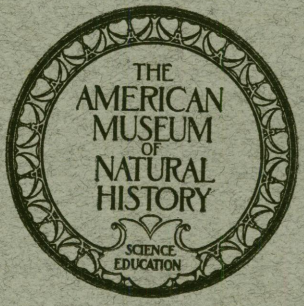
THE DISTRIBUTION OF BIRD-LIFE IN GUATEMALA

A Contribution to a Study of the Origin of Central American Bird-life

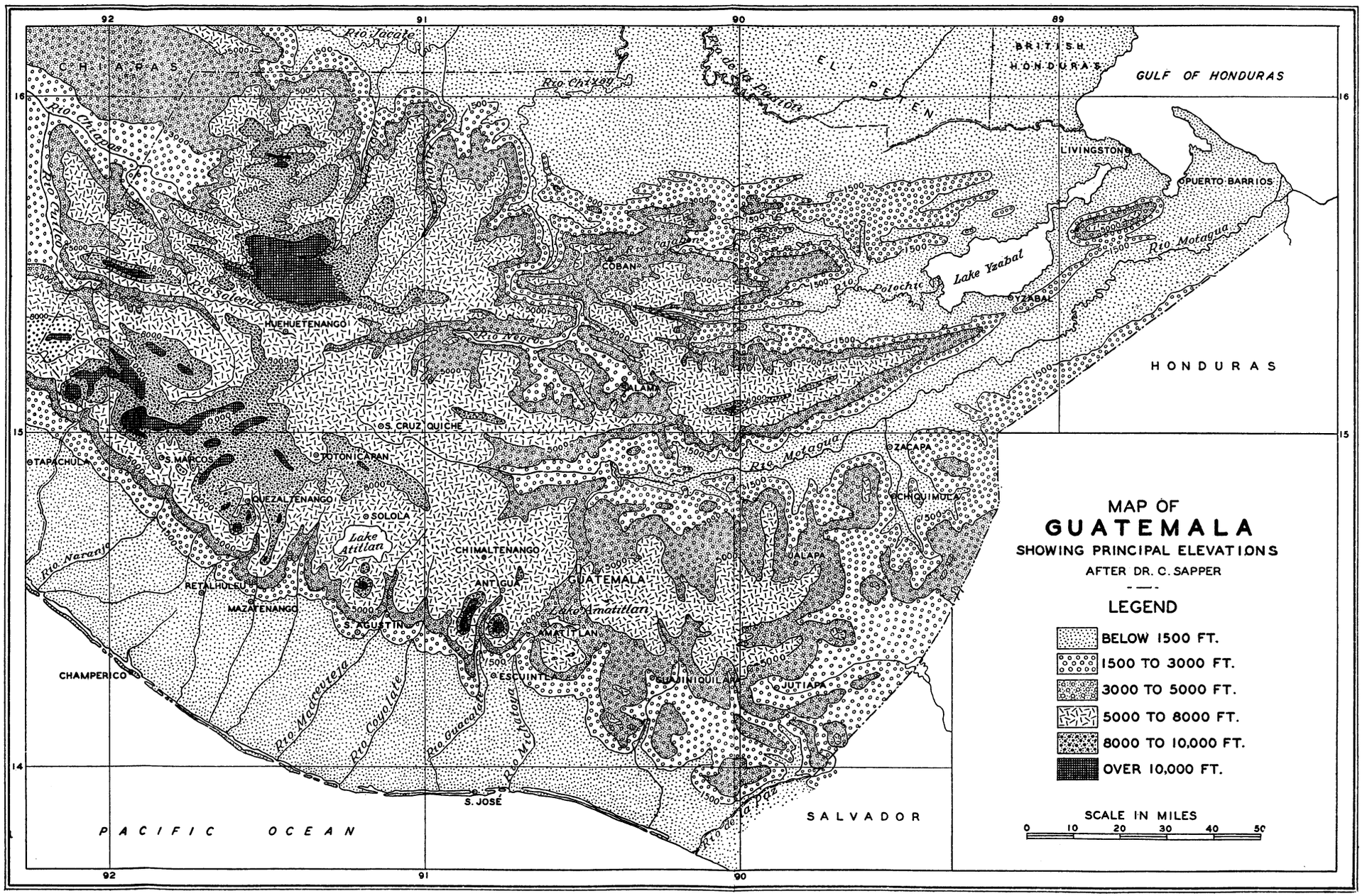
By LUDLOW GRISCOM

BULLETIN
OF
THE AMERICAN MUSEUM OF NATURAL HISTORY

VOLUME LXIV, 1932



NEW YORK
MAY 7, 1932


MAP OF
GUATEMALA
SHOWING PRINCIPAL ELEVATIONS
AFTER DR. C. SAPPER
LEGEND
BELOW 1500 FT.
1500 TO 3000 FT.
3000 TO 5000 FT.
5000 TO 8000 FT.
8000 TO 10,000 FT.
OVER 10,000 FT.
SCALE IN MILES
0 10 20 30 40 50
CHIAPAS
EL PETEN
BRITISH HONDURAS
GULF OF HONDURAS
HONDURAS
SALVADOR
PACIFIC OCEAN
GUATEMALA
Lake Yzabal
Lake Atitlan
Lake Amatitlan
Rio Jacaltenango
Rio Chixoy
Rio de la Pasion
Rio Chacamas
Rio Salegua
Rio Negro
Rio Motagua
Rio Polochic
Rio Naranjo
Rio Michatoya
Rio Coyolate
Rio Guacalate
Rio Paz
COBAN
HUEHUETENANGO
SALAMA
S. CRUZ QUICHE
TOTONICAPAN
S. MARCOS
TAPACHULA
QUEZALTENANGO
SOLOLA
RETALHULEU
MAZATENANGO
S. AGUSTIN
CHIMALTENANGO
ANTIGUA
AMATITLAN
ESCUINTLA
CHAMPERICO
S. JOSE
SANTIAGO
JUTIAPA
JALAPA
CHIQUIMULA
ZACAPA
YZABAL
LIVINGSTON
PUERTO BARRIOS

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DEDICATED

TO THE MEMORY OF

JONATHAN DWIGHT, JR.

PREFACE AND ACKNOWLEDGMENTS

In the year 1919, Austin Paul Smith, a professional collector, well known for his work in the southwestern States, decided to go to Guatemala. The late Dr. Jonathan Dwight, Jr., had for years been the principal purchaser of his material, and was offered the first choice of his collections. I persuaded Dr. Dwight to undertake their purchase, as at that time the great majority of Guatemala bird specimens in American museums were old trade-skins with very general labeling or none at all. Due to earthquakes and political uncertainty Mr. Smith's stay in Guatemala was brief, but he sent in some 400 specimens, including many of the rarer endemic species of the country.

This may be regarded as the inception of Dr. Dwight's interest in Central American birds. In the next few years he acquired Smith's birds from Costa Rica, and thus came into the possession of one of the finest representations in the world of this rich avifauna. Coming from so well-worked a country, there was little that was novel or interesting in this material, but it was invaluable both to Dr. Chapman and myself for purposes of comparison with the avifaunas of adjacent areas.

However, Dr. Dwight never abandoned his hope of acquiring an adequate collection of Guatemala birds, well aware that this country was a far richer field than Costa Rica. Providentially, early in 1924, Mr. A. W. Anthony, the veteran ornithologist of the Pacific Coast, proceeded to Guatemala to make general collections, and I had little difficulty in persuading Dwight to purchase his shipments as they came in, though the size of some of these was a considerable drain upon his resources. Mr. Anthony wasted no time, and in four years the Dwight collection of Guatemala birds was unique in this country, and exceeded only by the Salvin-Godman collection in the British Museum.

For some years our plan had been to write a joint report on this collection, but its preparation had been postponed, while new shipments from new localities had been steadily pouring in. Late in 1927 I was called to Harvard University, and about the same time Dr. Dwight's health completely failed. For over a year my old friend hoped that he would recover, and that then we could begin work. This was not to be, and one week before his death he asked me to study and report upon his collection without him, and gave orders to have it sent to Cambridge. I greatly appreciate the privilege of studying so valuable a collection, and take this opportunity of expressing my personal loss in Dr. Dwight's companionship in this undertaking. I should have benefited greatly from his experienced and conservative judgment, and he was a friend and mentor ever since my boyhood.

His collection passed into the possession of The American Museum of Natural History, the authorities of which authorized me to carry out Dr. Dwight's wishes and prepare the report which follows. Needless to say they have extended to me every courtesy and facility in examining necessary comparative material. Dr. Dwight's collection was so nearly complete that at Dr. Chapman's suggestion the report has been extended to include all birds recorded from Guatemala.

In the course of its preparation I have been indebted to many people and institutions for assistance of various kinds. The National Museum at Washington, the Bureau of Biological Survey, the Field Museum of Natural History, and the Carnegie Museum at Pittsburgh have forwarded me specimens and in some cases types for examination. Dr. Chas. W. Richmond, Dr. Herbert Friedmann, Dr. H. C. Oberholser, Dr. C. E. Hellmayr, and Mr. W. E. Clyde Todd have all given counsel or valuable information, for which my cordial thanks are extended.

To Dr. Percy R. Lowe of the British Museum I am particularly indebted for helpful correspondence and the opportunity of examining specimens from the great collection in his charge.

I also owe much to my colleagues at the Museum of Comparative Zoölogy. Mr. Outram Bangs examined every proposed new form and has constantly given helpful advice and criticism. Mr. J. L. Peters was of invaluable assistance throughout the systematic portion of the work. Mr. W. Sprague Brooks prepared the descriptions and measurements of all the nests and eggs. Professor Kirtley F. Mather of the Department of Geology gave me invaluable advice and information on important points in the geological history of Central America.

Finally, the report would never have been written without the friendly interest of Dr. Thomas Barbour, who afforded me ample time from other duties for its preparation. He was so kind as to read the entire introduction, correcting many errors, and suggesting many improvements.

All photographs are by A. W. Anthony. The two maps were drawn by Edward A. Schmitz.

June 15, 1931 LUDLOW GRISCOM

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[1]All photographs are by A. W. Anthony, and the maps were drawn by Edward A. Schmitz.

THE DISTRIBUTION OF BIRD-LIFE IN GUATEMALA

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THE DISTRIBUTION OF BIRD-LIFE IN GUATEMALA

A CONTRIBUTION TO A STUDY OF THE ORIGIN OF CENTRAL AMERICAN BIRD-LIFE

By Ludlow Griscom

PART I

INTRODUCTION

The republic of Guatemala, largest of the Central American states, has an area of about 48,250 square miles. It is therefore approximately the same size as New York State, while Ecuador is approximately five and one-half times as large. Chapman[1] records 1508 species and subspecies of birds from Ecuador, while I record 736 from Guatemala in the following pages. It will thus be seen that if due regard be paid to proportion, we are dealing with a region which possesses one of the richest and most concentrated avifaunas of the world. I shall attempt to show that the wealth of this avifauna is due to a series of favorable factors: (1) an unusually ancient geological history, (2) an exceptional degree of diastrophic activity, giving rise to (3) a highly complex topography, and (4) five distinct climates, often replacing each other with remarkable abruptness.

In the study and analysis of the avifauna of any particular political area, we find that the true faunal areas have limits which carry us beyond our appointed boundaries. This is particularly true of Central America. Its bird-life is really a combination of several faunal areas, not one of which is bounded by the limits of any of its several republics. Therefore, to appreciate properly the principles involved in the distribution of the birds of Guatemala, it is unavoidably necessary to go beyond its limits, especially as no zoögeographer has ever attempted the subdivision of Central America into faunæ. While an ideal treatment would consider Central America as a whole, the more restricted territory of Guatemala is a better starting point than any other subdivision of the field. Here the Holarctic and the Neotropical regions meet, and whether we proceed north or south, we steadily reach more homogeneous avifaunas, the origins and relationships of which are increasingly apparent, and where Life-

[1] 'Distribution of Bird-Life in Ecuador,' 1926, pp. 1–784.

Zones become more sharply defined, with greater significance. For Guatemala is part of an ancient land, which has been a "buffer state" between two growing continents since Palæozoic time. It has been separated and united with one or the other or both on several occasions. Many times has the tide of life flowed through it both north and south, and at the same time it has managed to create endemic forms of its own and safely preserve them against a horde of later immigrants. It is no exaggeration to say that Guatemala is the key to Central America.

Briefly stated, our task is to put on record the known facts regarding the bird-life of Guatemala, and then to ascertain, if possible, to what extent these facts correspond with other facts in the geological history, the topography, and the climate of the country. Should such correspondence exist, we may then get some clue as to the origin and evolution of that bird-life.

A REVIEW OF THE HISTORY OF GUATEMALAN ORNITHOLOGY

The ornithological exploration of Guatemala has been surprisingly erratic and irregular, periods of stagnation alternating with periods of great activity. As a whole, the exploration of Central America lagged way behind South America, and it was not until 1837 that Bonaparte's article on the birds collected by Col. Velasquez de Leon "during a fortnight's scientific tour in Guatemala" appeared in the Proceedings of the Zoölogical Society of London. This is the earliest record I have been able to find of specimens with a definite history reaching Europe from Guatemala.

Between 1837 and 1859 no paper was published dealing definitely with the bird-life of Guatemala. There were merely scattered notices of new species. In some cases the describer did not even know that his bird came from Guatemala. Thus Lesson described *Campylopterus rufus* in 1840. As this hummingbird is one of the endemic specialties of Guatemala, it must have come from there, but no clue as to the type's source or origin is available.

From 1842 on, however, Guatemala was visited by well-known collectors. These men trained the Indian hunters in making trade-skins, and a steadily increasing stream of specimens reached Europe. One of the earliest agents of this sort was Señor Don José Vicente Constancia of Antigua. He was a correspondent of H. E. Strickland, and sent him several collections of birds, some of which were figured in Jardine's 'Contributions to Ornithology.' Some of the duplicates passed into the hands of P. L. Sclater.

The noted traveler Delattre visited Guatemala in 1842, and remained in Vera Paz for nearly a year, with headquarters at Coban. He collected principally for the Derby Museum and the Philadelphia Academy, but obviously retained many specimens for himself, as he described several new hummingbirds, and wrote the first authentic account of the Paradise Trogon or Quetzal. It was undoubtedly the visit of Delattre which greatly stimulated the native collectors of Vera Paz, and started the "boom" in Vera Paz trade-skins. Tens of thousands of specimens were sent to Europe in the next twenty-five years, many finding their way to the older museums of the United States, such as the Boston Society of Natural History (now in the Museum of Comparative Zoölogy), the United States National Museum, and the private collections of D. G. Elliot and George N. Lawrence, now in New York.

Prévost obtained a few specimens in Guatemala during the voyage of the French Frigate 'Venus.' The type of *Melozone biarcuatum*, described in 1846, was obtained in this fashion, though how and where is unrecorded.

Morelet visited Peten in 1847, and returned to France in the early part of the following year. His specimens went to the Paris Museum, and the novelties were described by Bonaparte. One of them, *Sporophila moreleti*, appropriately commemorates this expedition. It is most unfortunate that a complete list of the collection was never published.

However, the most important of the early collectors was George Ure Skinner, who is best known as one of the greatest orchid collectors of all time. He by no means neglected ornithology, and employed native hunters in many parts of the Republic. He sent large series to Gould and Sclater. The majority of his specimens came from the vicinity of Salamá, Cahabon, and other parts of Vera Paz, but some came from the Altos, and a few even from the Pacific slope (such as the type of *Thryophilus pleurostictus*). However, they were all erroneously assumed to have come from Vera Paz, and these errors were corrected in later years by Salvin.

The brief outline given thus far might be called a summary of early Guatemalan ornithology. In 1859, Sclater and Salvin compiled all the existing information, and recorded 382 species from an area which included Yucatan, British Honduras and Honduras, as well as Guatemala. They included a small number of species collected by Leyland in Peten in 1857. The paper appeared just after Salvin's return from his first trip to Guatemala, and contained field notes by him, but not the results of a study of the collections he brought back.

Ninety per cent of what we know today about the ornithology of Guatemala is due to the explorations and interest of Osbert Salvin, his friend Frederick Ducane Godman, and the numerous collectors whom they trained and employed for many years. Certainly until the present generation, no more carefully planned or thorough exploration of a definite area was ever made in the New World tropics. The sixty-three volumes of the 'Biologia Centrali-Americana' are a lasting monument to these two English gentlemen. Necessarily a large corps of able specialists wrote the reports for a majority of the animal and plant groups treated, but the scientific caliber and merit of these reports and the philosophic insight shown in many of them were never superior to the writings of Salvin himself. I have read and reread everything he ever wrote on Central American birds, and I am glad to take this opportunity of testifying to my increasing respect for his work and his ability. He recorded exact altitudes at a time when no one else did so. He was not interested in subspecies or racial variation, but he described most of them informally in scattered notes and comments. Finally, he divined the fundamental principles of the distribution of Central American birds, fifty years ahead of any one else.

Salvin landed in Belize the middle of December, 1857. He proceeded down the coast and went up the Rio Dulce to Lake Yzabal, thence by easy stages to Guatemala City, collecting en route. For nearly six months his headquarters was a hacienda at Dueñas, but he made two excursions to the Pacific lowlands, and one to Lake Atitlan. He sailed from San José the end of June, 1858, returning by way of Panama. He brought back over 1000 specimens, and added 120 species to the Guatemala list. On this trip he was accompanied for part of the time by Skinner.

Salvin returned to Guatemala in the spring of 1859, and again remained some months at Dueñas at the ever hospitable hacienda of his friend William Wyld. In October he went to San Geronimo, where he met Robert Owen, the manager of a large plantation, whom he interested in natural history. He proceeded to Coban and other places in Vera Paz and returned to Dueñas about the end of the year. In March, 1860, he was again in Alta Vera Paz, and left for England, via Belize, the following month.

The third and most extensive expedition began in August, 1861, and on this occasion Salvin was accompanied by Godman. They went via Belize to Yzabal, and crossed the mountains to Quiriguá. From there they took mules and went to Guatemala City via Zacapa and the

Motagua Valley. As usual, some time was spent at Dueñas, and the Volcan de Fuego was ascended, while Godman made a brief side trip to Escuintla. The two friends then proceeded to Salamá in Baja Vera Paz, where their headquarters were as usual the hacienda of San Geronimo, and some weeks were spent in exploring the neighboring mountains. The journey was continued to Coban, and an expedition was made to Choctum and Cubilguitz in the tropical lowlands. Here Godman contracted a sharp attack of malaria and was forced to return to Coban to recuperate. Salvin, however, went on a long and arduous journey on foot to Lake Peten via Lanquin and Chisec. Sixty-eight years have elapsed, but no ornithologist has ever revisited Peten. Salvin went overland to Belize, and after an epoch-making trip to the outer cays after water birds, returned to Guatemala via Lake Yzabal. In the meantime Godman, after recovering from his fever, went to San Geronimo and then to Buenaventura on the upper waters of the Rio Motagua, where he collected fishes primarily. Returning to the Capitol he went to the silver mines of Alotepeque, thence to Copan in Honduras, and proceeded to Yzabal, via Zacapa. Here he met Salvin on his way back from Belize, and Godman returned to England.

Salvin went back to Dueñas and then rode over the Altos to Totonicapam and Quetzaltenango. He then descended to Retalhuleu on the Pacific slope and spent two months collecting water birds in the coastal lagoons at Champerico and Huamuchal, near the Chiapas border. He returned to England early in 1863.

However, these three expeditions had numerous by-products. Wherever Salvin went he aroused interest and trained native collectors who forwarded extensive collections to England throughout the year. The Wyld family and Indian hunters sent important additions from Dueñas and the slopes of Agua, Fuego, and Acatenango. Robert Owen and trained natives around San Geronimo sent in further collections from there and the neighboring mountains. The greater part of the Vera Paz collections was made by Cipriano Prado and his brother Juan, who worked at Choctum and other places in the "tierra caliente." Felipe Sierra worked the Polochic Valley and the vicinity of Cahabon and Tactic. On the Pacific coast, Enrique Arcé made a collection at Retalhuleu and Champerico, and later won fame by his pioneer work in Veraguas. Specimens were secured from Señor Constancia at Antigua, and other species were forwarded by Dr. Bernoulli of Mazatenango, the discoverer of the unique *Tangara cabanisi*. In the Ibis for 1866, Salvin summarized the results obtained and recorded a total of 612 species, of

which all but about thirty had been obtained within the actual limits of Guatemala.

