was made into low, desert country in northern San Luis Potosí. I also did considerable work in the desert country of extreme southern Coahuila near the villages of Agua Nueva, Carneros, and Gómez Farías, localities visited by Nelson and Goldman more than 60 years previously.

During May I spent a week collecting in the mountains east of San Antonio de las Alazanas. During this and shorter trips I was quartered at Rancho La Seberia. Brief visits were made from here to Mesa de las Tablas. A short pack trip was made into the Sierra Guadalupe from Rancho San Jose del Refugio at the north base of the range during early June. On June 13 I completed work and returned to the United States after a total

of just over 6 months work in southeastern Coahuila.

Collecting Localities

The following list includes all localities in southeastern Coahuila and adjacent Zacatecas at which major collections have been made by myself and others. I have visited all of the localities mentioned except La Ventura and Ávalos, most of them on several occasions. However, I worked chiefly above 7000 feet.

Mileage, except when otherwise noted, is airline or map mileage. Actual road mileage is often much greater, especially in mountainous areas with winding roads and long detours around unfavorable terrain. Actual road mileage from Las Vacas to Saltillo, for example, is 26 miles as compared with 8 miles airline.

I used two maps for my work in the area: 1) Mapa de Coahuila 1959, Edición 1957, escala 1:1,000,000 (which can be obtained in Saltillo book stores); and 2) Map No. N. G-14 (Monterrey) of the American Geographical Society, Provisional Edition, scale 1:1,000,000. Unfortunately, both maps have numerous minor errors.

Coahuila

Agua Nueva is a small village about 16 miles southwest of Saltillo at about 6300 feet. It is surrounded by Chihuahuan Desert Shrub and cultivated (usually irrigated) land, including orchards. It is reached by rail or highway 51 (unpaved) from Saltillo.

Arteaga is a small town about 9 miles east of Saltillo, just off highway 75, at about 5300 feet. It is surrounded by Chihuahuan Desert Shrub and cultivated (partly irrigated) land. Nearby are numerous small

tanks and a larger impoundment.

Bella Unión is a small village about 2 miles southeast of Arteaga at the base of the mountains. It is surrounded by Chihuahuan Desert Shrub and some cultivated (irrigated) land.

Carneros is a small village 8 miles south of Agua Nueva, and about 22 miles southwest of Saltillo. Reachable by rail or highway 51 from Saltillo, it is in a pass at 6900 feet. The region is arid but the mountains rise to at least 8000 feet and at higher elevations piñon-juniper replaces the yucca and more xeric vegetation. See also Goldman (1951: 129-130).

Chorro del Agua was formerly a waterfall in Flores Pass in the mountains south of Arteaga. It was destroyed when the construction of highway 75 diverted its water source.

Diamante Pass is a mountain pass at 7800 feet about 5 miles southeast of Saltillo. To the south, Mount Zapalinamé reaches a maximum elevation of 10,500 feet. To the north a low spur joins a second high ridge. Below the pass, Chihuahuan Desert Shrub merges into piñon-juniper-yucca and chaparral. Above the pass the original Montane Low Forest has been largely replaced by scrub oak, chaparral or piñon-juniper. Small groves of pines occur at higher elevations and small stands of fir, Douglas fir and cypress remain at the summit and in some steep ravines. The pass is reachable by dirt road from Saltillo (now impassable for wheeled vehicles), El Diamante and Las Vacas.

Diamante Valley is a broad V-shaped intermontane valley southeast of Saltillo, named from the Rancho El Diamante, which is at its west central edge. Las Vacas is at the point of the V, its greatest elevation

(7400 feet). The valley slopes northeastward around a small mountain to Flores Pass at about 6500 feet. Most of the valley is cultivated (wheat, corn, beans and apples). At lower elevations it is bordered by Chihuahuan Desert Shrub, at higher elevations by piñon-juniper-yucca or chaparral.

El Diamante is a small ranch below Diamante Pass at the western edge of the valley and about 7 miles southeast of Saltillo. It is reachable by dirt road from Flores Pass or from Las Vacas.

General Cepeda (formerly Patos) is a large town 30 miles west of Saltillo, reachable by rail or highways 60 and 74 from Saltillo. It is surrounded by Chihuahuan Desert Shrub and cultivated (irrigated) land.

La Rosa is a small village 25 miles northwest of Saltillo (on highway 60) and 15 miles north of General Cepeda. It is surrounded by Chihuahuan Desert Shrub and cultivated (largely irrigated) land.

La Ventura is a small village 25 miles southeast of Gómez Farías at about 5700 feet in Chihuahuan Desert Shrub. It is reachable by rail from Saltillo or by poor road from Gómez Farías. See also Goldman (1951: 130).

Las Vacas is a ranch 8 miles southeast of Saltillo and about $3\frac{1}{2}$ miles south of El Diamante. As a collecting locality it includes the ranch itself and the adjacent village of Sierra Hermosa, both of which are located at 7400 feet and surrounded by piñon-juniper and cultivated land. Mount Zapalinamé and a ridge to the south exceed 10,000 feet and converge to the west of the ranch buildings to form a small, very narrow valley. Piñon-juniper occurs to 8000 feet; chaparral-pine to 9000 or 9500 feet; and conifer forest above this. The virgin forests were cut after 1920 and have been largely replaced by chaparral and scrub oak. It is

best reached by dirt road from Flores Pass.

Gómez Fariás is a small village about 11 miles southeast of Carneros at about 6400 feet. It is surrounded by Chihuahuan Desert Shrub and by some cultivated land. It is reached by a spur of highway 51 from Saltillo.

Mesa de las Tablas is a small village about 39 miles southeast of Saltillo and 12 miles east of San Antonio de las Alazanas. The area in general resembles that around Las Vacas. The surrounding slopes are mainly cleared for grazing or cultivation, or covered with scrub oak and chaparral. High slopes have stands of conifer forest. Mesa de las Tablas is reached by a very poor road from San Antonio de las Alazanas.

Ramos Arizpe is a small town 10 miles north of Saltillo on highway 60. It is surrounded by Chihuahuan Desert Shrub and cultivated land. Small hills in the vicinity have a decidedly xeric vegetation.

Saltillo, the capital and largest city in Coahuila, is located on the desert plateau at 5200 feet. It is surrounded by Chihuahuan Desert Shrub and cultivated land. The mountains to the south have been described under Las Vacas and Diamante Pass; those to the north are lower in elevation and more xeric in nature. Saltillo is reached by highway 60 from Monterrey, Nuevo León, and by highway 75 from Piedras Negras. See also Goldman (1951:131-132).

San Antonio de las Alazanas is a large village in an intermontane valley east of Flores Pass and about 27 miles southeast of Saltillo. East of the Pass the broad valley rises gradually to 6000 feet, then more abruptly to about 7200 feet at the village. Despite its semi-arid nature the valley is an extensive wheat growing area. The ridges west of the

village are low and arid at their bases, but piñon-juniper flourishes above 7000 feet and some pines grow at the higher summits. To the east the valley rises steeply to over 9000 feet, then drops off into Nuevo León. Eleven miles east of town and at about 9000 feet is the small Rancho La Seberia. The ridge to the south of this ranch is massive, exceeding 12,000 feet in elevation. It is heavily forested though lumbered in the past and now largely second growth. Cut over areas and lower south slopes are covered with chaparral and scrub oak. Extensive stands of pines and Douglas fir occur from 9000 to 10,500 feet; above this the forest is largely Douglas fir and true fir. Potatoes, wheat and apples are grown in tiny plots on the steep slopes and in the narrow valley.

San José del Refugio is a small village about 11 miles southeast of General Cepeda and three miles southwest of La Paz at about 5500 feet elevation. It is at the north base of the Sierra Guadalupe and east of the mouth of Las Casitas Canyon. It is surrounded by Chihuahuan Desert Shrub and cultivated land. On a low ridge south of the village piñon-juniper grows above 5800 feet on the north slope and chaparral grows on the south slope. Succeeding ridges have piñon-juniper on both slopes and gradually merge into the foothills of the Sierra Guadalupe.

La Sierra Encarnación is a mountain range on the Zacatecas-Coahuila border, about 60 miles south of Saltillo and 30 miles east of Concepción del Oro, Zacatecas. It reaches a maximum elevation of about 10,000 feet. Residents insist that it was formerly well wooded near the summit, but it has been deforested except for piñon-juniper above 7500 feet and scattered trees in sheltered canyons and elsewhere. See also Goldman (1951: 132-133).

La Sierra Guadalupe is an extensive mountain mass some 10 miles south of General Cepeda and 35 miles southwest of Saltillo. It is composed of many steep ridges, most of which are aligned in an east-west axis. Las Casitas Cañon divides the range into eastern and western sections, the latter of which I visited. The mountains rise slowly from the desert, in a series of low foothills, to 7000 feet, then abruptly - often with precipitous cliffs - to over 10,000 feet. The lower slopes (to about 7500 feet) are covered with piñon-juniper. Remnants of Montane Low Forest are present to about 9000 feet and above this is Montane Mesic Forest, best developed in ravines. Cutting and burning have been extensive and most of the present forest is second growth. There are numerous small, grassy clearings (locally called playas) surrounded by pine and Douglas fir forests between 9000 and 10,000 feet. South slopes are more xeric. See also Goldman (1951: 133-135).

Zacatecas

Ávalos is a small railroad village 8 miles north of Concepción del Oro. It is surrounded by Chihuahuan Desert Shrub which becomes decidedly xeric on the hills nearby. Ávalos is reached by railroad from Saltillo or Concepción del Oro.

Concepción del Oro, the largest town in northeastern Zacatecas, is located 62 miles southwest of Saltillo at 8300 feet elevation. It is built in a high bowl surrounded by mountains, the highest of which (Timarosa) approaches 11,000 feet. Mining officials say that piñons and possibly small pines once grew on the upper slopes and in ravines of these mountains, but any such vegetation has been destroyed. Most slopes are now barren or covered with xeric chaparral. I visited one locality, six

miles southeast of town, where piñon-juniper covered several protected north slopes from 7500 feet to their summits at about 8000 feet. Lower elevations were covered with Chihuahuan Desert Shrub or chaparral. Concepción del Oro is reachable by railroad or highway 51 from Saltillo.

Providencia is a small mining town (9300 feet) on the northwest slope of Mount Timarosa just over the mountain from Concepción del Oro. The nearby mountains were deforested years ago when the mines of the area were dependent on steam power. At present, scattered remnants of Montane Low Forest occur in sheltered ravines, chiefly between 8000 and 8500 feet. Piñons occur on a grassy slope above the town at 9500 feet. Lower ridges across the valley to the south also have some piñon-juniper cover. South slopes and most of the steep north slopes are covered with a sparse, xeric chaparral. Providencia is reached by mountain road from Concepción del Oro via Terminal.

Terminal is a small town 5 miles southwest of Ávalos at 6700 feet. It is down slope from Providencia and is surrounded by Chihuahuan Desert Shrub. It is reached by road from Ávalos or Concepción del Oro.

CHAPTER II

PHYSIOGRAPHY

The state of Coahuila is in the northeastern portion of the Mexican Plateau just east of the continental axis. Two major mountain systems, the Rocky Mountain-Sierra Madre Axis (or Sierra del Carmen Axis) and the Parras-Salttillo Axis (Muller, 1947: 35) cross the state. The Carmen Axis, a discontinuous spur of the Sierra Madre Oriental, extends from southeast to northwest, a distance of some 325 miles, crossing the Río Grande into the United States. This system attains its greatest development in Nuevo León and extreme southeastern Coahuila (east of San Antonio de las Alazanas), where some peaks reach an elevation of over 12,000 feet. To the northwestward the mountains become more discontinuous and smaller, until some forty miles south of Monclova they give way to the broadly eroded plain of the Río Salado. The elevation here is from 2000 to 4000 feet, small ridges and buttes rising another thousand feet above the desert. North of Monclova the mountains again become massive, reaching a maximum elevation of 8800 feet (Miller, 1955: 155) to 10,000 feet (Goldman and Moore, 1945: 354) in the Sierra del Carmen.

The Parras-Salttillo Axis crosses the state in an east-west direction near its southern border. This system is also discontinuous and contains numerous peaks and ridges which exceed 10,000 feet in elevation. The most important of these are the Sierra Parras, Sierra Guadalupe and

Mount Zapalinamé, just south of Saltillo. Just north of this axis in western Coahuila is the Laguna Mayran, a huge undrained bolsón fed largely by the Río Nazas flowing from Durango. Although usually marked on maps as a laguna, it is normally arid desert except where irrigation is practiced.

West of the Carmen Axis, Coahuila is characterized by the Range and Basin topography (Muller, loc. cit.) of the Mesa del Norte. Broad, arid plains and basins alternate with numerous small mountain ranges. In central and northern Coahuila some of the larger of these ranges form minor north-south axes. The Sierra de la Madera-Sierra del Pino in north central Coahuila and the Sierra Mojada-Sierra de Hechiceros near the Chihuahua border are the best examples. The highest peaks in these ranges exceed 10,000 feet; between them the plains slope to the Río Grande at 2000 feet.

East of the Carmen Axis in northeastern Coahuila is the Serranías del Burro, an extensive mass of low (2000 to 7000 feet) mountains, which to the eastward gives way to the Gulf Coastal Plain.

The Río Grande at the northern border of the state, the Río Sabinas in northeastern Coahuila, and the Río Nazas in southwestern Coahuila are the principal rivers in the state. Streams and springs are rare throughout most of southeastern Coahuila. Even during the rainy season most streams flow only immediately after rains. Large springs feed streams in the vicinity of Saltillo and Arteaga. Permanent streams are present in the mountains east of San Antonio de las Alazanas and at Casitas in the Sierra Guadalupe. Small springs occur in nearly all of the mountain systems studied, usually near the bases of the mountains. Impoundments

are common, and these are often the only water source for ranches. Deep wells provide water for irrigation in many parts of southeastern Coahuila.

Baker (1956: 128-130) describes the physiography of Coahuila in considerable detail.

CHAPTER III

CLIMATE

The greater part of Coahuila is characterized by an arid continental climate. The several mountain systems have a great influence on the distribution of rainfall. The major rain-bearing winds reach Coahuila from the Gulf of Mexico. As these masses of moisture-laden air reach the mountains of the Carmen Axis they rise and cool and precipitation occurs, chiefly on the northern and eastern slopes. Rainfall decreases to the westward and very little falls in the low valleys of western Coahuila. Muller (1937: 992) found that in the Sierra Madre Oriental near southeastern Coahuila local convection currents produced the greatest amount of precipitation on the lee slopes. Adjacent ranges in Coahuila receive the heaviest rainfall of any place in the state. The Sierra Madre Occidental of western Chihuahua effectively blocks moisture-bearing winds from the Pacific Ocean, forming a rain shadow and causing very arid conditions in eastern Chihuahua and western Coahuila. The broad north-south valleys in western Coahuila allow the entrance of dry continental winds and further increase the aridity of this region. Precipitation over much of Coahuila, especially of the interior, is due mainly to local convectional storms along the major mountain masses.

Over much of Coahuila the annual fluctuations in precipitation are so great that the amount for any one year nearly always varies widely

from the mean. This is especially true of arid regions which may have long periods of drought broken by occasional but often very heavy rains. Shreve (1944: 108) has discussed the importance of season of rain in the development of various vegetation types in northern Mexico. He contrasts the vegetation of three localities (Monclova, Coahuila; Nogales, Sonora; and Ensenada, Baja California) each of which receives approximately 15 inches of rain annually, but due to its geographic position, at different seasons of the year. Monclova, with its summer rains, is characterized by arid scrub; Nogales, with its biseasonal (late winter and late summer) rains, by evergreen oaks; and Ensenada, with its winter rains, by chaparral.

The western and central three fourths of Coahuila are characterized by summer rains. Three fourths of the precipitation normally occurs from June to September, some occurs from October to December, and almost none occurs from January to May. The rainy seasons are prolonged in the northeastern and southeastern parts of the state. The annual rainfall east of the Carmen Axis in northeastern Coahuila probably exceeds 20 inches annually (Baker, 1956: 130). This amount decreases to 12 to 16 inches west of the mountains and finally to as low as 3 inches in the interior basins (Shreve, 1942: 236). In southeastern Coahuila precipitation is more general and some rain is recorded during every month of the year even at Saltillo on the upper edge of the desert. The mountains east of San Antonio de las Alazanas probably receive as much rainfall as the comparable elevations on Cerro Potosí, a few miles to the south. Estimated rainfall there, above 10,000 feet, is over 70 inches (Muller, 1939: 714).

Snow is rare on the desert plains surrounding Saltillo but is of common occurrence on the higher mountain ranges to the south, east of San

Antonio de las Alazanas, and in the Sierra Guadalupe. Heavy snow-falls are not uncommon in the latter two ranges. Goldman (1951: 134) states that frosts occurred during almost every month in the Sierra Guadalupe. This seems to be true also east of San Antonio de las Alazanas. At Las Vacas, at 7450 feet in an intermontane valley, frosts normally occur from October to March and snow-fall is usually light and of short duration.

Señor Ricardo Davila informed me that from about 1900 to 1940 he was able to produce good to excellent crops (corn, wheat, beans) at Rancho Las Vacas. This period was followed by some 15 years of drought during which the very little rain fell at scattered intervals, and few crops survived. In recent years the trend has reversed and precipitation is now "above normal." During the entire period that I worked in Coahuila rainfall was far above the expected, and much of the time I was hampered by rainy weather and impassable roads. During the fall of 1958 much of México, including parts of Coahuila, was plagued by heavy floods. This trend (if it is a trend) has been of too short duration to cause any noticeable change in vegetation types.

Any discussion of climate in mountainous areas is complicated by great differences within a relatively small area. Muller (1939: 693) found that "classifications [of climate] based solely on precipitation, temperature, and evaporation data can never be satisfactory for ecological purposes in mountainous areas for two reasons: 1) the data are insufficient and often quite lacking, and 2) the relationship between climate and biological phenomena does not lend itself to solution by mathematical formulae." I did not collect meteorological data while working in southeastern Coahuila. The classifications accepted by Muller (1939) for the Sierra

Madre Oriental in nearby Nuevo León are applicable to adjacent areas of Coahuila, and with minor adjustments can be applied to the mountain systems to the westward.

CHAPTER IV

VEGETATION

Several biologists have analyzed the Coahuila flora and fauna and attempted to explain the relationships between the two. Basically, the vegetation is determined by climatic and edaphic conditions, animal distribution by vegetational preferences. Some animals are limited to a very specific vegetation type and set of conditions. Others with less restrictive ecological preferences are found throughout a vegetational range including at one extreme lowland xerophytes, at the other conifer forests.

These faunal and floral analyses fall into one of two types or some combination of these two types. One method of analysis is concerned with large areas "characterized by isolation or by topographic or climatic peculiarities that tend to set them apart in contrast with adjoining areas, as centers of distribution" (Goldman, 1951: 311). This approach tends to show the affinities of the flora and fauna of these large areas and has resulted in the delineation of the Biotic Provinces as described by Goldman and Moore (1945) and Goldman (loc. cit.). A second system is concerned with species which are widespread in continuous range within areas of favorable environmental conditions and which therefore might occur on widely separated mountains (Goldman, loc. cit.). This approach tends to show in detail the dependence of most forms on specific vegetation types, and

results in the Life Zone concepts of Merriam (1898) and Goldman (loc. cit.). Both systems are valuable in ecological and distributional studies.

According to Goldman and Moore (1945: 349, map), Coahuila includes parts of the Chihuahuan-Zacatecan, Tamaulipan and Sierra Madre Oriental Biotic Provinces. The last named includes all of extreme southeastern Coahuila. The Chihuahuan-Zacatecan Province includes northeastern Zacatecas and the western part of southeastern Coahuila. All of the Life Zones present occur in the southeastern part of the state and in fact all are present in the Sierra Madre Oriental Province alone.

Baker (1956) suggested that the state might be divided physiographically into the Gulf Coastal Plain, the mountains, and the desert plains of the Mesa del Norte, these corresponding roughly to the Biotic Provinces of Goldman and Moore. However, for a detailed analysis of the mammalian fauna of the state, Baker used Merriam's Life Zones as major divisions and Muller's vegetation types (1947) as minor divisions. Urban (1959), in his analysis of the avifauna, used the Biotic Provinces as major divisions and the Life Zones as minor divisions. Despite the different approaches and different nomenclature both workers recognized the same major vegetation zones.

Two major works are concerned with vegetational analysis alone. Leopold (1950) divided temperate Mexico into five vegetation zones (Desert, Mesquite-Grassland, Chaparral, Pine and Oak Forest, Boreal Forest) and subdivided each of these according to their distinct plant communities. All of these major zones occur in Coahuila and all except Mesquite-Grassland are important in the southeastern part of the state. Muller classified the vegetation of Nuevo León (1939) and Coahuila (1947) in consid-

erable detail. He listed seven vegetational types, four of which (Chihuahuan Desert Shrub, Montane Chaparral, Montane Low Forest, Montane Mesic Forest) are important in southeastern Coahuila. Both workers recognized the same plant associations but delineated and named the various types differently.

It must be recognized that only rarely does a vegetation type have sharp and definite boundaries. Under normal conditions one type merges imperceptibly into another. A vegetation type can, however, be easily recognized when one is familiar with its characteristics. Edaphic conditions occasionally produce profound differences in an otherwise characteristic vegetation type. A gentle slope or level area may, for example, be grassland whereas an abrupt or broken slope in the same area and at the same altitude may have much herbaceous growth and either pinon-juniper or chaparral.

Of great importance also are the tremendous changes brought about by man's use and misuse of the land. Deforestation - by cutting, by fires, or by both - has destroyed or greatly reduced the forests on all of the mountains I visited in southeastern Coahuila. Mountain slopes thickly grown with scrub oak or chaparral are the usual result of heavy lumbering or fires. Where climatic conditions are favorable, natural reseeding occurs but often even these young trees are cut as saplings. Cultivation has destroyed or replaced any extensive grasslands which may have existed in the area formerly. At the same time irrigation has turned some desert areas into cultivated districts.

The following descriptions are of southeastern Coahuila and adjacent Zacatecas as they exist at present. Where possible I have noted

the probable conditions before exploitation by man. I feel that the avifauna of this area is best discussed in terms of Muller's vegetation types. I prefer to subdivide his Montane Low Forest into three elements: 1) Scrub Oak; 2) Piñon-juniper-yucca; and 3) Pine-oak-madroño. Representative plant collections made by me have been identified by authorities in the field and deposited in herbaria at Santa Barbara College and the University of Oklahoma.

Vegetation types are determined by factors too numerous to discuss in this paper. Certain basic ecological phenomena were apparent in all mountains that I visited. On north slopes rainfall increased with altitude resulting in more and more mesic vegetation at succeeding levels to about 10,000 to 10,500 feet. Above this elevation, runoff and evaporation were more rapid and tended to counteract increases in rainfall. This and perhaps temperature, ultra-violet light and other factors, resulted in a vegetation of simpler composition and a smaller variety of herbaceous growth at high elevations. Increased insolation and evaporation and decreased precipitation on south slopes resulted in higher temperatures and more arid conditions. In extreme cases a very xeric chaparral may cover an entire south slope to above 10,500 feet abruptly meeting at the summit a Montane Forest of Douglas fir, fir and cypress from the north slope.

Chihuahuan Desert Shrub

This vegetation type (=Central Plateau Desert Shrub of Muller, 1939: 716), occupies the plains and basins of the northern, western and southern three fourths of the state. The soil is usually shallow, stony, often of limestone derivation and with few deep soil pockets. The vegetation type is characterized by low, widely spaced, often thorny perennial

shrubs and ephemeral annuals. The latter are conspicuous only immediately after heavy rains. The climate for this vegetation type is warm and arid (Muller, 1939: 716).

Creosote bush (Larrea tridentata) is undoubtedly the most abundant, widespread and characteristic plant of this vegetation type. Other important constituents include ocotillo (Fouquieria splendens), several acacias (including Acacia vernicosa), mesquite (Prosopis juliflora), yuccas (including Yucca torreyi) and other desert shrubs. The species composition and importance of any one species are highly variable throughout this vegetation type as a result of soil moisture, soil derivation, and steepness of slope. Very dense stands of shrubs often occur on pockets of deep soil. In southeastern Coahuila, this vegetation type with its variations occurs commonly to 5500 feet and locally to 6000 feet and higher, especially on limestone-derived soils and steep slopes. In this area it gradually gives way to Montane Chaparral or the Piñon-juniper-yucca element of Low Montane Forest. This transition occurs between 6000 and 7000 feet on north-facing slopes and at higher elevations on exposed south slopes.

There are now no extensive grasslands in southeastern Coahuila. Some of the cultivated valleys such as Diamante Valley (6000 to 7400 feet) may once have been grassland or a mixture of grassland and desert shrub. However, when water is available through irrigation or during rainy seasons, much of this desert shrub land is cultivated with varying degrees of success, down to 5000 feet.

Breeding birds restricted to this vegetation type in southeastern Coahuila included: Speotyto cunicularia, Pyrocephalus rubinus, Corvus

cryptoleucus, Auriparus flaviceps, Polioptila melanura, Pyrrhuloxia sinuata, Guiraca caerulea, Chondestes grammacus and Amphispiza bilineata.

Montane Low Forest

As described by Muller (1947: 48-52) this vegetation type is the regional counterpart of encinal in Chihuahua (Shreve, 1939) and the piñon-juniper-oak woodland zone in the southwestern United States (Mc Dougall and Sperry, 1951: 1). It is characterized by "an open stand of low trees with rounded crowns, usually gnarled branches, and trunks less than one foot in diameter, the development of a copious grass cover, and the presence of one or more species of Agave of the Applanatae relationship." (Muller, 1947: 50). As would be expected, this vegetation type is very heterogeneous. Its composition varies considerably from northern to southern Coahuila and its affinities are with the Trans-Pecos of Texas and with Nuevo León, respectively. In southeastern Coahuila the species composition and relative importance of various species vary considerably from mountain to mountain, but the characteristics of the vegetation type remain.

As stated previously, I have divided this vegetation type into three elements (Piñon-juniper-yucca; Pine-oak-madroño; Scrub oak) though I doubt that all were of equal importance under primitive conditions. The entire area has been affected by man for many generations, and little if any of its primitive nature remains. At any rate, the following elements occur at the present time, and two of these have distinctive faunal components.

Piñon-juniper-yucca

This plant association is prevalent on most of the mountains in

southeastern Coahuila and near Concepción del Oro, Zacatecas. Scattered piñons (Pinus cembroides) and junipers (Juniperus monosperma) grow from 6500 to 6800 feet on north slopes. At this elevation they are outnumbered by several yuccas (including Yucca elata and Y. carnerosana), catclaw (Acacia constricta), algerita (Mahonia trifoliata) and other scrub elements. Most of the thorny shrubs disappear by 7000 feet except along arroyos and ravines. Juniperus monosperma becomes rare at 7800 feet and is seldom present above this elevation. Alligator juniper (J. pachyphoea) and drooping juniper (J. flaccida) are present from 7000 to 8500 feet, chiefly on north slopes, the former being more abundant at higher elevations.

Near Las Vacas, piñons are most abundant between 7500 and 8000 feet, but some are present on ridges to 9000 feet. South of Concepción del Oro piñons are present to 9700 feet on at least one ridge. On south slopes a few piñons extend up arroyos and draws to 7500 feet but are usually displaced by a more xeric association of yuccas, agaves and magueys, or chaparral. According to Pearson (1920: 293), piñon-juniper forest is limited downward by deficient moisture and upward by low temperature. On the Sierra Guadalupe this element gives way to pine-oak-madroño at about 7500 feet on north slopes. Near Las Vacas it is usually replaced by chaparral, scrub oaks or larger pines and madroño. In high valleys the transition is sometimes directly to Arizona pine (Pinus arizonica) and Douglas fir (Pseudotsuga taxifolia).

Breeding birds restricted to this habitat in southeastern Coahuila were Sialia mexicana and Poliioptila caerulea.

Pine-oak-madroño

This vegetation type is most clearly marked in the Sierra Guadalupe where it occurs between the piñon-juniper-yucca and higher conifer belts, chiefly in ravines and on north slopes between 7500 and 9000 feet. Several pines, including Arizona pine, and at least three species of oaks (Quercus omissa, Q. saltillensis and Q. pringlei) together with madroño (Arbutus xalapensis) are the major species in this area. Steep, rocky slopes and south slopes have a more xeric vegetation which includes several agaves and sotols.

Probably as a result of heavy and continued cutting, this association is relatively uncommon in the mountains south of Saltillo and east of San Antonio de las Alazanas. Traces do occur between 8000 and 9500 feet, usually on north slopes. The same is true in the mountains near Concepción del Oro, where it usually occurs in ravines. Here the oaks are larger and a wild cherry (Prunus capuli) is common.

Breeding birds restricted to this habitat in southeastern Coahuila were Melanerpes formicivorus and Setophaga picta.

Scrub Oak

This association consists of the chaparral oaks and occasionally Rhus, Cowania, Cercocarpus or other chaparral genera. In many respects it is a depauperate chaparral in which oaks are very dominant. It is widespread, apparently as the vegetation immediately following deforestation. It occurs in clearings, under pines and even under high conifer forest. Stands of dense shrubby oaks, or encinal, are common on many ridges at any altitude between 8000 and 10,500 feet. Leopold (1950: 511) described a similar association as a subtype of his Pine and Oak Forest [Montane Low Forest]. He stated that it usually occurred at the lower fringe of

the pine-oak zone adjacent to the semi-arid foothills. My observations suggest that the present distribution of scrub oak is highly artificial and largely the result of man's activities.

No breeding birds were restricted to this habitat. Most of the chaparral species bred here, usually where the scrub oak bordered another vegetation type.

Montane Chaparral

Muller (1939: 702) lists the following characteristics for this vegetation type: "1) shrub habit, 2) importance of evergreen species, 3) density of plant cover, and 4) an altitudinal range subtended below by central plateau desert [= Chihuahuan Desert Shrub] and above by montane mesic forest or subalpine humid forest." The growth form and the genera represented indicate its close relationship to California chaparral.

In southeastern Coahuila chaparral is characterized by the presence of at least three species of oaks (Quercus hypoxantha, Q. pringlei, and Q. greggi), evergreen sumac (Rhus virens), Arbutus xalapensis and a second madroño in addition to some combination of at least several of the following: Cercocarpus, Cowania, Nolina, Yucca and Dasyllirion. This vegetation type in one or another of its forms occurs from 7000 or 7500 feet to at least 10,500 feet on most of the mountains visited. It was usually associated with steep slopes and shallow soils. It is apparently more widespread than formerly, since it often develops as a succession after deforestation. Muller (1939: 703) noted that under some conditions, in Nuevo León, this type could occur above mesic forest and even merge directly into subalpine forest.

The composition of chaparral is so varied from one area to another that a detailed description is impossible. Two types are prevalent in the area studied. Gentle and north slopes at moderate elevations, and some intermontane valleys, are characterized by a growth of large sumacs, several species of oaks and Cowania, often associated with piñon-juniper. Most exposed south slopes, however, have a more xeric chaparral in which Cercocarpus, Nolina, yuccas and similar forms are more important than the oaks. This type is especially prevalent on steep slopes. In arroyos, on gentler slopes, and on ridge tops, oaks are more dominant and sometimes form a dense encinal similar to, if not identical with, that discussed under Scrub Oak.

A number of bird species were primarily birds of chaparral, but only Geothlypis nelsoni was restricted to this habitat. Aphelocoma coerulescens, Psaltriparus melanotis, Vermivora crissalis and Pipilo erythrophthalmus, all birds of low undergrowth, were most abundant in areas where chaparral entered piñon-juniper-yucca or growths of larger trees.

Montane Mesic Forest

This vegetation type is characterized by the dominance of close-spaced trees with tall, straight trunks, closed crown canopy and poor development of grass and shrubs, except in clearings (Muller, 1947).

The soil of this vegetation type normally has a deep humus layer, except on steep, eroded slopes and on exposed ridge tops. The abundant rainfall and concomitant mesic conditions result in a dense ground cover of herbs and shrubs (oaks, dogwoods, and brambles) in clearings and even under some second growth forest. Natural reseeding is extensive and, especially east of San Antonio de las Alazanas, results in thick, almost

impenetrable groves of young Douglas fir.

It is characterized by one or two pines, usually Pinus arizonica and P. teocote, and Douglas fir. At higher elevations and on north slopes, fir (Abies coahuilensis) and cypress (Cupressus arizonica) are more common and may locally replace the pines and Douglas firs. Aspen (Populus tremuloides) is an important succession species chiefly between 9500 and 10,500 feet. Montane Mesic Forest is best developed on the massive ridges east of San Antonio de las Alazanas. It is not very extensive in the Sierra Guadalupe and occurs only in isolated groves on Mount Zapalinamé. In the Sierra Guadalupe, natural grassy meadows occur in tiny valleys and on level areas in conifer forest above 9500 feet. The extensive conifer belt east of San Antonio de las Alazanas has a very dense encinal undergrowth between 9000 and 10,500 feet.

Eleven miles east of San Antonio de las Alazanas the higher slopes above 10,500 feet approach the subalpine humid forest as described by Muller (1939: 703-704). Steep slopes are characterized by a forest of large firs and Pinus ayachuite and a low, dense herb cover. Near the summit a small, unidentified piñon and some low pines occur, but no timberline is reached.

A number of breeding bird species are restricted to one or another of the variants of this vegetation type. Rhynchopsitta pachyrhyncha, Otus flammeolus, Empidonax affinis, Cyanocitta stelleri, Sitta pygmaea, Troglodytes brunneicollis, Catharus occidentalis, Vermivora superciliosa, Peucedramus taeniatus and Spinus pinus were present only where this vegetation was well developed.

CHAPTER V

CONIFER ISLAND HABITAT

The bird populations of the conifer zones at high elevations east of San Antonio de las Alazanas are very similar to those of similar, nearly adjacent ranges in the Sierra Madre Oriental in Nuevo León. The mountains west and northwest of San Antonio de las Alazanas extend across Coahuila in broken chains and as a result the conifer habitat occurs only as "islands" at the summits of some of the higher ridges.

In southeastern Coahuila a series of these conifer islands extends in a shallow arc, some 120 miles in length, from the Sierra Madre Oriental to the mountains near Concepción del Oro, Zacatecas. The composition and extent of the conifer habitat, and therefore the distribution of the birds, differs somewhat from one island to another. A number of these bird species and their local distribution are shown in Table 1.

Conifer forests are found on the following:

1) Cerro Potosí - a massive mountain system in northwestern Nuevo León just west of the Sierra Madre Oriental and a part of that system. Conifer forests are extensive and very well developed. Records listed here are from the published literature.

2) Mountains east of San Antonio de las Alazanas - described previously under vegetation and locality. Conifer forests here are extensive and well developed though largely of second growth. These mountains are

essentially a part of the Sierra Madre Oriental. Piñon-juniper is limited to low elevations.

3) Mount Zapalinamé - previously described under Las Vacas and Diamante Pass. High conifers are limited to small groves at the summit and are largely of second growth. Poorly developed pines occur from 8000 to 9000 feet. Piñon-juniper occurs from 6800 to 8000 feet.

4) Sierra Guadalupe - previously described under locality and vegetation. High conifers occur above 9000 feet, largely as second growth, but are extensive. Pine-oak occurs from 8000 to 9000 feet and piñon-juniper from 6500 to 8000 feet.

5) Concepción del Oro - previously described under locality. No high conifers occur at present and it is doubtful if any have occurred within historical times. Now largely deforested. Records refer to piñon-juniper (7500 to 8000 feet) 6 miles southeast of town and to scattered pine-oak and piñon above Providencia (above 9000 feet).

Areas 1, 2, 3, and 5 are a direct part of the arc previously discussed. The Sierra Guadalupe is some 60 miles due north of Concepción del Oro and about the same distance from the Sierra Madre Oriental. However, it possesses much more extensive conifer zones, especially high conifers, than either Concepción del Oro, or Mount Zapalinamé, some 35 miles to the northeast.

Table 1 shows that some bird species, notably Vermivora superciliosa, Atlapetes pileatus and Catharus occidentalis were restricted to extensive, well developed conifer areas adjacent to the main Sierra Madre Oriental. At the same time other species, including Certhia familiaris, Empidonax affinis and Parus sclateri, occurred on all ranges which had at

TABLE I
CHARACTERISTIC BREEDING BIRDS OF CONIFER ISLANDS

Species	Conifer Forest No.				
	1	2	3	4	5
<i>Dendrocopos villosus</i>	?	***	**	***	0
<i>Empidonax affinis</i>	?	***	**	***	0
<i>Empidonax difficilis</i>	**	**	**	**	0
<i>Aphelocoma ultramarina</i>	**	**	***	**	0
<i>Parus sclateri</i>	**	***	***	***	0
<i>Sitta pygmaea</i>	**	**	*	?	0
<i>Certhia familiaris</i>	**	**	*	**	0
<i>Troglodytes brunneicollis</i>	?	***	**	***	0
<i>Catharus occidentalis</i>	?	**	0	0	0
<i>Vermivora superciliosa</i>	**	**	0	0	0
<i>Peucedramus taeniatus</i>	**	***	**	***	0
<i>Atlapetes pileatus</i>	**	*	0	0	0
<i>Junco phaeonotus</i>	?	***	***	***	*

- * Breeds locally in small numbers
- ** Widely distributed in moderate numbers
- *** Common and conspicuous throughout the habitat
- 0 Not present as a breeding species
- ? Data lacking or inconclusive

least small areas of large conifers. These species are not known, at present, to breed on similar conifer islands to the north and west in other parts of Coahuila, although they may possibly do so. Other species such as Peucedramus taeniatus, Empidonax difficilis and Troglodytes brunneicollis bred in all areas of high conifers and occurred also on conifer islands in central and northern Coahuila.

A few species such as Junco phaeonotus occurred on all ranges visited and appeared equally at home in thick fir forest or sparse piñons. The requirements of these species are apparently less rigid than those of many other conifer-inhabiting species.

In summary, the continuing impoverishment of the avifauna of the various conifer islands along the east-west arc seems dependent on the continuing reduction of available habitat rather than on mere distance from the main axis of the major mountain systems.

CHAPTER VI

AFFINITIES OF THE AVIFAUNA

The fossil record indicates that the modern orders of birds originated in the Northern Hemisphere during the Eocene. Several workers have attempted to determine the origins of bird families by using the data available from the fossil record and from present day distribution. Mayr (1946) was the first to analyze the North American avifauna on the family level. His paper was followed by that of Griscom (1950), who discussed the origins of Mexican birds in more detail but used similar procedures. Many groups are so widespread in both the fossil record and at present that their origins cannot be traced. Families with few species and families rarely found as fossils are difficult to analyze, even as are many of the passerine families which lack distinctive osteological characters.

México has always been a southern extension of the North American continent. During the Tertiary one or more water gaps separated the North and South American continents. These gaps were, however, only minor barriers to most avian groups. In addition, for most of this period a Bering Land Bridge joined the North American continent with northeastern Asia. Subtropical conditions prevailed throughout the southern half of the North American continent to late Miocene, but by late Pliocene temperature conditions were much as they are today. It is doubtful that the

Bering Land Bridge climate was ever more than temperate - even at its warmest.

A number of distinct North American families evolved while the above conditions existed. In addition, numerous Old World families crossed the Bering Land Bridge to the New World and a few families followed the reverse route to the Old World. At the beginning of the Pleistocene the development of the continental ice sheets and the resultant lowering of temperatures forced the southern elements of the North American avifauna into the Gulf or into México. The succeeding interglacial period then permitted a reversal of this movement and the northern elements retreated behind the ice sheet, were left isolated on high mountains, or became extinct. At the same time, the southern elements pushed northward and moved higher into the mountains. This retreat and advance apparently took place during each of the four ice sheet movements.

The present North American (including México) avifauna is the result of these phenomena during the Tertiary and Pleistocene. Wetmore (1959: 20) believes that "most of the species of our present avifauna had attained development by the beginning of the Pleistocene, and that the major changes since have come through extinction of numerous kinds." He also suggested that the number of species north of the Mexican boundary at the beginning of the Pleistocene was equal to the number in México today.

Urban (1959: 452-453) has analyzed the avifauna of Coahuila on the family level as discussed by Mayr (loc. cit.). According to his calculations, based on 154 "probable" breeding species, 24.7 % of the families were of Old World origin, 37.0 % of North American origin, 24.0 % of South

American origin, and 14.3 % of unanalyzed origin.

At the present time 104 species are known to breed in southeastern Coahuila and adjacent Zacatecas between 5500 and 12,000 feet. When these species are analyzed with respect to their overall ranges we find that: 1) 49 (47.1 %) breed in western rather than eastern North America; 2) 31 (29.8 %) breed in both eastern and western North America; 3) none breeds in eastern rather than western North America; 4) 16 (15.4 %) breed chiefly in México but occur also in small numbers in adjacent parts of Texas, or New Mexico and Arizona; 5) 8 (7.7 %) are endemic to México or occur in México and southward.

The avifauna of southeastern Coahuila is very similar to that of the southwestern United States including the southern part of the Rocky Mountains, but a number of characteristic forms are replaced by distinctively Mexican species. Fewer species occur here than in either the southwestern United States or in the Sierra Madre Occidental to the west of Coahuila.

The geographic location and physiographic features of Coahuila make it an area where many races meet and intergrade. As a result the avifauna of the southeastern part of the state is composed of elements of many affinities and is distinctive only in its total composition. In general, breeding forms of the high conifer zones have their affinities with the Sierra Madre Oriental of Nuevo León while forms at lower elevations and especially in desert country have their affinities to the north or west. There are many exceptions to this, however. It is not advisable to attempt an analysis on the racial level until both Coahuila and the neighboring states are known in more detail. Affinities of some races are included under the appropriate species accounts.

CHAPTER VII

SEASONAL CYCLE OF THE BIRDLIFE

The areas near Las Vacas, El Diamante and Saltillo were worked most intensively. Field work was carried out in one or another of these areas daily except when I was on brief trips to other areas. Therefore, seasonal information on bird populations of these areas is more complete than that of other areas.

Bird populations were at a low during the winter months. Many of the breeding species had migrated south, others had moved to lower elevations, and others had dispersed widely or were concentrated in a few favorable areas. The influx of wintering birds from farther north was negligible except for wintering sparrows and a few other forms.

Relatively few birds were present in stands of large conifers and in pure chaparral during the winter months. Birds were present in greatest numbers in piñon-juniper, its border (edge) with cultivated land, and at lower elevations in catclaw and mesquite thickets. Parus sclateri and some other conifer-dwelling species moved down slope into piñon-juniper; Vireo huttoni moved down into thickets in arroyos; and Sayornis saya and other forms moved down into desert country. Spizella passerina, S. pallida, Oreoscoptes montanus and Vermivora celata were among the species which wintered in desert habitats in large numbers. Various sparrows, Regulus calendula and Falco sparverius were common in piñon-juniper bordering

Diamante Valley. Flocks of Bombycilla cedrorum and Turdus migratorius and mixed flocks and scattered individuals of other species wandered widely over many habitats. The larger buteos and Corvus corax were present in small numbers.

I did not see the early stages of the spring migration. Sutton and Burleigh (1939) observed a few transients at Diamante Pass in early March. Apparently the spring migration, like that in fall, is gradual rather than sudden and spectacular. By mid-April many of the migrant breeding species had returned and such residents as hawks, ravens, Bubo virginianus and Sayornis saya were already nesting. By late April nearly all of the resident species were nesting (some shrikes had already fledged) and transients were passing through in large numbers. Water birds were present in small numbers on tanks throughout the area. Most of the wintering birds, including Regulus calendula, Anthus spinoletta and Accipiter striatus returned north. The remainder of the migrant breeding species had returned and were nesting by early May. High conifer species such as Certhia familiaris and Sitta pygmaea began nesting about two weeks later.