In April, 1873, Salvin and his wife sailed on his fourth and last visit to Guatemala, reaching the capital in June, via the Isthmus of Panama and the port of San José. As usual, some months were spent at Dueñas, and then they went to the Altos, visiting Atitlan, Sololá and Quetzaltenango. Some time was also spent in the Costa Grande at the coffee estate of Las Nubes, Mazatenango and Pantaleon. Brief visits were then made to San Geronimo and Coban, and they left Guatemala in March, 1874, going to the United States, where they remained nearly a year. No report of this trip was ever made, and all we know of its results are contained in extracts from letters to Sclater. While Salvin added a few birds to the Guatemala list himself, he was especially interested in the recently formed Museo de la Sociedad Economica in Guatemala City, under the patronage of Don Juan José Rodriguez. Salvin obviously made a careful list of the more noteworthy birds, and it was this collection which contained a Saw-whet Owl and Grace's Warbler. Salvin, himself, always felt that the Altos of Guatemala were the region least adequately explored, and the most likely places for additional novelties. His judgment has been proved to be entirely correct. Incidentally this collection was totally destroyed in the 1917 earthquake.

Departing for a moment from strict chronological sequence, the next expedition of importance was that of G. C. Champion, in the employ of Salvin and Godman, who spent a little over two years in Guatemala, from 1879 to 1881, primarily engaged in collecting insects. As his detailed itinerary and a map of his travels are published in the introductory volume of the 'Biologia' (1915), it need not be repeated here. Barring a ride from Salamá through Quiché to Totonicapam, he visited no country which had not been explored by Salvin personally, and he did not obtain results of any great importance ornithologically.

The last expedition under the auspices of Salvin and Godman was that of W. B. Richardson, who arrived in Guatemala the latter part of 1889, after several years work in Mexico. He remained in Guatemala a little over a year, and spent practically the entire time in the Altos of the northwestern districts, which are now San Marcos and Quetzaltenango. He ascended the Volcan de Santa Maria, and spent several months around Lake Atitlan. No separate report of his results was ever published. We have the records for the families of birds in the 'Biologia,' which appeared in parts published from 1891 on, but we know nothing

of the extent of his collections or just what species he secured in the whole Order Passeres, except the Tracheophonæ.

With the conclusion of our brief summary of the carefully planned explorations of Salvin and Godman, we may now go back chronologically. The French collector Adolphe Boucard visited Guatemala from June 1–30, 1877. He stayed at Escuintla, Antigua, and Guatemala City, and spent some time at the hacienda of Capetillo, owned by Don Juan José Rodriguez. He was primarily interested in insects, but employed native hunters, and brought back 263 species of birds, practically all without localities or data of any kind. The report (1878) teems with obvious errors, and is chiefly notable for having added nothing to the knowledge of Guatemala birds available at that time. This paper is more extensively reviewed in the bibliography.

During the early eighties, Colonel N. S. Goss, the well-known ornithologist of Kansas, made several trips to Mexico and Central America, in pursuance of his ambition to have his collection contain representatives of every species of North American bird. He reached San José, Guatemala, in December 1882, and remained two months, collecting near the port, at Palin, Naranjo, and Amatitlan. In December 1885, he landed at Santo Tomas on the east coast and collected for several weeks in that vicinity. Early in 1887, Colonel Goss visited Honduras and British Honduras and made a short but laborious trip overland from Cayo to Yaxhá in Peten, where he secured a pair of Ocellated Turkeys. At his death, some years later, his collection passed to the Kansas Academy of Science, and D. E. Lantz (1899) published a brief check-list of his Central American specimens. There are many errors of identification in this paper, but a few worth-while locality records.

On December 14, 1895, Nelson and Goldman arrived at Nenton, Guatemala, from Comitan, Chiapas, and remained in the country until January 29, 1896. They collected at various localities in Huehuetenango, Quetzaltenango, and San Marcos, previously unvisited by an ornithologist, and ascended the Volcan de Santa Maria. No report on this collection was ever published, but the locality records for nearly all the families of birds are given by Ridgway in the 'Birds of North and Middle America.' The trip, though brief, was a most important one, and much valuable information was secured. The collection of about 150 specimens is in the Biological Survey. I am much obliged to Dr. E. A. Goldman for information supplied me.

If this review has been followed, it will be apparent that the ornithological exploration of Guatemala practically ceased with the close

of the expeditions of Salvin and Godman. Other people and institutions for the most part devoted their time and money to those parts of Central America upon which Salvin and Godman had not concentrated their attention. The older American museums all possessed trade-skins of many of the endemic Guatemalan specialties, and the United States National Museum received a fairly complete representation of the Salvin Collection by exchange. I do not mean this in the modern sense, but prior to 1900 that institution had at least one or two specimens of most of the birds known from Guatemala. American museums, therefore, devoted their attention to Mexico, Costa Rica or Panama, and with excellent results. There were only two exceptions.

Ned Dearborn reached Guatemala early in January, 1906, and remained until the middle of April, under the auspices of the Field Museum of Chicago. With slight assistance from Messrs. Heller and Barber the preceding and the same winter, 305 species and subspecies were collected. Dearborn made no effort to visit unexplored territory, but selected his localities with excellent judgment, so as to get as great variety as possible. Nearly a month was spent in the Caribbean lowlands, a week at El Rancho in the arid Motagua Valley, another month in the Pacific lowlands, and several days each on Lake Amatitlan and Lake Atitlan at Panajachel, and Tecpam. The valuable report contains many new or interesting records of rare birds, and several novelties are described. Perhaps the most important discovery was that of a local race of the Golden-crowned Kinglet (*Regulus satrapa*) in the Boreal Zone above Tecpam.

S. N. Rhoads of Haddonfield, N. J. accompanied by Mr. Earl L. Poole, paid a brief visit to Guatemala from February to April, 1915, and collected 704 specimens, now in the Philadelphia Academy. The birds were taken at Quiriguá and Gualan, and a very few from El Pilar, a United Fruit Co. farm. Dr. Witmer Stone, who has been most helpful in supplying me with information, has been so kind as to send me a tentative list of the species, in advance of proposed publication. Naturally, some interesting records were obtained. The birds are a mixture of tropical rain forest and Motagua Valley desert forms.

Austin Paul Smith collected in Guatemala from October 1919 to February 1920. He visited Quetzaltenango, where he reached Humid Temperate Zone altitudes, and also spent some time at Lake Amatitlan, Palin, San José, Pantaleon, and San Felipe near Retalhuleu. The skins, totaling 421, were purchased by Dr. Dwight, and include small series of some of the rarer and less-known birds of Guatemala.

THE COLLECTING EXPEDITION OF MR. ANTHONY

Early in 1924, Mr. A. W. Anthony, a veteran ornithologist of the Pacific Coast, proceeded to Guatemala on a general collecting expedition, and arrangements for the disposal of his collections were made by his son Harold E. Anthony, now Curator of Mammals in the American Museum. Partly at my instigation, Dr. Dwight undertook to purchase the birds, which were not adequately represented in any American museum, the mammals were purchased by the American Museum, and the herpetological material was bought for the Museum of Comparative Zoölogy. I drew up a list of the more desirable birds, with the localities at which they had been collected, and Mr. Anthony secured specimens of all but four or five of these during his four and a half years in the country.

Mr. Anthony's entire time was spent north of the railroad which divides the country into approximate halves, but he did not succeed in exploring Peten, though he twice reached its southern boundary in the lowlands of Alta Vera Paz. He has prepared the itinerary given below, which is arranged in chronological order, and which gives a brief description of the country in the vicinity of each collecting station, with remarks on the altitude, character of the environment, etc. Well-known cities and towns, shown on all maps, are not located.

ANTIGUA.—The old and first capital of Guatemala, at the base of the Volcan de Agua. Altitude about 5000 feet. Most of the forest has been cleared to admit planting of cane and coffee, but the slopes of Agua and the mountains to the north still have plenty of original forest, where conditions must be as they were when Pedro Alvarado marched here from Mexico and established the capital. The sides of the volcano are planted with corn to an altitude of about 7000 feet, where the "rain forest" begins, a dense wall of tropical growth, with the usual vines to make climbing almost out of the question. Three miles from this station is found Dueñas, where Salvin made his headquarters for three years. Several hours were spent about a small lake, near San Antonio and not far from Dueñas, known as Lake Dueñas, or Lake San Antonio. This station is also known as Puebla Vieja, to distinguish it from the present town of Antigua, established after the first capital was destroyed by the Volcan de Agua in the early history of Spanish rule. Collecting was done from May 12–June 8, 1924.

QUIRIGUÁ.—Altitude 150 feet. A station on the railroad about 60 miles from the port of Puerto Barrios. The collecting was done on one of the farms of the United Fruit Company about six miles from Quiriguá, in the banana plantation. Nearly all of the section was planted to this fruit, leaving only a little forest available along the edges of the valley. The station was chiefly remarkable for what it did not produce. Collecting was done from June 14–June 26, 1924.

PROGRESO.—Altitude 2000 feet. A station on the railroad between the capital and Puerto Barrios, in the upper end of the Rio Motagua Valley. This station is at the western end of the dry belt. The landscape is more typical of Arizona than of Central America, rich in species not found in the humid sections. Along the small streams were found a few trees and vines of the tropics, but for the most part the growth was of the leguminous type, similar to the mesquite, with several species of cactus. Collecting done from July 2–July 14, 1924, September 5–September 29, 1924, and October 26–November 5, 1924.

FINCA CIPRES.—A coffee plantation, some nine miles from Mazatenango, on the Pacific slope. This station was at the base of the Volcan Zunil, altitude about 2000 feet. The original forest had been cleared only enough to permit of the planting of coffee, leaving, as is often done, half or more of the native trees for shade. One or two trips, of a few hours each, were made to SALACHE, a plantation of similar condition, but only 1000 feet altitude, some six miles south of Cipres. Attempts were made to work the upper slopes of Zunil, resulting in only two or three short trips to the edge of the rain forest, at five or six thousand feet. July 19–August 29, 1924, and June 28–September 5, 1925. During the second visit, a side trip was made to Finca El Espino.

FINCA EL ESPINO.—A ranch fifteen miles south of Mazatenango; altitude 150 feet. Mostly virgin forest of the Pacific coast. July 23–28, 1925.

LA MONTAÑITA.—In the Sierra de las Minas, twelve miles north of El Rancho, on the railroad between Guatemala City and Barrios; elevation 3000 feet. Open forest of pine and oak, draped with long streamers of gray "moss," which is chiefly found in forests of this nature only when shrouded by more or less constant fog. Most of the collecting was done well above the 3000 feet contour line, up to 4500 feet. October 11–22, 1924.

CHICHICASTENANGO.—Shown on some maps as Santo Tomas; altitude 6500 feet. In the District of Quiché, about fifteen miles south of the city of that name. Most of the land near the town was planted to corn, but on the hills to the west the forest still furnished cover for plenty of bird-life. December 12–19, 1924, and January 26–February 17, 1925.

MOMOSTENANGO.—About thirty miles west of the last station and in the District of Totonicapan, twenty miles north of that city. Altitude about 6500 feet; forest open, of pine and oak with very little undergrowth. December 24, 1924–January 23, 1925.

ZANJON.—An Indian camp, about fifteen miles west of Momostenango; altitude 9500 feet. Pine forest and open grassland. January 6–9, 1925.

USPANTAN.—A small town in the northern part of the District of Quiché, about fifty miles west of Coban. Altitude about 6500 feet; forest open, of pine and oak. February 23–24, 1925.

FINCA EL SOCHE.—A coffee plantation twenty miles east of the last station, located in a deep basin on the west side of the Rio Negro. Altitude 3400 feet. The forest here was typical of the rain belt, well tangled with vines and creepers. February 27–March 6, 1925.

LA PRIMAVERA.—A sugar finca some fifteen miles east of Finca El Soche, and the same distance south Coban, in Alta Vera Paz. Forest of pine, oak, and alder, with rain forest along the ridges, where the heavy rains fell. Altitude 3200 feet. March 9–April 21, 1925, and April 2–9, 1928.

FINCA SEPACUITE.—Fifty miles east of Coban, in Alta Vera Paz. Altitude 3200 feet. An important station, as it was situated on the divide between the Rio de la Pasion, flowing to the northwest and to the Gulf of Mexico, and the waters of the Rio Polochic, that flow to the Caribbean on the east. Much of the collecting was done along an old abandoned coffee plantation, but virgin forest was within easy distance and often visited. April 30–June 13, 1925, and December 15–20, 1925.

SEPUR.—A coffee plantation, on the last finca, a few miles east of the main station, at an altitude of 3000 feet. Forest typical of the rain belt. December 24, 1925–January 5, 1926.

SECANQUIM.—Ten miles north of Sepacuite; altitude 1600 feet. Pine and oak forest and considerable brush-land in abandoned fields. January 15–April 9, 1926, and August 5–28, 1927.

FINCA CAROLINA.—A coffee plantation in San Marcos, ten miles south of Tumbador; altitude 3500 feet. On this plantation and for many miles in every direction, the original forest growth has been cut to make room for coffee, the shade so necessary for the growth of the coffee being furnished by bananas planted between the coffee trees. This condition has made the avifauna very restricted and collecting poor. September 26–November 2, 1925, and May 10–27, 1926.

HACIENDA CALIFORNIA.—A cattle ranch on the Pacific coast, six miles from Ocos and about the same distance from the Chiapas border. Enough of the native forest still stands to furnish homes for a rich avifauna, while the marsh, bordering the Ocosita river, abounds in species favoring such a habitat. June 3–July 4, 1926; September 22–October 3, 1927, and October 31–November 12, 1927.

TECPAM.—Also spelled Tecpan and Texpan. The work was all done from a ranch house about three miles north of the town, which is located some sixty miles north of Guatemala City. The ranch was the same used as headquarters by Heller and Barber some twenty years ago, and is situated in a beautiful forest of oak, pine, and alder, at an altitude of 8650 feet. Several trips were made to a heavy forest of cypress, two leagues from the house, at an altitude of about 10,000 feet, where several species not met with elsewhere were found. July 14–August 16, 1926.

PANAJACHEL.—Located on the north shore of Lake Atitlan; altitude 5500 feet. The growth that is still to be found near the town is of pine, oak, and alder, with a sprinkling of species from the rain belt of the lower sections. August 23–October 23, 1926, and November 23–27, 1926.

SAN LUCAS.—Also known as Toliman. On the south side of Lake Atitlan. Altitude 5500 feet. This station, located at the base of the Volcan San Lucas, presents a somewhat different fauna from the last, though the surrounding forest is the same. The slopes of the volcano are well broken by blocks of basalt thrown from the crater, offering cover for such species as *Salpinctes* and *Aimophila*, more common here than at any other station. Two weeks were spent at the lower edge of the rain forest on this volcano, at 9000 feet, working up the slopes to 10,000 feet or higher. Collecting was done from October 26–November 18, 1926, May 18–July 4, 1927, and November 24, 1927–January 19, 1928.

HUEHUETENANGO.—Capital of the district of the same name. Altitude 6800 feet. Located at the base of the Cuchumetan Mountains, the highest and most extensive range in the Republic, the mean elevation being about 10,000 feet, with many peaks extending much higher. Huehuetenango was expected to be one of the rich fields for the collector, but the open pine and oak forests were not up to expectations. December 14–30, 1926.

CHANQUEJELVE.—A ranch on the north side of the Cuchumetan Mountains, about thirty miles north of Huehuetenango, and about ten miles east of Nenton; altitude 5000 feet. Oak, pine, and alder forest, with many old corn-fields grown to weeds. January 21–February 5, 1927.

SAN MATEO.—About fifteen miles northeast of the last station; altitude 9000 feet. The forest above the town was chiefly pine, with some oak and alder. February 10–24, 1927.

BARRILLOS.—Twenty-five miles east of San Mateo, at an elevation of 5200 feet. Forest largely alder and oak, with brush-land near the town. Rain forest crowned the ridges and summits of the higher elevations. February 28–March 22, 1927.

FINCA LA PERLA.—A coffee plantation in the District of Quiché, about forty (?) miles northeast of Barrillos. Altitude 4400 feet. Strictly rain forest, on slopes so steep that collecting was almost impossible. March 29–April 8, 1927.

NEBAJ.—Located about fifty miles northwest of Quiché; altitude 6700 feet. The more or less level land near the town was chiefly planted to corn, with many of the lower slopes cleared and pastured. The upper levels, however, were timbered, the ridges being rain forest with its usual fauna. April 13–May 3, 1927.

OCOS.—Formerly a busy port on the Pacific side, three miles from the Mexican border, now abandoned by all but a handful of natives too lazy to go away. Bordering the coast-line is a series of tide lagoons, with a growth of mangroves with few, if any, equals on the coast of Central America. Bird-life was abundant, but impossible to

collect without a cayuca, and as the natives refused to rent me the boats, though there were plenty, very little could be done with these rich fields. October 6–28, 1927.

SACAPULAS.—Twenty-five miles north of Quiché; altitude 4500 feet. This station presents an interesting contrast to most of the surrounding area, located in the valley of the Rio Negro, here a dry, sandy wash, but surrounded by mountains that receive much more rainfall than the valley. The flora is that of the dry sections of the Rio Motagua, with its fauna differing in a similar manner. February 4–March 24, 1928.

CHAMÁ.—A coffee finca thirty miles northwest of Coban, on the Rio Negro, here called the Rio Chixoy; altitude 1200 feet. The coffee plantation furnished most of the ground required for collecting, the shade growth being rubber and cacao, with a sprinkling of the native forest. April 19–May 23, 1928.

FINCA CONCEPCION.—A coffee plantation thirty-five miles east of Coban; altitude 3750 feet. The native growth being cleared and coffee the chief remaining tree, there was but little to note. June 12–28, 1928.

CHIPOC.—Some miles north of Finca Sepacuite; altitude 1250 feet. Mostly brushland, with some forest along the river a mile below. August 24–September 11, 1928.

CHIMOXAN.—A few miles north of the last station; altitude 1500 feet. Forest typical of the coast tropics. September 13–October 9, 1928.

In my work in Guatemala during the past five years, I often called on the hospitality of the several Americans whom I met in that country, always meeting with instant assistance. To give credit to all of these would be to publish a roster of the American inhabitants of that Republic. Since, obviously, this is out of the question, I will take this opportunity of thanking them collectively. However, I cannot pass, with this simple statement, the many and by no means slight kindnesses extended to me by the Hon. Philip Holland, at that time Consul General of Guatemala, without whose assistance my efforts would have been futile many times. (Anthony, MS.)

GENERAL PHYSIOGRAPHY OF GUATEMALA

A glance at the contour map of Guatemala will disclose one of the most complicated physiographies to be found anywhere in the world. The northern third of the country (Peten) is a vast plain wholly in the humid tropics and densely forested. The middle third is a highly complex mountain mass, rising with great abruptness in the west and forming an irregular tableland with large areas above 3000 meters. The mountains have a general easterly trend in Alta and Baja Vera Paz, which becomes more marked as we proceed eastward. Large rivers drain tropical valleys between these ranges, some flowing into the Caribbean Sea, while others, rising on the northern slopes of these mountains,

flow north into Peten, turn west and empty into the Gulf of Mexico west of the Yucatan Peninsula. None of these mountain ranges reaches the coast, where we again encounter a belt of tropical lowlands. The southern third of Guatemala, bounded by the Pacific Ocean, is a tropical coastal plain from thirty to fifty miles wide, from which rises with the greatest abruptness a solid wall of mountains, the average height of which is 7000 feet, with few and narrow passes and defiles. A chain of fourteen great volcanoes rises five to seven thousand feet higher, always from the outer edge of the range. Behind them is another broken tableland from five to seven thousand feet above sea-level with occasional higher crests, all of which is deeply buried under volcanic deposits. To the west this tableland falls steeply into the valley of the Rio Salegua (flowing west and north into the Gulf), the Rio Negro or Chixoy (here flowing east), and to the east drops into the valley of the Rio Grande or Motagua. The river systems mentioned separate the southern from the northern tablelands or Altos, and volcanic deposits are practically unknown north of them. It is a further characteristic of the southern third that the rivers flowing into the Pacific all rise well to the north of the great volcanoes. The height of land has nothing to do with the continental divide. Wherever the great river valleys in the interior have mountain masses to the east and north, local deserts occur.

As will be seen beyond, this division of the country is based on fundamental geological facts. It would be equally correct to describe it as composed of six general regions: (1) the Pacific littoral; (2) the volcanic mountains; (3) the plateau region or the Altos; (4) the mountainous region of Vera Paz; (5) the desert or semi-arid interior river valleys; and (6) the Caribbean coastal plain, including the lowlands of Peten.