The breeding season at 5500 feet in desert country was about a month earlier than for the same species at 7400 feet. Colaptes cafer, for example, had fledged in desert areas by April 25, on which date most high country birds were still excavating nests or incubating. On several occasions I collected north-bound transients and breeding individuals of the same species in the same area on the same day. Spizella passerina and Contopus sordidulus were two good examples.

By mid-May the last transients and winter residents had left the area and nearly all of the breeding species were actively nesting. Lam-

pornis clemenciae visited the nest caves in May but did not begin nesting until early or mid-June. Most individuals of several species bred chiefly in late summer. Poliioptila caerulea and Spizella atrogularis started nesting in mid-May but the bulk of the nesting was in late June, and throughout July, respectively. Pipilo fuscus nested from late June to August, but principally during the latter half of this period. Spinus psaltria, which I first recorded in mid-May, began nesting in late July and continued until mid-October. The latest egg date for the area, was of Columba fasciata - October 6.

The earliest fall transients (Mniotilta varia and Dendroica chrysoparia) reached the area on July 22 while much local nesting was still going on. These two species were followed almost immediately by Icterus spurius, Accipiter striatus, Nuttallornis borealis and many Empidonax minimus. The fall migration was a gradual movement; the only perceptible peak passed on October 19. Populations of the resident species built up either through concentration of birds in especially favorable areas or by the addition of birds from other areas. Flocks of ravens, swallows, and mixed sparrows were common throughout the area at this season. Petrochelidon pyrrhonota left the area in late July and was soon followed by Tachycineta thalassina.

By mid-September the bulk of the warbler migration was passing through and most warblers were gone by early October. The bulk of the transient and wintering species, including various sparrows, Circus cyaneus and Troglodytes aedon reached the area in late September. Regulus calendula, Melospiza lincolni and Hyllocichla guttata arrived at this time, built up peaks of numbers in mid-October, and then became less common as

many individuals left the area. Numbers of waterfowl (chiefly ducks) visited tanks in the area from late October through mid-November. The breeding species which winter south of Coahuila left the area in late September (Vermivora crissalis) and early October (Tyrannus vociferans). A few Empidonax affinis were present to mid-November.

By mid-November populations seemed to be about the same as those I had observed the previous December. Nesting definitely followed a spring-summer-fall cycle rather than a less well-defined wet-dry season cycle.

CHAPTER VIII

SPECIES ACCOUNTS

The following accounts are based on personal observations and collecting, and on the available literature. I have borrowed and examined a number of critical specimens from several museums. All forms recorded from southeastern Coahuila are included. Races are listed only when specimens have been subspecifically identified. Sight records refer merely to observations of a species. I have included only forms which are supported by specimens with two exceptions: 1) my personal, positive sight records, usually based on several sightings, and 2) previously published sight records. Since I have been unable to verify the latter, I have enclosed them in brackets.

I have followed the nomenclature of the Distributional Check-list of the Birds of Mexico, Part I, Friedmann, et. al. (1950) and Part II, Miller, et al. (1957) with two exceptions. In my discussion of Anas carolinensis and the genera Contopus and Caracara I have followed the Check-list of North American Birds, Fifth Edition (1957) published by the American Ornithologists Union.

The discussion of each form is followed by a brief summary which includes the earliest published record for each observation or specimen and any species or racial determination that differs from my own. The

number and location of all specimens which I have examined also follows each species or racial account. Abbreviations refer to the following museums and institutions:

CAE Specimens at present in my collection
 CM Carnegie Museum
 CU Cornell University
 GMS George M. Sutton collection at the University of Oklahoma
 KU University of Kansas
 LSU Louisiana State University
 USNM United States National Museum

Order Podicipediformes

Family Podicipedidae

Podilymbus podiceps (Linnaeus). I saw one bird on the impoundment near Arteaga, April 16, 1959.

Order Ciconiiformes

Family Ardeidae

Ardea herodias Linnaeus. I saw one bird on the impoundment near Arteaga, April 16, 1959.

Order Anseriformes

Family Anatidae

[Dendrocygna autumnalis (Linnaeus). Sight record: one along railroad between Saltillo and Ávalos, March 5, 1951, Evenden (1952: 112).]

Anas cyanoptera Vieillot. I saw this species on three occasions - a pair on the impoundment near Arteaga, April 16, 18, 1959 and on the latter date an adult male on a small pond 11 miles west of San Antonio de las Alazanas.

Anas discors Linnaeus. I saw the species on four occasions during 1958 - two to five birds on a small pond $1\frac{1}{2}$ miles east of Las Vacas, October 24, November 3, 4 and two at the tank in Las Vacas, October 31. I also saw a pair on a small pond 11 miles west of San Antonio de las Alazanas, April 18, 1959. The two specimens collected represent the nominate race. Specimens examined: CAE - 2.

Anas carolinensis Gmelin. I saw three, including an adult male, on a small pond $1\frac{1}{2}$ miles east of Las Vacas, November 3, 4, 1958.

Mareca americana (Gmelin). I saw two males on the impoundment near Arteaga, April 16 through 23, 1959.

Bucephala albeola (Linnaeus). I saw five birds on the impoundment near Arteaga, November 19, 1958.

Order Falconiformes

Family Cathartidae

Coragyps atratus (Bechstein). This was a rare and local resident in desert country near Saltillo and northeast of the Sierra Guadalupe, but I never observed it above 5500 feet. I saw a flock of 15 south of Saltillo on December 26, 1957 and one and two birds occasionally north and east of Saltillo during July, 1959 and June, 1958 and 1959. Other records: Sutton

and Burleigh (1939: 25), low country east of Saltillo; Burleigh and Lowery (1942: 188), rare, in low country near Saltillo.

Cathartes aura (Linnaeus). The species was observed throughout the area, soaring over all habitats from scrub desert at 5200 feet to fir forest at 10,500 feet. The numbers and local distribution of birds varied considerably with the food supply. One to seven birds were noted almost daily in Diamante Valley and in the desert country surrounding Saltillo. The species was observed during all months that I was in the area. The first brown-headed birds were observed June 24, 1958. Other records: Sutton and Burleigh (1939: 25), sight records in southern Coahuila; Burleigh and Lowery (1942: 188), sight records throughout the Saltillo area.

The two specimens collected represent the race teter but may not represent the breeding population. The male, collected May 23, 1959, had a .10 mm. testis and a flattened wing of 520 mm. The female collected October 23, 1958 has a flattened wing of 526 mm. Specimens examined: CAE - 2.

Family Accipitridae

[Accipiter gentilis (Linnaeus). Sight record by Hardy, 13 miles east of San Antonio de las Alazanas, July 6, 1955 (Urban, 1959: 456).]

Accipiter cooperi (Bonaparte). My only positive record is of a bird (in immature plumage) which I saw in piñons, 1 mile west of Las Vacas, June 21, 1958.

Accipiter striatus Vieillot. The species was a common transient and winter resident at all altitudes, though most regular in the piñon

and catclaw-bordered arroyos between 7000 and 8000 feet. The orchard at Las Vacas seemed to be especially favorable and whenever one bird was collected here it was soon replaced by another. During 1958 I observed single birds on July 31 and August 11 and almost daily between late September and mid-November. I also observed single birds on December 27, 1957 and from April 16 to 23, 1959. The majority of these birds were in immature or sub-adult plumage.

I collected four immature birds and one adult which had the barred flags of typical A. s. velox. Specimens examined: CAE - 5.

I collected a male of the race suttoni (flattened wing 191.5 mm.) in the orchard at Las Vacas, October 23, 1958. The almost uniform reddish brown underparts were a conspicuous field mark. I saw no other adults of this race, but some of my sight records of immatures and sub-adult birds might possibly refer to this form.

CAE 983 is a fully adult male in fresh fall plumage, very bright, dark gray above and almost uniformly reddish-brown below. In all respects it closely resembles the type and strict topotypes of suttoni in the Sutton Collection. A male (KU 32626, flattened wing 186 mm) collected July 6, 1955, 13 miles east of San Antonio de las Alazanas, has the uniform reddish flags of suttoni. It is in very worn plumage, brownish above and partially barred, nearly striped, rather than uniform below. In my opinion it is suttoni in the second breeding or sub-adult plumage. Other record: Urban (1959: 457), 13 miles east of San Antonio de las Alazanas, July, 1 collected. Specimens examined: CAE - 1; KU - 1.

Buteo jamaicensis (Gmelin). The red-tails of this area present

an interesting problem. The species was widespread, especially in the non-breeding season, and was observed in or over all habitats from 5000 to 10,500 feet. In the breeding season it was present usually above 8000 feet except when descending to lower elevations to feed. I found no nests but was able to observe known pairs throughout the summer. The resident pair at Las Vacas was composed of one very light bird and one completely (except tail) dark, brownish black bird. I never saw more than two dark birds at any one time. All birds seen in other parts of southeastern Coahuila during the breeding season were light phase birds. I was not able to collect any positive breeding birds. Sight records of transients and winter birds only add to the confusion. Other record: sight record by Dickerman, 1 immature, Saltillo, January 17, 1954 (Urban, 1959: 457).

On August 1, 1958 I was allowed to examine, but not prepare, a fine specimen of B. j. fuertesii shot by a local hunter. It was dark above with moderately light tail, brownish barred flanks and nearly clear white lower chest and abdomen. The light bird of the Las Vacas pair was observed at close range in the field and was probably of this race.

Burleigh and Lowery (1942: 188) observed the species near Saltillo and in Diamante Valley during April, 1941. The one specimen collected was tentatively identified as B. j. borealis.

Both specimens which I collected are clearly B. j. calurus. I collected a light phase male at the summit of Mt. Zapalinamé, 10,500 feet, May 21, 1959. I doubt that this bird (testis 10 mm.) was breeding. It was not the light phase Las Vacas bird which was regularly seen later. I collected an immature in Diamante Valley, November 7, 1958. Several

mounted birds of this race which I examined in Saltillo were without data.

Specimens examined: CAE - 2.

Buteo albonotatus Kaup. A breeding bird was present in a pine-encinal covered canyon 1 mile south of Las Vacas during both 1958 and 1959. The female and a juvenal still in the nest were collected June 26, 1958. I saw the male occasionally near Las Vacas later in the summer. An adult with a small mammal in its talons was observed over open desert a few miles north of the Sierra Guadalupe, 5500 feet, June 9, 1959. Other record: Sutton and Burleigh (1939: 26), west of Saltillo, January, 1938, sight record. Specimens examined: CAE - 2.

Buteo platypterus (Vieillot). Packard (1957: 370-371) collected a male in Douglas fir-pine-aspen, 13 miles east of San Antonio de las Alazanas, July 6, 1955. The bird was not in breeding condition and lacked the right foot and distal third of the tarsus. The specimen is typical of the nominate race. Specimen examined: KU - 1.

[Buteo nitidus (Latham). Sight record by Evenden (1952: 112) of one near Ramos Arizpe, March 4, 1951.]

Parabuteo unicinctus (Temminck). Sutton and Burleigh (1938: 26) reported P. u. harrisi from southern Coahuila but apparently collected no specimen. I saw a single bird soaring over piñon-juniper just north of the Sierra Guadalupe at 6500 feet, June 7, 1959.

Aquila chrysaetos (Linnaeus). During 1958 I observed adults near Las Vacas on June 18, July 2 and October 1. I also saw a single adult near Providencia, Zacatecas, 9700 feet, May 16, 1959.

Circus cyaneus (Linnaeus). A few birds were present in Diamante Valley from September 25 through at least mid-November, 1958. The species may winter here also. Other record: Burleigh and Lowery (1942: 188), near Saltillo, Diamante Pass, April, 1941.

Family Falconidae

[Caracara cheriway (Jacquin). Sight record by Evenden (1952: 113) from 3 miles south of Saltillo, March 5, 1951.]

Falco mexicanus Schlegel. A pair nested at a cliff on the south slope of Mt. Zapalinamé, $1\frac{1}{2}$ miles northwest of Las Vacas at 8500 feet in 1958. The pair and two immatures out of the nest were observed at the nest cliff June 30 and an immature female was taken at this time. I observed birds near the nest cliff until July 19. Single birds were noted near Las Vacas, September 24 and 28. I did not observe the species during several brief visits to the nest cliff in May and June, 1959. Other record: Urban (1959: 458), near Saltillo, January 10, 1954, 1 collected. Specimens examined: CAE - 1; KU - 1.

Falco peregrinus Tunstall. A pair nested at a cliff on the north slope of Mt. Zapalinamé at 9000 feet, about 2 miles northwest of Las Vacas during 1958 and possibly during 1959. One and possibly both adults were present at the nest cliff between July 12 and August 4 and on September 27, 1958 and May 21, 1959. An immature (sex ?) was collected there July 14, 1958. Only one adult was present at the time. I saw two or more birds perched in dead stubs over an encinal covered slope, 9500 feet, 11 miles east of San Antonio de las Alazanas, May 27, 1959. There are many suit-

able nesting cliffs in this area. My only specimen is referable to F. p. anatum. Specimen examined: CAE - 1.

Falco columbarius Linnaeus. Two birds were present in the orchard at Las Vacas, November 15, 1958. A male in immature plumage was collected and proved to be F. c. richardsoni. Specimen examined: CAE - 1.

Falco sparverius Linnaeus. Resident, primarily in cultivated areas and open piñon-juniper to 8000 feet. Widespread during the non-breeding season and present in all habitats except thick conifers. In winter common in desert country and frequently seen on poles along highways. During the breeding season present chiefly in semi-open country. I saw juvenals out of the nest at Las Vacas on June 21 and 22 (different family), 1958 and June 12, 1959. It was observed during all months that I was in the area. Other records: Sutton and Burleigh (1939: 27), southern Coahuila, January, 1 collected; Burleigh and Lowery (1942: 188), near Saltillo, Diamante Valley, April, 1 collected; Urban (1959: 459) Sierra Guadalupe, April, 1 collected. All of these records and my series are referable to the nominate race. Specimens examined: CAE - 5; KU - 1.

Order Galliformes

Family Phasianidae

Callipepla squamata (Vigors). Common resident in scrub desert and cultivated areas from 5000 to 7200 feet. Observed in low country throughout southeastern Coahuila, in desert areas near Concepción del Oro, and sparingly in Diamante Valley. Other records: Burleigh and Lowery (1942: 188-189) collected 3 birds near Saltillo and Diamante Pass during

April, 1941 (two were typical of the nominate race; 1 was intermediate toward C. s. castanogastris); Amadon and Phillips (1947: 577), 19 miles west of Saltillo, 1 collected (typical C. s. squamata).

Cyrtonyx montezumae (Vigors). I saw a pair $1\frac{1}{2}$ miles east of El Diamante, May 18, 19, 1959. The species inhabited a north-facing slope where the piñon-juniper was dotted with many small grassy clearings. They were difficult to flush but the characteristic whistle was frequently heard at dawn and dusk. On May 21, I heard birds calling from sotol-maguey-chaparral at 9800 feet on the south slope of Mt. Zapalinamé. Birds were commonly heard near wheat fields and in open pine woods 11 miles east of San Antonio de las Alazanas in late May and I saw a male there on May 28. I apparently overlooked the species during the summer of 1959. Other records: sight record by Baker (Urban, 1959: 461) of a pair 13 miles east of San Antonio de las Alazanas on March 25, 1950; Ridgway and Friedmann (1946: 396), near Saltillo (C. m. montezumae).

Order Gruiformes

Family Rallidae

Fulica americana Gmelin. I collected a female on the tank at Las Vacas, September 29, 1958. A single bird was present on a small pond 2 miles north of Las Vacas, October 13. Two to four birds were present on the impoundment near Arteaga, April 16 to 23, 1959. My specimen is typical of the nominate race. Specimen examined: CAE - 1.

Order Charadriiformes

Family Scolopacidae

Numenius americanus Bechstein. A skeleton collected 7 miles west of San Antonio de las Alazanas, January 11, 1954 is considered to be N. a. parvus by Urban (1959: 462).

Actitis macularia (Linnaeus). Burleigh and Lowery (1942: 189), Chorro del Agua, April 17, 19, 1941, one to five seen and one collected.

Capella gallinago (Linnaeus). During a period of rainy weather I flushed one from open desert just south of San José del Refugio at 6000 feet, October 11, 1958. A single bird was present in a flooded corn field $1\frac{1}{2}$ miles east of Las Vacas on October 24 and November 3, 4, 1958.

Order Columbiformes

Family Columbidae

Columba livia Gmelin. Domestic and semi-feral populations were present in all of the towns and most of the villages and larger ranches of the area. I found no completely feral populations nesting in cliffs or similar "wild" situations.

Columba fasciata Say. Present in large pines and other conifers from 7500 to 10,500 feet throughout southeastern Coahuila. Usually seen in stands of large, though sometimes sparse, pines. However, 11 miles east of San Antonio de las Alazanas it was more common in Douglas fir-pine. At Las Vacas birds were regularly flushed from small springs and leaking water lines above 7500 feet. Two nests, each with one egg, were found on July 5 and October 6, 1958. During August, birds gathered in large flocks at stacked wheat near Las Vacas. Five were taken from a flock of over 80

on August 9, 1958. Two of these were in full breeding condition - female with a full sized ovum, male with 18 mm. testes. I was told that large flocks visited the mountains near Providencia, Zacatecas in fall and winter. Other record: Burleigh and Lowery (1942: 189), Diamante Pass, April. My series is typical of the nominate race. Specimens examined: CAE - 3.

Zenaidura macroura (Linnaeus). Common resident near towns and in cultivated areas from 5000 to 8000 feet; present in smaller numbers in scrub desert and in open pines and piñon-juniper to 9000 feet; very uncommon and local at higher elevations. Near Concepción del Oro, Zacatecas, and 11 miles east of San Antonio de las Alazanas, birds were breeding to 9800 feet and were commonly seen on open slopes and near grain fields. Local numbers varied considerably with the season. At Las Vacas the species was most abundant in September when large numbers of immatures and transients flooded Diamante Valley and the surrounding piñon woods. I found nests from May through August and observed family groups commonly during this period. Other records: Sutton and Burleigh (1939: 29), southern Coahuila; Burleigh and Lowery (1942: 189), near Saltillo, Diamante Pass, to 7500 feet, April.

My series agrees in coloration with a series of Mexican and western United States Z. m. marginella in the Kansas University collection. Specimens examined: CAE - 3.

Zenaida asiatica (Linnaeus). A few birds were present in a wooded park in Saltillo. I did not see the species outside Saltillo though small populations do exist in mesquite thickets in central Coahuila. Other record: Sutton and Burleigh (1939: 29), between Saltillo and San

Pedro, January, several sight records.

Scardafella inca (Lesson). Common in Saltillo and in many of the villages throughout southeastern Coahuila. At least six or seven pairs nested in orchards near Las Vacas. I also observed the species at San Antonio de las Alazanas and in several villages near Concepción del Oro, Zacatecas. Other records: Burleigh and Lowery (1942: 189), Saltillo and nearby villages, April, 2 collected. Specimens examined: CAE - 4.

Order Psittaciformes

Family Psittacidae

Rhynchopsitta pachyrhyncha (Swainson). Present in small numbers in the mountains south of Saltillo, chiefly in pines and Douglas fir above 9000 feet. Much more common in the extensive high conifer forests 11 miles east of San Antonio de las Alazanas, chiefly above 10,000 feet. During most of the day, the birds were found in small flocks feeding on conifer seeds or the juice of agave flowers. During the piñon season flocks were observed as low as 7500 feet. During summer, east of San Antonio de las Alazanas, small flocks started gathering in several favored localities at 10,200 feet in late afternoon. By dusk several hundred birds would be assembled and after much calling the whole flock would fly eastward along the ridge to a roosting locality. I never saw the morning dispersal. Even when in large flocks birds characteristically flew in pairs, one bird just behind and to one side of the other. The calling of a large flock in flight or feeding was almost deafening. The birds covered wide distances and the usual sight record was of a pair or small

flock flying very high overhead from one mountain to another. On November 16, 1958, flocks totaling over 600 birds passed very high over Las Vacas in a general southerly direction.

At present I am treating the "terrissi" population as a race of R. pachyrhyncha, but I am not convinced that this is correct. The Coahuila-Nuevo León birds are distinct from specimens of pachyrhyncha of the Sierra Madre Occidental but whether they represent a distinct species or a very well defined race cannot be determined at present. The breeding range of this form is very poorly known and I have seen no specimens from between Saltillo and the Sierra Madre Occidental. Hardy and Dickerman (1955: 305-306) felt that their Coahuila specimens were intermediates between R. p. pachyrhyncha and R. p. terrissi, closer to the latter. My series agrees with the Kansas series in coloration and averages slightly larger in all dimensions. I feel certain that a larger series of "typical terrissi" will readily include the Coahuila "intergrades."

The maroon forehead is a good field character at reasonable range and all birds that I have examined in the flesh or have seen at close range in the field have been maroon rather than scarlet fronted. One of my five adults and the Kansas University specimens have a few scarlet feathers among the maroon and my series of five first year birds also have a trace of this scarlet. One of my most reliable guides claims to have collected scarlet fronted birds 11 miles east of San Antonio de las Alazanas during the winter months. Both forms are known to wander and perhaps birds from western areas do wander into this area during winter. If so, stragglers from such a flight might remain to nest and hence explain the "intergrades" which have a few scarlet feathers in otherwise

maroon foreheads.