This description can be slightly amplified to advantage. The Pacific coastal plain rises gradually from the sea and has an elevation of 1000 to 2000 feet at the base of the sierra. From west to east the volcanoes are as follows:

Tacaná on the Chiapas border—13,167 feet
Tajumulco (the highest summit in Central America)—13,600 feet
Santa Maria, with two cones, one now active—12,540 feet
Zunil—7050 feet
San Pedro—9570 feet
Atitlan—10,000 feet
San Lucas—11,790 feet
Fuego—12,540 feet
Acatenango—12,870 feet
Agua—12,110 feet
Pacaya—8350 feet

Of these, Tacaná and Tajumulco have never been ascended by naturalists. Both are definitely above tree-line, and snow is frequently recorded for short periods in summer. East of Pacaya, none of the volcanic peaks is of any consequence, and the average altitude of the tableland decreases rapidly to the Salvador frontier.

The orography of the Altos is so inconceivably complex that study of the contour map is worth more than pages of description. The topographer of Guatemala could not live long enough to complete his task. The Altos of the volcanic area are a wild jumble of ridges and slopes, the greater part between 6500 and 8000 feet above sea-level. In lake-beds, river-valleys, and canyons, it drops to 5000 feet. Occasional mountain-ridges rise to 11,000 feet, but areas above 9000 feet are very limited in extent, and are like small islands.

The chief distinction of the northern Altos of Huehuetenango and Quiché is that there are large areas continuously above 10,000 feet, several large "islands" above 11,000 feet, and Sapper reports two areas which are savannas above tree-line, resembling the grassy slopes above tree-line on the high volcanoes, but more or less level and many square miles in area. This region has never been explored, and I know of no more likely spot in Central America to find some surprising novelty than these boreal savannas.

The highlands of Alta and Baja Vera Paz have an equally complicated topography, but the altitudes are much lower, there are no tablelands, and well-marked ranges appear with a definite east and west strike. North of Coban is the Sierra Pocolhá, forming the boundary between the watershed of the Rio Polochic and the Rio de la Pasion. The maximum altitude is about 6500 feet. The eastern half of this range is known as the Sierra de Santa Cruz. South of the Polochic Valley and north of the Motagua Valley is the well-marked Sierra de las Minas with a length of over one hundred miles. Considerable areas of this range are over 7500 feet and a small section near the western end is well above 9000 feet. There might well be a Temperate Zone island here, which would repay exploration, as it is at least one hundred miles east of similar altitudes in the Altos. Farther east this range is known as the Sierra del Mico, due south of the Rio Dulce. As the top of this range is above 6000 feet, there is here an isolated Subtropical Zone island, which might also repay exploration.

The great plain of Peten is partly known only to archeologists, but must have a very uniform fauna and flora. The rainfall decreases northward, and at the same time a well-marked dry season appears. It is

almost unknown ornithologically, but it is certain that the rich Caribbean rain-forest fauna at the southern base gradually passes into the drier forest-fauna of Campeche and Quintana Roo. Peten is nearly one-third of Guatemala, and it has been roughly calculated that the average altitude of the country is 5000 feet above sea-level. No more striking index of its mountainous nature could be given.

GENERAL CLIMATIC CONDITIONS

In so highly diversified a country as Guatemala, with so complex a topography and such a great range of altitude, it follows naturally that there is great diversity in climate, and the changes are often as abrupt as the orography.

The fact of fundamental importance is that Guatemala is sufficiently far north for the temperature to be not quite constant at any given altitude throughout the year. During the winter months of the north temperate regions the average monthly temperature in Guatemala drops as well. This drop is scarcely perceptible in the lowlands and has no effect on the fauna or flora, but is very marked indeed in the Altos, where the months of December, January, and February are distinctly cooler than the balance of the year. There is slight but good evidence to indicate that some of the birds of the upper Temperate Zone regularly descend to lower levels in the winter months.

With this exception, seasonal change is largely a question of rainfall, and the distribution of rain is largely a matter of topography. High ranges intercept moisture-laden winds, so that the leeward side receives comparatively little precipitation. Temperature naturally varies with altitude, and the mean annual temperature drops about 8° with every 3000 feet increase in altitude.

RAINFALL.—If we start with the Caribbean slope of Guatemala, the outstanding factor is the easterly (northeast to southeast) trade-winds, which blow with more or less regularity throughout the year. Heavy precipitation consequently ensues on the eastern and northern slopes of the more easterly mountain ranges, and there is no real dry season. The average rainfall in the Caribbean lowlands and the northern slopes of the mountains of Alta Vera Paz is 180 to 200 inches annually. The maximum recorded rainfall in 24 hours is 9.6 inches.

It follows that those areas lying immediately west and southwest of the eastern mountain ranges get little or no rain. This explains the desert

strip in the center of the Rio Motagua Valley, the arid belt of the Rio Negro Valley, and the arid plains of Salamá.

From these points west to the Pacific slope of the mountains, rainfall conditions strongly recall those in Arizona, though the meteorological causes are different. By this I mean that rainfall increases with altitude, until thoroughly humid conditions reappear at about 9000 feet, where we again encounter a dripping rain forest. Thus there may be annually less than six inches of rain in the Motagua Valley, while Salamá (3000 feet) has 26.5 inches, and Guatemala City (5000 feet) about 55 inches. The latter is the approximate figure for the lower levels of the Altos. No figures exist for any locality above 9000 feet, but the traveler immediately perceives the greatly increased precipitation, and sees the results in the vegetation. There is a pronounced wet and dry season in the Altos, the wet season lasting from May to November, with more or less of an interruption in August.

Still other conditions prevail on the Pacific slope, where the mountains rise out of the coastal plain like a solid wall. Here there is a pronounced dry and wet season, and the latter is caused by southwest winds from the Pacific, which blow somewhat irregularly from May to November. I am not aware of any published figures for a station in this coastal plain, but judging by the similarity of conditions to those of the coasts of Salvador, Nicaragua, and western Costa Rica, I should say that the rainfall would average about 80 inches a year on the coast. The great wall of the mountains causes heavy precipitation above 1500 feet, and consequently there is a narrow belt of humid rain forest, part of which is in the Tropical Zone. Mr. Percy E. Davis, the manager of the great Hacienda Helvetia above Retalhuleu, tells me that the rainfall at his station is the same as at Puerto Barrios; namely, 180 to 200 inches a year. These conditions are exactly the same as those in Veraguas, western Panama, where there is a belt of humid rain forest at the base of the mountains.

The high volcanoes are the centers of little areas of precipitation, and have some effect on the surrounding country. As their western slopes all lie on the Pacific slope, and their eastern slopes at higher altitudes intercept the northeast trade-winds, there is almost daily precipitation somewhere on their summits. Last August, at Lake Atitlan, I witnessed a most complex war of the elements. At Panajachel I could look across the lake and see the three volcanoes and the mountains, the western slopes of which I knew fell sharply away to the Pacific lowlands. At

sunrise the sky would be cloudless, the wind northeast. About 10 A.M., the southwest monsoon would blow on the Pacific slope, and clouds would bank up against the mountains, getting blacker and blacker, until about 2 P.M., when flashes of lightning and the rumble of thunder would indicate that it was pouring rain on the Pacific slope. In the meantime it was cloudless at Panajachel, with the wind steadily northeast. The two winds appeared to meet at the volcanoes. One day the clouds would advance from the Pacific and roll completely around the volcanoes, so that it would rain on their eastern slopes; in other words, on the western side of Lake Atitlan. Another day the northeast trade-wind would be stronger, and the clouds would never get through the spaces between the volcanoes. We have here, then, a further explanation of the heavy precipitation on the western slopes of the mountains. The rain clouds almost never advance beyond these slopes, and consequently all their moisture is deposited in one place.

In passing, it will be illuminating to explain how and when it rained at Panajachel. It rained for two diametrically opposite reasons. On an occasional day the northeast trades would blow very much harder than usual, and it would cloud over from the east, resulting in light showers by late afternoon or evening. One would conclude that, under such conditions, not all the moisture-laden clouds were intercepted farther east. But on another day the trade-wind seemed to fail completely, and the cloud banks on the Pacific slope broke through the spaces between the volcanoes, spread completely across the lake, and as a result it poured rain throughout the lake basin. This brief sketch shows how complicated the question of rainfall is in the Altos, so that almost any conceivable spot on the map would have a set of factors all its own.

Snow is a very rare phenomenon, for the simple reason that the three winter months, when the temperature frequently drops below freezing at high altitudes, are dry months. Snow is definitely recorded only on the summits of Tacaná and Tajumulco, where it has occurred in the month of July, never lasting more than forty-eight hours. Hail is almost as rare a phenomenon. Most of the snows reported by natives are really hard frosts, gleaming white in the morning sunlight on the distant summit of a volcano.

TEMPERATURE.—While there are very few stations in Guatemala with good records, there are just enough to give an adequate idea of temperature factors. The following table gives mean monthly data for various altitudes. The scale is Fahrenheit.

Locality	Altitude	January	May
Puerto Barrios	6	74	81
Salamá	3000	68	77
Chimax	4280	61	68
Guatemala City	5000	60	67
Quetzaltenango	7700	50	62

Certain comments on this table are necessary. At Puerto Barrios the lower January temperature is almost entirely due to the occasional "northers," which last from one to three days and lower the temperature 10° to 15°. With this exception there is no appreciable difference in daily temperatures throughout the year. At higher altitudes, however, the difference between January and May has real significance. Salamá is in a desert area, and the daily range of temperature is far greater than at Puerto Barrios, although the mean is but little less for May. Thus a temperature of 94.1° has been recorded at Salamá, and it often reaches 90° every day, a phenomenon quite unknown at Puerto Barrios. On the other hand the minimum daily temperatures at Salamá fall below those at Puerto Barrios.

The hottest part of Guatemala is naturally the desert section of the Motagua Valley. Here, temperatures of 98° are regularly recorded in the winter months, and it is almost certain that in July and August (locally largely cloudless) temperatures over 100° would be far from rare. There are no exact data for the Pacific lowlands, but travelers are agreed that it is a little hotter than the eastern lowlands, a generality true of all Central America. The actual difference in mean annual temperature would be two or three degrees only, but it SEEMS hotter most of the year, because of the many months of cloudless skies in the dry season and the absence of the trade-winds.

In the Altos the daily range of temperature is greater than in the tropical lowlands. The maximum in summer is 80° to 90°, and the minimum in winter 30° to 40°. Below 6500 feet, frost is exceedingly rare, but it has killed coffee trees at Antigua and once (January 27, 1885) at Coban. Severe frosts occur in winter above 8000 feet, and on rare occasions do considerable damage. I, myself, have seen a fair-sized patch of pine forest at 10,500 feet completely killed by frost the preceding winter. Even at this altitude, however, there is no evidence to show that the temperature has ever fallen below 20°, and occasionally it goes as high as 75°.

DISTRIBUTION OF FORESTS

It is a truism that in Central America there is an absolute relation between rainfall and forest. The eastern lowlands and Alta Vera Paz are consequently covered with a primeval tropical rain forest, and where sufficiently humid conditions prevail this rain forest passes gradually into the Subtropical Zone cloud forest. On the Pacific slope the forest is scattered and of the gallery type, with large areas of open savanna land. This country dries up in the dry season, the landscape appears parched and withered, and many of the trees lose their leaves. In the humid belt at the base of the mountains dense rain forest again appears (Fig. 2), but this belt is lacking at the eastern end of the country.

The interior desert river valleys have no forest. Tree cactus is common; and a xerophytic thorny scrub, with many members of the Mimosaceæ, closely resembles the chapparal of southern Texas (see Figs. 3 and 4).

Most of the Altos were originally covered by an open pine and oak forest (Figs. 8 and 9), which in general aspect is reminiscent of the upper Austral and Canadian Zones in the southern Rocky Mountains. It tends to increase in size, density and vigor upward, and at lower altitudes cactus and thorny scrub give the country a distinctly arid appearance. This transition takes place between 5000 and 7500 feet. It is just in this belt that extensive deforestation has taken place, and this must be considered by the faunal zoölogist. At least nine-tenths of the Altos below 8000 feet is now under cultivation by the Indians. The landscape is largely a series of wheat or corn-fields, varied with truck patches or pasturage for sheep and cattle, and only small patches of the original forest remain (Figs. 5 and 6). This condition of affairs undoubtedly dates far back of the historical period, and must have profoundly altered the native avifauna. We have no means of appraising these changes. It is true that a minority of the native species are now very local and confined to undisturbed areas of forest. It would seem safe to infer that these must have been more common and widely distributed in former times. On the other hand, many of the characteristic endemic genera and species of Guatemalan birds are common in the cultivated areas of the Altos. It is inconceivable that they could have originated elsewhere, and that they are recent immigrants to newly created favorable environments. What is most probable is that the native civilization developed very slowly, and that the present degree of deforestation has required a relatively long time. If this be true, the environmental change

was a very gradual one, and the great majority of the native birds were able to adapt themselves to it.

Above 8000 feet the human population is greatly reduced due to the lowered temperature. The rainfall also increases, and large areas of very fine primeval forest exist, particularly in the Altos of Huehuetenango and Quiché. Even at 10,500 feet the pines and oaks average six feet in diameter and the trees are so lofty and loaded with epiphytes that the smaller passerine birds are most difficult to observe or collect. At the highest altitudes spruce also appears, and a marvellous alpine flora makes a blaze of color in the open park-like glades. Where particularly humid conditions prevail, extensive forests of cypress (*Cheirostemon*) are found from 7500 to 10,000 feet. These have a dense undergrowth and are almost impenetrable (Fig. 7).

The greatest apparent anomaly in the vegetation of Guatemala is the distribution of pine. While it is true that pine forests are characteristic of subtropical and temperate climates, the pine is by no means confined to these climates, but descends to sea-level on the eastern side of Guatemala wherever (1) the soil is especially poor or (2) where the rainfall is locally decreased. Thus, in Peten there are extensive areas of Tertiary limestone, which have local areas of savanna and pine woods, strongly reminiscent of parts of south central Florida. Pines also occur locally in Alta Vera Paz (Fig. 1); they are dominant on the south slopes of the Sierra de las Minas, and descend practically to sea-level in the Motagua Valley between Gualan and Los Amates. Here there are Pleistocene deposits and the climate is a transition between the desert areas to the west and the humid tropics farther east. These tropical pine woods occur locally south to northeastern Nicaragua and cause the greatest confusion to the zoögeographer, as they apparently destroy his altitudinal arrangement of Life-Zones. The case will be fully discussed in its proper place beyond. Suffice it to say here that birds of Neotropical origin for the most part avoid these woods, and species which are characteristic of the boreal pine forests of North America follow their coniferous habitat to sea-level in the tropics.

GEOLOGICAL AND PALÆOGRAPHIC SUMMARY

Geologically Central America[1] is not a part of either North or South America, but is a third element between the two. The folds in the earth's crust which form the Andes and the western ranges of North America

[1]This term, as used here, is restricted to the mainland south of Mexico, and does not include the Caribbean arc.

are not continued in Central America, where the strata are folded from west to east.

By far the greater part of Central America and Mexico is covered by Cretaceous and Tertiary deposits, both sedimentary and volcanic. But here and there from southern Oaxaca to northern Honduras, and particularly in Guatemala, Palæozoic granites and schists, overlaid by limestones containing Carboniferous fossils, are known to occur and below these is a considerable thickness of beds supposed to be Silurian. Wherever the strike has been observed, it is approximately from west to east. Sapper has definitely identified Palæozoic rocks in the Altos of Huehuetenango and Quiché, and the ranges running east in Vera Paz. The remainder of these mountain masses are Mesozoic, but their exact age is undetermined. Sands and red and yellow clays are possibly Triassic. The limestones are possibly Cretaceous or early Tertiary and cover a much larger area of country.

The Tertiary system in Guatemala is poorly understood, and the Pliocene is not clearly distinguished from the Pleistocene. Much of Peten and the lowlands of Alta Vera Paz and Yzabal are Tertiary, and perhaps are of shallow-water origin, but its limits in Peten and Yzabal are not known. There are small Tertiary deposits along the Rio Motagua, and more extensive ones in the lowlands in Huehuetenango near the Chiapas border.

The Pacific coastal plain is Quaternary, and certain areas along the main rivers are ascribed to this period, particularly in the arid or desert regions.

The great volcanoes of Mexico and Central America began their eruptions towards the close of the Cretaceous period, and vulcanism was widespread during the Eocene and possibly the Oligocene. Hill believes that the greater mass of the present volcanic heights was piled up before the Pliocene, and the present craters are feeble and expiring phenomena. The extent of the volcanic deposits is very great, and most of the southern half of the Altos is buried under these to a maximum thickness of 10,000 to 12,000 feet, entirely concealing the original structure of the country.

If the geology of Central America is but little known, it is obvious that palæographical deductions are vague and general, as very few fossils have been found. The ornithologist is scarcely concerned with events prior to the Cretaceous period, and the following summary is largely a digest from the writings of Scott, Schuchert, and more recent papers by Vaughan. Palæontologists seem agreed that at least by early Cretaceous

time the outline of Central America was approximately the present one, with even broader connection with South America. Probably most of the continents were connected, as is proved by the almost world-wide distribution of dinosaurs. Partial submergence began perhaps in late Cretaceous time, but late Eocene and Oligocene time was a period of extensive submergence, and Vaughan believes that there were a number of oceanic connections across Central America. Guatemala was separated from Mexico, and at least southern Nicaragua and the Isthmus of Panama were under water.[1]

Some connection between the Atlantic and the Pacific may have persisted into lower Miocene, but this period as a whole was one of great uplift, which may have lasted into the Pliocene. There is no definite evidence to show that South and North America were ever separated after this period, and none is demanded by vertebrate zoögeographic data. There was a possible West Indian connection in late Miocene, but Vaughan considers that such a connection was more probable in Pliocene time, when the West Indian islands were produced by block faulting. The connection may have been with South America, with Cuba and Yucatan, or both. It seems certain, however, that the land-mass of Central America was never greater. No uplift, however, ever raised the level of the Isthmus of Panama more than 1000 feet.

The extensive glaciation during the Pleistocene is supposed to have caused a general lowering of the oceans, so that the land of the Isthmus was 200 to 300 feet higher than it now is. It was subsequently depressed lower than it now is, and then raised to the present level. The most important event during this period for the zoögeographer, however, was the general world-wide refrigeration of climate, with a lowering of the mean annual temperature of at least 7° centigrade. That this refrigeration was not purely local in the northern hemisphere is evidenced by the glaciation in the Andes. Professor Kirtley F. Mather assures me that the snow-line in the Andes of Ecuador and Colombia, and in the Sierra Nevada de Santa Marta, was 1000 meters lower than now in places, and that this glaciation has been correlated with that in the north. There is no evidence of any glaciation in the mountains of Central America, but the Subtropical Zone must have descended to sea-level in most of this territory, and the Temperate Zone must have been correspondingly lowered.

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[1]Schuchert (1929) adopts this view, but reverses his opinion in a footnote, denying any Oligocene interoceanic connections, a view in sharp conflict with abundant mammal evidence.

References

1898. Hill, R. T. 'The Geological History of the Isthmus of Panama and portions of Costa Rica.' Bull. Mus. Comp. Zool., XXVIII, pp. 150–285.

1910. Schuchert, Charles. 'Palæography of North America.' Geol. Soc. Amer. Bull., XX, pp. 427–600.

1914. Sievers, Wilhelm. 'Reise in Peru und Ecuador.' Wiss. Veroff. Gesell. Erdkunde, Leipzig, VIII.

1917. Ospina, Tulio. 'Geologia general y economica de Colombia.' Proc. 2d Pan-Amer. Sci. Cong., VIII, pp. 322-346.

1919. Vaughan, T. W. 'Contributions to the Geology and Palæontology of the Canal Zone, Panama.' U. S. Nat. Mus., Bull. CIII, pp. 189–524, and pp. 547–612.

1925 Wollaston, A. F. R. 'The Sierra Nevada de Santa Marta, Colombia.' Geog. Journal, LXVI, pp. 97-111.

1929. Schuchert, Charles. 'Geological History of the Antillean Region.' Bull. Geol. Soc. Amer., XL, pp. 337–360.

Summary of Palæontological Evidence

The paucity of avian fossil remains requires no renewed emphasis here, but it is well to point out that in the opinion of all experts this lack is no evidence whatever of the relatively recent origin of modern birds. Wetmore's[1] recent excellent summary may well be given. The toothed birds of the Cretaceous period were apparently not ancestral to modern types. Modern families of birds first appeared in North America in the Eocene, and the first perching bird in the Miocene. As with mammals, the warmer climates of the Tertiary brought many birds we now think of as tropical into North America. "Though a part of the birds of the Miocene and Pliocene are peculiar, many are identified in genera existing at the present time. It is my own belief that these two ages mark the period of evolution of our modern genera of birds and there has come comparatively little change in generic type since. In my opinion evolution among birds during the Quaternary has been concerned principally with the development of those differences that characterize species and subspecies, differences which in some cases have been so pronounced that present usage, with its close perception of minutiæ, concedes them as generic. . . .

"It seems probable that the bird life of the Miocene and Pliocene was even more varied and wonderful than that of today, and that a larger number of species may have existed. . . . We are aware that the

[1]Smithsonian Report for 1928, pp. 377–389.

present number of species in tropical and subtropical sections of America is much greater than in the Temperate Zone. . . . By analogy we may suppose a rich and highly varied bird life for the Miocene and Pliocene periods in North America, a fauna that since has been in part exterminated and in part restricted to more southern latitudes." Dr. Wetmore's ensuing analysis of Pleistocene fossils shows that two-thirds of them belong to species now living. He concludes that the steadily increasing rigors of climate and environment which began with the opening of the Pleistocene initiated a reduction and extermination among birds which has been progressing steadily ever since.

Dr. Wetmore's summary for birds is almost exactly the same as the evidence supplied by the far better-known history of mammals. This need not be recapitulated here, and readers can refer to the well-known books by Osborn and Scott and Matthew's classic paper on 'Climate and Evolution.' In only one respect is the palæontological record of mammals of major importance to our present theme. The avian record is so fragmentary that it gives us no evidence as to the time of arrival in the New World of any of the major groups of birds. The mammalian record, however, is replete with incontrovertible evidence as to the migration of various families and orders into North America both from the Old World and from South America. It is practically certain that the migrations of birds must have been contemporaneous, as favorable climates and land bridges were equally requisite. It is unthinkable that the evolution of an order or family of birds in one of the great continents was due originally to the accidental arrival of some wind-blown vagrants.

It is not without significance, then, for the avian geographer, that the Miocene (or Pliocene) connection between North and South America did not produce immediate or startling results. Ground sloths have been found in the middle Miocene of Oregon, but there is no definite sign of a North American invasion in southern South America. There was but little change in Pliocene time. Ground sloths, a glyptodont, edentates, and opossums reached North America, but camels were the only definite arrivals in South America. According to Scott, the identifications of certain ancient dogs, racoons and bears is doubtful. Extensive migration took place, however, in the Quaternary, and the trend was reversed. Most of the present-day mammal groups in South America are of northern origin, and they arrived in the Quaternary, including *Smilodon*, *Equus*, *Mastodon*, and antelopes, all now extinct. Glyptodonts and ground sloths reached North America in increased numbers, and *Toxodon* reached Nicaragua. But the fact remains that the great majority

of the peculiar orders and families of South American mammals, like the lipotheres, originated and died out there, without ever coming near North America.

Historical Summary and Conclusions

The ornithologist studying the bird-life of Guatemala must remember that he is dealing with a section of a relatively narrow land bridge, which has connected two great continents since the Miocene. Each of these continents has been a great center of development for higher vertebrates, and more or less of an interchange of faunas has been possible for a very long period of time.

1.—Much of the mountain system of Guatemala is Palæozoic, and has had a continued existence above the ocean to the present time.

2.—The lowlands of Guatemala were of much later origin and extensive areas are sedimentary.

3.—These lowlands and the adjacent lowlands to the north (Isthmus of Tehuantepec) and the south (Nicaragua canal route) have been extensively and completely submerged at least once, and at least partially submerged on other occasions.

4.—The highlands of Guatemala consequently have always been available as a place of refuge for faunas and floras expelled from the lowlands by submergence.

5.—Our problem is consequently the direct opposite of Chapman's with the Andes of Colombia and Ecuador. Most of the elevation of the highlands of Guatemala took place before modern birds existed. There is no evidence of uplift after Miocene (or Pliocene) time.

6.—No birds ancestral to modern types could have reached Guatemala from South America prior to Miocene time.

7.—If any birds ancestral to modern types reached Guatemala in Eocene or Oligocene time, they must have come from North America.

8.—During the Miocene and Pliocene periods there was relatively little migration between North and South America. Perhaps the extensive vulcanism in the relatively narrow Central American land bridges was a factor.

9.—During Pleistocene time extensive migration took place, and the trend was overwhelmingly from north to south. General refrigeration took place and amounted to at least 7° centigrade.

10.—The close of the Ice Age undoubtedly ushered in another period of south to north migration. This recent period has seen the extensive repopulation of nearly half of North America from the south.

11.—The history of the land mammals of the western hemisphere shows the ornithologist the possibly dangerous fallacy of assuming that present-day families of birds, which are exclusively Neotropical, originated in South America. Chapman has already done pioneer work in this field in showing that motmots, *Compsothlypis*, and *Buarremon* probably originated in Central and not in South America.

The conclusions given above are not intended to be dogmatic statements of fact, but represent a series of reasonable and conservative in-

ferences based on the best available geological and historical evidence. Unless overwhelming biogeographic evidence to the contrary can be demonstrated, it is the duty of the avian geographer to see to it that his deductions are kept within the limits indicated by such geological and historical data. To do otherwise would be to engage in idle and fanciful speculation.

With this ground work laid, we may now proceed to a detailed analysis of the avifauna of Guatemala. It will be seen that there are no peculiarities in the distribution of any birds of northern Central America which compel inferences carrying us outside the limits set in the conclusions listed above.

LIFE-ZONES OF GUATEMALA AND THEIR BIRD-LIFE

Definitions and Methods

The literature of zoögeography is replete with terms and expressions which are loosely defined, and often used in different senses by different writers. Such terms as region, fauna and life-zone are part of the familiar "patter" of the science. No correlation of faunas has ever been attempted in the New World. I show below how different is the "zone" in the Andes from the "life-zone" on one of the Rocky Mountains. These difficulties are inherent in the subject, and are due fundamentally to the total lack of uniformity in the distribution of animals, and the multiplicity of factors which have given the several species their present ranges. A study of the avifauna of Guatemala is no place to settle these points, but it is well to define these terms as I use them in the following pages.

The word "region" is a loose geographic term, but "Region" is technically restricted to one of the main zoögeographic regions of the world, as defined by Wallace, with slight recent modifications.

The word "fauna" or "avifauna" connotes the sum total of the species and subspecies of mammals or birds of a particular area, usually political. The word "Fauna," however, is part of a definite term to describe a particular assemblage of birds, containing a high percentage of endemic or peculiar forms, shown to be characteristic of a particular area, termed a "faunal area." In this sense "Faunæ" are best developed in the tropics, and decrease in definiteness northward, while the area occupied by the "Fauna" increases. There is no such thing, however, as a "homogeneous fauna." No continental faunal area on earth has an avifauna composed solely of endemic forms. With very rare exceptions "Faunæ"

in the tropics are restricted to one zone, and usually to the arid or humid portions of it.

In the tropics a "Zone" is a climatic belt based on altitude, like the "Temperate Zone" at higher levels in the mountains of Ecuador. There are consequently no such zones in the northern hemisphere, where the entire mountain is in one zone. "Life-Zones" are minor divisions of the north Temperate Zone, and are latitudinal as well as altitudinal. As we proceed southward, Life-Zones become more and more telescoped. In the Temperate Zone in the mountains of Guatemala for instance, the birds are close relatives of species characteristic of the Lower Sonoran, Upper Sonoran and Canadian Zones in the Rockies.

THE VALIDITY OF ZOÖGEOGRAPHIC DATA.—Any study of the origin of the bird-life of any country or region must have certain bases of fact on which inferences can be erected, leading to other generalizations. Finality could only be attained by the discovery of an absolutely complete series of fossils not only in the particular area selected but in all adjacent areas, where the same birds or their ancestors either occur now or used to occur. Ideally, the various geological horizons would also have to be worked out perfectly. Were the record thus complete, we could begin at the very beginning, with the inception of the class Aves if necessary, and step by step work upward through geological time to the present. The present avifauna of our territory would consequently be reached last.

The zoögeographer reverses this ideal process. With a general outline only of geological history and a fragmentary palæontological record, he begins with the existing avifauna and reasons backward, making use of what information is available in cognate sciences. It is apparent that the value of his results depends not only upon the validity of his data, but on the validity of his methods.

As regards data, he has not only the birds known to inhabit the area studied, but their ranges outside it. The student must also be personally acquainted with all their relatives and their ranges, and must have a critical opinion on the varying degrees of that relationship. Differences of opinion in taxonomic treatment often obscure the issue, and allowance for these must be made. Chapman has written eloquently concerning generic "splitting" ('Birds of Colombia,' pp. 171–175), and has shown how the generic concept *Dyctiopicus* obscures the northern origin of the little Downy Woodpecker of Chile. While this is entirely true, my point here is that the recognition of this genus does not impair the validity of THE REASONING by which we infer the northern origin of this

woodpecker. This error is, however, often made by critics. I have tried to be consistently conservative in recognizing genera throughout this paper

The taxonomic problem just raised bears very directly on zoögeographic methods in another connection. The evidence of the palæontological record shows very clearly that, other things being equal, families arose before their present-day component genera, that genera arose before their present-day component species, and that very distinct species arose before the minor variations of one of them. In spite of the disagreement among systematists as to whether certain birds are racially or specifically distinct, the fundamental validity of this proposition is unquestioned. When, therefore, the zoögeographer speaks of the relatively recent origin of a certain "representative species," he recognizes that the degree to which it differs from a geographically adjacent relative is much less than that of some other species of the genus, the unique characters of which show it has no near relatives.

This proposition is also sound in spite of the easily demonstrable fact that different species are varyingly plastic; that the capacity to vary is greater in some, less in others. Not only is it demonstrable by breeding experiments, but it is also easily inferable among living birds. The validity of conclusions calling one species of older origin than another is sometimes impugned by some, who assume that the greater degree of difference of this species might be due not to its greater antiquity, but to its greater plasticity. Such cases are very common, and are easily recognized. In the high mountains of Guatemala, for instance, there is a group of birds of mainly boreal distribution, and undoubted boreal origin. The factor which brought them there was undoubtedly the refrigeration of the Pleistocene. Roughly speaking, they arrived at about the same time for the same reasons. The junco is generally regarded as specifically distinct, but the creeper and the kinglet are only races. The junco belongs to a particularly plastic group. The chances are, therefore, that the greater degree of difference of the junco is due to its greater plasticity, and we are not justified in announcing that the junco arrived in Guatemala before the creeper. It also happens that in the same mountains lives a guan, *Oreophasis*, a peculiar subfamily of the Cracidæ, found nowhere else in the world, and its relatives are wholly Neotropical. There is no doubt that it arrived in Guatemala long before the junco, and it may well have originated there. In fact its origin is so much older than that of the junco, that we are not justified in speculating about it at all. The soundness of this reasoning is not changed by the believer in the

"Formenkreis," who chooses to reduce the junco to subspecific rank, nor is it affected by some other systematist, who declines to divide the Cracidæ into subfamilies.

Our illustration can be continued to advantage in clarifying other elements in the methods employed, and in showing the fallacy of certain types of criticism and the falsity of possible assumptions. I spoke of the junco as a bird of boreal distribution and undoubted boreal origin. The use of the word origin introduces a time element, and this is always relative in zoögeography. I am correct concerning a particular species of junco, and I am correct concerning the boreal distribution of the genus *Junco* today and now. The boreal origin of the genus is quite another thing, and this may or may not be correct. The point here is that the origin of the species, genus, and family is not necessarily the same. I am convinced, for instance, that a certain trogon in the Caribbean lowlands came recently from the south, and I am equally certain that trogons, as a group, not only originated north of Guatemala, but in the Old World.

We have seen that there are many borderline cases, and other cases like that of the junco, about which we can infer one thing but not others. There are problems concerning many birds about which we can infer nothing. These birds usually belong to orders and families of more ancient origin, which attained world-wide distribution so long ago that the factors causing it are quite beyond our powers of inference. Other birds of much more recent origin are so adaptable and so successful that they occur in several climates and life-zones with or without racial variation, and we have no real clues as to their origin. All birds in these categories are omitted in distributional analyses as being too speculative and uncertain. Curiously enough, this conservatism arouses the suspicion of an occasional reader, not a systematist, who feels that only those birds are used which fit the thesis of the writer, and that a large number are discarded as "of no geographic significance."

But enough has been said, I trust, to explain and justify the distributional analyses which follow. Just as faunæ never consist of absolute endemism, so no political area like Guatemala ever possessed an avifauna which all came from the same direction at the same time. The most we can show is that some of its bird-life came from the north, some of it came from the south, and that some birds show every sign of having been in Guatemala a very long time. Provided we are correct in the interpretation of the cases cited, it makes but little difference that a group of species exists about whose origin we could only speculate.

General Considerations

The inhabitants of Guatemala divide their country into three general temperature zones: (1) the "tierra caliente," or tropics; (2) the "tierra templada," or subtropics, from four or five to eight thousand feet; and (3) the "tierra fria," or temperate zone. While this rough division has a very obvious basis in fact, it is entirely inadequate for the faunal zoölogist. The subtropics of the Guatemaltecan has no faunal existence, and the true Subtropical Zone in Guatemala is not distinguished by the inhabitants of the country.

Briefly, then, we recognize three life-zones in Guatemala as follows:

Tropical Zone—sea-level to 3000–4500 ft.
Subtropical Zone—3000 to 6000 ft. and locally much higher
Temperate Zone—5000 to 13,000 ft.

Before we take up these zones in greater detail, certain general observations are in order. The nomenclature used is strictly in accordance with the definitions of Chapman in his studies of Colombia and Ecuador, but these definitions are much harder to apply consistently. For this state of affairs there are two outstanding reasons.

(1) Guatemala is so far north that its higher altitudes are faunally a transition from the Neotropical to the Holarctic Region, and it is well known that life-zones are less marked in an area of transition than elsewhere. Put in other terms we may profitably contrast the zones on the equator with the life-zones on one of the higher peaks of the Rockies. No one can doubt the reality of the zones in Ecuador, and proceeding northward, my own field experience in Panama and Nicaragua convinces me that the same, often sharp, demarcation occurs there. If, on the other hand, we ascend a high peak in northern Arizona, we are equally impressed with the reality of the Upper Sonoran and the Canadian Zones. These zones are not real homologues of the equatorial Subtropical and Temperate Zones, for the reason that the entire mountain is in a temperate region to start with. It will follow, therefore, that as we go northward we are bound to reach latitudes where the Zones of the Andes are gradually destroyed and replaced by the Zones of the North Temperate Region, as a temperate climate more and more closely approaches sea-level. This transition area is in Guatemala and Mexico. In Guatemala we find the Subtropical Zone greatly reduced, and poorly developed in most of the highlands, while a much greater area must loosely be called Temperate, as its fauna is almost entirely of northern or Holarctic origin. In Mexico the Subtropical Zone is completely

destroyed north of the southern edges of the great central plateau, or some of its most characteristic genera reach sea-level. In the meantime, more and more of the country enjoys a temperate climate, and its division into the life-zones of the Holarctic Region becomes increasingly obvious northward.

(2) In the equatorial Andes we have a great mountain mass of recent uplift of unbroken continuity to South Temperate regions. The bird-life of the upper zones must consequently have been derived from the tropics below, or the same zone at sea-level farther south. In Guatemala the situation is roughly reversed. We have an ancient mountain mass, which has never been continuous with any other mountain mass to the north or south, and the tropical lowlands are of relatively recent to very recent origin. In general, therefore, the avifauna of these mountains has not been derived from the lowlands at their bases, but the present fauna of the lowlands has in part been derived from the mountains. The highland fauna could only have been derived from the north or the south at periods when radical climatic change permitted highland forms to descend to sea-level, or tropical lowland forms to ascend far above limits which they can now endure.

Proof of the validity of these general statements can only be secured by a more detailed examination of the several zones and their birds.

The Tropical Zone

Boundaries, Characteristics, and Habitats.—It is fortunate that the zone with which we most naturally begin is the most clear-cut and easily defined of all in Guatemala. The Tropical Zone includes the lowlands of the Caribbean and Pacific coastal plains, the whole of Peten and the lowlands of Alta Vera Paz, and extends up the larger river valleys of the interior, wherever these valleys are below 4500 feet, in the form of narrow tongues. It follows, therefore, that the northern and eastern divisions are continuous, but the western or Pacific division is separated from the eastern by the entire mountain system of the country. Since the elevation of the mountains took place before the lowlands existed, it follows that any bird-life which these two divisions have in common must have descended from the mountains or come in either from the north or the south. No passes, breaks, or depressions of any kind exist in the mountains, which make possible, or have ever made possible, a direct east and west connection in Guatemala.

The Caribbean Lowlands.—This term includes the northern and

eastern divisions. The entire region has a very humid climate, and is covered with a luxuriant evergreen tropical rain forest. This tropical rain forest is unbroken from eastern Mexico to northern Colombia on the Caribbean slope. A narrow tongue of it crosses the continent in southern Nicaragua, and again in eastern Panama, at the Isthmus. From here south to northwestern Ecuador, it is continuous along the Pacific coast. Faunally, in Central America at least, it is absolutely homogeneous. It is characterized by an extraordinary wealth of bird-life, with a marked paucity of endemic forms. A high percentage of the genera and species do not occur outside this forest in Central America. A further point of great importance is the steady decrease in variety northward. Thus, there are 400 species of birds known from eastern Costa Rica, but only 200 from eastern Guatemala, which is equally well explored.

THE PACIFIC LOWLANDS.—The Tropical Zone of western Guatemala is divisible into a humid and an arid section. The humid section is limited, as we have seen, to a narrow strip at the base of the mountains. Faunally this narrow strip is of interest, as a very few of the typical Caribbean rain-forest species occur there. They are unknown elsewhere on the Pacific side of Central America, north of Panama. This humid strip disappears south and east of Escuintla, and is lacking in Salvador, Honduras, and Nicaragua. It extends northward into Mexico, however, and its special birds must have been derived from the North (Fig. 2).

The balance of the Pacific lowlands is relatively arid, and is a mixture of gallery forest, varied with savannas and scrub. This region is also continuous from the Isthmus of Tehuantepec to northwestern Costa Rica on the Pacific slope, and reappears on the outer half of theYucatan Peninsula. Faunally it is so peculiar, and with such a high percentage of endemism, that I propose for it the name of Central American Arid Tropical Fauna. It is analagous to the Equatorial Arid Fauna of west Ecuador, and I shall show that they have points in common.

THE DESERT INTERIOR VALLEYS.—The upper part of the Rio Negro Valley, the plains around Salamá, and the whole western half of the Rio Motagua Valley are desert or nearly so, and the greater heat undoubtedly locally raises the upper limit of the Tropical Zone. The vegetation is highly xerophytic, but Standley has pointed out that the natural sterility of the soil has probably been as much of a factor as the lack of rain. These areas are practically continuous in Guatemala, and extend southward through central Honduras to north central Nicaragua. There is no actual continuity northward with similar very extensive areas in Mexico, but it is significant that the mountain barriers are arid

themselves. These desert valleys have a small, but specialized bird-life, which is far less peculiar than one would suppose. It is a mere subdivision of the Central American Arid Tropical Fauna. (Figs. 3 and 4.)

Having outlined the approximate limits of the Tropical Zone and its main subdivisions, we can take up the geographic origin of its bird-life. Several obvious questions arise. Where did the avifauna of the Caribbean rain forest come from, and why is the element of endemism so slight? Where did the Central American Arid Fauna originate? How did the birds of the desert interior valleys get there? Which are older, which more recent?

Birds of General Distribution

Before taking up the special elements in the avifauna of the various divisions of the Tropical Zone, we should first briefly consider those birds which are of general distribution; in other words, those species which belong to generalized types, or which from greater adaptability are not restricted to any one special environment or climate. Such birds occur in any political area in the New World, and it is most exceptional if one of them serves as a faunal indicator, or has any geographic significance. They do not invalidate the concept of a fauna. No continental faunal area in the world is composed wholly of endemics. I follow Chapman in omitting wide-ranging water-birds and birds of prey.