I did not find this bird in the Sierra Guadalupe in June although habitat seemed favorable. I received conflicting reports as to whether this bird was present there during the breeding season. Other records: Burleigh and Lowery (1942: 189-190), Diamante Pass, April, small flock; Hardy and Dickerman (loc. cit.), 13 miles east of San Antonio de las Alazanas, 4 collected; Mesa de las Tablas, 1 collected. I consider all of these specimens R. p. terrisi. Specimens examined: CAE - 10; KU - 4.

Order Cuculiformes

Family Cuculidae

Coccyzus erythrophthalmus (Wilson). I collected an immature in piñons along an arroyo 1 mile north of Las Vacas, 7200 feet, September 21, 1958. Specimen examined: CAE - 1.

Coccyzus americanus (Linnaeus). I have actually seen this species only in northern and central Coahuila. Birds were, however, heard calling in desert country east of Saltillo during June, 1959.

Geococcyx californianus (Lesson). Fairly common resident in scrub desert, piñon-juniper, and in the sotol-maguey-yucca vegetation of exposed south slopes from 5200 to 10,000 feet. I collected a male in breeding condition June 14, 1958. Other records: Sutton and Burleigh (1939: 30), southern Coahuila, winter; Burleigh and Lowery (1942: 190), west of Saltillo, April. Specimen examined: CAE - 1.

Order Strigiformes

Family Strigidae

Otus flammeolus (Kaup). I collected a pair at their nest hole in a tall dead stub in open woods, 11 miles east of San Antonio de las Alazanas, 9200 feet, May 28, 1959. Other record: Van Hoose (1955: 302), 13 miles east of San Antonio de las Alazanas, pine-spruce- [sic] aspen, 9345 feet, April 9, 1954, 1 collected. My birds are typical of the nominate race. Specimens examined: CAE - 2.

Otus asio (Linnaeus). Apparently common in the mountains south of Saltillo, chiefly in piñons between 7500 and 8500 feet. Most of my records are for September and October during which time the birds were calling regularly and for long periods of time. By April most birds called only very briefly at dusk and were very difficult to locate. Birds were also heard in the Sierra Guadalupe, Douglas fir-aspen-pine, 9800 feet; and 11 miles east of San Antonio de las Alazanas, pine-oak, 9500 feet. In late May several Mexicans collected a female and three juvenals near Las Vacas.

My series of five specimens is uniform in coloration except that a June female is browner than fresh-plumaged birds. This series differs from both topotypical semplei, and Nuevo León and Texas mccalli in the Sutton collection. The general coloration is a "colder" gray with more purely black and white pattern, as contrasted with the browner tones of semplei and mccalli. The toes are usually well feathered. The crown streaks are as broad or broader than in semplei. Flattened wing lengths (2 males average 159.5 mm.; 3 females average 167.3 mm.) are slightly larger than those given by Miller (1955: 163) for a series of suttoni from northwestern Coahuila. Unfortunately I have been unable to borrow the

Miller specimens and two Kansas University specimens (identified as mc-calli) from northeastern Coahuila at this time. I consider my series to represent O. a. suttoni. Specimens examined: CAE - 5.

Bubo virginianus (Gmelin). Common throughout the area except in areas of dense conifers. Most regular in arroyos and about cliff faces from 5500 to 8000 feet. At least three birds, probably a family group, were present near Las Vacas in 1958. The birds in this area seemed to move up-slope as the season progressed and in late fall and early spring most of the calling was from above 8000 feet. Birds were heard or seen on all mountains visited. My specimens represent the race B. v. pallescens. Specimens examined: CAE - 2.

Glaucidium gnoma Wagler. I collected a female $1\frac{1}{2}$ miles southwest of Las Vacas, 7500 feet, April 25, 1959. She was flushed from a nest cavity (four partly incubated eggs) near a well used trail through pine-chaparral. Her measurements (flattened wing - 93.5 mm. and tail - 66.5 mm.) are clearly of the race G. g. californicum. Specimen examined: CAE - 2.

Speotyto cunicularia (Molina). Up to four birds, possibly a family group, were present at a large prairie dog colony west of San Antonio de las Alazanas on several occasions between June 28 and July 8, 1958. I did not see the species during several trips to the same area in May and June, 1959. Neither did I find the species at several other prairie dog colonies east of Las Vacas or west of Gómez Farías. Other records: Urban (1959: 467), San Antonio de las Alazanas: 6 miles west, July, 1

collected; 14 miles west, January, 1 collected; sight record by Baker, 7 miles east of Bella Unión, 7200 feet, June. These specimens are referable to S. c. hypugaea. Specimens examined: KU - 2.

Order Caprimulgiformes

Family Caprimulgidae

Chordeiles acutipennis (Hermann). Burleigh and Lowery (1942: 190-191), near Saltillo, two seen, one collected, April. This specimen (identified as C. a. texensis) was very fat and probably a transient. I have no positive records of this species in southeastern Coahuila.

Chordeiles minor (Forster). I feel that the majority of my sight records of nighthawks are unsatisfactory on the species level. On May 14, 1959 two pairs of C. minor were observed over creosote bush desert a few miles south and east of Concepción del Oro, Zacatecas. At least one pair seemed to be on territory and repeatedly dived at the ground and me and regularly gave the characteristic "beant" call note. Several small impoundments and wheat fields were nearby. I collected no specimens.

Phalaenoptilus nuttalli (Audubon). Common breeder in desert and on exposed south slopes from 5000 to at least 9000 feet. It was found at low elevations throughout southeastern Coahuila and adjacent Zacatecas and in Diamante Valley. Near Las Vacas most birds spent the day in chaparral or sotol-maguey-yucca vegetation above 8000 feet, called from there at dusk, and then moved down-slope to feed in open piñon-juniper and in the grassy fields of Diamante Valley. Calling was most noticeable during September, October and April. Other record: Ridgway (1914:

550), Saltillo, May. My series is referable to the nominate race. Specimens examined: CAE - 4.

Caprimulgus vociferus Wilson. Common breeder chiefly in ravines on wooded north slopes from 8000 to 10,500 feet. Usually found in piñon-chaparral, pine-oak, or conifers especially where encinal was present as a dense undergrowth. Present on all mountains visited in southeastern Coahuila. At Las Vacas less common and much more restricted than the Poorwill. Most common 11 miles east of San Antonio de las Alazanas during May. A female and two fledglings were collected there May 28, 1959. I am referring my specimens to the poorly defined and very variable race, C. v. oaxaceae. Not enough specimens are available at present to justify further analysis. Other records: Burleigh and Lowery (1942: 190), south of Saltillo, 7500 to 9000 feet, April, 1 collected (as C. v. setosus); Ridgway (1914: 521), Sierra Guadalupe, 2 males collected (as Antrostomus vociferus macromystax). Specimens examined: CAE - 6; USNM - 2; LSU - 1.

Order Apodiformes

Family Apodidae

Aëronautes saxatalis (Woodhouse). Uncommon local resident at cliff faces on some of the mountains south of Saltillo. During both 1958 and 1959 a colony of up to 20 birds nested near the top of a 300 foot cliff on the south slope of Mt. Zapalinamé at 8500 feet. Small flocks of feeding birds were often seen miles from this site, usually along ridges but also high over Diamante Valley. The birds commonly drank from the tank at Las Vacas; over 50 were present there on July 28, 1959. I

did not find other colonies on other cliffs on Mt. Zapalinamé. During May, 1959 a pair was present around the highest tower of a cathedral in Saltillo. Small numbers were present in Concepción del Oro and Providencia. The species was present in the area until at least October 14.

My two specimens are large for A. s. saxatalis (male - flat wing, 147 mm., tail 62 mm.; female - flat wing, 148.5 mm., tail, 60.5 mm.), approaching sclateri in size. Single specimens from northwestern Coahuila (Miller, 1955: 164-165) and southwestern Coahuila (Urban, 1959: 468) also approach A. s. sclateri in size. Other record: Burleigh and Lowery (1942: 191), Diamante Pass. Specimens examined: CAE - 1; GMS - 1.

Family Trochilidae

Hylocharis leucotis (Vieillot). I collected a singing male in Douglas fir-pine forest at 9500 feet about 15 miles east of San Antonio de las Alazanas near the Nuevo León boundary on July 8, 1958. It represents the nominate race. Specimens examined: CAE - 1.

Amazilia yucatanensis (Cabot). A male collected October 10, 1888 and reported by Todd (1942: 329) is typical of A. y. chalconota. Specimen examined: CM - 1.

Lampornis clemenciae (Lesson). Local in distribution and probably more common than my few positive records indicate. At Las Vacas during 1958 two females nested in separate rooms of a vacant adobe building (eggs, July 27). Two juvenals were flushed from a nest in a cave at the base of a small sink June 19. Two females were collected at this spot on the same day. By July 5 another female had built a new nest in the

same spot and had laid the first of her two eggs. Another female was flushed from a nest in a similar cave, July 28. In 1959 I did not see the birds at the caves until May 23. No nesting was underway at this time possibly because of the great swarms of flies in each cave. Birds of both sexes were frequently seen in the orchard at Las Vacas and in open pine and Douglas fir-pine (especially in ravines) from 7500 to 10,000 feet on Mt. Zapalinamé. I also recorded the species 11 miles east of San Antonio de las Alazanas along shady ravines from 9500 to 10,000 feet. I collected a male at 8000 feet in a pine-oak-covered ravine in the Sierra Guadalupe, June, 1959. Other record: Urban (1959: 469), 13 miles east of San Antonio de las Alazanas, 9950 feet, July, 1 collected. All of these specimens are representative of the nominate race. Specimens examined: CAE - 8; KU - 1.

Eugenes fulgens (Swainson). I observed single males on the south slopes of Mt. Zapalinamé between 8000 and 9000 feet in agave-sotol-chaparral, June 17, 20, July 12, 1958. During late May, 1959 the species was common in open pine woods at the summit of a ridge 11 miles east of San Antonio de las Alazanas. It was also present along shady ravines of a nearby north slope. A few males were observed from 8000 to 9000 feet in pine-oak in the Sierra Guadalupe, June 8, 9, 1959. My only specimen is referable to the nominate race. Specimen examined: CAE - 1.

Calothorax lucifer (Swainson). Uncommon breeder about mesquite thickets in scrub desert surrounding Saltillo and in catclaw-bordered arroyos from 5000 to 7500 feet. The upper limit of distribution seemed to be 7500 feet, at which elevation it was greatly outnumbered by the

Broad-tailed Hummingbird which here reached its lower limits. At Las Vacas a few males and at least one female Lucifer Hummingbird (with brood out of nest) were present in a fruit orchard. Nests with eggs were found May 19, July 25 and juvenals were collected July 3, 16, 17. Other record: Burleigh and Lowery (1942: 191), Chorro del Agua, 1 collected. Specimens examined: CAE - 9.

Archilochus alexandri (Bourcier and Mulsant). Burleigh and Lowery (1942: 191), 20 miles west of Saltillo, April, 1 male collected.

Archilochus colubris (Linnaeus). Burleigh and Lowery (1942: 191), 20 miles west of Saltillo, April, 1 male collected.

Selasphorus platycercus (Swainson). Common and locally abundant breeder from 7200 to over 10,500 feet in all habitats above desert. Most common in orchards, piñon-juniper, pine-chaparral and Douglas fir-pine forests. Present in small numbers in encinal and cultivated areas. Also present in the mountains near Concepción del Oro. Most conspicuous in ravines and on higher slopes, but most nests which I found were in piñon-juniper along arroyos and in orchards. A group of four or five males and nearly as many females were courting near Diamante Valley, June 15, 1958. I found 11 nests with eggs or small young between June 17 and July 15, 1958. The species was common throughout September but only a few were still present in October. Other records: Burleigh and Lowery (1942: 191), Diamante Pass, 7800 to 10,000 feet, and 20 miles west of Saltillo, 4900 feet (probably a transient), April, 1941; Urban (1959: 469), 13 miles east of San Antonio de las Alazanas, July 6, 1955, 1 specimen collected. All of

these specimens are typical of the nominate race. Specimens examined:
CAE - 13; KU - 1.

Order Coraciiformes

Family Alcedinidae

Ceryle alcyon (Linnaeus). During 1958 I collected a female at a small tank in Las Vacas, September 28 and saw a second bird in a nearby arroyo on October 1. This specimen (flattened wing 166.5; tail 100 mm.) is within the range of overlap between C. a. alcyon and C. a. caurina but is nearer the larger race. Specimen examined: CAE - 1.

Order Piciformes

Family Picidae

Colaptes cafer (Gmelin). Most common in piñon-juniper-yucca, pine-oak and open pines from 6800 to 9000 feet. Present in small numbers in Douglas fir-pine to 10,500 feet and in desert country down to 5000 feet, usually where cottonwoods or other large trees were present, therefore usually near villages or ranch buildings. Some were present in scrub desert where the only possible nest sites were tall yuccas. The species was observed at all localities visited in southeastern Coahuila and to 9700 feet near Concepción del Oro. During 1959 a pair near Las Vacas was excavating a nest cavity in an agave stalk at 7300 feet on April 23 and had completed it by April 30. Juvenals were collected as early as April 25 at 6600 feet. I collected birds in breeding condition throughout April and May.

I have examined the Couch specimen (female, USNM # 4041, wing -

149 mm., flattened wing - 151 mm., tail - 98 mm.) reported by Baird (1859: 6) and subsequently quoted by others and find it to be normal C. c. nanus. Other records: Sutton and Burleigh (1939: 31), 5 miles east of La Rosa, January, Diamante Pass, April, 2 specimens collected; Burleigh and Lowery (1942: 192), Saltillo and vicinity, April, several collected; Urban (1959: 470), Sierra Guadalupe, 6500 feet, April 21, 1953, 2 collected, and sight record by Hardy 13 miles east of San Antonio de las Alazanas, July 6, 1955. My series and the above records are referable to the small race C. c. nanus. Specimens examined: CAE - 16; KU - 2; GMS - 1; USNM - 1.

Melanerpes formicivorus (Swainson). I found this species at only one locality, 11 miles east of San Antonio de las Alazanas. Here three scattered pairs were nesting in tall pine stubs in pine-encinal, 9300 to 9500 feet, and an incubating male was collected May 29, 1959. Other record: Urban (1959: 471), Sierra Guadalupe, 6500 feet, April 23, 1953, 1 collected. Both specimens are referable to the nominate race. Specimens examined: CAE - 1; KU - 1.

Centurus aurifrons (Wagler). Locally distributed from 5000 to 7500 feet. Most common in orchards and in groves of cottonwoods and similar trees near water sources and villages. It was much less common in scrub desert but often present if large yuccas were common. A family in the orchard at Las Vacas was occasionally visited by wandering birds but at this elevation the species was noted only in this village. I collected an incubating female in scrub desert north of the Sierra Guadalupe, 5800 feet, June 7, 1959.

My series of adults (three females) seems to be intermediate

between C. a. aurifrons and C. a. incanescens, though closer to the former. A breeding female from Sierra Guadalupe is lighter below and on the forehead than are the fresh plumaged Las Vacas birds. The former is very worn and of little taxonomic value. The others are darker below and have wider white bars above than do specimens of C. a. incanescens in the Sutton collection. Other record: Burleigh and Lowery (1942: 192), vicinity of Saltillo, local, several collected. Specimens examined: CAE - 6.

Sphyrapicus varius (Linnaeus). A first year male collected in the orchard at Las Vacas, November 4, and a first year female collected there on October 13, 1958 have the typical red nape of S. v. nuchalis. Specimens examined: CAE - 2.

One of two birds present in the orchard at Las Vacas December 27, 1957 was collected and proved to be of the nominate race as is an immature female collected there October 5, 1958. Other records: Ridgway (1914: 275), Sierra Guadalupe; Burleigh and Lowery (1942: 192), Diamante Pass, April, 1 collected; Urban (1959: 471), Sierra Guadalupe, 6400 feet, April 19, 1953, 1 collected. Specimens examined: CAE - 1; KU - 1.

Sphyrapicus thyroideus (Cassin). I collected an adult male in cypress forest, 10,000 feet, 1 mile southwest of Las Vacas, September 30, 1958. On basis of the short bill (exposed culmen - 24 mm.) it is referable to S. t. nataliae. Specimen examined: CAE - 1.

Dendrocopos villosus (Linnaeus). Uncommon resident in conifer forests of southeastern Coahuila from 8000 to 10,500 feet. During the breeding season present usually in pine, Douglas fir and cypress above

9000 feet. In the non-breeding season, birds moved down-slope into scattered large pines and piñon-juniper to 7300 feet. Family groups were noted 11 miles east of San Antonio de las Alazanas between 9000 and 9500 feet on May 23, 1959; near the summit of Mt. Zapalinamé on June 20, 1958; and near Las Vacas, June 4, 1959. The species was observed in suitable habitat on all mountains visited in southeastern Coahuila. Other records: Ridgway (1914: 221-222), Carneros, Sierra Guadalupe (as D. v. icastus); Urban (1959: 472), 13 miles east of San Antonio de las Alazanas, 9950 feet, July 6, 1955, 1 collected; and 2 miles east of Mesa de las Tablas, 8500 feet, January 15, 1954, 1 collected (as D. v. intermedius).

The Coahuila specimens (as a series) are quite variable but seem to be intergrades between D. v. icastus and D. v. intermedius. The lightest bellied birds (especially CAE 1315) are as light below as Durango specimens of icastus in the Sutton and Kansas University collections. The majority are darker below, especially on the throat and chest, and resemble Nuevo León intermedius in the Sutton collection. The darkest bird in the series (an immature, CAE 622) is much darker below than any D. v. intermedius which I have seen. Specimens examined: CAE - 8; KU - 2; USNM - 3.

Dendrocopos scalaris (Wagler). Widespread and locally common resident in scrub desert, open piñon-juniper-yucca, and in sotol-maguey-yucca on exposed south slopes from 5000 to 9000 feet. In the non-breeding season, it moved up into the denser piñon belt at 8000 feet and into orchards. I never found it in stands of large conifers. At Las Vacas, immature birds were collected from family groups between June 23 and July

27, 1958, in piñon-juniper at 7200 feet. A family with small juvenals was present in scrub desert near Saltillo, June 3, 1959. The species was observed in suitable habitat throughout southeastern Coahuila and near Concepción del Oro, Zacatecas. Other records: Oberholser (1912: 159), southeastern Coahuila (as D. s. giraudi); Burleigh and Lowery (1942: 193), west of Saltillo, April, 2 collected (as D. s. symplectus); Urban (1959: 472), Sierra Guadalupe at 6700 feet, April 18, 1953, 1 collected (intermediate between D. s. symplectus and D. s. giraudi).

My series is intermediate between D. s. symplectus and D. s. giraudi. Nine males, including three birds in fresh fall plumage, have wings of 101 to 114 mm. (average 105.3 mm.) and are dark below. The fall birds are as dark below as typical giraudi. The La Ventura and Carneros specimens (Ridgway, 1914: 259), reported as Dryobates scalaris bairdi, agree with the other southeastern Coahuila specimens in comparable plumage. Specimens examined: CAE - 10; KU - 1; LSU - 2; USNM - 2.

Order Passeriformes

Family Tyrannidae

Sayornis phoebe (Latham). I collected a male in desert scrub north of the Sierra Guadalupe at 5600 feet on October 11, 1958. I also saw one along an arroyo near Las Vacas, October 19, 1958. Specimen examined: CAE - 1.

Sayornis nigricans (Swainson). I observed single birds of this species on three occasions: near Las Vacas on June 21 and July 10, 1958 and at an impoundment 10 miles north of Saltillo, May 8, 1959. Burleigh

and Lowery (1942: 193), near Saltillo, Chorro del Agua, April, several breeding S. n. nigricans collected.

Sayornis saya (Bonaparte). Common breeder in open piñon and in cultivated areas near villages and in arroyos from 5200 to 8000 feet; less common at cliff faces to 9700 feet. Present in all habitats except chaparral and conifers. Nests with eggs were found April 19, May 14, 23, 1959; with young April 25 (two nests), 1959 and June 21, July 1, 1958. Other records: Sutton and Burleigh (1939: 33), southern Coahuila, January; Burleigh and Lowery (1942: 193), Diamante Pass, near Saltillo; Urban (1959: 474-475), 7 miles south, 4 miles east of Bella Unión, 7200 feet, June 25, 1952, 1 collected. My series and the above records are referable to the nominate race. Specimens examined: CAE - 8; KU - 1.

Pyrocephalus rubinus (Boddaert). Common in mesquite groves in partly cultivated areas surrounding Saltillo; not observed in very arid or open desert. Except for a wandering male at Las Vacas, July 23, 1958, I never saw the species above 5500 feet during the breeding season. I observed several near ranch buildings north of the Sierra Guadalupe. On October 19, 1958 a family group of five appeared at Las Vacas. A female collected June 3, 1959 two miles east of Saltillo, had a fully formed egg in her oviduct. Nearly full sized juvenals were present in the immediate vicinity. Other record: Burleigh and Lowery (1942: 195), near Saltillo, under 5300 feet. My series and the above record are referable to the large race P. r. mexicanus. Specimens examined: CAE - 9.

Muscivora forficata (Gmelin). Observed on three occasions in

open piñons and orchards near Las Vacas during 1958; single birds October 19, 22; two birds October 21. Not seen in spring. Specimens examined: CAE - 2.

Tyrannus vociferans Swainson. Common but local breeder in orchards, cultivated areas and open piñon-juniper chiefly from 6000 to 7500 feet. Small numbers present in scrub desert down to 5000 feet throughout southeastern Coahuila and near Concepción del Oro, often but not always near a water source. At Providencia, pairs present in oaks and madroños to 9700 feet. Occasional in conifers at the summit of Mt. Zapalinamé, 10,300 feet. Present at Las Vacas in mid-April but specimens collected were not in breeding condition. Birds were observed building July 2, 1958. Another pair had small young June 29 and the juvenals were collected on July 18. By September 25 nesting at Las Vacas was finished and from 15 to 20 birds were roosting nightly in a densely-leaved mulberry tree in an orchard. Most of the birds left the area in early October and only a few were present during the cold and very rainy weather of early November. Other records: Burleigh and Lowery (1942: 193), arid country near Saltillo, April, 2 collected; Urban (1959: 473), 7 miles south, 4 miles east of Bella Unión, June, 1 collected, and Sierra Guadalupe at 6500 feet, April 15, 1953, 1 collected. My series and the above records are referable to the nominate race. Specimens examined: CAE - 6; KU - 2.