BIRDS OF GENERAL DISTRIBUTION IN THE TROPICAL ZONE

A.—With no Racial Variation

Crax globicera
Penelope æquatorialis purpurascens
Columbigallina rufipennis
Oreopeleia montana
Pulsatrix perspicillata saturata
Ciccaba virgata centralis
" *nigrolineata*
Glaucidium brasilianum ridgwayi
Ara macao
Megaceryle torquata
Chloroceryle amazona
" *americana isthmica*
" *ænea stictoptera*
Nyctibius griseus mexicanus
Chordeiles acutipennis micromeris
Tyrannus melancholicus chloronotus
Myiodynastes luteiventris luteiventris
Megarhynchus pitangua mexicanus
Myiozetetes similis texensis
Pitangus sulphuratus guatimalensis
Myiarchus tyrannulus nelsoni
" *tuberculifer connectens*
Myiochanes cinereus brachytarsus
Platyrinchus cancrominus cancrominus
Tolmomyias sulphurescens cinereiceps
Todirostrum cinereum finitimum
Oncostoma cinereigulare
Elainea flavogaster subpagana
" *viridicata placens*
Tityra semifasciata personata

Chætura richmondi
Saucerottia beryllina devillei
Anthracothorax prevosti prevosti
Trogon violaceus braccatus
Piaya cayana thermophila
Dromococcyx phasianellus
Crotophaga sulcirostris
Pteroglossus torquatus torquatus
Notharchus hyperrhynchus dysoni
Phlæoceastes guatimalensis guatimalensis
Ceophloeus lineatus similis
Thamnophilus doliatus intermedius
Lepidocolaptes souleyeti insignis
Dendrocincla homochroa homochroa
Muscivora tyrannus
Platypsaris aglaiæ subspecies
Attila spadiceus flammulatus
Iridoprocne albilinea
Progne chalybea chalybea
Rhamphocænus rufiventris rufiventris
Troglodytes musculus intermedius
Vireo flavoviridis flavoviridis
Cyanocompsa parellina dearborni
Volatinia jacarini atronitens
Saltator atriceps atriceps
Tanagra lauta lauta
Thraupis cana diaconus
" *abbas*
Amblycercus holosericeus holosericeus
Megaquiscalus major macrourus[1]

In addition to these species, there is a further group of seventeen which I regard as subspecifically distinct on opposite sides of Guatemala. These are:

B.—With Representative Races on the Two Slopes

		Caribbean Slope	Pacific Slope
Leptotila	*verreauxi*	*fulviventris*	*bangsi*
Aramides	*albiventris*	*albiventris*	*vanrossemi*
Momotus	*lessoni*	*goldmani*	*lessoni*
Nyctidromus	*albicollis*	*yucatanensis*	*intercedens*
Piculus	*rubiginosus*	*yucatanensis*	*differens*
Synallaxis	*erythrothorax*	*erythrothorax*	*pacifica*
Empidonax	*albigularis*	*australis*	*albigularis*
Pheugopedius	*maculipectus*	*umbrinus*	*varians*
Turdus	*grayi*	*grayi*	*umbrinus*
Vireo	*ochraceus*	*semiflavus*	*ochraceus*
Cyclarhis	*flaviventris*	*flaviventris*	*nicaraguæ*
Chamæthlypis	*poliocephala*	*palpebralis*	*caninucha*
Sporophila	*moreleti*	*moreleti*	*mutanda*
Saltator	*grandis*	*grandis*	*hesperis*
Habia	*rubica*	*confinis*+*rubicoides*	*salvadorensis*
Habia	*salvini*	*salvini*+*littoralis*	*wetmorei*
Agelaius	*phœniceus*	*richmondi*	*grinnelli*

As a matter of interest, a third list is appended of the very few species which occur in the desert interior valleys, as well as the Pacific and the Atlantic coastal plains. They afford one more instance of the severe restrictive effects of this habitat, and two show distinct signs of racial variation.

[1]Now called *Cassidix mexicanus*

C.—Occurring Also in the Desert Interior Valleys

Glaucidium brasilianum ridgwayi
Chloroceryle amazona
Piaya cayana thermophila
Crotophaga sulcirostris
Ceophlœus lineatus similis
Tyrannus melancholicus chloronotus
Megarhynchus pitangua deserticola (endemic race)
Pitangus sulphuratus pallidus (endemic race)
Myiozetetes similis texensis
Myiarchus tyrannulus nelsoni
Tityra semifasciata personata
Progne chalybea chalybea
Vireo flavoviridis flavoviridis
Megaquiscalus major macrourus[1]

Distributional Analysis.—It does not take a very detailed knowledge of Neotropical birds to see at a glance that the great majority of the genera in this list either range throughout the New World or throughout the Neotropical Region. Out of a total of 69 genera, none is peculiar to Mexico and northern Central America, and only two do not reach South America. These are *Oncostoma*, the unique little Bent-billed Flycatcher, and *Chamæthlypis*, a very close monotypic relative of *Geothlypis*. There is no reason to doubt that these genera originated in some part of their present range. A third genus, *Megaquiscalus*[1], just reaches Colombia, but almost certainly originated north of Guatemala.

Distribution of Species.—A study of the species tells us more than the genera.

Total Species	77
a.—Reaching west Ecuador, northern Colombia, or even farther	60
b.—Peculiar to Central America	7
c.—Peculiar to Mexico and northern Central America	10

Subspecific variation occurs in most of the birds in group *a*. We find that eleven subspecies range well into South America, twenty-eight are peculiar to Central America, while thirty-one are peculiar to northern Central America. There is a very striking contrast here. Subspecific differentiation increases as we go northward, but specific segregation decreases. When we recall that these species all belong to widely ranging Neotropical genera, the inference is reasonable that these birds were of southern origin and some of them may have reached Guatemala quite recently. The seven species peculiar to Central America endorse this

[1]Now called *Cassidix mexicanus*.

view, as six are obvious representatives of South American stocks. One, *Empidonax albigularis*, belongs to a group which has evolved chiefly in Mexico, and the species is without near allies.

The species peculiar to Mexico and northern Central America are in a slightly different category, and are listed below.

Saucerottia beryllina	*Vireo ochraceus*
Anthracothorax prevosti	*Cyanocompsa parellina*
Synallaxis erythrothorax	*Tanagra lauta*
Platypsaris aglaiæ	*Thraupis abbas*
Pheugopedius maculipectus	*Agelaius phœniceus*

Of these, the *Agelaius* is unquestionably of northern origin, and so is *Vireo ochraceus*, an exceedingly local bird, largely restricted to the vicinity of the coast. While the species may well be endemic, the genus cannot have come from the south, as it does not exist south of the mountains of Costa Rica. The remaining eight species have no near allies, although *Thraupis abbas* may represent *T. palmarum*, and the *Pheugopedius* is related to *P. paucimaculatus* of west Ecuador. We cannot say even this much of the remaining six, but they belong to groups which are all extensively developed south of Guatemala.

Summary and Conclusions

1.—A considerable number of birds are common to the Caribbean and Pacific divisions of the Tropical Zone.

2.—Only fourteen occur also in the desert interior valleys.

3.—Seventeen species are sufficiently plastic to vary racially on the two sides of the country.

4.—Only two of the genera are Central American. The others are widely distributed Neotropical types.

5.—Only three of the birds are of undoubted northern origin. All the others came from the south.

6.—The number of species peculiar to northern Central America is very small, but the number of endemic subspecies is three times as large. This indicates the relatively recent arrival of some of them.

7.—Some of the endemic species have now no near allies. Their ancestors must consequently have reached Guatemala from the south long before other species on the list.

8.—It would appear, therefore, that there were at least two invasions into Guatemala from the south.

9.—As the Pacific coastal plain is wholly of Quaternary origin, we know the maximum length of time required to evolve some of the endemic Pacific slope races. We have, however, no clue as to the minimum possible time.

The Humid Tropical Zone

Turning now to the wealth of bird-life which is characteristic of humid tropical rain forests, we find no less than 112 species which are confined to this zone in eastern Guatemala, and which occur in no other type of country. Of these, twelve only occur in the narrow humid strip, which occupies a part of the Pacific slope at the base of the mountains, and only one of these shows definite signs of racial variation. The majority are known from very few to single specimens only. It is apparent, therefore, that this strip of humid forest has received a mere fraction of the great avifauna which swarms in the forests of eastern Central America. Since this strip is lacking for many miles farther south in Central America, the majority of these twelve species must have reached western Guatemala via the Isthmus of Tehuantepec and the Pacific slope of Chiapas. Two tables follow: one, the twelve species found on both slopes; and the second, the balance confined to the Caribbean slope. As usual, marine, littoral, migratory, and wide-ranging raptorial birds are omitted.

a.—LIST OF HUMID TROPICAL SPECIES, WHICH OCCUR ON THE PACIFIC SLOPE OF GUATEMALA, AS WELL AS THE CARIBBEAN SLOPE

Columbigallina minuta interrupta
Lophostrix cristata stricklandi
Agyrtria candida pacifica (endemic form)
Hylocharis eliciæ
Lophornis helenæ
Veniliornis oleaginus sanguinolentus
Automolus ochrolæmus cervinigularis
Sclerurus mexicanus mexicanus
Sittasomus griseicapillus sylvioides
Onychorhynchus coronatus mexicanus
Rhynchocyclus olivaceus brevirostris
Pipromorpha oleaginea assimilis

b.—CARIBBEAN SLOPE ONLY (101)

Tinamus major robustus
Crypturus boucardi
Crypturus soui meserythrus
Columba speciosa
Columba rufina pallidicrissa
Columba nigrirostris
Claravis pretiosa
Leptotila plumbeiceps plumbeiceps
Terenotriccus erythrurus fulvigularis
Myiobius sulphureipygius sulphureipygius
Todirostrum sylvia schistaceiceps
Tyranniscus vilissimus vilissimus
Microtriccus semiflavus
Leptopogon amaurocephalus pileatus
Pipra mentalis mentalis
Manacus candei

Leptotila cassini cerviniventris
Amaurolimnas concolor guatemalensis
Eurypyga major major
Glaucidium pumilum
Aratinga astec astec
Amazona autumnalis autumnalis
Amazona farinosa guatemalæ
Pionus senilis senilis
Pyrilia hæmatotis hæmatotis
Electron carinatus
Hylomanes momotula momotula
Caprimulgus salvini badius
Phæthornis superciliosus longirostris
Phoethonis adolphi saturatus
Florisuga mellivora mellivora
Phæochroa cuvieri roberti
Amazilis tzacatl tzacatl
Thalurania colombica townsendi
Colibri delphinæ
Heliothryx barroti
Trogon massena massena
Ramphastos sulphuratus brevicarinatus
Galbula melanogenia
Malacoptila panamensis inornata
Centurus pucherani perileucus
Celeus castaneus
Taraba major melanocrissa
Thamnistes anabatinus anabatinus
Dysithamnus mentalis septentrionalis
Myrmotherula schisticolor schisticolor
Microrhopias boucardi boucardi
Cercomacra tyrannina crepera
Gymnocichla nudiceps chiroleuca
Formicarius analis moniliger
Xenops minutus mexicanus
Sclerurus guatemalensis guatemalensis
Dendrocolaptes certhia sanctæthomæ
Xiphorhynchus guttatus confinis
Glyphorhynchus spirurus pectoralis
Dendrocincla anabatina anabatina
Legatus leucophaius variegatus
Myiodynastes maculatus nobilis
Schiffornis turdinus veræpacis
Erator albitorques fraseri
Pachyrhamphus cinnamomeus
Pachyrhamphus polychropterus cinereiventris
Lathria unirufa unirufa
Laniocera rufescens
Lipaugus holerythrus holerythrus
Cotinga amabilis
Stelgidopteryx ruficollis ridgwayi
Polioptila bilineata bilineata
Henicorhina leucosticta tropæa
Microcerculus philomela philomela
Hylophilus decurtatus decurtatus
Hylophilus ochraceiceps ochraceiceps
Smaragdolanius pulchellus pulchellus
Compsothlypis pitiayumi inornata
Oryzoborus funereus funereus
Sporophila corvina
Euetheia olivacea pusilla
Caryothraustes poliogaster poliogaster
Saltator magnus magnoides
Arremonops striaticeps chloronotus
Arremon aurantiirostris saturatus
Cœreba mexicana mexicana
Cyanerpes cyaneus cyaneus
Cyanerpes lucidus lucidus
Chlorophanes spiza guatemalensis
Tanagra olivacea humilis
Tanagra gouldi gouldi
Tangara larvata larvata
Tangara lavinia cara
Ramphocelus passerinii passerinii
Phlogothraupis sanguinolenta sanguinolenta
Lanio aurantius
Eucometis spodocephala spodocephala
Zarhynchus wagleri mexicanus
Gymnostinops montezuma
Psomocolax oryzivorus impacifus
Icterus prosthemelas
Icterus mesomelas mesomelas
Psilorhinus mexicanus cyanogenys

DISTRIBUTION OF GENERA.—The avifauna of the Humid Tropical Zone consists of 99 genera. Of these, NONE is endemic in Mexico and northern Central America, and only five are restricted to Central America or just reach Colombia. The balance are widely distributed Neo-

tropical types, nearly all of which are best developed in South America. An analysis of the five special genera yields further interesting results. They are:

Hylomanes — *Gymnocichla*
Phæochroa — *Phlogothraupis*
Psilorhinus

1.—*Hylomanes* belongs to the motmots, which unquestionably originated in Central America (cf. Chapman, Bull. Amer. Mus. Nat. Hist., XLVIII, 1923, pp. 27–59).

2.—*Phæochroa* is an isolated group of hummingbirds, whose nearest relative is *Aphantochroa cirrhochloris* of eastern Brazil.

3.—*Gymnocichla*, a monotypic antbird, exceedingly close to a section of the genus *Myrmeciza*.

4.—*Phlogothraupis*, a tanager very close to *Ramphocelus*.

5.—*Psilorhinus*, a jay, with no relatives in South America, and, like the rest of the Corvidæ, of northern origin.

A study of the genera of birds found only in the Humid Tropical Zone in Guatemala yields results exactly similar to those obtained for the genera of more general distribution in the Tropical Zone. Only one is of undoubted northern origin. A minute proportion only either originated in Central America, or must have required some time to evolve there. All the others are of relatively recent arrival from the south or particularly stable types genetically.

Distribution of Species.—As already stated, I allot 112 species to the Humid Tropical Zone in Guatemala. Of these, only six are peculiar to Mexico and northern Central America, and twenty-one are confined to Central America. The six endemic species are:

Crypturus boucardi — *Agyrtria candida*
Electron carinatus — *Manacus candei*
Caprimulgus salvini — *Lanio aurantius*

1.—*Crypturus boucardi* belongs to a little-known section of the genus. Its nearest relatives are *kerriæ* and *columbianus* of Colombia. It may prove to intergrade with *inornatus* of Mexico.

2.—*Electron carinatus*, a motmot, belongs to a family which originated in northern Central America.

3.—*Caprimulgus salvini* belongs to a group of species peculiar to Mexico and northern Central America, with no relatives in South America. It is idle to speculate as to where they originated or whence they came.

4.—*Agyrtria candida* is a northern outpost of a large and widely distributed genus in South America, which is lacking in southern Central America.

5.—*Manacus candei* is an obvious representative of *M. vitellinus* of the Colombian-Pacific and Cauca-Magdalena Faunæ.

6.—*Lanio aurantius* closely represents *leucothorax* and *melanopygius* of southern Central America, but the genus is lacking in the Colombian-Pacific and Cauca-Magdalena Faunæ.

Of the twenty-one species peculiar to Central America, only six do not obviously represent South American allies:

Columba nigrirostris	*Celeus castaneus*
Aratinga astec	*Hylophilus decurtatus*
Pionus senilis	*Tanagra gouldi*

The remaining species can be divided into the following categories:

1.—Of undoubted northern origin and relationships, *Compsothlypis pitiayumi inornata* (cf. Chapman, Auk, 1925, p. 200).

2.—Representatives of groups lacking in west Ecuador and western Colombia, and usually lacking in the Cauca-Magdalena Fauna, but reappearing east of the Andes. Examples are *Lophornis helenæ* and *Caryothraustes poliogaster*. In practically all such cases the Central American representative is specifically distinct; it may vary subspecifically within its range as with *Caryothraustes*, or there may be several distinct species (*Lophornis*) in a particularly plastic family like the hummingbirds.

3.—The great majority reach the Colombian-Pacific Fauna, the Cauca-Magdalena Fauna, or both. Subspecific variation is usual in these species. In thirty cases northern Central America has an endemic subspecies, in twenty-eight cases there is a Central American subspecies, and in only eleven cases is the bird of Guatemala and northern South America the same.

4.—In thirty-five cases the species is widely distributed throughout most of the humid tropics of the New World, with or without racial variation. This variation has little significance other than to show that some species are more plastic than others.

A review of the evidence adduced above shows that the avifauna of the restricted environment of the rain forest does not differ as regards its origin in any essential detail from the tropical birds of more general distribution. As bearing on this question, we can obtain some evidence in a slightly different direction. The tropical rain forest on the Caribbean slope of Central America, while continuous, is a relatively narrow strip, compared to its enormous areas in Amazonia and Guiana. Let us consider for a moment the great family of Formicariidæ or antbirds, one of many groups which have reached their greatest development in Amazonia, and which probably originated there. It is one of the largest families of passerine birds in the world, with a bewildering number of genera and species. The table below shows graphically the decrease of this family as we proceed northward in Central America.

	Genera	Species
Eastern Panama	23	36
Western Panama	18	27
Nicaragua	17	21
Guatemala	10	10
Mexico	7	7

It should be noted that the decrease northward is neither even nor regular. The biggest drop is between eastern and western Panama, and there is little change until we turn the corner of eastern Honduras. I could multiply similar tables, provided that I selected only families of relatively recent South American origin. A table for trogons, tinamous, or pigeons would show nothing of the kind, as these groups are either far more ancient, or by no means exclusively Neotropical, or both. The point of this table is to illustrate the fact that group after group of characteristic Neotropical birds declines in numbers northward in Central America. When we recall that a large majority of them are only subspecifically different from their Colombian representatives, the evidence of their relatively recent arrival at the northern limit of their ranges is very strong indeed.

Interestingly enough, there is now ample field experience in eastern Central America to prove definitely that the decrease northward of family after family of birds is also accompanied by a corresponding decrease in the number of individuals of the species. Any specialist in Central American birds knows that genus after genus, and species after species, which is common in eastern Panama, is one of the great rarities in Costa Rica, or if relatively common in Costa Rica, it becomes a rare bird in northern Central America. The list is far too long to give here, but this fact is most carefully recorded throughout the systematic portion of this study. I might add that the evidence from Guatemala is particularly satisfactory, as the area of tropical rain forest is very great, and tens of thousands of specimens have been collected, far more than in any other portion of Central America. So much is this the case, that a typical rain-forest species, which does not decrease in numbers as we proceed northward in Central America, arouses attention. We then find that it belongs either to a much older group, or to one which is not of Neotropical origin.

And so I might proceed to multiply illustrations, if space permitted, until I had analyzed the ranges and relationships of everyone of the seven or eight hundred species of birds restricted to humid tropical forests in Central America.

But enough, I trust, has been said to warrant the following conclusions:

1.—The bird-life of the tropical rain forests of Guatemala is particularly rich in species.

2.—Only twelve species have spread to the narrow humid strip on the Pacific slope, and the majority must have reached it from Mexico.

3.—Only three birds belong to groups which unquestionably originated in Guatemala or north of it.

4.—There are no genera peculiar to northern Central America, and only three which do not reach the Cauca-Magdalena Fauna.

5.—Only six species are peculiar to northern Central America and only twenty-one to Central America.

6.—The majority of the birds in the last two groups are so distinct, or so widely separated geographically from their nearest South American allies, that they must have required a considerable length of time to evolve.

7.—The balance of the genera and species are either widely distributed in the tropical rain forests of the New World, or are characteristic members of the Colombian-Pacific or the Cauca-Magdalena Faunæ.

8.—In a few cases the Central American representative is specifically distinct, but usually only subspecific variation occurs.

9.—The relatively recent arrival of these birds in northern Central America is consequently indicated.

10.—The rapid decrease northward in Central America of many tropical rain-forest families of South America, and the increasing rarity northward in Central America of many rain-forest species is corroborative evidence of this view.

11.—Our study of the birds of the Humid Tropical Zone in northern Central America fully endorses and confirms Chapman's conclusions regarding the Colombian-Pacific Fauna.

12.—In both cases the genera are largely of Amazonian origin.

13.—The bird-life of both areas is largely of recent or post-Andean origin.

14.—There is no objection to the view that Central America was the probable geographic origin of many of the subspecies of west Ecuador.

15.—The greater isolation of western Colombia and western Ecuador, and the heaviest rainfall there in the New World probably account for the large number of endemic species.

16.—Neither factor exists in northern Central America, and we find practically no endemic species.

17.—It is also quite possible that the bird-life of the Humid Tropical Zone in northern Central America was of even more recent origin than the Colombian-Pacific Fauna.

Bird-Life of the Arid Tropical Zone

We have seen that the arid portion of the Tropical Zone in Guatemala is confined to the Pacific slope, with a subdivision in the desert interior river valleys, and a mere trace in Peten. As its bird-life is that of the Central American Arid Fauna, we may consider it under that head.

THE CENTRAL AMERICAN ARID FAUNA.—Even the tyro bird-lover on a visit to any part of northern Central America would readily see that faunally the Pacific and Caribbean slopes were two different worlds. If, however, he had had previous field experience on both coasts of western Panama, the Caribbean lowlands of Guatemala would produce scarcely one unfamiliar bird, while the Pacific slope would introduce him to a novel fauna. As already mentioned, the Central American Arid Fauna extends from the Gulf of Nicoya in northwestern Costa Rica, where its limits are quite sharply defined, to the Isthmus of Tehuantepec in Oaxaca, with a subdivision in Yucatan. Many of the peculiar genera and species occur throughout arid tropical Mexico, some even to the United States border. It includes the whole Pacific slope of northern Central America, most of the interior of Nicaragua and Honduras, and much of the interior of Oaxaca and Chiapas. The eastern limits of the fauna are always topographic features, which block the progress westward of the heavy rains of the Caribbean slope. This is why much of the Motagua Valley of eastern Guatemala is in this faunal area. Similar conditions prevail in Honduras, and in certain localities the Arid Tropical Zone very nearly reaches the Caribbean Sea. It consequently not only borders and parallels the Humid Tropical Zone but actually penetrates it with narrow easterly tongues, wherever mountain ranges to the north and northeast catch the rainfall. The fact that high mountain ranges often isolate these eastern tongues from the Pacific lowlands in no case acts as a barrier to the Fauna, for reasons which will presently be discussed. In spite of the close physical juxtaposition of the two subdivisions of the Tropical Zone, their faunas are utterly unlike, and of different geographic origin. The wealth of endemic genera and species is as marked in the Central American Arid Fauna, as their absence is conspicuous in the Humid Tropical Zone, and we are obviously dealing with a fauna of much greater antiquity.

In Guatemala we apparently have three sharp divisions of this Fauna: (*a*) those birds found on the Pacific slope, and not in the desert interior valleys; (*b*) those found only in the interior valleys; and (*c*) the very few recorded from Peten. There is a very small list of species common to the first two. This division is more apparent than real, and is not true of other parts of Central America. The solid wall of the Pacific cordillera in Guatemala, with its resultant increased precipitation, does not exist farther south. In Nicaragua, for instance, the volcanoes are quite isolated, and the mountains rise gradually in the interior to a well-marked continental divide. The forests are small patches localized

on the slopes of the volcanoes. In Guatemala the forests are much more extensive. Most of the species confined to the interior valleys in Guatemala occur on the Pacific coast of Nicaragua as well as the interior. The lists follows:

a.—BIRDS COMMON TO THE PACIFIC SLOPE AND THE ARID INTERIOR VALLEYS

Melopelia asiatica asiatica
Scardafella inca
Aratinga canicularis
Amazona albifrons nana
Chlorostilbon caniveti osberti
Tapera nævia excellens
Centurus aurifrons santacruzi
Xiphorhynchus flavigaster flavigaster
Myiarchus nuttingi
Camptostoma imberbe
Thryophilus pleurostictus pleurostictus
Thryophilus modestus pullus
Mimus gilvus lawrencei
Pheucticus chrysopeplus aurantiacus
Melozone biarcuatum
Melozone occipitale

b.—PACIFIC SLOPE ONLY

Crypturus cinnamomeus
Ortalis vetula leucogastra
Columba flavirostris flavirostris
Œdicnemus bistriatus bistriatus
Asturina plagiata micrus
Aratinga strenua
Brotogerys jugularis
Amazona auropalliata
Eumomota superciliosa bipartita
Saucerottia cyanura guatemalæ
Amazilis rutila corallirostris
Anthoscenus longirostris pallidiceps
Morococcyx erythropygus erythropygus
Myiarchus brachyurus
Chiroxiphia linearis
Heleodytes capistratus nigricaudatus
Euthlypis lachrymosa schistacea
Basileuterus delattrii delattrii
Sporophila minuta parva
Tanagra affinis
Icterus gularis troglodytes
Icterus pectoralis anthonyi
Calocitta formosa azurea
Xanthoura luxuosa vivida

c.—ARID INTERIOR RIVER VALLEYS ONLY

Colinus leucopogon hypoleucus
Columbigallina passerina pallescens
Cryptoglaux rostrata
Momotus castaneiceps
Eumomota superciliosa vanrossemi
Caprimulgus ridgwayi anthonyi
Amazilis rutila rutila
Anthoscenus constanti leocadiæ
Trogon elegans elegans
Geococcyx velox
Morococcyx erythropygus macrourus
Polioptila bilineata albiloris
Heleodytes capistratus xerophilus
Thryothorus albinucha subfulvus
Aimophila ruficauda connectens
Passerina versicolor purpurascens
Icterus gularis subspecies
Icterus sclateri subspecies
Icterus pectoralis pectoralis
Calocitta formosa pompata

d.—BIRDS OF THE YUCATAN OR MEXICAN DIVISIONS RECORDED FROM PETEN

Agriocharis ocellata
Pampa pampa pampa
Amazilis yucatanensis yucatanensis
Centurus aurifrons grateloupensis
Pyrocephalus rubinus blatteus
Thryothorus albinucha albinucha
Aimophila botterii petenica
Granatellus sallæi sallæi
Cissilopha yucatanica

DISTRIBUTION OF THE GENERA.—The tabular summary below shows graphically the complete contrast between the genera of the Arid and Humid Tropical Zone.

Total	51
Of general, at least tropical, distribution	29
Ranging south of the Fauna, with notable lacunæ	9
Ranging north of the Fauna, but not south of it	4
Endemic	9

To this table should be added, by way of supplement, the fact that ten genera in the first two groups are widely distributed in North America beyond the Lower Sonoran Zone, and that six others reach the United States, leaving only eighteen which are of strictly Neotropical distribution and undoubted southern origin.

In comparing the birds of the Central American Arid Fauna, therefore, with those of the Humid Tropical Zone, not only do we notice an increased endemic element, but also an even larger element which is not South American at all.

The endemic genera are:

Agriocharis
Eumomota
Pampa
Morococcyx
Deltarhynchus[1]
Euthlypis
Melozone
Calocitta
Cissilopha

The genera that range north, but not south of the limits of the Fauna, are:

Geococcyx
Thryothorus
Aimophila
Passerina

The genera ranging south of the fauna, with notable lacunæ, are:

1.—*Colinus* reappears in the arid portions of western Panama and northern South America.

2.—*Melopelia* reappears in Coclé, western Panama, and west Ecuador.

[1]Not recorded south of Mexico.

3.—*Scardafella* reappears in the arid portions of northern South America.

4.—*Œdicnemus* reappears in west Ecuador and Haiti. A very ancient type, scattered in the Old World.

5.—*Pyrocephalus*—see page 51.

6.—*Mimus* reappears in northern Colombia and west Ecuador.

7.—*Heleodytes* reappears in eastern Panama, northern Colombia and west Ecuador.

8.—*Cissilopha*—see page 51.

9.—*Xanthoura* reappears in the Andes, where it is unknown in the Tropical Zone.

It will be noted that seven of these genera occur in the United States.

Another point is the number of cases where a genus has two or more species within the limits of the Fauna, such as *Colinus*, *Geococcyx*, *Heleodytes*, *Aimophila*, *Melozone* and *Calocitta*. Subspecific variation is equally marked among the various species. While the subject carries us too far from our proper theme to elaborate it here, the facts are that the Central American Arid Fauna has two well-marked divisions, one richly developed in arid tropical Mexico, and the other from the Pacific slope of Chiapas southward. When we recall that most of this southern division is of Quaternary origin, this fact is not only not surprising but takes on added significance, in view of the number of these genera which are well represented in the Temperate Zone farther north.

DISTRIBUTION OF SPECIES.—Even more definite results are obtained in a study of the species. They may be allotted as follows:

Total species	60
Of general, at least tropical distribution	5
Ranging south of the Fauna	1
Ranging south, with notable lacunæ	3
Ranging north of the Fauna, but not south of it	10
Endemic	41

1.—*Thryophilus modestus* ranges south to the Canal Zone.

2.—The three species, with notable lacunæ, are *Pyrocephalus rubinus*, *Mimus gilvus*, which reappears in the Lesser Antilles and northern South America, with a representative on Old Providence Island, and the *Pheucticus*, which reappears in Ecuador and Peru with a wide distribution.

The following general comments on this table are obvious:

1.—The high degree of endemism is notable.

2.—Most of the 18 genera of purely Neotropical distribution and southern origin are represented by peculiar species.

3.—We have consequently diametrically opposite conditions from those prevailing in the Humid Tropical Zone.

4.—The relatively greater age of the Fauna is clearly indicated.

5.—The Central American Arid Fauna bears the same relation to the Equatorial Arid Fauna that the bird life of the Humid Tropical Zone bears to the Colombian-Pacific Fauna. The greater age of the first two and their complete isolation have reduced the number of representative genera and species. The recent age of the two last and the continuity of their humid forest habitat accounts for the high proportion of representative subspecies over species and genera.

A few words of comment should now be devoted to the subdivisions of this Fauna in Guatemala.

THE DESERT INTERIOR VALLEYS.—The peculiarities of the avifauna have already been explained as in part due to the locally greater rainfall on the Pacific slope of Guatemala than elsewhere in northern Central America. Only the following species do NOT reach the Pacific coast of Salvador, Nicaragua and Honduras.

1.—*Cryptoglaux rostrata*, too little known to warrant geographical discussion.

2.—*Momotus castaneiceps* represents *M. mexicanus* of arid tropical Mexico.

3.—*Caprimulgus ridgwayi* is otherwise known only from southwestern tropical Mexico.

4.—*Geococcyx velox* ranges south to Nicaragua, but never reaches sea-level.

5.—*Thryothorus albinucha* is otherwise known only from north central Nicaragua and Yucatan.

6.—*Passerina versicolor* ranges north to the United States.

Eight birds are subspecifically distinct from the Pacific coast form, but in no case is there full specific differentiation. Going south we notice that there are also eight cases where a bird of the Motagua Valley is racially different from the form in northwestern Costa Rica and Nicaragua. In Nicaragua and Honduras we find these species ranging as high as 4500 feet in the interior. In every one of these cases we are dealing with birds which could not possibly have originated in the Neotropical region south of the present limits of the Fauna. Bearing these facts in mind, and recalling that the Rio Motagua Valley and the Pacific coastal plain of Central America did not exist until Quaternary time, the inference is clear that these birds COULD NOT HAVE OCCUPIED the tropical lowlands until relatively recently. They could only have emigrated from farther north or have DESCENDED from the lower levels of what is now the Arid Temperate Zone. Confirmation of this view is obtained by glancing northward and recalling our analysis of the genera. The genera concerned are represented by distinct species in Mexico, Yucatan or both, and many of them are still found in extra-tropical Mexico or the southwestern United States. Examples are *Colinus nigrogularis* (Yucatan) and *virginianus* (United States and Mexico, both tropical and temp-

erate), *Trogon ambiguus* in temperate Mexico, *Geococcyx californianus*, and numerous species of *Heleodytes*, *Aimophila*, and *Passerina*.

THE LOWLANDS OF PETEN.—So little ornithological exploration has been done in Peten that the region cannot receive thorough treatment as yet. It is a limestone plain which slopes northward from the mountains of Alta Vera Paz, and all of it is below the 1000 feet contour line. The rainfall steadily decreases northward, and we pass imperceptibly into the drier climate and the open forests of the Yucatan Peninsula. I have elsewhere (Amer. Mus. Novitates, No. 235, 1926) analyzed this avifauna and given a list of the endemic forms, which need not be repeated. Suffice it to say that Yucatan is a well-marked subdivision of the Central American Arid Fauna, and its endemism is due in part to isolation and in part to the survival there of certain relict species. A list of the special birds which have been collected in Peten is given below, with appropriate comments on their distribution. All are members of this Fauna.

1.—*Agriocharis ocellata* is endemic in Yucatan and Peten, and is the southern outpost of the Meleagridæ. As Chapman long ago pointed out, it is too distinct to have originated in the geologically recent region where it now occurs, and is a relict waif, presumably from the north.

2.—*Pampa p. pampa*, a monotypic hummingbird of southeastern Mexico, Yucatan, and Peten. It is most closely related to South American members of the genus *Campylopterus*, and is a relict of ancient origin, like *Campylopterus rufus* of the mountains of Guatemala.

3.—*Amazilis yucatanensis* represents *A. rutila*.

4.—*Centurus aurifrons grateloupensis* represents *C. a. santacruzi*.

5.—*Pyrocephalus rubinus blatteus*. A remarkable case of discontinuous distribution, as there is no apparent reason why the species should not occupy the entire Central American Arid Fauna. It reappears in Colombia and west Ecuador.

6.—*Thryothorus a. albinucha*, a Yucatan specialty, very close to *T. ludovicianus berlandieri* of arid tropical Mexico, through the subspecies *subfulvus*.

7.—*Granatellus sallæi*, an exceedingly rare warbler, the genus also in arid tropical Mexico and Yucatan, reappearing in the Amazon Valley. It is most closely related to *Cardellina*, *Setophaga*, and *Myioborus*, of which genera it is the tropical representative.

8.—*Aimophila botterii petenica*, a rare and little-known species of arid tropical Mexico, represented by a distinct race in western Nicaragua, and undoubtedly overlooked elsewhere.

9.—*Cissilopha yucatanica*. One of the many genera which has both temperate and tropical species, and is peculiar to Mexico and northern Central America.

SPECIAL CASES.—Before our survey of the tropical bird-life of Guatemala is complete, a few cases demand enumeration of birds, whose paradoxical or aberrant distribution does not warrant their definite allocation in any one zone or faunal area. None has been included in the numerical tabulations. In the first place we have a group of subspecies

of birds which are unquestionably members of the Central American Arid Tropical Fauna, but are so dominant and successful that they have invaded the Humid Tropical Zone in one part or another of eastern Guatemala. These are:

1.—*Ortalis vetula jalapensis*, which is in the humid tropics throughout its range.

2.—*Ortalis vetula plumbiceps*, which is chiefly in the arid tropical areas south of Guatemala.

3.—*Trogon m. melanocephalus*, ranging chiefly in the Arid Tropical Zone, and not occurring south of it in Central America.

4.—*Centurus aurifrons pauper*, eastern Honduras and southeastern Guatemala.

5.—*Icterus gularis* subspecies and

6.—*Icterus sclateri* subspecies; both range eastward from the desert section of the Motagua Valley into a more humid section around Gualan.

7.—*Xanthoura luxuosa guatimalensis* ranges from the very arid tip of the Yucatan Peninsula to the humid tropics in Alta Vera Paz.

The blackbird, *Dives dives*, probably has the same general status as the species just listed. Its range is by no means co-extensive with the Central American Arid Fauna, and from Guatemala south it is rare and local. It is a bird which has taken kindly to man, and prefers the vicinity of settlements. This, perhaps, accounts for its invasion of parts of northern Guatemala, including some of the rainiest sections. The genus is lacking south of Nicaragua, but reappears in west Ecuador in the arid tropics. I do not know where it originated, but it is an older type, and either went south or came north long before the arrival in Central America of the avifauna of the Humid Tropical Zone.

Our last case is the paroquet *Aratinga rubritorquis*, a close relative of *strenua* and *holochlora* of the arid tropics of Mexico and Central America. It was long known only from the pine forests of north central Nicaragua, but has recently been collected in the pine woods around Gualan and Iguana, in just that part of the Motagua Valley which is faunally a transition from the arid to the humid tropics.

Summary and Conclusions

1.—The bird-life of the Central American Arid Tropical Fauna is totally different from that of the adjacent Humid Tropical Zone.

2.—Not only does it possess peculiar genera, but a majority of them range north, but not south, of the limits of the fauna. Only one-third are strictly Neotropical and of undoubted southern origin. In a number of these cases specific segregation takes place within the limits of the fauna.

3.—Over two-thirds of the species are endemic, and there is abundant subspecific variation, within the limits of the fauna.

4.—In only five cases out of the eighteen genera of southern origin is the species not endemic.

5.—This is so different from the lack of endemism in the species of the Humid Tropical Zone, as to raise the presumption of greater antiquity of origin.

6.—The majority of the remaining genera and species originated in this Fauna or north of it.

7.—We note that many of them have one or even many species in temperate climates.

8.—The tropical lowlands which they now occupy in Central America did not exist until Quaternary time.

9.—This fauna could not have occupied these lowlands until relatively recently.

10.—They must have come from the north or may have descended from the lower levels of adjacent areas now in the Arid Temperate Zone.

General Summary for the Tropical Zone

It will now be advantageous to make a brief recapitulation, for the entire Tropical Zone.

1.—The bird life of the Tropical Zone of Guatemala is composed of three main elements:

a.—Species of general occurrence throughout this zone.

b.—Others strictly confined to the Humid Tropical Zone.

c.—Still others confined to the Arid Tropical Zone, which is part of the southern division of the Central American Arid Fauna.

2.—The birds of general occurrence are easily divisible into three groups:

a.—Belonging to wide-ranging genera of doubtful origin and no geographic significance.

b.—The majority belong to well-known Neotropical genera best developed in South America. The lack of anything but racial variation argues for the relatively recent arrival of these birds from the south.

c.—A small minority show every sign of a much earlier arrival.

3.—The birds of the Humid Tropical Zone divide into two groups:

a.—The great majority are of recent origin from the south, originally of Amazonian origin, but closely related to the Colombian-Pacific and Cauca-Magdalena Faunæ, which are known to be of recent development. This bird-life rapidly decreases northward in Central America, and in Guatemala the remnant is at or very near the northern limit of its range.

b.—A small minority show every sign of a much earlier arrival.

4.—The Central American Arid Fauna is also easily divisible into two groups:

a.—About one-third belong to well-known Neotropical genera, which originated south of Guatemala. Two-thirds of these species are endemic, some present notable

cases of discontinuous distribution, and others belong to relict genera and species, all indicating that these birds must have arrived relatively early.

b.—The balance originated in or north of this fauna, and are well represented in temperate climates to the north. The recent age of the tropical lowlands makes it impossible for these birds to have occupied them until recently. They must consequently have come from the north or descended from adjacent higher levels.

5.—It is thus clear that the evidence indicates at least two immigrations from the south and one from the north.

6.—Recalling the geological and palæontological summary, we find the zoögeographic evidence tallies perfectly.

7.—The older immigration from the south was presumably pre-Glacial.

8.—The immigration from the north took place during the Pleistocene.

9.—The close of the Ice Age initiated another great south to north movement, and brought the second and recent immigration from the south to Guatemala.

10.—The evidence for the northern immigration is relatively weak as regards the Tropical Zone. It will be overwhelming when we analyze the bird-life of the Temperate Zone.

The Subtropical Zone

List of Characteristic Birds

[1]*Penelopina nigra*
Odontophorus guttatus
[1]*Claravis mondetoura salvini*
Oreopeleia albifacies anthonyi
Otus guatemalæ
Otus barbarus
[1]*Bolborhynchus lineola*
Streptoprocne zonaris mexicana
Campylopterus hemileucurus
Eupherusa eximia
Abeillia abeillei abeillei
[1]*Pharomacrus mocinno mocinno*
Trogon collaris puella
[1]*Aulacorhynchus prasinus stenorhabdus*
Grallaria guatimalensis guatimalensis
Xenicopsoides montanus variegaticeps
Automolus rubiginosus subspecies
Dendrocolaptes picumnus puncticollis
Xiphocolaptes promeropirhynchus emigrans
Xiphorhynchus erythropygius erythropygius
[2]*Lepidocolaptes affinis affinis*
[1]*Empidonax flavescens dwighti*
[2]*Mitrephanes phæocercus phæocercus*
Elainea obscura frantzii
Henicorhina leucophrys (*castanea*) (*capitalis*)
Myadestes unicolor veraepacis
Myadestes obscurus oberholseri
Turdus assimilis subspecies
Catharus dryas
Catharus mexicanus cantator
[2]*Myioborus miniatus* subspecies
Basileuterus culicivorus culicivorus
Idiotes salvini
[2]*Atlapetes gutturalis griseipectus*
Chlorophonia occipitalis
[1]*Tanagra elegantissima*
Piranga leucoptera leucoptera
[1]*Chlorospingus olivaceus* subspecies
Cyanolyca mitrata

[1]Also in Humid Temperate Zone islands.
[2]Also in Arid Temperate Zone.

BOUNDARIES, CHARACTERISTICS AND HABITATS.—The Subtropical Zone in Guatemala presents some features which are different from those in the Andes, largely because of a different history. The mountains being of Palæozoic or Mesozoic Age, it follows that subtropical temperatures probably existed before the present Subtropical Zone Fauna existed in Guatemala. I use the term strictly as applied by Chapman, the zone of "mountain rain forest." Ample humidity is consequently as essential as altitude in producing the zone. What little evidence there is gives us no reason to suppose any radical change in the distribution of rain in Guatemala for long periods of geological time. The habitat is absolutely uniform, and is now so well known as to require no extended description here. Briefly it is a cloud forest, remarkable for extreme density of undergrowth, the wealth of parasites, and the reduced height of the trees, with everything saturated with moisture for a large part of the year.