Tyrannus verticalis Say. My only positive record is of a male collected April 30, 1959, 5 miles northeast of El Diamante in open piñon-juniper near a cultivated field. Specimen examined: CAE - 1.

Myiarchus cinerascens (Lawrence). Common breeder in scrub desert, piñon-juniper-yucca and sotol-maguey-yucca on exposed south slopes from 5200 to 8000 feet, occasionally higher. Birds in breeding condition were collected from mid-April through June. Although I saw many pairs, apparently on territories, I found only a single nest, this on May 14. I saw juvenals June 21, July 4, 6, 1958. After early July, family groups were frequently observed in catclaw along arroyos and in piñon-juniper and were very shy and difficult to observe. A male collected July 6 was undergoing the post-juvinal molt. Other records: Baird (1859: 8), one collected near Saltillo (as Myiarchus mexicanus); Burleigh and Lowery (1942: 193), near Saltillo, infrequent, April, 1 collected (as M. c. cinerascens). My specimens are intermediate between M. c. cinerascens and M. c. mexicanus but much nearer the former. Specimens examined: CAE - 12.

Nuttallornis borealis (Swainson). Observed on five occasions within a few miles of Las Vacas in orchards and open pines (7200 to 7500 feet) and at edges of pine woods (8500 feet) between July 31 and September 29, 1958. No spring observations. Other record: Burleigh and Lowery (1942: 194), Diamante Pass, April 14, 2 collected. Specimens examined: CAE - 3.

Contopus sordidulus Sclater. Local breeder in open piñon-juniper along arroyos, chiefly from 6800 to 7500 feet. In July 1958 only one pair and a single bird were seen near Las Vacas, but during 1959 the species was not uncommon throughout the piñon zone to 8000 feet and even in open pines at 10,000 feet. Birds collected during both seasons were

on territory and in breeding condition. One was calling in piñons, 7000 feet, at the north base of the Sierra Guadalupe, June 7. The species was common 6 miles south of Concepción del Oro, Zacatecas, 7500 feet, May 14, 1959 on which date an incubating female was collected on her nest. Transients were observed during August at all elevations, usually in piñons or open pines. A female collected $1\frac{1}{2}$ miles east of El Diamante, piñon-juniper, 6800 feet, April 21, 1959 was very fat and not yet in breeding condition. Other records: Ridgway (1907: 523), Sierra Encarnación; Burleigh and Lowery (1942: 194), Chorro del Agua, April, 1 collected; Urban (1959: 476), Sierra Guadalupe, April 19, 1953, 1 collected. My series and the above records are referable to C. s. veliei. Specimens examined: CAE - 5; KU - 1; USNM - 1; LSU - 1.

Contopus virens (Linnaeus). I collected an immature female in piñons, $\frac{1}{2}$ mile west of Las Vacas, 7300 feet, October 19, 1958. Other record: Burleigh and Lowery (1942: 194), Chorro del Agua, April, 2 collected. Specimens examined: CAE - 1; LSU - 2.

Contopus pertinax Cabanis and Heine. I collected the female of a pair in open woods, 9500 feet, 11 miles east of San Antonio de las Alazanas, June 28, 1958. I have re-examined the Diamante Pass specimen (Burleigh and Lowery, 1942: 194) and consider both specimens to be C. p. pallidiventris or intergrades nearest this form. Specimens examined: CAE - 1; LSU - 1.

Empidonax flaviventris (Baird and Baird). My only records are of single immatures collected in piñon-juniper, 7300 to 7600 feet, within

a half mile of Las Vacas on September 24 and 25, 1958. Specimens examined: CAE - 2.

Empidonax minimus (Baird and Baird). Observed commonly between July 23 and October 19, 1958. Present in catclaw along arroyos and in the low, vine-covered trees in the orchard at Las Vacas. One bird was collected at the edge of cypress forest, 10,000 feet on September 30. No other birds were observed above 7500 feet. This species nearly always frequented perches within a few feet of the ground. Specimens examined: CAE - 7.

Empidonax hammondi (Xantus). Uncommon transient, usually in piñon-juniper and pine-chaparral between 6800 and 7300 feet. I collected four specimens within a few miles of Las Vacas between September 26 and October 9, 1958 and on April 23, 1959. Three of these specimens are typical hammondi while the other is much paler and grayer and probably from a hybrid hammondi x wrighti population. It is however, nearest hammondi. Other records: Burleigh and Lowery (1942: 193-194), Diamante Pass, Chorro del Agua, April, 6500 to 10,000 feet, 6 collected; Urban (1959: 475), Sierra Guadalupe, April 20, 1953, 1 collected. Specimens examined; CAE - 4: KU - 1.

Empidonax wrighti Baird. Apparently an uncommon transient in piñon-juniper and pine-chaparral between 6800 and 7400 feet. I collected four specimens within a few miles of Las Vacas between April 23 and May 9, 1959. Two of these specimens have the tenth primary shorter than the fourth as in typical wrighti while the other two are not typical in this character. All four are very similar in coloration, however, and none re-

sembles griseus in color. Specimens examined: CAE - 4.

Empidonax griseus Brewster. Burleigh and Lowery (1942: 194) collected single specimens near Saltillo, Chorro del Agua and 20 miles west of Saltillo. Specimens examined: LSU - 3.

Empidonax affinis (Swainson). Common in pine, Douglas fir and fir forests chiefly above 9000 feet. Birds commonly perched and fed from within tree canopies, called little except for soft "whit" notes, and were very difficult to observe. The full song, heard only rarely, was a complicated "jack win-ter, jack deer" the last syllable slurred downward. Birds in breeding condition were collected from late April through June. The species was present on all mountains visited where large conifers, especially Douglas fir, were present. In fall, birds were observed in piñon-juniper down to 7300 feet (September 27 - November 18, 1958). Other records: Ridgway (1907: 576), Sierra Guadalupe; Urban (1959: 475), 13 miles east of San Antonio de las Alazanas, July 6, 1955, 1 collected. My series and the above records are referable to E. a. trepidus. Specimens examined: CAE - 18; KU - 1.

Empidonax difficilis Baird. Common but local breeder in shady ravines, often near water, from 7500 to 9000 feet. The song was a loud, emphatic "whee zit." The usual call notes were a "whit" and chips similar to those of the larger hummingbirds. I found nests on cliff faces and in caves as follows: May 23 (4 eggs); May 27 (3 eggs); June 13 (hatching young). The species was present in the mountains south of Saltillo and 11 miles east of San Antonio de las Alazanas as well as in the Sierra Guadalupe. Other records: Burleigh and Lowery (1942: 194), Diamante Pass

(as E. d. salvini); Miller, et al. (1957: 91), Sierra Guadalupe, April (USNM). Specimens examined: CAE - 9; LSU - 1; USNM - 3.

My breeding series and the three Sierra Guadalupe birds are clearly E. d. hellmayri. LSU 5329 is near hellmayri in size (wing - 72 mm.; tail - 62 mm.) but is much nearer occidentalis in coloration. Compared with hellmayri, the underparts are a much brighter yellow with a sharply contrasting bright yellowish brown chest band. The upper parts are brighter and much more yellowish as contrasted with the greener tones of hellmayri. It closely resembles breeding occidentalis from the state of México.

Epidonax fulvifrons (Giraud). I collected four birds from a family of six in open pine woods, 9500 feet, 11 miles east of San Antonio de las Alazanas, June 28, 1958. The encinal under the pines had been burned and the birds were feeding from these dead stubs. A pair and a single male (all calling) were collected in piñons along an arroyo north of Las Vacas, April 16, 1959, but they did not seem to be breeding. I observed two birds in piñons west of Las Vacas, April 19, 1959, and a single bird north of Las Vacas, September 22, 1958. Other record: Miller, et al. (1957: 94-95), Sierra Guadalupe, April (USNM). My series is referable to E. f. pygmaeus. Specimens examined: CAE - 7.

Family Alaudidae

Eremophila alpestris (Linnaeus). Most common in cultivated areas in Diamante Valley and the broad valley west of San Antonio de las Alazanas (6800 to 7500 feet) and present in smaller numbers in open des-

ert and in some irrigated areas west of Gómez Farías down to 5000 feet. The species was observed in suitable habitat throughout southeastern Coahuila and near Concepción del Oro, Zacatecas. Singing birds were observed from April through June. Other records: Baird (1859: 14), Saltillo, 1 collected; Oberholser (1902: 863), La Ventura (as aphrasta); Sutton and Burleigh (1939: 35), Saltillo, Ramos Arizpe, March (as aphrasta); Burleigh and Lowery (1942: 195), Saltillo, Diamante Valley, April, 6 collected; Urban (1959: 477-478), 7 miles south, 4 miles east of Bella Unión, 7200 feet, June 25, 1952, 7 collected; 14 miles west of San Antonio de las Alazanas, 6500 feet, January 9, 1954, 2 collected. In my opinion birds from southeastern Coahuila represent the race E. a. diaphora. Specimens examined: CAE - 8; CU - 2; GMS - 1; KU - 9; LSU - 5; USNM - 18.

Family Hirundinidae

Progne subis (Linnaeus). Couch collected a first year male at Agua Nueva (Baird, 1859: 11) which represents the nominate race. Specimens examined: USNM - 1.

Petrochelidon pyrrhonota (Vieillot). Nested locally in Saltillo, in many of the villages in southeastern Coahuila, and in Concepción del Oro, Zacatecas. Several pairs were present in Las Vacas in 1958 and juvenals were out of the nest by July 1. Most of the colony had departed by late July but one pair remained to August 11. This may have been the pair that made several unsuccessful nesting attempts in mid-July. In 1959, one pair arrived about April 27 and six pairs were present by early May. Incubation was under-way by May 23. Other records: Burleigh and

Lowery (1942: 196), Saltillo and vicinity, Chorro del Agua, Diamante Valley; Urban (1959: 478), 14 miles west of San Antonio de las Alazanas, April, 2 collected (as minima). My series and the above records are referable to P. p. melanogaster. Specimens examined: CAE - 2; KU - 2.

Petrochelidon fulva (Vieillot). Saltillo is the type locality of P. f. pallida. I did not see the species anywhere in southeastern Coahuila. The many Saltillo references are based on early specimens (Ridgway, 1904: 56).

Stelgidopteryx ruficollis (Vieillot). I saw a single bird of this species flying over a dry arroyo $1\frac{1}{2}$ miles north of Las Vacas, April 30, 1959. Miller, et al. (1957: 111) report the race S. r. psammachrous from Saltillo (USNM). Specimen examined: USNM - 1.

Hirundo rustica Linnaeus. Common in Saltillo and present in nearly all of the villages and ranches throughout the area wherever there is an open water supply. Most abundant in irrigated areas and near towns, nesting to at least 9800 feet. It arrived at Las Vacas by April 16, at least a week earlier than the local colony of Cliff Swallows. All but a few stragglers had left Las Vacas before the arrival of cold, very rainy weather in mid-October. My series is referable to H. r. erythrogaster. Other records: Burleigh and Lowery (1942: 195), near Saltillo, 3 collected; Miller, et al. (1957: 113), Saltillo, April, May, 2 collected (USNM). Specimens examined: CAE - 3; GMS - 1.

Tachycineta thalassina (Swainson). Observed in at least small numbers on all mountains visited. Locally distributed in southeastern

Coahuila and near Concepción del Oro, Zacatecas, mainly from 7500 to 10,000 feet. Near Las Vacas some birds nested in old woodpecker holes in yucca stalks, usually on steep slopes among piñon-juniper; others nested in crevices in cliffs on the upper slopes of Mt. Zapalinamé. Birds visited the tank at Las Vacas daily for drinking and bathing. I found a nest with eggs April 23, 1959. Adults were feeding young in an inaccessible cliff nest June 17, 1958. Many families moved down into the orchard at Las Vacas after the young had fledged, a few by June 19. By June 29 up to 30 birds were present, mostly immatures; all but a few had left by early August.

The breeding birds of this area are intermediates. Two males approach T. t. thalassina in size (wing - 122.5, 123 mm.; flattened wing - 124.5, 124; tail - 50, 51.5 mm.) but have the purple and green rumps of T. t. lepida. A female has no purple on the rump and upper tail coverts and is also nearer thalassina in size (wing - 110.5 mm.; flattened wing - 111 mm.; tail - 46 mm.). Other records: Baird (1859: 11), Saltillo, 2 collected; Burleigh and Lowery (1942: 195), Diamante Pass, April, 1 collected. Specimens examined: CAE - 3; LSU - 1.

Family Corvidae

Corvus corax Linnaeus. Uncommon resident in mountains of southeastern Coahuila from 6800 to 10,500 feet. I have no positive records from the low country around Saltillo, but some of my sight records of "ravens" may refer to this species. Near Las Vacas it nested in large pines at 7500 feet and on cliff faces to 9000 feet. Flocks of up to 30 birds frequently fed in open piñon-juniper near Las Vacas and in the cul-

tivated fields of Diamante Valley. Such flocks were often easy to approach in late summer. Flocks of up to 20 birds were present near Las Vacas through August but only a few remained from early September through the winter and the following spring. On May 21 a flock of about 30 was present in Douglas fir-pine near the summit of Mt. Zapalinamé, 10,300 feet. Two birds collected from this flock did not seem to be breeding (male - testis 10 mm.; female - ovary 6 x 5 mm.). I found a nest with large juvenals July 5. Young birds were often heard calling from cliff nests during May and June. I saw only a few birds in the Sierra Guadalupe and 11 miles east of San Antonio de las Alazanas. Other records: Burleigh and Lowery (1942: 196), higher slopes south of Saltillo, April, 1 collected; Sutton and Burleigh (1939: 35), southern Coahuila, winter. My series and the above records are referable to the race C. c. sinuatus. Specimens examined: CAE - 5.

Corvus cryptoleucus Couch. Apparently a common resident at low elevations in southeastern Coahuila and near Concepción del Oro, Zacatecas. A few were present to 6500 feet in desert country north of the Sierra Guadalupe. I never saw the species in Diamante Valley. I collected no specimens but examined the remains of one west of La Rosa. Most ravens seen over desert country near Saltillo from 5000 to 5500 feet were of this species; some birds seen in other areas may have been C. corax. Other records: Sutton and Burleigh (1939: 35-36), Saltillo, January; Burleigh and Lowery (1942: 197), Saltillo, Diamante Valley, 1 collected.

Aphelocoma coerulescens (Bosc). Common resident on all mountains visited in southeastern Coahuila and near Concepción del Oro, Zacatecas.

The only requirement seemed to be a low, broad-leaved thicket vegetation, or scrub, of some type. Near Las Vacas this species was more widespread than, and at least common as, A. ultramarina but not conspicuous due to its quiet, retiring habits. Present in piñon-juniper (where juniper predominated), encinal and chaparral from 6800 to 10,500 feet. At higher elevations it inhabited thick encinal under cypress (Sierra Guadalupe) or Douglas fir-pine forest. Birds in breeding condition were collected during April and May. A pair was completing a nest April 29 and a female collected May 9 was laying. Juvenals just out of the nest were collected May 14 (two families near Concepción del Oro) and June 28 (11 miles east of San Antonio de las Alazanas, 9500 feet).

My series is nearest A. c. cyanotis in both size and coloration but shows some slight intergradation with A. c. woodhousei of the southwestern United States. Other records: Ridgway (1904: 335), Carneros, Sierra Encarnación, Sierra Guadalupe; Sutton and Burleigh (1939: 35), Diamante Pass, March, 2 collected; Burleigh and Lowery (1942: 196), Diamante Pass, lower slopes and a few on outskirts of Saltillo, 2 collected; Miller, et al. (1957: 123), El Diamante (RTM). Specimens examined: CAE - 17; GMS - 1.

Aphelocoma ultramarina (Bonaparte). Common and very conspicuous resident in piñon-juniper, pine-oak and Douglas fir-pine from 7000 to 10,500 feet. The bold, noisy habits and inquisitive nature often gave a misconception of great abundance. Observed on all mountains visited in southeastern Coahuila but not near Concepción del Oro, Zacatecas, although the habitat there seemed favorable. Near Las Vacas the species was most.

common in piñon-juniper between 7000 and 8000 feet. Flocks of three to eight birds roamed over all habitats. In the Sierra Guadalupe and 11 miles east of San Antonio de las Alazanas, birds were most common in pine-oak and open Douglas fir-pine. I found a nest with three partly incubated eggs, April 29, and one with small young May 31. At Las Vacas young were out of the nest by mid-June; 11 miles east of San Antonio de las Alazanas, in late May.

Specimens of A. u. couchi from southeastern Coahuila are near the southern end of a cline of increasing size. They approach A. u. sordida in both size and coloration but are nearer to couchi from northern Coahuila and southwest Texas. Other records: Ridgway (1904: 340), Carneros; Burleigh and Lowery (1942: 196), Diamante Pass above 6500 feet, April, nest with well grown young, 3 collected; Urban (1959: 479-480), Sierra Guadalupe, April 13, 1953, 1 collected; San Antonio de las Alazanas: 13 miles, east, 3 miles south, January 11, 1954, 1 collected; 13 miles east, July 6, 1955, 1 skeleton; 7 miles south, 4 miles east of Bella Unión, June 25, 1952, 1 collected. Specimens examined: CAE - 13; KU - 3.

Cyanocitta stelleri (Gmelin). I observed this species at only one locality, 11 miles east of San Antonio de las Alazanas. I saw three birds in Douglas fir-pine-encinal, 9300 feet, November 7, 1958 and three along a log slide, 9800 feet, May 29, 1959. I did not see the species at other parts of the mountain which I visited. If large size is a valid character, Coahuila specimens are referable to the race C. s. macrolopha. Other record: Urban (1959: 479), 13 miles east of San Antonio de las Alazanas, July 6, 1955, 2 collected. Specimens examined: CAE - 2; KU - 2.

Family Paridae

Parus sclateri Kleinschmidt. Common resident in piñon-juniper and other conifer habitats from 7300 to over 10,500 feet. Noted infrequently in Douglas fir-pine on summit of Mt. Zapalinamé. Present on all mountains visited in southeastern Coahuila but not found in the mountains near Concepción del Oro, Zacatecas. Near Las Vacas a pair was building April 22 and most birds were definitely on territory. Birds collected from mid-April to June were in breeding condition. A female collected April 25 had a full-sized egg in her ovary. After the young had fledged, family groups were commonly seen in all habitats, especially piñon-juniper and pine-chaparral, often in mixed flocks with other species. By mid-June all young had reached full size though some were still being fed by adults. Birds collected in late July were molting heavily.

My specimens, as a series, are nearest P. s. eidos but show intergradation toward P. s. sclateri. Other records: Sutton and Burleigh (1939: 36), Diamante Pass, 7800 to 9000 feet, March, several collected; Burleigh and Lowery (1942: 197), Diamante Pass, several collected; Miller, et al. (1957: 133), El Diamante (RTM); Urban (1959: 480-481), Sierra Guadalupe, 7800 feet, April 20, 1953, 2 collected; 2 miles east of Mesa de las Tablas, 9000 feet, January 25, 1954, 1 collected; 7 miles south, 4 miles east of Bella Unión, 7700 feet, June 25, 1952, 1 collected. Specimens examined: CAE - 27; KU - 4; GMS - 1.

Parus atricristatus Cassin. Miller, et al. (1957: 134) report the nominate race from southeastern Coahuila.

Auriparus flaviceps (Sundevall). Common in desert scrub below

5500 feet and one of the most widespread desert species. Noted near Saltillo, north of the Sierra Guadalupe, and southeastward at low elevations to Concepción del Oro, Zacatecas. A pair was completing a nest 5 miles south of Gómez Farías, April 27. Full-sized juvenals were present east of Saltillo, June 3. Other records: Baird (1859: 14), Saltillo, 1 collected; Burleigh and Lowery (1942: 197), east of Saltillo, 20 miles west of Saltillo, scarce and local, 2 collected. My series is referable to A. f. ornatus. Specimens examined: CAE - 3.

Psaltiriparus melanotis (Hartlaub). Common resident in piñon-juniper, encinal and chaparral from 6500 to 10,500 feet. Present in suitable habitat on all mountains visited both in southeastern Coahuila and near Concepción del Oro. At Las Vacas most common in piñon-juniper. Not found in encinal under large conifers but usually present where removal of conifers has left clearings of pure encinal. Birds moved about in family-sized or larger flocks (up to 40 birds) except when actually nesting. Nests with eggs were found from April 21 to June 15, but building was observed through July 24. Nests with young and stub-tailed juvenals were found through August 1. Nesting pairs sometimes momentarily joined flocks that moved through their territories, but in all cases observed, the pair soon returned to the immediate vicinity of its nest.

My specimens (as a series) are nearest P. m. iulus but show some intergradation toward P. m. lloydi. Other records: Sutton and Burleigh (1939: 36), Diamante Pass, March, 2 collected; Burleigh and Lowery (1942: 197), mountains south of Saltillo, April, 4 collected; Urban (1959: 482), Sierra Guadalupe, April 15, 23, 1953, 2 collected. Specimens ex-

amined: CAE - 20; KU - 2; GMS - 1.

Family Sittidae

Sitta carolinensis Latham. Local resident in mountains of southeastern Coahuila. Singles and family groups were observed near Las Vacas in pifion-juniper and pine-chaparral from 7300 to 8000 feet from June through October. I did not see the species in this same area during April and May. Occasional birds were seen in the Sierra Guadalupe, in pine-oak-madroño, 6800 to 8000 feet, in early June and October and they probably bred there. I did not record the species 11 miles east of San Antonio de las Alazanas or in any other Douglas fir-pine or cypress habitat. Adult sized immatures were collected at Las Vacas between June 16 and July 9.