There are only two sections in Guatemala where these three factors combined produce a Subtropical Zone which is exactly like the same zone, as I know it in Nicaragua and western Panama. Indeed, it may be added parenthetically that the ornithologist visiting Guatemala, after field experience in southern Central America, will find that practically all the birds are old friends. The two sections are the western or Pacific versant of the mountains as they rise from the Pacific coastal plain, and the northern and eastern slopes of the mountains of Alta Vera Paz and the adjacent eastern departments. So far as we know, these two divisions are completely separated, and consequently considerable subspecific and some specific differentiation has occurred.

In the case of the eastern or Alta Vera Paz division, the mountains do not rise above the Subtropical Zone, and we consequently find the zone "spilling over" as it were for a short distance down the western and southern slopes, wherever the soil is not sufficiently sterile to be occupied by a pine forest. On the Pacific slope the situation is a little more complicated due to the great volcanoes, which are local humid centers of their own at higher levels. East of them we change abruptly to an arid climate in the Altos, with sterile soils of volcanic origin. Here and there in "breaks" or passes between the volcanoes, the Subtropical Zone invades the Altos for short distances. The western slopes of the volcanoes are heavily forested to 10,000 feet, and there is no sharp division between the Subtropical and the Temperate Zones. These same humid deciduous forests tend to curl around the eastern versants of the volcanoes, unless relatively recent eruptions or lava flows have destroyed

them. We have here an interesting ecological succession, every stage of which can be found on one or another volcano today. On the eastern versants an eruption destroys the forest, and it takes about twenty-five years for thick vegetation in the form of grass and bushes to spring up, provided that the eruption is not a lava flow. A pine forest next appears and it apparently takes a very long time before a cloud forest replaces it. Erosion is on a grand scale in Guatemala, as the volcanic ashes, sands and tufa, which cover most of the Altos, are easily water-worn. The upper slopes of the volcanoes are consequently seamed with ravines, with brooks in their bottoms and knife-like ridges between. Time and again a dense subtropical growth is found in the ravine bottoms, while pine woods grow on the sterile ridges. An exact delimitation of the Subtropical Zone in western Guatemala would consequently defy the powers of a cartographer.

Anomalous Distribution of Certain Birds.—Turning now to the avifauna of the Subtropical Zone, we all know how characteristic and how specialized are its birds in the Andes and in southern Central America. Chapman has graphically described the potency of environmental influences with the birds of this zone. In Guatemala, however, the ornithologist discovers to his sorrow that the birds do not behave according to rule. Particularly in western Guatemala, several species fail entirely to confine themselves to their zone or their proper habitat, and we find them common and thriving in surroundings in which they never occur farther south. There are three ways in which this departure takes place.

In the first case, cloud-forest species of the Pacific division have left their "proper" habitat, and occur more or less commonly or rarely in adjacent areas of arid pine forest in the Altos. Both accurately labeled specimens and my own field experience render this incontestable. I well recall walks down the arid river valley back of Panajachel, through dry scrubby woods and thickets, watching to my amazement *Geococcyx* dodge out of sight underfoot, while *Picolaptes affinis* flew to neighboring tree-trunks, *Myadestes* lurked in the thickets, and in the shadier nooks *Mitrephanes* hawked for flies and *Myioborus* flitted about from twig to twig. All four genera and species are typical Subtropical Zone indicators in southern Central America, and their occurrence in an arid environment would usually be thought inconceivable. All four, however, are equally characteristic of the cloud forest on the Pacific slope.

The second case affects species in the Vera Paz division of the Zone, some of which enter the pine forests and descend to the Tropical Zone.

Thus the Green Toucanet, *Aulacorhynchus*, and *Xiphocolaptes* have both been collected in pine forests in British Honduras, below 1500 feet. These birds consequently occur in an altered habitat and temperature, but a similar humidity.

The third case consists of those species which reappear at much higher altitudes in humid cloud-forests but well above the Subtropical Zone. On the western slopes of the Pacific volcanoes, where humid conditions prevail from 1500 to 10,000 feet, it need occasion no surprise to find a Subtropical Zone species extending upward into the Temperate Zone. This phenomenon is recorded frequently in Colombia, Ecuador, and Costa Rica, and it merely illustrates the fact that some species are more aggressive and adaptable than others. It we leave the volcanoes behind us, however, and roam eastward over the Altos, we find small islands from 8000 to 10,000 feet, where more humid conditions prevail, and in these areas we are surprised to find some of our old friends of the Subtropical Zone here associating with birds of Boreal and Holarctic affinities. In reality, such cases of discontinuous distribution are less hard to explain than the discontinuous distribution of the Subtropical Zone Avifauna itself.

It should here be noted that, while I have said that the two divisions of the Subtropical Zone were entirely separated, they are connected in part through these Humid Temperate Zone islands. In other words, the species common to both divisions are mainly those which also occur either in the humid or arid sections of the Temperate Zone. *Pharomacrus* and *Aulacorhynchus* are examples of the first group, and *Myioborus* of the second.

We now, however, approach a limited number of cases where a Subtropical Zone bird in Guatemala has been found only in the Temperate Zone. The most conspicuous is the famous *Buarremon brunneinuchus*. It is a common bird, and is never overlooked by the collector. Moreover, the bird-life of the Subtropical Zone has been thoroughly collected in Guatemala. The facts are that this finch almost never has been collected below 8000 feet, and INCREASES UPWARD in abundance to 10,000 feet. It is consequently unknown in the Subtropical Zone proper, and is unrecorded from Vera Paz, where there is no Temperate Zone. A careful search through the literature regarding Mexico shows that in that country it is primarily a species of the Temperate and Alpine Zones also. Consequently, my study of the species at the northern limit of its range abundantly confirms Chapman's conclusion ('Birds Ecuador,' p. 90) that it originated in Mexico. There are other cases, somewhat similar

to that of *Buarremon*, which I shall not discuss here, as they anticipate a study of the Temperate Zone.

The long array of anomalous facts given above explains in part the remark in my preliminary outline of the life-zones of Guatemala that the Subtropical Zone is poorly developed.

The question arises, on what basis do I assign some of these species to the Subtropical Zone? The Green Toucanet, for instance, also occurs in the Temperate Zone, and is found locally in tropical pine-forests. I have indicated all such cases. I admit that it is often quite arbitrary, and there would be no objection to transferring some to the Temperate Zone, provided they were discussed there as anomalous cases. In general, I have been guided by the bird's distribution elsewhere. With *Aulacorhynchus*, for instance, the distribution of *prasinus* is chiefly subtropical, and every other species of the genus is wholly subtropical.

DISTRIBUTION OF THE GENERA.—Having explained some of the vagaries of distribution of birds of the Subtropical Zone within the limits of Guatemala itself, we may analyze their distribution outside of it. This is a relatively simple matter, as there are only thirty-nine species belonging to thirty-six genera. Three of the genera are endemic, and are not represented in South America. These are:

Penelopina, monotypic, ranging from Chiapas to northern Nicaragua.

Eupherusa, ranging from southern Mexico to western Panama, with three distinct species in each of the divisions of the Zone.

Abeillia, monotypic, ranging from southern Mexico to northern Nicaragua.

The remaining thirty-three genera are represented in the Subtropical Zone from Costa Rica to Ecuador, and thirty occur also in southern Mexico. The three genera not represented in the Subtropical Zone north of the Isthmus of Tehuantepec are *Pharomacrus*, *Dendrocolaptes*, and *Elainea*. Chapman has already expounded the inevitable discontinuity of the Zone in his 'Birds of Colombia,' so that we are prepared for discontinuous distribution as the normal phenomenon of its bird-life. Two cases, however, are so exceptional as to warrant special notice. *Bolborhynchus* is very rare in Central America, and lacking in Colombia and Ecuador, but represented on Mt. Roraima; from Peru southward the genus is chiefly Temperate. Another case is the finch, *Spodiornis*, which occurs in southeastern Brazil and the Andes, is one of the rare birds of Costa Rica, and is known from a single specimen taken many years ago in Mexico.

Continuing the survey of these thirty-three genera, it is noteworthy that thirteen are distinctively Subtropical, *Grallaria* predominantly so,

while the balance have other species in other zones and climates. In the case of almost world-wide genera like *Otus* and *Turdus*, the development of distinct species in this Zone has no special significance and can lead to no novel inference. It is, however, quite striking that the proportion of distinctive genera to the total should be exactly the same in Guatemala and Ecuador, namely about one-third, in spite of the immeasurably greater development of this fauna in Ecuador.

In addition to the three endemic genera, there are only five, the relatively northern origin of which no one could seriously question. These are:

Myadestes *Myioborus*
Catharus *Atlapetes*
Cyanolyca

All the others must have been derived from the tropics. Whether these tropical ancestors themselves originated south or north of Guatemala at a much more remote period need not concern us here, and in most cases it would be pure speculation. With the ant-birds and wood-hewers on our list, we are undoubtedly dealing with birds which originated far south of Guatemala, but who would care to say where *Pharomacrus* originated? It could be argued that as *P. mocinno* is the most differentiated member of the genus, it must have arisen first, and that the genus evolved from a tropical ancestor in Guatemala. On the other hand, we could maintain that the genus originated in northwestern South America, where most of the species now are, and the greater differentiation of *P. mocinno* is due to its greater isolation from the parent stock. It seems to me that these arguments balance. We do not know where *Pharomacrus* and many other genera of tropical and subtropical birds originated, and we may never know.

Distribution of Species.—Certain primary facts may be put in tabular form. Subspecific variation is not counted.

Total species		39
Only racially different from a Colombian representative		15
Number of races in Central America	35	
Identical		1
Peculiar to Mexico and Central America		23
Mexico and Guatemala	1	
Mexico to Salvador	1	
Mexico to Nicaragua	6	
Chiapas to Nicaragua	1	
Chiapas to western Panama	2	
Guatemala only	1	
Mexico to western Panama	12	

This table discloses a very interesting point. The Subtropical Zone north of Colombia is divided into three sections by "breaks" or "faults" in the mountains: (1) the Isthmus of Panama; (2) the lowlands of southern Nicaragua; and (3) the Isthmus of Tehuantepec. It will be obvious from the table that the majority of the species are the same IN SPITE OF THREE GAPS, a large number are the same in spite of two gaps, and a small minority only remain constant for but one gap, while only one (*Otus barbarus*) is not known to have a discontinuous distribution. If we eliminate the species belonging to the endemic genera and those admittedly of northern origin, the proportion of species which remains constant for one gap only is still further reduced. Bearing in mind our analysis of the genera, we are now able to reach a series of interesting conclusions:

1. The Subtropical avifauna of Guatemala consists of two elements:

a.—Genera that are endemic in Mexico and Central America or of northern origin, or relicts of older groups. In all cases the species are endemic, and there is often much speciation in Central America itself. Every known species of *Catharus*, for instance, occurs in the region between Mexico and western Panama.

b.—Genera widely distributed in South America, a minority of which are distinctively subtropical. The species concerned give every evidence of having been derived from the humid tropics, though we cannot say whether in Central or South America in some cases.

2.—In this second group, therefore, we have far less speciation than racial variation between Guatemala and Colombia.

3.—The situation, when analyzed, proves to be surprisingly similar to that which we found in the Humid Tropical Zone, in spite of the two "breaks" in the range of the subtropical birds and the continuous environment of the tropical. This situation is so contrary to that which experience would suggest, as to call for explanation.

4.—It is consequently quite impossible to suppose that a Subtropical Zone avifauna developed in any one place and spread north or south over then existing land-bridges. As Chapman shows in his discussion of this Zone in Ecuador (pp. 88–89), some species came from the north, others from the south, and others arose in the adjacent tropics. The situation in Guatemala would appear to be precisely the same.

A very interesting side-light is thrown on this situation, when we examine some of the Subtropical Zone birds in Ecuador, which Chapman regards as of probable northern origin. These are *Compsothlypis*, *Xanthoura*, *Veniliornis oleaginus*, *Momotus lessoni* (the representative of *M. æquatorialis*), *Pheucticus chrysopeplus*, and *Buarremon brunneinuchus*. As we have already seen, *Buarremon* is Humid Temperate in Guatemala. All the others are PURELY TROPICAL in northern Central America, and none are definitely subtropical until we reach Costa Rica. When we recall the data already presented as to the species which are not constant

zonally in Guatemala itself, we are reminded of the old saying that the exception proves the rule. As a matter of fact, by drawing on my own field experience in western Panama and published data for Costa Rica, I could multiply these instances. It should be emphasized that we are not dealing with cases involving the local descent of the Subtropical Zone into tropical lowlands. Such exceptions as these by no means destroy my knowledge of the sharp definiteness of this Zone. I might abandon faith in the Tropical Zone, because the little tropical House Wren (*Troglodytes musculus*) is common in temperate Guatemala and has once been collected near the summit of one of the volcanoes. I rather welcome these exceptions, as I submit that they furnish us clues as to how various species in the past may well have become members of a Subtropical Zone Avifauna. Undoubtedly every such case was the result of slightly different reasons or factors, which required a longer or a shorter time, and each bird responded differently to the changed environment.

Further reflections on the origin of Subtropical bird-life in Central America bring us to a consideration of the "Panama Fault." Chapman coined this happy phrase, while discussing the Subtropical Fauna of Colombia and in calling attention to the reappearance of numerous genera and species in Costa Rica. Emphasizing the impossibility that so large a number of particularly sedentary species could have reached Costa Rica fortuitously or by emigration, he suggested that the mountain-ranges with subtropical altitudes must formerly have been continuous, and were locally eliminated in the present lowlands of the Isthmus by subsidence or erosion. This suggestion, even if tenable, is of no real assistance to the student in Guatemala, as he must reckon with an equally extensive "Fault" in southern Nicaragua. For that matter, a third is just north of him, and most of the subtropical birds of Guatemala reach Vera Cruz. On this basis, therefore, we should need a whole series of mountain land-bridges, and we must appeal to the geological record for evidence.

Most fortunately, as regards the Panama land bridge, we have finality. The geology of the Canal Zone has been carefully studied in recent years by Vaughan and his students, and others. The earlier work of Hill is confirmed, and it is out of the question that an elevation in excess of 1000 feet ever took place in the Isthmian region. While so definite a statement cannot be made for the other two depressions, there is nothing in the evidence to warrant regarding it as even a reasonable possibility.

Since the idea of a Panama mountain bridge must be abandoned by the zoögeographer, there is no point in speculating about the possible

existence of two others. SOME OTHER FACTORS MUST EXIST to account for the origin of a Subtropical Zone avifauna in Central America. When we see what they are, any hypothetical land bridge becomes unnecessay. There are four:

(1) Minor contributions to the Subtropical Zone may have come from temperate regions to the north. I am not aware of such a case in Guatemala, but there is abundant evidence of it in Costa Rica, where the Hairy Woodpecker, for instance, is a characteristic species in the cloud forest.

(2) Thanks to the height and the age of the mountains, minor contributions to the Subtropical Zone may have come from the Temperate Zone above it in northern Central America. The case of *Buarremon brunneinuchus* is an illustration of this possibility.

(3) Granted that the majority of the birds must have originated somewhere in the tropics, and recalling the numerical majority of the cases, where only subspecific variation has occurred in spite of discontinuity of range, it follows that these birds must have originated from ancestors in the Humid Tropical Zone, WHICH HAD A CONTINUOUS RANGE from Colombia to varying points northward in Central America. To broaden this statement, the parallelism between the specific and racial variations of the present Subtropical and Humid Tropical Avifaunæ suggests that the ancient Humid Tropical Zone Avifauna must have varied approximately as the present one does. Let us review the facts in the humid tropics as we find them today: we notice (*a*) numbers of species ranging from Colombia to Mexico, usually dividing into three or more races in this area; (*b*) a large number of representative species from Mexico to western Panama, dividing into two or three races; (*c*) a very small number of cases where one distinct species inhabits southern Central America and another northern Central America. Glancing back at our analytical table of subtropical species it will be found that this summary applies perfectly to this Zone also. If we imagine the present avifauna of the humid tropics to ascend into the subtropics, the facies of that future subtropical fauna would show just the anomalies of interrupted distribution shown by the present one. In addition to this line of argument I would point out once more the steady decrease northward of the Subtropical Zone Avifauna in Central America, and call attention once more to the steady decrease northward of typically South American stocks. We have a further striking parallelism here.

I submit, therefore, that some of the Subtropical Zone birds of Central America may well have originated from ancestors in the humid

tropics, some of which ranged continuously from Colombia northward, and which may or may not have varied racially within their ranges, and others which were already specifically distinct from their South American ancestors at the time they entered the Subtropical Zone in Central America. Chronologically these tropical ancestors had arrived in pre-Glacial time and before the Andes had cut off their entry into northern Colombia from Amazonia. I consequently correlate their arrival with the first immigration from the south, of which we saw faint signs in our analysis of the birds of general and humid tropical distribution, and abundant evidence in the birds of the arid tropics.

One objection to this view is that it calls for a high degree of "teamwork," so to speak, on the part of those birds particularly which are specifically identical between Mexico and Colombia. The tropical ancestor of such a bird must have entered the Subtropical Zone at about the same time throughout its range, and it would have to have become extinct in one or more of the lowland areas. The chances are against all these factors acting in combination. The reply is that the objection itself explains why the number of genera and species in the Subtropical Zone of Costa Rica is less than half that in Colombia.

But the most serious objection to this hypothesis is that in the mountains of Central America we have an old land, with a very ancient endemic fauna in the upper altitudes. In the slowly rising Andes the newly formed subtropical areas were relatively birdless, awaiting colonization. In Central America it would be preposterous to suppose this Zone devoid of birds. It is hard to believe that its original avifauna was exterminated by the tropical invaders without leaving some trace. While, therefore, I regard this hypothesis as sound, I do not think that it could account for more than a fraction of the birds, because of the objections just stated.

(4) These objections are partly resolved by the fourth factor, which is the refrigeration brought on by the Ice Age. At its maximum development, at least, the avifauna of the Subtropical Zone in Central America descended to sea-level and had consequently a chance to pass continuously from Mexico to Colombia. With the close of the Ice Age, the survivors of this experience gradually regained their present altitudes, while a new horde from the south reoccupied the Humid Tropical Zone. The present avifauna of the Subtropical Zone in Central America consequently consists of the survivors of this double experience, their close relationship yet discontinuous distribution being explained.

Further discussion of the validity of this factor must be postponed

until we have examined the bird-life of the Temperate Zone, where the effects of the glacial refrigeration are greatly intensified.

The problem of the origin of the Subtropical Zone Avifauna in Central America is difficult, and can only be outlined here. The far richer avifauna of Costa Rica must be considered, before any thesis could bring conviction, or correct deductions be made. To do so is outside our present purpose, and will be considered in another connection.

The Temperate Zone

Boundaries, Characteristics, and Habitats.—Roughly speaking, all areas in Guatemala above the Subtropical Zone where it exists, or above the Tropical Zone, where the Subtropical is lacking, are in the Temperate Zone. With the possible exception of a small unexplored area on the highest summit of the Sierra de las Minas, it is consequently wanting in the eastern half of Guatemala, and exists only in the Altos of western and northwestern Guatemala. To put it in another way, the entire Altos are in the Temperate Zone.

When I say that the entire Altos are in the Temperate Zone, I am speaking primarily of the avifauna, not the temperature. As a matter of fact, any nomenclature or descriptive term will be misleading, since we are not dealing with a life-zone which is in any way commensurate with the Temperate Zone in the equatorial Andes, The avifauna of the Altos of Guatemala is almost wholly of Nearctic or northern origin. This is a very different state of affairs compared with the Humid Temperate Zone Avifauna of Ecuador, which is a highly modified assemblage derived originally from the tropics at the base of the Andes. It is, however, strikingly similar to the avifauna of the Arid Temperate and Paramo Zones in Ecuador, which came mostly from the south at lower levels.

Concerning temperature, there is a great difference between the lowest and the highest altitudes in the Altos of Guatemala. Indeed, at the lowest altitudes, the climate is by no means temperate, but rather subtropical. While I am quite aware, therefore, that the temperature variation is much greater than in the Temperate Zone of the Andes, I am bound to report that this variation is not accompanied by sufficient variation in the bird-life to characterize warmer and cooler divisions, which are in any way homologous to the great faunal changes observable in Ecuador, in rising from 9000 feet to snow line. In Guatemala, we can rise from 6000 to 14,000 feet without any marked change in the bird-life.

If we return now to the comparison which I made on an earlier

page (33) between a mountain on the Equator and another in the Rockies, we can appreciate just what was meant by saying that Guatemala was in a transition region. The Tropical and Subtropical Zones in Guatemala are strictly homologous with the same zones in Ecuador, though the latter is poorly developed. But the Temperate Zone is not homologous, and a study of its avifauna shows that it belongs primarily to the North Temperate and not the Neotropical Region.