My series and the following records are referable to the race S. c. mexicana. Other records: Ridgway (1904: 449), Sierra Guadalupe; Urban (1959: 482), Sierra Guadalupe, April 23, 1953, 2 collected. Specimens collected: CAE - 9; KU - 2.

Sitta pygmaea Vigors. Local resident in mountains of southeastern Coahuila. A small population bred near the summit of Mt. Zapalinamé, from 9800 to 10,300 feet, during both seasons. On July 12, 1958 a breeding pair was collected from a small patch of pine woods, 10,000 feet; two immatures were collected near the same spot on July 14. On May 21, 1959, a breeding pair was collected from the same patch of pines; a second pair was found with its nest in a grove of Douglas fir-pine-cypress, 10,300 feet, a few hundred yards east of the first pair. The female was collect-

ed and had a well developed brood-patch and a soft-shelled egg in her oviduct. The species was common 11 miles east of San Antonio de las Alazanas chiefly in Douglas fir-pine and Douglas fir-fir above 10,000 feet. A pair in breeding condition was collected at 10,200 feet on May 29, 1959. Several family groups were noted in the same general area between June 28 and July 8, 1958 and an immature was collected on the former date.

My specimens are referable to the race S. p. flavinucha on basis of both large size and coloration. These specimens and birds from nearby Cerro Potosí, Nuevo León, are slightly larger than typical flavinucha from the southern Sierra Madre Oriental. Five males average: wing - 69.0 mm. (67.5 - 70.5); flattened wing - 70.1 mm. (68 - 72); tail - 37 mm. (36.5 - 37.5). Five females average: wing - 68.5 mm. (67.5 - 69.5); flattened wing - 69.6 mm. (68.5 - 71); tail - 36.6 mm. (36 - 37.5). Other record: sight record by Hardy, 13 miles east of San Antonio de las Alazanas, July 6, 1955, Urban (1959: 482-483) as S. p. melanotis. Specimens examined: CAE - 10.

Family Certhiidae

Certhia familiaris Linnaeus. Uncommon and local resident in mountains of southeastern Coahuila from 9000 to 10,500 feet. Present in Douglas fir-pine, Douglas fir-fir and cypress forest, showing a decided preference for cypress even in mixed conifer (e. g., the Sierra Guadalupe). At least one pair nested in Douglas fir-pine-cypress near the summit of Mt. Zapalinamé during both seasons. A singing male was collected there May 21, 1959, and an immature (sex?) was taken June 14, 1958. I saw one in cypress forest at 10,000 feet $2\frac{1}{2}$ miles west of Las Vacas on

July 22, and collected an immature female (not fat) there September 30. The species was more common 11 miles east of San Antonio de las Alazanas and birds in breeding condition were collected May 26 and 27. It was present in small numbers in cypress forest in the Sierra Guadalupe, 9800 feet, June 8.

My series and the following records are referable to the race C. f. albescens on basis of pale brownish gray underparts. Other records: Miller, et al. (1957: 143), southern Coahuila; Urban (1959: 483), San Antonio de las Alazanas: 13 miles east, July 7, 1955, 1 collected; 13 miles east, 3 miles south, January 12, 1954, 2 collected. Specimens examined: CAE - 7; KU - 3.

Family Troglodytidae

Campylorhynchus brunneicapillus (Lafresnaye). Common locally in scrub desert, 5500 to 7500 feet, from Carneros south and west to Concepción del Oro, Zacatecas, and at the north base of the Sierra Guadalupe. In most areas present only where cholla or a similar form of cactus occurred and nests were nearly always placed in this vegetation. A large population present in yucca-piñon habitat at 7500 feet about 6 miles south of Concepción del Oro spent most of the time in yuccas or pinons but nested in cactus. Birds near Gómez Farías had not laid on April 27, whereas nests found near Concepción del Oro held incomplete sets. Many nests with eggs or small young were found southeast of Concepción del Oro, May 14, but many full sized juvenals were flying about on this date. Other records: Burleigh and Lowery (1942: 198), west of Saltillo, April, sight records; Urban (1959: 484-485), 7 miles south, 1 mile east of Gómez Farías,

6500 feet, November 18, 1949, 1 collected (as C. b. couesi).

The birds of southeastern Coahuila are apparently intergrades between C. b. guttatus and C. b. couesi. My series is closer to guttatus in that on most specimens the markings of the flanks and under tail coverts are streaks rather than spots. The influence of age on this character cannot be determined until larger series become available from critical areas. Specimens examined: CAE - 6; KU - 1.

Thryomanes bewicki (Audubon). Observed in suitable habitat on all mountains visited. Common resident from 5500 to 10,500 feet except in desert, cultivated fields and dense conifers. Usually shy and difficult to collect. Rare in scrub desert near Saltillo. Most abundant in piñon-juniper, chaparral and, on exposed south slopes, in yucca-maguey-sotol. Not present in the dense encinal under conifers at higher elevations but usually present where cutting had produced encinal or chaparral choked clearings. At several places this species inhabited encinal, chaparral and open pine woods along with Troglodytes brunneicollis. At Las Vacas birds were breeding from mid-April through June and stub-tailed juvenals were collected as late as July 9.

Specimens from southeastern Coahuila are intergrades between T. b. eremophilus and T. b. murinus. My series (as a whole) is darker and browner both above and below than are typical eremophilus, and it approaches murinus in this respect. My specimens have a slightly grayer, less distinctly brown tone above than do typical murinus. Other records: Ridgway (1904: 557), Saltillo, April; Burleigh and Lowery (1942: 198), Saltillo, desert to highest ridges, April, several collected; Miller, et al.

(1957: 161), Saltillo (USNM) as cryptus; Urban (1959: 484), Sierra Guadalupe, 6500 feet, April 21, 1953, 1 collected. Specimens examined: CAE - 23; GMS - 1; KU - 1.

Troglodytes aëdon Vieillot. I observed single birds in cat-claw thickets along arroyos near Las Vacas, 7200 to 7400 feet, on several occasions between September 20 and November 5, 1959. Several were present at a deserted ranch house in piñons, 6800 feet, just north of the Sierra Guadalupe, October 12. Other record: Burleigh and Lowery (1942: 197), near Saltillo, April, 1 collected. My specimens have the barred back and flanks of T. a. parkmani. Specimens examined: CAE - 3.

Troglodytes brunneicollis Sclater. Resident in pine, Douglas fir and fir from 9000 to 10,500 feet throughout south-eastern Coahuila. Small populations nested in conifers near the summit of Mt. Zapalinamé and on a similar ridge to the south. Families from each population moved down-slope after the breeding season, being seen as low as 8000 feet in encinal and chaparral. Very common in ravines and thick brush under conifers in the Sierra Guadalupe and 11 miles east of San Antonio de las Alazanas, juvenals being collected here from June through August. During both seasons a pair nested in open pines, 10,000 feet, 11 miles east of San Antonio de las Alazanas, on or very near a Bewick Wren territory.

Specimens from southeastern Coahuila seem to be intergrades between T. b. cahooni and T. b. compositus. When viewed in large series, specimens from southeastern Coahuila are highly variable, but the majority fall into two noticeable series: 1) light colored (especially below), grayish birds which resemble T. b. cahooni from the Sierra Madre Occiden-

tal; 2) darker, richer brown birds which more nearly resemble T. b. compositus of the Sierra Madre Oriental. Other specimens are intermediate in coloration. Specimens from northwestern Coahuila are all definitely of the grayish cahooni type. In southeastern Coahuila both types occur in the same populations. Larger series from critical areas are needed before these intermediate populations can be understood. Other records: Ridgway (1904: 588), Sierra Guadalupe (as cahooni); Burleigh and Lowery (1942: 198), Diamante Pass, April, 1 collected (as cahooni); Urban (1959: 483-484), 13 miles east of San Antonio de las Alazanas, July 6, 1955, 1 collected (toward cahooni). Specimens examined: CAE - 14; KU - 1; LSU - 2; USNM - 5.

Salpinctes obsoletus (Say). Common in scrub desert, along arroyos and on exposed rocky slopes from 5000 to 10,500 feet. Ranges widely throughout southeastern Coahuila and adjacent Zacatecas. Nests with small young were found May 11 to June 25; juvenals were collected through July 12. Near Las Vacas common in deep arroyos, a few pairs frequenting the ranch buildings and nearby villages. Other records: Baird (1859: 13), Patos (General Cepeda), 1 collected; Burleigh and Lowery (1942: 198), Saltillo and adjacent slopes to 6000 feet, April, several collected; Urban (1959: 485), 7 miles south, 4 miles east of Bella Unión, 7200 feet, June 24, 1952, 1 collected. My specimens and the above records are referable to the nominate race. Specimens examined: CAE - 7; KU - 1.

Catherpes mexicanus (Swainson). Locally common about cliff faces and steep rocky slopes usually above 8000 feet. Several males were found below 7000 feet at cliff faces north of Diamante Pass. Present in

the mountains south of Saltillo, near Mesa de las Tablas (1 immature, May 31, 1959) and in the mountains near Concepción del Oro. Other records: Baird (1859: 13), Patos (General Cepeda), 1 collected; Burleigh and Lowery (1942: 198), Saltillo, Diamante Pass, Chorro del Agua, rare, April, 1 collected. My specimens and the above records are referable to the race C. m. albifrons. Specimen examined: CAE - 1.

Family Mimidae

Mimus polyglottos (Linnaeus). Locally common from scrub desert at 5000 feet up to piñon-juniper-catclaw at 7000 feet. After the breeding season it follows the larger arroyos to orchards and piñons at 7500 feet. At Las Vacas less common than in the thorn scrub in the northeastern part of the state. I obtained no nesting data. My series is referable to the race M. p. leucopterus on basis of large size (2 males average (wing) - 114 mm.; 4 females average 108 mm.) and relatively short tails (2 males average 113 mm.; 4 females average 111.5 mm.). Other records: Sutton and Burleigh (1939: 37), southern Coahuila, sight records; Burleigh and Lowery (1942: 199), near Saltillo, 1 collected. Specimens examined: CAE - 6.

Oreoscoptes montanus (Townsend). I collected a male in desert scrub about 10 miles west of La Rosa, December 25, 1957. Specimen examined: CAE - 1.

Toxostoma curvirostre (Swainson). Common resident in scrub desert, in open piñon-juniper and in semi-arid cultivated districts from 5000 to 7600 feet. Common around villages and ranch houses, especially in

tuna (Opuntia) orchards and along catclaw-bordered arroyos. Observed in suitable habitat throughout southeastern Coahuila and near Concepción del Oro, Zacatecas. A few were present in open pines, 9500 feet, 11 miles east of San Antonio de las Alazanas, June 28. I collected birds in breeding condition from May through July and found nests with eggs May 11 and July 28 and a nest with small young May 25.

Specimens from southeastern Coahuila are intergrades between T. c. celsum and T. c. oberholseri, in my opinion closer to the former. My small series averages larger in size (5 males: wing - 111.3 mm.; tail - 108.2 and 3 females: wing - 109.5 mm., tail - 105.5 mm.) than does a series of oberholseri from Texas and Tamaulipas in the Sutton collection. In this respect they approach T. c. celsum. Color comparisons are difficult to make since most Coahuila specimens are in worn, faded plumage. Fresh plumaged birds are nearly as dark as celsum and have numerous, large spots on the underparts, but some specimens have this spotting much reduced.

Other records: Burleigh and Lowery (1942: 199), Diamante Pass, near Saltillo; Amadon and Phillips (1947: 578), 20 miles west of Saltillo, 1 collected; Miller, et al. (1957: 177), El Diamante, July, laying (RTM); Urban (1959: 486), 16 miles west of San Antonio de las Alazanas, 6500 feet, January, 1 collected and 7 miles south, 4 miles east of Bella Unión, 7200 feet, June, 1 collected. Specimens examined: CAE - 9; KU - 2.

Toxostoma dorsale Henry. Present in a wide range of shrubby habitats from scrub desert at 5000 feet to encinal at 10,500 feet; near Las Vacas most common in piñon-juniper and chaparral from 6800 to 9000 feet. At low elevations often seen with T. curvirostre and during the

fall and winter occasionally occurring in small flocks with that species. Though shy and often difficult to observe, T. dorsale was much more common at higher elevations and in denser habitats than was T. curvirostre. Singing males were very conspicuous, chiefly at dawn and dusk, from April to June and occasionally in fall. I found a nest with two fresh eggs April 30 and observed juvenals out of the nest from April 20 to July 16. Birds in breeding condition were collected from April through June. My series and the following records are referable to T. d. dumosum on the basis of dark coloration. Other records: Sutton and Burleigh (1939: 37), Diamante Pass, March, 1 collected; Burleigh and Lowery (1942: 199-200), near Saltillo, Diamante Pass to 7500 feet; Urban (1959: 487), 8 miles north of La Ventura, 6000 feet, November. Specimens examined: CAE - 14; CU - 1; KU - 1.

Family Turdidae

Turdus migratorius Linnaeus. Uncommon breeder in the mountains of southeastern Coahuila but not observed in the mountains near Concepción del Oro. The species bred locally in orchards and in clearings in piñon-juniper, pine and Douglas fir-pine from 6500 to 10,500 feet, chiefly at the higher elevations. It was most common in the Sierra Guadalupe and 11 miles east of San Antonio de las Alazanas. Local birds were very shy and difficult to approach, especially after the breeding season. At such times single birds and small flocks were often present in piñon-juniper in areas where they did not breed. Wintering birds seem to represent another population. During the winter I frequently saw small flocks in open piñon-juniper near Las Vacas and in desert country north of Saltillo.

These birds were not shy, and a female collected from a large flock at Las Vacas, December 27, is smaller and more brightly colored than breeding females from the same locality. My entire series is referable to the large race T. m. propinquus. Wings of three males average 133.3 mm. (133-134 mm.); of five females 130.6 mm. (128.5 - 135 mm.). Other records: Burleigh and Lowery (1942: 200), Diamante Pass, Chorro del Agua, April, 2 collected. Specimens examined: CAE - 6; LSU - 2.

Hylocichla guttata (Pallas). The species was a common transient throughout southeastern Coahuila, especially in the mountains south of Saltillo and in the Sierra Guadalupe. It inhabited piñon-juniper and chaparral-bordered arroyos from 7000 to 9000 feet. Near Las Vacas it was most common in juniper thickets. It arrived from the north in September and migration reached a peak in October, a small number of birds still being present when I left the area in mid-November. It was common through mid-April but only a few stragglers remained by early May.

Five specimens collected within a few miles of Las Vacas, 7300 to 8000 feet, October 26 to November 11, 1958, are referable to the nominate race. A sixth H. g. guttata was collected in the Sierra Guadalupe at 6400 feet, October 11, 1958. My specimens vary widely in coloration from moderately light to very dark birds. Wings of five males average 92.4 mm. (90.3 - 94.5 mm.); of one female, 87 mm. Other record: Burleigh and Lowery (1942: 200), Diamante Pass, near Saltillo, 4 collected. Specimens examined: CAE - 6.

Seven specimens collected within a few miles of Las Vacas, 7300 to 10,300 feet, between September 25 and October 31, 1958, and on May 21,

1959, are referable to the large race H. g. auduboni. Wings of five males average 102.8 mm. (101 - 105.5 mm.); of two females 96.5 mm. (96 - 97 mm.). Specimens examined: CAE - 7.

A male collected $1\frac{1}{2}$ miles east of El Diamante at 7000 feet, April 23, 1959, is referred to the race H. g. sequoiensis on basis of medium size (wing 93 mm.) and pale, gray coloration. Other record: Ridgway (1907: 45), Sierra Guadalupe, April. Specimens examined: CAE - 1; USNM - 1.

Catharus occidentalis Sclater. This species was common but even singing males were difficult to observe in the dense undergrowth. I found it only in the conifer zones of the ridge directly south of San Antonio de las Alazanas, from a point 11 miles east of town eastward along the ridge into Nuevo León. It was present in the dense encinal under Douglas fir-pine and Douglas fir-fir forests from 9000 to 10,500 feet. It was less common in the more open fir forests which predominate at higher elevations. Birds were singing on territory during May, June and early July. A male collected May 27, 1959 was in breeding condition. This specimen is referable to the race C. o. fulvescens because of its rich reddish brown upperparts. Specimen examined: CAE - 1.

Myadestes townsendi (Audubon). Ridgway (1907: 164) reported the nominate race from the Sierra Guadalupe during April.

Sialia mexicana Swainson. Resident in open woods in the mountains of southeastern Coahuila, common between 6800 and 8000 feet, uncommon between 8000 and 10,500 feet. Known to breed in open piñon-juniper-yucca and open pine to 9000 feet. Remained in family groups during most

of year, but by mid-April had dispersed for the breeding season. I found a fresh but empty nest April 25, and nests (each with four eggs) May 11, 18 and July 4. Juvenals out of the nest were frequently seen between June 11 and July 18. In fall, family groups were joined by wintering birds of other species and moved down into cultivated areas. I never saw the species in desert at 5500 feet, however. A family was observed in open pine, 9000 feet, 11 miles east of San Antonio de las Alazanas on June 28, and a pair in breeding condition was collected in a nearby cultivated area May 28. I observed a male near Carneros on April 27 and a breeding pair near Concepción del Oro, 7500 feet, May 14. I did not find the species in the extensive piñon-juniper habitat on the lower slopes of the Sierra Guadalupe and on the foothills to the north of this range, although conditions seemed favorable.

Other records: Baird (1859: 9), Saltillo, Agua Nueva, 1 collected; Ridgway (1907: 150), Saltillo, Carneros, Sierra Guadalupe; Sutton and Burleigh (1939: 38), Diamante Pass, March; Burleigh and Lowery (1942: 200), Diamante Pass, above 6500 feet, 8 collected; Miller, et al. (1957: 199), El Diamante, July, breeding condition (RTM). My series and the above records are referable to the uniformly blue-backed nominate race. Specimens examined: CAE - 28; GMS - 1.

Family Sylviidae

Poliioptila caerulea (Linnaeus). Resident from 6500 to 8000 feet, common in piñon-juniper, uncommon in pine-chaparral and encinal; in non-breeding season often present in dense juniper thickets and in catclaw along arroyos. Found in suitable habitat in the mountains south of Salti-

llo, in the Sierra Guadalupe, and near Concepción del Oro. Near Las Vacas I found nests with eggs (clutch-size four) from May 25 to July 1. Between July 3 and 27 I found four nests with young ready to fledge and six additional broods which had recently left the nest. Specimens were collected as late as November 17. My series is referable to the race P. c. amoenissima on basis of reduced white in tail and dull dorsal coloration. Other records: Burleigh and Lowery (1942: 200), Diamante Pass, April, 2 collected; Miller, et al. (1957: 201), El Diamante, July, laying (RTM). Specimens examined: CAE - 19.

Polioptila melanura Lawrence. Present in scrub desert below 5500 feet. Observed 10 miles west of La Rosa, December 25, 1957; in desert north of the Sierra Guadalupe, June 9; in arroyos north of Saltillo, June 11, 1959. Other record: Burleigh and Lowery (1942: 200-201), west of Saltillo, below 5000 feet, 1 collected. These specimens are referable to the nominate race on basis of large size (wing - 48, 48 mm.; tail - 52, 51 mm.). Specimens examined: CAE - 1; GMS - 1.

Regulus calendula (Linnaeus). Common transient and uncommon winter resident throughout southeastern Coahuila from scrub desert at 5500 feet to pine woods at 10,000 feet. At Las Vacas most common in orchards, in piñon-juniper, and in catclaw along arroyos from 7000 to 8000 feet. The earliest fall transients were noted September 22, the latest spring transients April 30. The species was observed near La Rosa, December 25, 1957.

In my series spring birds are grayer both above and below than fall birds, but all compare favorably with specimens of R. c. calendula from eastern North America; none is gray enough for R. c. cineraceus.

Other records: Sutton and Burleigh (1939: 38), southern Coahuila; Burleigh and Lowery (1942: 201), Diamante Pass, Chorro del Agua, 20 miles west of Saltillo, April, 3 collected; Urban (1959: 489), Sierra Guadalupe, 7800 feet, April 20, 1953, 1 collected and sight record by Dickerman, 3 miles south, 13 miles east of San Antonio de las Alazanas, January 12, 1954. Specimens examined: CAE - 10; KU - 1.

Family Motacillidae

Anthus spinoletta (Linnaeus). Flocks of 10 to 50 birds were present in the cultivated fields of Diamante Valley and at Las Vacas from late September to mid-November, when I left the area. I also saw a flock over Diamante Valley on April 19. The species probably winters in the area. Two immatures collected October 31, 1958 compare favorably in coloration and streaking with series of A. s. rubescens in the Kansas University collection. Other record: Burleigh and Lowery (1942: 201), near Saltillo, April, 1 collected. Specimens examined: CAE - 2.

Family Bombycillidae

Bombycilla cedrorum Vieillot. One bird was present in Las Vacas December 27 and several were present in piñon-juniper nearby December 28, 1957. Flocks of up to 60 birds were present in an orchard near Las Vacas from April 16 to early May and in Saltillo until mid-May. Other record: Burleigh and Lowery (1942: 201), near Diamante Pass. Specimens examined: CAE - 2.

Family Ptiligonatidae

Phainopepla nitens (Swainson). Uncommon and local breeder at low elevations in mountains of southeastern Coahuila. Seen occasionally in open piñon-juniper east of El Diamante during June and July. Several pairs were on territory in piñon-juniper at north base of the Sierra Guadalupe, June 7. Small groups, largely immatures, were observed near Las Vacas in August and November. A nest with three incubated eggs was found just north of Las Vacas July 4. These eggs hatched about July 10. My series of breeding birds and the following records are referable to the nominate race. Other records: Sutton and Burleigh (1939: 39), Diamante Pass, March, 2 collected; Burleigh and Lowery (1942: 201), Diamante Pass, April, 1 collected; Miller, et al. (1957: 213), El Diamante, breeding.

Sutton and Burleigh (loc. cit.) reported single specimens of P. n. nitens and P. n. lepida from Diamante Pass, March 6. Actually three birds were collected, two of which (adult male, wing 100.5 mm., tail - 98 mm.; adult female, wing - 100 mm., tail - 96 mm.) are clearly P. n. nitens. The third bird, an immature male in mixed plumage, reported as lepida, wears its first season's primaries. The wing is small (95mm.) but within the range of three immatures (94.5 - 95.5 mm.) collected in the same area in early fall. This bird cannot be positively identified to race, but in my opinion is P. n. nitens and short-winged due to immaturity. Specimens examined: CAE - 6; GMS - 1; CU - 1; CM - 1.

Family Laniidae

Lanius ludovicianus Linnaeus. As a breeding species local and uncommon in cultivated areas and open piñon-juniper from 6500 to 7500 feet; less common in open desert and arid areas down to 5000 feet. Common tran-

sient and uncommon winter resident in open country from 5000 to 7500 feet. Specimens in breeding condition were collected from mid-April to May. Juvenals out of the nest were observed in piñon-juniper north of Las Vacas and near Diamante Valley from April 25 to July 4.

Birds from southeastern Coahuila are intermediate between L. l. mexicanus and L. l. excubitorides although much closer to the former. My series averages lighter above than mexicanus from the southern part of the Mexican Plateau. Other records: Burleigh and Lowery (1942: 201-202), Diamante Pass, 1 collected; Urban (1959: 491), 7 miles south, 4 miles east of Bella Unión, 7200 feet, June 25, 1952, 1 collected. Specimens examined: CAE - 15; KU - 1.

Burleigh and Lowery (1942: 202) recorded an intergrade between excubitorides and migrans taken near Saltillo in April.

Family Vireonidae

Vireo huttoni Cassin. Present in suitable habitat on all mountains visited in southeastern Coahuila and in the mountains near Concepción del Oro. Common breeder in piñon-juniper, encinal and pine-encinal from 6800 to 10,500 feet. Near Las Vacas and in the Sierra Guadalupe most common in piñon-juniper below 8000 feet. At higher elevations and 11 miles east of San Antonio de las Alazanas present in smaller numbers in encinal under large conifers. Nest data: pair building, 15 feet from ground in top of piñon, May 11; nest (four eggs), 3 feet from ground in small oak, June 18 (juvenals collected July 15); pair building, 3½ feet from ground in juniper, June 23; nest (four eggs), 6 feet from ground near top of small piñon, July 30. Birds in breeding condition were collected

from April through June. It was present in smaller numbers during late fall. Apparently the birds disperse somewhat after the nesting season. I heard singing as late as September 21. My series and the following records refer to the race V. h. carolinae. Other records: Burleigh and Lowery (1942: 202), Diamante Pass, 2 collected; Urban (1959: 492), 13 miles east of San Antonio de las Alazanas, July 6, 1955, 1 collected; 7 miles south, 4 miles east of Bella Unión, June 25, 1952, 1 collected.

I have examined part of the material reported by Sutton and Burleigh (1939: 39) and Ridgway (1904: 198) and find it to agree well with my series of carolinae from the same localities. I do not agree with Urban's suggestion (loc. cit.) that stephensi migrates through southeastern Coahuila. I have seen no Coahuila specimens which even approach stephensi in grayness of coloration. Specimens examined: CAE - 21; CU - 2; CM - 1; KU - 2; USNM - 2.

Vireo belli Audubon. Local but common resident in catclaw-bordered arroyos, mesquite thickets and dry stream beds at low elevations. Breeding birds were present east of Saltillo and north of the Sierra Guadalupe (near San José del Refugio) between 5000 and 5500 feet in May and June. An immature female was collected from a family group at the latter locality June 9. Breeding specimens from central and southern Coahuila compare favorably with Texas specimens of V. b. medius. The upperparts (especially the head) are more grayish olive, and the flanks are paler than specimens of V. b. belli from Oklahoma, but they do not approach the extremely gray coloration of V. b. arizonae from Arizona. Other record: Burleigh and Lowery (1942: 202), near Saltillo, April, 4 collected. Specimens examined: CAE - 1.

A transient collected in a catclaw-bordered arroyo 1 mile north of Las Vacas, October 19 has the more yellowish upperparts and flanks of typical V. b. belli. Specimen examined: CAE - 1.

Vireo solitarius (Wilson). Apparently a rare transient in southeastern Coahuila. I observed single birds and once a small group (September 29) in piñon-juniper and in pine-oak from 7000 to 8000 feet in the mountains south of Saltillo and in the Sierra Guadalupe. I collected four specimens between September 29 and October 18. These specimens are very similar in coloration to specimens of V. s. solitarius from Michigan and Pennsylvania. Specimens examined: CAE - 4.

Vireo gilvus (Vieillot). Miller, et al. (1957: 232) reported the nominate race from 12 miles west of Saltillo, September 28.

Family Parulidae

Mniotilta varia (Linnaeus). I observed two, possibly three, birds, 2 miles southwest of Las Vacas in cypress forest at 10,000 feet, July 22, and two more 2 miles northwest of Las Vacas in Douglas fir-pine forest at 10,000 feet, August 4. Other records: Burleigh and Lowery (1942: 202), near Saltillo, Diamante Pass, April, 2 collected; Urban (1959: 493), Sierra Guadalupe, April 20, 1953, 1 collected. Specimens examined: CAE - 1; KU - 1.

Vermivora celata (Say). I observed singles and small flocks from mid-September through November chiefly in catclaw thickets along arroyos near Las Vacas, between 7200 and 7500 feet. I saw an occasional

bird in chaparral or piñon-juniper. I saw one in mesquite along a dry arroyo 4 miles east of La Rosa, December 25, 1957. My specimens show varying amounts of intergradation between V. c. celata and V. c. orestera but as a series are near celata in that they are not strongly yellow below. Specimens examined: CAE - 6.

Burleigh and Lowery (1942: 202) reported V. c. orestera from Diamante Pass. Specimen examined: LSU - 1.

Vermivora ruficapilla (Wilson). Uncommon transient from mid-September to late October near Las Vacas; inhabited lush vegetation (rye fields and weed beds) along arroyos from 7200 to 7500 feet. Occasionally seen in orchards, piñon-juniper and pine-chaparral to 8000 feet. My specimens compare favorably with specimens of V. r. ruficapilla from the northeastern United States. In my opinion they are not brightly enough colored for V. r. ridgwayi. Specimens examined: CAE - 8.

Vermivora crissalis (Salvin and Godman). Common breeder throughout southeastern Coahuila in chaparral dotted with 15- to 20-foot pines of any species from 7200 to 10,500 feet; in some areas common in low encinal bordering conifer forest. Nesting data: female with 5 mm. ovum, April 23; nest with three eggs, May 30; nest with three newly hatched young, May 31; parents with small juvenals, June 14, 20, July 19. In addition, the Sutton Collection contains a juvenal taken from nest of four, 5½ miles southeast of El Diamante by R. R. Graber, June 21, 1956. On August 4 I collected an immature male which was undergoing an extensive post-juvenal body molt. My latest fall date is September 26. Other records: Bangs (1925: 251), Sierra Guadalupe; Burleigh and Lowery (1942: 203),

Diamante Pass. Specimens examined: CAE - 11; GMS - 2.

Vermivora superciliosa (Hartlaub). Nested 11 miles east of San Antonio de las Alazanas in Douglas fir-pine over encinal, chiefly between 9200 and 9500 feet; common locally. Territories of all birds observed included small, partly open areas where 15- to 20-foot aspens were present. Singing was usually from the aspens and lower trees rather than from the much taller conifers. Females were repeatedly flushed from low encinal but no nests were found. I collected breeding birds from May 27 to 31 and July 5. My series agrees with specimens of V. s. mexicana from Tamaulipas in both pale coloration and size. Wings of four males average 63.3 mm. (61.5 - 66 mm.). Other record: Urban (1959: 494), 13 miles east of San Antonio de las Alazanas, April 10, 1954, 1 collected. Specimens examined: CAE - 8; KU - 1.

Peucedramus taeniatus (Du Bus). Common resident throughout southeastern Coahuila; bred wherever conifers other than piñons were present from 7800 to over 10,500 feet. During the non-breeding season and when foraging observed down to 7200 feet in piñon-juniper and in chaparral often in company with chickadees, kinglets and bush-tits. I found no nests but birds were on breeding territories from at least mid-April through June. A female with brood-patch was collected April 18, 11 miles east of San Antonio de las Alazanas. I observed immatures out of the nest south of Mesa de las Tablas, May 29; in the Sierra Guadalupe, June 9; and near Las Vacas, July 5. My specimens are referable to the race P. t. arizonae on basis of the dorsal coloration which is as grayish as in specimens from Arizona and New Mexico. Other records: Sutton and Burleigh

(1939: 40), March, 1 collected; Burleigh and Lowery (1942: 203), Diamante Pass, April, several collected; Urban (1959: 494-495), 13 miles east of San Antonio de las Alazanas, April 10, 1954, sight record by Dickerman. Specimens examined: CAE - 17; GMS - 2.

Dendroica auduboni (Townsend). Common transient throughout the area; wintered in small numbers. It went about in small flocks, usually with bluebirds and Chipping Sparrows, in piñon-juniper, cultivated areas, and near villages and houses, from 6800 to 7500 feet. I saw the species infrequently in mixed warbler flocks in piñon-chaparral and in larger pines at higher elevations, rarely in conifers and desert areas. I collected specimens from September through November and during April. At Las Vacas it was more common in fall than in spring.

Most of my birds are fall immatures. Five specimens are clearly of the nominate race. Wings of two males average 76 mm. (75 - 77 mm.); of three females, 74.1 mm. (72.5 - 76 mm.). An adult male (wing 77.5 mm.) and an unsexed bird (78 mm.) are intermediate between D. a. auduboni and D. a. memorabilis. One specimen cannot be identified racially. Other records: Burleigh and Lowery (1942:203), Diamante Pass, Saltillo, 6 collected (2 toward memorabilis); Urban (1959: 495), sight record by Dickerman, 13 miles east of San Antonio de las Alazanas, April 10, 1954. Specimens examined: CAE - 8.

A male collected near El Diamante, April 30, 1959 and an immature male (?) collected October 23, 1958 near Las Vacas are D. a. memorabilis (wings measure - 81.5, 81 mm.; tails - 60.5, 60.5 mm.). Other record: Oberholser (1921: 246), Saltillo, April, 1 collected. Specimens examined: CAE - 2.

Dendroica townsendi (Townsend). Single birds and small groups were regularly observed from September 20 to late October near Las Vacas. Most frequently seen in company with other species in piñon-juniper or larger pines from 7400 to 8000 feet; present in smaller numbers to 10,500 feet. Other records: Burleigh and Lowery (1942: 203), near Diamante Pass, April, 1 collected; Amadon and Phillips (1947: 578), 20 miles west of Saltillo, August, 1 collected; Urban (1959: 495-496), sight record by Dickerman, 13 miles east of San Antonio de las Alazanas, April 10, 1954. Specimens examined: CAE - 5.

Dendroica virens (Gmelin). I observed single birds (some of which may have been immature D. chrysoparia) regularly between September 22 and October 7. The birds were usually with other warblers in piñon-juniper or chaparral-pine from 7300 to 8000 feet. All records are from within a few miles of Las Vacas. My series is large-billed and represents the nominate race. Other record: Urban (1959: 496), sight record by Dickerman, 13 miles east of San Antonio de las Alazanas, April 10, 1954. Specimens examined: CAE - 4.

Dendroica chrysoparia Sclater and Salvin. I collected an immature female 2 miles west of Las Vacas in cypress forest, 10,000 feet, July 22; saw a single bird in piñon-juniper 1 mile north of Las Vacas, 7400 feet, July 23; and collected an immature male 1 mile northwest of Las Vacas in piñon-chaparral, 8000 feet, August 2. Specimens examined: CAE - 2.

Dendroica occidentalis (Townsend). I collected an immature

(sex ?) on the north slope of the Sierra Guadalupe, 6800 feet, in pine-oak-madroño, October 12, 1958. Other record: Urban (1959: 496), 13 miles east of San Antonio de las Alazanas, April 10, 1954, 1 collected. Specimens examined: CAE - 1; KU - 1.

Dendroica dominica (Linnaeus). I collected an immature (sex ?) in piñons near cultivated fields at Las Vacas, 7400 feet, October 2, 1958. This specimen though referable to D. d. albilora does have a few yellow feathers in the white lores. Specimen examined: CAE - 1.

Seiurus aurocapillus (Linnaeus). I collected a male in dense catclaw along an arroyo 1 mile north of Las Vacas, 7200 feet, September 28, 1958. It is typical of the nominate race in the color of the upperparts. Specimen examined: CAE - 1.

Oporornis tolmiei (Townsend). Present in suitable habitat on all mountains visited in southeastern Coahuila; common summer resident in chaparral-pine and low encinal especially in ravines on steep, north-facing slopes, from 8000 to 10,500 feet. It was difficult to observe when not singing but the "chip" alarm call was distinctive and birds occasionally responded to squeaking. Pairs were observed on territory from May 21 to July 22 and birds remained in the area to at least August 8. I saw a female with two full-sized juvenals on July 5 near Las Vacas and collected an immature female from a family group 15 miles west of San Antonio de las Alazanas on July 8.

My specimens are referable to the race O. t. monticola. Phillips (1947: 296-300) described a clinal increase in tail-length from north to

south. My series from very near the southern limits of the species' breeding range supports this idea by having longer tails and less difference between tail- and wing-length than do his series from the United States. Specimens examined: CAE - 10.

Geothlypis trichas (Linnaeus). I collected a male in catclaw in an arroyo near Las Vacas, 7300 feet, October 19, 1958. Other record: Burleigh and Lowery (1942: 204), near Saltillo, 3 collected. These specimens are referable to G. t. occidentalis on basis of both size and coloration. Specimens examined: CAE - 1; LSU - 3.

Geothlypis nelsoni Richmond. Found breeding in a series of steep, chaparral covered ravines on the spur just north of Diamante Pass, 7800 to 8000 feet. On June 27, 1958 I visited four ravines and found a singing male in each. Females were observed at two of these points and one which employed broken wing tactics was collected. I revisited two of these ravines June 12, 1959, and collected the singing male in each. I also collected a singing male on territory just east of Diamante Pass, 7800 feet, July 29. On July 31, I found a male (apparently not on territory) in sotol-yucca-encinal on the south slope of a ridge south and east of Las Vacas. Singing males were easy to observe from a distance but were wary and difficult to approach. Males sang both from exposed yucca tops and from within low, dense encinal, and covered wide areas of the ravines when pursued. All birds collected were in breeding condition. My series is referable to the nominate race. Other record: Burleigh and Lowery (1942: 204), near Diamante Pass (as microrhyncha). Specimens examined: CAE - 5.

Icteria virens Linnaeus. I noted one several times in dense catclaw along an arroyo 1 mile north of Las Vacas, 7300 feet, October 8 to 14. I found breeding birds in mesquite thickets in desert country near Saltillo and northeast of the Sierra Guadalupe, 5000 to 5400 feet, during May and June. A singing male collected at the latter locality June 9, 1959 is of the long-tailed race, I. v. auricollis (tail 86 mm.). Specimens examined: CAE - 1.

Wilsonia pusilla (Wilson). A transient, common from late September to mid-October, less common to November 6. Also present from mid-April to May 11. At Las Vacas more common in spring than in fall and most common in the lush vegetation in the orchard near Las Vacas, in rye fields, and in catclaw along ravines from 7200 to 7500 feet. Also present in chaparral at least to 9000 feet. Eleven miles east of San Antonio de las Alazanas, present to at least 9500 feet in pine-encinal on April 18. I refer my specimens to the race W. p. pileolata because of their bright yellow underparts. Other records: Burleigh and Lowery (1942: 204), throughout southeastern Coahuila, April, 7 collected (1 toward pusilla); Urban (1959: 497), Sierra Guadalupe, April 21, 1953, 1 collected (as pusilla). Specimens examined: CAE - 7; KU - 2.

Setophaga ruticilla (Linnaeus). I saw a female or immature male in dense junipers along an arroyo near Las Vacas, September 21, 1958.

Setophaga picta Swainson. I saw a single bird 2 miles north of Las Vacas, 10,300 feet, Douglas fir forest, August 8. I found singing males and a pair on territory in oak-pine-madroño bordered ravines at the

north base of the Sierra Guadalupe, 6500 to 7000 feet, June 7. Other record: Urban (1959: 497), Sierra Guadalupe, April 23, 1953, 1 collected (S. p. picta). Specimen examined: KU - 1.

Family Ploceidae

Passer domesticus (Linnaeus). Resident in Saltillo, Arteaga, and all villages visited in southeastern Coahuila and near Concepción del Oro, Zacatecas. Bred at most of the larger ranches in the area, but apparently was absent from the small ranches above 9000 feet east of San Antonio de las Alazanas. At least 50 birds were present in Las Vacas in early July. Other records: Burleigh and Lowery (1942: 204), Saltillo and vicinity, Chorro del Agua, Diamante Valley; Urban (1959: 497), 12 miles east of San Antonio de las Alazanas, several captured by Baker. Specimens examined: CAE - 9.

Family Icteridae

Molothrus ater (Boddaert). Seen only in cultivated areas in southeastern Coahuila chiefly below 6000 feet. Five birds were present at Las Vacas, April 16. A lone male collected $1\frac{1}{2}$ miles east of El Diamante, 6800 feet, April 29, 1959, is referable to the nominate race on basis of size (wing - 110 mm.; flattened wing - 113 mm.). Other record: Burleigh and Lowery (1942: 206), sight records near Saltillo. Specimens examined: CAE - 1.

Cassidix mexicanus (Gmelin). Common resident in towns and irrigated areas throughout southeastern Coahuila and near Concepción del

Oro, Zacatecas, chiefly below 6000 feet. Usually found wherever there was surface water, hence near human habitations. On a few occasions found in flooded mesquite thickets in desert, miles from ranches or towns. One pair nested at Las Vacas, and a small flock visited the tank there on October 22. Other records: Sutton and Burleigh (1939: 42), Saltillo area, January, several collected; Burleigh and Lowery (1942: 205-206), Saltillo, Chorro del Agua, Diamante Valley, 3 collected (1 as mexicanus). My specimens are similar in coloration to specimens of C. m. prosopidicola from Nuevo León and Tamaulipas. Specimens examined: CAE - 4.

Euphagus cyanocephalus (Wagler). Common transient and winter resident at low elevations chiefly near villages and in cultivated areas from 5000 to 7500 feet. Observed at most of the villages in southeastern Coahuila, including San José del Refugio north of the Sierra Guadalupe. Observed between September 27 and April 27. I took a female from a small flock at Las Vacas, November 13. Other record: Burleigh and Lowery (1942: 205), Saltillo area, Diamante Valley, April, 3 collected. Specimen examined: CAE - 1.

Icterus spurius (Linnaeus). I saw three birds in the orchard at Las Vacas on July 24, and collected two of these, an adult male and a subadult male. One or two males were observed there on several dates between July 24 and August 3. Specimens examined: CAE - 2.

Icterus parisorum Bonaparte. Common breeder in piñon-juniper-yucca and in sotol-maguey-yucca on exposed south slopes from 6800 to 10,500 feet; present in smaller numbers in yucca in scrub desert down to

at least 5000 feet. Wintered in small numbers near Las Vacas. In late fall and winter commonly seen in tuna orchards where it fed on cactus fruits. Shy and difficult to approach at all seasons. Birds were building under the drooping fronds of a large yucca on April 23. A nest with three eggs was found June 27. Juvenals out of the nest were seen June 24 and August 1. Birds in breeding condition were collected from April through June. An immature was collected in open pines at 9500 feet on Mt. Zapalinamé, July 14. Other records: Burleigh and Lowery (1942: 205), Diamante Valley, Chorro del Agua, above 7000 feet, 5 collected; Urban (1959: 499), 7 miles south, 4 miles east of Bella Unión, 7200 feet, June 25, 1952, female (egg in oviduct). Specimens examined: CAE - 11; KU - 1.

Icterus wagleri Sclater. Observed on several occasions at widely scattered localities. I saw a male in the orchard at Las Vacas on July 4, and collected specimens there July 23 (pair) and 24 (stub-tailed juvenal). A pair was present in scrub desert, 6500 feet, north of the Sierra Guadalupe, October 11. I saw at least four in tall yucca "forest" 15 miles southwest of Gómez Farías, April 27. My specimens do not have a chestnut band on the breast and are therefore typical of the nominate race. Other record: Baird (1859: 19), Saltillo. Specimens examined: CAE - 4.

Icterus cucullatus Swainson. I saw a male in cottonwoods along an arroyo about 10 miles north of Saltillo, May 8, 1959.

Agelaius phoeniceus (Linnaeus). The race A. p. megapotamus has been reported from southeastern Coahuila as follows: Baird (1859: 18),

Saltillo, 1 collected; Burleigh and Lowery (1942: 205), near Saltillo, 1 collected.

Xanthocephalus xanthocephalus (Bonaparte). I saw a single male at Las Vacas on September 20 and people of the village reported a flock of about 40 seen there April 24. I also saw a pair several miles north-east of El Diamante, April 25.

Sturnella neglecta Audubon. Common resident in cultivated areas, chiefly between 6000 and 7500 feet. Most common in Diamante Valley, where I collected three breeding birds between April and mid-June. Also breeding in desert north of the Sierra Guadalupe, 6500 feet, and in the broad, usually arid valley west of San Antonio de las Alazanas. Other records: Baird (1859: 19); Burleigh and Lowery (1942: 205), Saltillo, Diamante Valley, several collected; Miller, et al. (1957: 295), El Diamante, July. Specimens examined: CAE - 3; GMS - 1.

Family Thraupidae

Piranga rubra (Linnaeus). I collected single birds in the orchard at Las Vacas and in nearby piñons September 20, 23, and 28. An unidentified "yellowish tanager" seen in piñons along an arroyo 1 mile north of Las Vacas on October 7 was probably of this species. My specimens are intermediate between P. r. rubra and P. r. cooperi in both size and color. Specimens examined: CAE - 3.

Miller, et al. (1957: 302) reported the race P. r. cooperi from the Sierra Guadalupe.

Piranga flava (Vieillot). Miller, et al. (1957: 303) have identified five specimens collected by Nelson and Goldman in the Sierra Guadalupe as P. f. hepatica. I have examined these five birds, as well as several from farther north in Coahuila, and consider them all to be P. f. dextra, both males and females being too bright for hepatica. The Nelson and Goldman specimens were first identified by Oberholser (1919: 78) as "oreophasma," a synonym of hepatica according to Zimmer (1929), of dextra according to Sutton and Phillips (1942: 278). Specimens examined: USNM - 5.

Piranga ludoviciana (Wilson). I saw an adult male in the orchard at Las Vacas July 30. Other record: Miller, et al. (1957: 305), 12 miles west of Saltillo.

Family Fringillidae

Carpodacus cassini Baird. Duvall (1945: 203) recorded a specimen or specimens from the Sierra Guadalupe in winter.

Carpodacus mexicanus (Muller). Resident from scrub desert at 5500 feet through piñon-juniper to 8000 feet and on exposed south slopes to 10,500 feet; most common among tall yuccas and in piñon-juniper-yucca from 5500 to 7500 feet; abundant in fruit and tuna orchards, around ranch buildings and in towns. Near Las Vacas nests were usually under dead fronds of tree yuccas or in Opuntia clumps, but six miles southeast of Concepción del Oro they were in tops and upper branches of piñons from eight to 14 feet above ground. Egg dates were from May 25 to August 28; the clutch-size usually four.

My specimens have the wide, dark ventral streaks of C. m. potosinus. Other records: Burleigh and Lowery (1942: 206), Saltillo area, several collected; Miller, et al. (1957: 316), El Diamante, July 6, laying; Urban (1959: 504-505), Bella Unión: 3 miles south, 3 miles east, June 27, 1952, 2 collected; 7 miles south, 4 miles east, June 24, 1952, 2 collected. Specimens examined: CAE - 21; GMS - 1; KU - 4.

Spinus pinus (Wilson). Uncommon resident in high conifer forests. Observed in June and July in Douglas fir-pine above 10,000 feet at the summit of Mt. Zapalinamé, and in conifers above 9000 feet, 11 miles east of San Antonio de las Alazanas. Males in breeding condition were collected at the latter locality May 27 and June 28. During the non-breeding season birds were present in piñon-juniper down to 7000 feet, usually in flocks of mixed species. Near Las Vacas flocks of six to 30 birds were present during November; a few were seen in late December; and small flocks were seen in April. Other record: Urban (1959: 505), 13 miles east of San Antonio de las Alazanas, July 6, 1955 (1 skeleton) and April 10, 1954 (sight record by Dickerman).

Three breeding birds and two of seven fall and early spring birds are clearly S. p. macropterus in color, markings and size (wing, 74 - 77.5 mm., average, 75.9 mm.). The remaining five are nearer S. p. pinus in coloration but average larger (wing - 74.0 mm.) than pinus from the United States (73.2 mm.). Specimens examined: CAE - 10.

A very dark, heavily marked transient (very fat, small testes) collected from a group of three, 6 miles south of Concepción del Oro, 7500 feet, May 14, 1959, is of the nominate race (wing, 71.5 mm.). Other rec-

ord: Miller, et al. (1957: 318), Sierra Guadalupe. Specimen examined:
CAE - 1.

Spinus psaltria (Say). Present from open desert country at 5500 feet through piñon-juniper to 8000 feet and in cultivated areas and near ranch houses to 9,000 feet. Most common in towns and, near Las Vacas, in piñon-juniper from 7500 to 8000 feet. Not seen at Las Vacas during late April and early May. Common by mid-May, much singing and courting taking place at that time. Actual nesting, however, began much later. Two nests, each with four eggs, were found July 25 and 26. A small chick fell from another nest October 5; two larger chicks were collected from a fourth nest, October 17. Nest building was noted as late as September 21. In late October small flocks gathered in the catclaw in arroyos near Las Vacas, but by mid-November most of these had left the area. One was seen in desert 4 miles west of La Rosa, December 25, 1957.

My series is uniformly black-backed and is therefore referable to the nominate race. Other records: Baird (1859: 14), Agua Nueva, 1 collected (Couch); Burleigh and Lowery (1942: 206), Saltillo, April; Urban (1959: 505), Mesa de las Tablas, July 7, 1955, 2 collected. Specimens examined: CAE - 9; KU - 2.

Richmondia cardinalis (Linnaeus). Sutton and Burleigh (1939: 43) reported the race R. c. canicauda from the low country east of Saltillo during 1938.

Pyrrhuloxia sinuata (Bonaparte). Observed in scrub desert near San José del Refugio, October 11; 4 miles east of La Rosa, December 25;

north of Saltillo, June 11. The following records refer to the nominate race. Other records: Ridgway (1901: 628), La Ventura (as texana); Burleigh and Lowery (1942: 206), west of Saltillo, April, 3 collected. Specimens examined: GMS - 1.

Pheucticus melanocephalus (Swainson). Uncommon breeder in piñons, pine-oak and pine-encinal chiefly from 7000 to 8000 feet; more common in foothills north of the Sierra Guadalupe than in other areas of southeastern Coahuila. Species was not often observed except when it was singing. A few were present in Douglas fir-pine near the summit of Mt. Zapalinamé, 10,300 feet. A singing male was collected from its nest (12 feet from the ground in a piñon), 6200 feet, in the foothills north of the Sierra Guadalupe, June 7. Breeding birds were collected in June and July and an immature was taken in late August. My series and the following records are referable to the nominate race. My birds are large-billed (18 - 20 mm., averaging 19.1 mm.) and do not have tawny postocular streaks. Other records: Oberholser (1919: 416), Sierra Guadalupe, April; Urban (1959: 502-503), Sierra Guadalupe, 7500 feet, April 30, 1953, 1 collected. Specimens examined: CAE - 5; KU - 1.

Guiraca caerulea (Linnaeus). A pair observed in an arroyo near Las Vacas on May 11, 1959, did not seem to be on territory and were probably transients, but birds seen in scrub desert near Saltillo during June of that year were singing on territory. An immature bird was seen in an arroyo near Las Vacas, 7300 feet, September 28, 1958; an immature male was collected at this spot on October 3, 1958. Two males reported by Burleigh and Lowery (1942: 206) from 20 miles west of Saltillo are G. c.

interfusa on basis of larger size (wing, 92, 94.5 mm.; flattened wing, 93, 96 mm.). Specimens examined: CAE - 1; LSU - 2.

Passerina cyanea (Linnaeus). I observed a few transients in catclaw along an arroyo 1 mile north of Las Vacas between September 29 and October 15, and collected two immature females. Specimens examined: CAE - 2.

Atlapetes pileatus Wagler. Urban (1959: 505-506) reported a pair collected 13 miles east of San Antonio de las Alazanas, 9950 feet, July 6, 1955. These birds were identified as A. p. dilutus. Specimens examined: KU - 2.

Chlorura chlorura (Audubon). Transient in catclaw and scrub vegetation, most frequently in arroyos, from 5200 to 7300 feet. I observed the species at several localities near Las Vacas between October 1 and November 5. Other records: Burleigh and Lowery (1942: 207), 20 miles west of Saltillo, April, 3 collected; Miller, et al. (1957: 351), 12 miles west of Saltillo, September (RTM). Specimens examined: CAE - 4.

Pipilo erythrophthalmus (Linnaeus). Observed on all mountains visited in southeastern Coahuila, shrubby vegetation of some kind being the major habitat requirement; common resident from 6800 to 10,500 feet in piñon-juniper, encinal, chaparral and pine-oak; common also in shrubby undergrowth (usually oaks) bordering or under conifer forest; most abundant in chaparral and in sotol-maguey-yucca on exposed south slopes. I did not find it in piñon-chaparral or encinal on the mountains east of Concepción del Oro, though conditions there seemed favorable and scrub

jays, juncos and associates lived there. Birds in breeding condition were collected from mid-April to mid-July. Short-tailed juvenals were observed from June 20 to August 2 (1 collected). I collected an immature undergoing the postjuvenal molt September 24.

Specimens from southeastern Coahuila are referable to the race P. e. orientalis. Compared with P. e. gaigei from northwestern Coahuila, orientalis has the rump more admixed with black, the back clearer black (less grayish), and the flanks darker. Other records: Baird (1859: 17), Saltillo, 1 collected; Burleigh and Lowery (1942: 207), Saltillo, to 8000 feet, April, 4 collected (as gaigei); Sibley (1950: 128-130), various localities near Saltillo, Sierra Guadalupe; Urban (1959: 506-507), 7 miles south, 4 miles east of Bella Unión, 7200 feet, June 25, 1952, 1 collected; Mesa de las Tablas, 8600 feet, January 15, 1954, 1 collected; 13 miles east of San Antonio de las Alazanas, July 6, 1955, 1 skeleton. Specimens examined: CAE - 27; KU - 2.

Pipilo fuscus Swainson. Present in suitable habitat in all localities visited including the mountains near Concepción del Oro, Zacatecas; most common in open piñon-juniper, in brushy edges to fields, and near towns and ranch houses from 6500 to 7500 feet; less common in scrub desert at 5500 feet and in brush-edged clearings on exposed south slopes to at least 9000 feet. Nests with usually three, sometimes four, eggs were found between June 26 and August 1. Juvenals recently out of the nest were collected August 5, September 23, 28, 29. September adults were in very worn plumage and were molting badly about their heads.

Specimens from southeastern Coahuila are referable to P. f. po-

tosinus. As a series they are darker than P. f. texanus from the southwestern United States. Plumage color changes greatly with age and season and it is imperative that birds of comparable plumage be used when identifying birds of this species. Other records: Sutton and Burleigh (1939: 45), Diamante Pass, 8000 to 9000 feet, March (as texanus); Burleigh and Lowery (1942: 207), near Saltillo, to 8000 feet, 5 collected; Miller, et al. (1957: 358), El Diamante, July 5, small juvenal (RTM); Davis (1951: 69-73), several localities near Saltillo, Carneros; Urban (1959: 507), 7 miles south, 4 miles east of Bella Unión, 7200 feet, June 25, 1952, 1 collected; 7 miles south, 1 mile east of Gómez Farías, 6500 feet, November 19, 1949, 1 collected. Specimens examined: CAE - 34; GMS - 1; KU - 2.

Calamospiza melanocorys Stejneger. Burleigh and Lowery (1942: 207) collected several near Saltillo during April.

Passerculus sandwichensis (Gmelin). I observed the species on numerous occasions during October and early November in grassy fields near Las Vacas and in Diamante Valley. Single specimens collected October 19 and 29, 1958, agree well in coloration with specimens of P. s. anthinus in the Kansas University collection. Other record: Burleigh and Lowery (1942: 208), Diamante Pass, April, 1 collected. Specimens examined: CAE - 2.

Burleigh and Lowery (1942: 208) reported the race P. s. brooksi from Diamante Pass during April. Miller, et al. (1957: 363) suggested that this specimen might be an atypical example of some other race.

Burleigh and Lowery (1942: 208) reported the race P. s. brunneus from Diamante Pass during April.

Ammodramus savannarum (Gmelin). I collected single birds in weed-grown fields near Las Vacas, October 6, 19. I also collected one of several seen in similar habitat $1\frac{1}{2}$ miles north of Las Vacas, October 27. My series is referable to the race A. s. perpallidus on basis of the extent and brightness of rusty brown on the upperparts and the relatively narrow bills. Specimens examined: CAE - 3.

Ammodramus bairdi (Audubon). Miller, et al. (1957: 368) reported that this species was taken near Saltillo in May (USNM).

Poocetes gramineus (Gmelin). Uncommon transient and winter resident in cultivated districts; observed singly and in small flocks in weed-grown fields in Diamante Valley, 6800 to 7400 feet. My earliest fall record is September 23. My series is referable to P. g. confinis on basis of pale coloration, narrow shaft streaks and large size. Two males average: wing - 85.0 mm. (84.5 - 85.5 mm.); tail - 64.8 mm. (64 - 65.5 mm.). Three females average: wing - 80.7 mm. (80.5 - 81 mm.); tail - 62.2 mm. (60 - 64 mm.). Other record: Burleigh and Lowery (1942: 208), Diamante Valley, April, 1 collected. Specimens examined: CAE - 5.

Chondestes grammacus (Say). Uncommon and local summer resident in scrub desert in southeastern Coahuila from 5000 to 6000 feet; more common as a transient in cultivated areas and open piñon-juniper to 7500 feet. I recorded very fat, non-breeding birds near Las Vacas July 19, August 3, 8. Small flocks were present in nearby fields and open piñons from mid-August to mid-September. Transients were present in Diamante Valley from mid-April to mid-May. The seven birds collected show considerable

individual variation in dorsal coloration and streaking but all are of the pale race C. g. strigatus. Specimens examined: CAE - 7.

Aimophila ruficeps (Cassin). Present in mountains south of Saltillo, in the Sierra Guadalupe, and in the mountains near Concepción del Oro, Zacatecas. Resident on grassy, rocky slopes and in barren ravines from 7000 to 9000 feet; probably present over a wider altitudinal range than my records indicate. Most common near Diamante Pass, 7000 to 8000 feet, on exposed south slopes of Mt. Zapalinamé, and on nearby ridges. Small patches of grass seemed to be a very important part of the habitat. I found a nest (on the ground) with three eggs on July 27 and collected juvenals out of the nest June 12 and September 26 (several families seen). Breeding birds were collected from May through June.

Birds of southeastern Coahuila have been considered to be A. r. boucardi or intermediate between A. r. boucardi and A. r. tenuirostris or A. r. eremoeca. My series of breeding birds is nearest tenuirostris of northern Coahuila and western Texas. In darkness of crown and breadth of dorsal streaking, however, they approach boucardi. Dorsally they are gray, like boucardi and tenuirostris, rather than rufescent as in eremoeca. Other records: Burleigh and Lowery (1942: 208), near Saltillo, to 8000 feet, 8 collected; Ridgway (1901: 252), Carneros; Sutton and Burleigh (1939: 45-46), Diamante Pass; Miller, et al. (1957: 376), 12 miles west of Saltillo (RTM). Specimens examined: CAE - 8; CM - 1; GMS - 1.

Aimophila cassini (Woodhouse). Breeds in scrub desert near Saltillo, probably from 5000 to 5500 feet; in migration occurs to at least 7100 feet in cultivated areas. I collected an immature undergoing exten-

sive wing and tail molt in desert country north of the Sierra Guadalupe, 5600 feet, October 11. A second immature collected $1\frac{1}{2}$ miles north of Las Vacas, 7100 feet, October 27 was also molting heavily. Other record: Miller, et al. (1957: 378-379), 12 miles west of Saltillo, September, and 10 miles northeast of Saltillo, July (breeding). Specimens examined: CAE -2.

Amphispiza bilineata (Cassin). Common in desert country throughout southeastern Coahuila and adjacent Zacatecas from 5000 to 6500 feet. Most common in creosote bush desert. I never saw the species in Diamante Valley or in the broad cultivated valley west of San Antonio de las Alazanas. Breeding birds were collected from April through June. One of several juvenals seen east of Saltillo was collected June 3. I also saw numerous family groups east of San José del Refugio in early June; all of these juvenals had full length tails.

My specimens are nearest A. b. grisea in being intermediate in size and dark above. Wings of four males average 67.1 mm. (65.5 - 68.5 mm.); of three females 63.7 mm. (60.5 - 67.5 mm.). Tails of five males average 61.3 mm. (59 - 64 mm.); of three females 57.5 mm. (54.5 - 61 mm.). The pale dorsal coloration of some specimens shows intergradation with A. b. bilineata of eastern Coahuila, but the tail spots are too small for that race. In five males the tail spot averages 7 mm. (3 - 9 mm.); in three females 8 mm. (6 - 10 mm.). Seasonal and age variations in this species are considerable and larger series are needed from critical areas.

Other records: Burleigh and Lowery (1942: 208), near Saltillo, below 6000 feet, 7 collected; Amadon and Phillips (1947: 581), near Saltillo, August, adults feeding young; Miller, et al. (1957: 380-381),

southern Coahuila: Urban (1959: 510), Sierra Guadalupe, 6500 feet, April 25, 1953, 1 collected. Specimens examined: CAE - 10; KU - 1.

Junco phaeonotus Wagler. Common resident throughout southeastern Coahuila in piñon-chaparral and the various conifer zones from 7400 to 10,500 feet; near Providencia inhabited grassy north slopes dotted with small junipers above 9500 feet; in the area 11 miles east of San Antonio de las Alazanas lived around buildings and on edges of wheat fields as well as in conifer habitats. I found nests May 27 (four eggs), May 29 (four eggs), June 26 (four young) and saw juvenals just out of the nest May 21 and July 30. Families with small juvenals were commonly seen from June through September. Large flocks, chiefly immature birds, were present during July in Douglas fir-pine forest at the summit of Mt. Zapalina-mé, 10,300 feet; by September they moved down-slope.

Southeastern Coahuila specimens, as a series, are slightly darker gray throughout (especially on the head) and slightly less gray (more olive) on the rumps and sides than are J. p. palliatus from Arizona in comparable plumage. Although they thus show some approach to J. p. phaeonotus, they are much nearer to palliatus.

Other records: Ridgway (1901: 300), Sierra Encarnación; Sutton and Burleigh (1939: 46), Diamante Pass, March, several collected; Miller (1941: 414), Sierra Encarnación, Sierra Guadalupe; Burleigh and Lowery (1942: 208-209), Diamante Pass, above 7000 feet, 4 collected; Urban (1959: 510-511), Mesa de las Tablas, 8600 feet, January 16, 1954, 1 collected; 13 miles east of San Antonio de las Alazanas, April 10, 1954, 1 skeleton, and July 6, 1955, 1 skeleton. Specimens examined: CAE - 19; GMS - 1; KU - 1.

Spizella passerina (Bechstein). Common resident in open piñon-juniper bordering Diamante Valley from 6800 to 7600 feet; more common near Las Vacas. Abundant and widespread in migration and during winter, often in flocks of mixed species. Some birds collected in late April were singing on territory while wintering birds in the same area were still undergoing the prenuptial molt. Birds in breeding condition were collected from May through July; one nest held three fresh eggs on August 1. Immature specimens collected June 15 and July 4 were undergoing the postjuvenal molt.

My specimens are referable to the race S. p. arizonae on basis of the pale coloration and large size. Wings of 12 males average 72.1 mm. (69.5 - 74.5 mm.); of four females 70.0 mm. (66.5 - 72.5 mm.). Tails of 12 males average 61.4 mm. (56.5 - 64 mm.); of four females 59.5 mm. (55 - 62.5 mm.). Other records: Burleigh and Lowery (1942: 209), Saltillo, to 7500 feet, April, several collected; Urban (1959: 511), Sierra Guadalupe, April 19, 1953, 1 collected. Specimens examined: CAE - 20; GMS - 1; KU - 1.

Spizella pallida (Swainson). I observed single birds and small groups in brushy areas and in the orchard at Las Vacas from September 23 to late October, and during April. I did not record the species during my brief winter visit. Other record: Burleigh and Lowery (1942: 209), near Saltillo, April, 4 collected. Specimens examined: CAE - 5.

Spizella breweri Cassin. Burleigh and Lowery (1942: 209) collected two specimens of the nominate race at Saltillo in April.

Spizella wortheni Ridgway. A specimen collected near Saltillo, and reported by Burleigh and Lowery (1942: 209-211) as S. pusilla wortheni, is of the nominate race according to Miller, et al. (1957: 390).

Spizella atrogularis (Cabanis). Present on all mountains visited south of Saltillo, in the Sierra Guadalupe, and in the mountains near Concepción del Oro, Zacatecas. Common breeder in catclaw thickets in arroyos, in piñon-juniper, and in chaparral from 7200 to 10,000 feet. I found nests May 19 (three young), June 24 (three eggs), and July 1 (four eggs), 13 (three young), 23 (three eggs) and 30 (three eggs), and saw many families with small juvenals from late June through July. My latest fall date is November 5. My specimens are referable to the nominate race on basis of the dark coloration and deep black lores. Other records: Baird (1859: 16), Agua Nueva, 1 collected (Couch); Burleigh and Lowery (1942: 212), south of Saltillo, to 6000 feet, April, 4 collected. Specimens examined: CAE - 17.

Zonotrichia leucophrys (Forster). Burleigh and Lowery (1942: 212) collected two specimens of the nominate race near Saltillo during April.

Melospiza lincolni (Audubon). Common, locally abundant, transient in southeastern Coahuila. Near Las Vacas most common in catclaw thickets in arroyos, in orchards, and in lush grain fields, chiefly from 6800 to 7500 feet. The first birds were seen September 23 and a peak of hundreds was reached in mid-October in an arroyo near Las Vacas. At this time 20 or more birds could be counted at one time about a single tiny

grain plot. By mid-November, when I left the area, the species was much less common. A few were present in the area April 16 to 21. My specimens compare favorably with specimens of the nominate race in the Kansas University collection in grayness of dorsal coloration and in breadth of streaking. In wing length three males average 62.3 mm. (62 - 63 mm.); one male (?), 65 mm.; three females, 60.0 mm. (58.5 - 61 mm.). This is the characteristic size for M. l. lincolni. Other record: Burleigh and Lowery (1942: 212), near Saltillo, April, 4 collected. Specimens examined: CAE - 7.

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