While I have said that there was no MARKED change in the bird-life of temperate Guatemala, there is SOME change. It will be noted in the lists given farther on (p. 67) that among those species preferring the higher altitudes are most of the boreal genera which farther north are characteristic of the Canadian Zone, such as *Loxia*, *Junco*, *Certhia*, and *Regulus*, while in the lower altitudes we find characteristic Sonoran genera and species, such as *Cyrtonyx*, *Balanosphyra*, and *Myiochanes pertinax*. Here, then, we have the first faint indications of the life-zones of the north temperate regions, but far too slightly developed in Guatemala for formal separation or description. Many birds range throughout the Altos, like *Sialia* and *Turdus rufitorques*. The distribution of others is largely due to habitat factors, such as extensive stands of pine or oak, regardless of altitude.

Humidity factors also do not provide a satisfactory basis for division. As we have seen, the climate of the Altos is arid, except for certain areas of high altitude which induce local precipitation. These humid temperate islands are chiefly characterized by the occurrence on them of characteristic Subtropical genera. Only six temperate genera out of eighty-four are mainly confined to them. There is no faunal distinction possible between the Humid and Arid Temperate Zones in Guatemala, as is so marked in Ecuador.

In those parts of the country, where there is no Subtropical Zone, there is a broad transition belt between the Arid Tropical and the Humid Tropical Zone, which is characterized by the depauperate nature of its avifauna. Thus, one rises very rapidly from the Motagua Valley to Guatemala City. The Arid Tropical Fauna is almost intact at 3000 feet and the Arid Temperate Fauna predominates at Guatemala City, but the belt in between has very few birds indeed.

The habitats in the Temperate Zone are relatively few. There are (1) the open, deforested, cultivated country (Fig. 5), (2) the pine woods at lower levels, (3) pine forests at higher levels (Fig. 6), (4) oak woods, and (5) humid cypress forest (Fig. 7). Any further division than this

would be based primarily on ecological associations which are outside the province of this paper. In most cases, two or more of these habitats are coalesced. Mixed pine and oak woods are much commoner than pure stands of oak (Figs. 8 and 9). Similarly high pine forests almost invariably contain cypress. Cultivated fields practically cease above 8500 feet, and cypress is not a habitat factor below that level.

The birds characteristic of the Temperate Zone are given below in two lists. The first list is more general; the second gives those species which are almost wholly restricted to higher altitudes, and it is most exceptional to record them under 7500 feet. Some at least unquestionably occur at lower altitudes in winter than in summer. It is also quite possible that the relative inadequacy of collecting at higher altitudes has failed to produce records for more of the lower-level species. There is no doubt that ten times as much collecting has been done below 8000 feet in Guatemala as above 9000 feet. I am convinced that further exploration will tend to alter and correct the arrangement I give below.

A.—List of Temperate Zone Birds of More General Occurrence, or Not Ranging to Higher Altitudes

Dendrortyx leucophrys
Cyrtonyx ocellatus
Dactylortyx thoracicus chiapensis
Columba fasciata
Podilymbus gigas
Accipiter chionogaster chionogaster
Buteo borealis costaricensis
Cerchneis sparveria tropicalis
Otus trichopsis trichopsis
Otus flammeolus
Glaucidium gnoma cobanense
Aspatha gularis
Caprimulgus vociferus chiapensis
Aeronautes saxatilis nigrior
Panyptila sancti-hieronymi
Cypseloides brunneitorques
Campylopterus rufus
Amazilis cyanocephala cyanocephala
Amazilis cyanocephala guatimalensis
Hylocharis leucotis leucotis
Colibri thalassinus
Eugenes fulgens
Lampornis viridipallens viridipallens
Doricha enicura
Empidonax difficilis salvini
Empidonax fulvifrons fusciceps
Xenotriccus callizonus
Notiochelidon pileata
Stelgidopteryx ruficollis salvini
Heleodytes zonatus zonatus
Cistothorus polyglottus elegans
Salpinctes obsoletus neglectus
Melanotis hypoleucus
Turdus rufitorques
Catharus melpomene bangsi
Sialia sialis guatemalæ
Vireolanius melitophrys
Myioborus miniatus intermedius
Basileuterus belli belli
Basileuterus belli scitulus
Hesperiphona abeillii pallida
Spinus notatus notatus
Spinus psaltria mexicanus
Spinus psaltria croceus (tropical, temperate)
Sicalis chrysops
Aimophila rufescens gigas
Spizella socialis mexicana

Tilmatura dupontii
Atthis heloisa ellioti
Colaptes mexicanoides
Piculus rubiginosus maximus (derived from Tropical Zone)
Balanosphyra formicivora lineata
Sayornis nigricans aquatica (habitat factor)
Myiochanes richardsonii sordidulus
Myiochanes pertinax pertinax
Empidonax fulvipectus fulvipectus
Zonotrichia capensis septentrionalis
Buarremon brunneinuchus
Piranga flava albifacies
Piranga bidentata sanguinolenta
Sturnella magna alticola
Icterus maculi-alatus
Icterus wagleri wagleri
Icterus chrysater chrysater
Cissilopha melanocyanea melanocyanea
Cyanolyca pumilo

B.—List of Temperate Zone Birds Confined to Higher Altitudes

[1]*Oreophasis derbyanus*
Strix fulvescens
Lampornis amethystinus salvini
Lamprolaima rhami
Selasphorus platycercus guatemalæ
Trogon mexicanus
Dryobates villosus sanctorum
[1]*Regulus satrapa clarus*
[1]*Troglodytes rufociliatus rufociliatus*
Cinclus mexicanus anthonyi
[1]*Turdus infuscatus*
[1]*Turdus plebejus* subspecies
[1]*Catharus frantzii alticola*
Vireo huttoni vulcani
Ptilogonys cinereus molybdophanes
Psaltriparus melanotis melanotis
Certhia familiaris alticola
Vermivora superciliosa superciliosa
Peucedramus olivaceus aurantiacus
Dendroica graciæ decora
Cardellina rubrifrons bella
Setophaga picta guatemalæ
[1]*Ergaticus versicolor*
Spinus atriceps
Loxia curvirostra stricklandi
Junco alticola
Pipilo maculatus repetens
[1]*Buarremon brunneinuchus*
[1]*Diglossa baritula montana*
Corvus corax sinuatus
Cyanocitta stelleri ridgwayi
Aphelocoma unicolor cœlestis

Distributional Analysis of Temperate Zone Bird-Life in Guatemala

DISTRIBUTION OF FAMILIES.—As families of birds are regarded as indices of major zoölogical regions, it will be worth while to examine those represented in the Temperate Zone of Guatemala. A total of twenty-eight are represented.

Only TWO are Neotropical. The motmots originated in Central America.

The Ptilogonatidæ are endemic in the high mountains of Central America and Mexico. They are of northern origin and an offshoot of the waxwings.

The Paridæ and Certhiidæ reach their southern limit in the New World in northern Central America.

[1]Chiefly in humid sections.

GENERA	
Total number	84
Endemic in the mountains of Mexico and Central America[1]	29
Ranging into North America	19
Ranging into South America	12
General	24
SPECIES	
Total number	94
Endemic in the mountains of Mexico and Central America[1]	55
Ranging into North America	25
Reaching South America	7
General	7

A study of this table brings out very clearly (1) the high percentage of endemism in both genera, and species; (2) the minute percentage of a Neotropical element; (3) the consequent overwhelming preponderance of the northern over the southern element in the avifauna; (4) the fact that most of the genera of South American origin are represented by distinct species in Guatemala.

The eight genera of probable South American or Neotropical origin are:

Cypseloides	*Colibri*
Panyptila	*Piculus*
Campylopterus	*Diglossa*
Amazilis	*Sicalis*

Commenting on this list we may note that *Piculus rubiginosus maximus* is of very recent origin from the tropical lowlands of Guatemala, and furnishes a unique case in its bird-life of a very plastic species already slightly modified by a new environment. *Cypseloides brunneitorques* is unmodified from southern Mexico to Peru and is chiefly subtropical. That it is primarily arid temperate in Guatemala is of no geographic significance. The *Panyptila*, the *Campylopterus*, and the *Sicalis* are all relicts, and the representatives of the other genera are all specifically distinct.

These figures would be misleading, however, if we did not include the endemic genera and species belonging to families of Neotropical rather than Holarctic affinities and distribution. The genera are:

1.—*Oreophasis* is a special subfamily of the Cracidæ, a family now known from the Pliocene of the western United States.

2.—Seven hummingbird genera, about whose origin it is futile to speculate.

3.—*Aspatha*, belonging to the Momotidæ, which probably originated in Central America.

[1]Some reaching the mountains of the southwestern United States.

The species will naturally belong to the sixteen genera mentioned, but there are more than sixteen, as several of the genera have two or more species in the Temperate Zone in Mexico and Central America.

By way of contrast let us now examine the genera and species of northern origin. All twenty-five species ranging into North America vary only subspecifically in Guatemala. Examining the nineteen genera which range into North America, we find only seven cases where distinct species represent the genus from southern Mexico southward. This leaves us the balance of the endemic genera, which do not belong to purely Neotropical families. Here, too, the representative in Guatemala is specifically distinct in but four cases; in all others only racial variation occurs.

There is no difficulty, therefore, in showing that there are two elements in the present-day avifauna of the Temperate Zone of Guatemala. There is an older element with great generic and specific endemism, composed chiefly of birds of present-day Neotropical families, and others of New World or cosmopolitan distribution, such as *Notiochelidon* of the Hirundinidæ and *Xenotriccus* of the Tyrannidæ, which have no close representatives and are too distinct to be of recent origin. The majority of the birds, however, are of very recent origin from the north, and racial variation greatly outweighs specific segregation. We have consequently the same two elements in the Temperate Zone, which we found in the Tropical and Subtropical Zones, only much more obvious. Chronologically they also are pre-Glacial and Glacial. The only sign of a post-Glacial invasion in the Temperate Zone is *Piculus rubiginosus maximus*.

Zonally Inconstant Birds.—Final evidence of the great part which the Ice Age has played in moulding the present distribution of birds in Guatemala is supplied by certain relicts which have managed to survive in environments south of their ancestral homes, where factors of habitat, humidity or temperature were, or have since become, quite different from those farther north. Let us consider for a moment a Holarctic bird like the Red Crossbill, which is confined to coniferous forests. It need occasion no surprise to find it working south in the mountains of western North America, spreading over the tableland of Mexico, and even reappearing in the mountains of Guatemala, but we do not expect to find it in the Tropical Zone south of Guatemala, in north central Nicaragua. The Hairy Woodpecker is an analogous case, but occurs in the Subtropical Zone in Costa Rica and western Panama, where there are no conifers. This species of the genus *Dryobates* may

be contrasted with the fate of the Downy Woodpecker (*D. pubescens*), the ancestor of which succeeded in reaching temperate South America, where it survives as *D. lignarius*, but was not able to maintain a foothold anywhere else south of northern Mexico.

I give below lists of various birds which are characteristic of the Temperate Zone in Guatemala, which occur in other zones in other parts of their range. In no case do any of these birds occur in two zones in any one area or country. In addition to authentically labeled specimens and published records, my own field experience includes the great majority of these cases. It should be emphasized that no birds of Neotropical origin are included.

1.—Species with representative races in pine forests in the Humid Tropical Zone of eastern Guatemala to northeastern Nicaragua. These birds have preserved their habitat, but have changed their humidity and temperature factors. All are peculiar subspecies, and all parallel the ranges of other subspecies in the highlands.

Heleodytes zonatus restrictus (the species in western Panama and Ecuador)
Aimophila rufescens discolor
Spizella socialis pinetorum
Dendroica graciæ decora
Piranga flava figlina.

2.—Species which occur in arid tropical pine forests in Nicaragua.

(*a*) Lower Level Species:
Cyrtonyx ocellatus
Accipiter chionogaster
Amazilis cyanocephala
Hylocharis leucotis
Eugenes fulgens
Colaptes mexicanoides
Balanosphyra formicivora
Sialia sialis
Spinus notatus
Spinus psaltria (also irregularly tropical and subtropical)
Piranga flava (also eastern Panama and South America)
Icterus chrysater (generally tropical south of Guatemala)

(*b*) Higher Level Species:
Dryobates villosus
Certhia familiaris
Vermivora superciliosa
Peucedramus olivaceus
Loxia curvirostra
Cyanocitta stelleri

3.—Species characteristic of the Subtropical Zone south of Guatemala.

(*a*) LOWER LEVEL SPECIES:

Dendrortyx leucophrys (north Nicaragua)
Columba fasciata " "
Tilmatura dupontii " "
Balanosphyra formicivora (Costa Rica and western Panama)
Catharus melpomene (throughout)
Piranga flava (Costa Rica and western Panama)

(*b*) HIGHER LEVEL SPECIES:

Dryobates villosus (Costa Rica and western Panama)
Turdus plebejus (throughout)
Catharus frantzii (throughout)

There are two comments on the birds in these lists. One is the remarkable fact that far more Temperate Zone species descend to the Tropical Zone south of Guatemala than to the Subtropical Zone. This is because the majority occur in arid tropical pine forests in Nicaragua, and do not occur south of Nicaragua, because there are no pine forests. Most of these birds do not occur in the Subtropical Zone for exactly the same reason. It is obvious, therefore, that an arid climate and a similar habitat have been more important for the survival of these birds than temperature. When we recall that the mean annual temperature of the New World fell at least seven degrees[1] during the period of maximum glaciation, and when we reflect on the great length of time which elapsed before present temperatures were restored, we can see that these birds were not plunged suddenly into violent temperature changes and had ample time to adjust themselves. The two really remarkable birds are the two woodpeckers which are boreal in one part of their range, arid tropical in another, and humid subtropical in a third. Small wonder that they have survived and are in no danger of extinction.

No one in any way familiar with the fixed habitat and climatic factors governing the ranges of most birds can assimilate the anomalous distributions outlined above without seeking some underlying cause to coördinate and explain them all. When we recall the outline of the Glacial Period and its effects in Central America and the Andes presented in an earlier chapter, it requires no elaboration to see that the great migration southward of mammals and birds affected the entire New World. The increasing refrigeration of the climate steadily rendered more lowlands southward available for occupation by northern species escaping the ice. At the same time mountain species of tropical origin must have descended once more to lower levels, from which tropical species must have emigrated or become extinct.

[1]Centigrade.

With the close of the Ice Age, the reverse process began. In Central America, the Subtropical Zone, which must have reached sea-level, rose to its present altitudes, birds of boreal origin ascended higher in the mountains, and a new emigration from tropical South America occupied the lowlands. The cases, whose anomalous zonal distributions we have just been studying, are those birds which stood still and survived the changes in their environment which ensued.

Finally, it is more than likely that the wealth of endemic birds in the small mountain area of Guatemala is due in part to the absence of glaciation, whereas the wealth of bird-life in the high Andes is due to the enormous areas above the Subtropical Zone and relatively slight glaciation.

GENERAL SUMMARY AND CONCLUSIONS

We can now advantageously recapitulate the analysis of the preceding chapters. The bird-life of Guatemala is seen to fall into three zonal groups, each with two or more subdivisions.

1.—Tropical Zone

a.—Of more general distribution, the majority of recent, a small minority of more ancient origin or arrival.

b.—Strictly Humid Tropical, the majority of recent origin, a small minority so distinct or so widely separated geographically from their nearest South American allies that they must have required some time to evolve.

c.—Arid Tropical, belonging to the Central American Arid Tropical Fauna. About one-third originated south of Guatemala, but are so distinct that they must have arrived relatively early. The balance originated in or north of Guatemala, and must have come from the north, or descended from adjacent higher levels.

2.—The Subtropical Zone

a.—One or two birds of possible Temperate Zone origin.

b.—The great majority of pre-Glacial tropical ancestors that either ascended into the Subtropical Zone or survived when this zone descended to sea-level during the period of maximum Pleistocene refrigeration.

3.—Temperate Zone

a.—A pre-Glacial element with many endemic genera and species.

b.—A Holarctic or northern element of Pleistocene origin, slightly differentiated from northern relatives, but entirely unrelated to Neotropical birds.

Zone by zone, then, we find definite signs of an older element and a larger one of more recent origin, and we are impelled to seek a cause, to find an explanation for so uniform and unvarying a result of our analysis throughout the bird-life of the country.

Recapitulating the geological and historical record we have:

1.—Possible interchange of South and North American bird-life from Miocene or Pliocene time on, with the arrival of Old World families into North America also possible.

2.—Definite evidence in the palæontological record that there was a south-to-north migration in Miocene and Pliocene time.

3.—Overwhelming evidence to show that the majority of the great modern families of birds and mammals were of Holarctic or northern origin, and did not reach South America until Pliocene and chiefly Pleistocene time.

4.—The chief factor of this southward migration was the progressive refrigeration of northern climates in Pleistocene time, culminating in the Ice Age, which brought many mammals and birds to temperate South America.

5.—While glaciation existed in the Andes, none took place in Central America, but a lowering of the mean annual temperature of at least seven degree centigrade must have brought the Subtropical Zone nearly to sea-level.

6.—The close of the Ice Age and the change to modern climatic conditions were accompanied by a pronounced northward migration of mammals and birds, during which at least half of North America has been repopulated or recaptured.

It would seem an inescapable conclusion that the Ice Age was a zoögeographic factor of major importance and caused as extensive migration and wholsesale extermination as any other epoch in the world's history. When the data concerning the distribution of present-day birds in Guatemala is superimposed on the geological record as a base, it will be seen to fit very well, in spite of the inferential nature of some of the evidence, and the chance for error. We can reverse our approach and point out that the present-day distribution of birds in Guatemala must have been profoundly influenced by the Glacial Epoch. When, therefore, it becomes apparent that the birds of Guatemala show distinct signs of belonging to two groups, one older, and the other more recent, we are justified in concluding that the Glacial Epoch came between, leaving but few survivors of the older avifauna and bringing in a horde of northern immigrants. The return of milder climates brought a later migration from the south.

Let us now recast the origin and distribution of the birds of Guatemala in historical form.

In pre-Glacial times it is apparent that there must have been a rich and varied bird-life in Guatemala and Central America. We know practically nothing about it, but we may infer that modern families and most modern genera existed. The zoögeographer infers that there was such a bird-life, because of the relatively small number of very distinct endemic genera and species which exist today side by side with representative

species and races of groups of relatively wide continuous distribution. It is certain that from Mexico northward into the western United States there was an area of great evolutionary development of birds. Modern genera of turkeys, American partridges, mimids, wrens, warblers, hummingbirds, and whole groups of genera of finches must have originated in this area, and I could greatly expand this list. At the same time another center of development was in Amazonia, where antbirds, woodhewers, flycatchers, cotingas, jacamars, and a host of other groups are richly developed. To what extent these elements existed in Guatemala and Central America, and in what proportions, we do not know, and for the zoögeographer it would be idle to speculate. Chapman, however, has shown that there was an Amazonian invasion into northern Colombia and eastern Panama before the Andean uplift had separated the tropical zones.

The avian zoögeographer is consequently not concerned with earlier elements in the geological history of Central America. It would, of course, make a great deal of difference whether the Panama land-bridge dates from Miocene or Pliocene time, and the extent to which northern and southern migrations populated Central America. These factors must be left for solution in the future to the palæontologist. Any reconstruction of the details of the pre-Glacial period would be the wildest speculation, if based exclusively on the evidence supplied by the distribution of living birds.

While one factor is irremediably an inherent limitation of the field of zoögeography itself, and I wish to emphasize my full recognition of this limitation, another factor of great importance was the Glacial Epoch, which exterminated, drove out, or so altered the distributions of nearly all the elements of the earlier avifauna that any attempt to reconstruct it would be analagous in its futility to solving a prehistoric picture puzzle, with only one or two pieces surviving. In addition to the effects on this earlier avifauna, we must also reckon with an incalculable host from the north which flooded Central and South America. The fossil mammals of Patagonia show us how much greater was this invasion than could possibly have been inferred from the distribution of living South American mammals today. While there are no comparable avian fossils, an occasional bird of North Temperate affinities in South America should warn the ornithologist not to assume that the present southern limits of families, genera, and species of Holarctic or boreal origin were those reached during the maximum refrigeration of the Glacial Epoch. Similarly he should beware of supposing that the present northern limits of

Neotropical families and genera are the same as those in pre-Glacial and Pleistocene time. What these limits actually were, however, lies outside the field of competence of the avian zoögeographer.

The bird-life of Guatemala was deeply affected by this southward migration. As we have seen, the present Arid Tropical Fauna is partly of northern origin, and the Temperate Zone Fauna almost entirely so. The Subtropical Zone must have descended to sea-level, and the present Subtropical Zone avifauna probably consists of those birds which survived the climatic change involved, combined with an earlier element which may have ascended into this Zone from tropical lowlands. The Glacial Epoch probably accounts for the Colombian-Pacific fauna, the Amazonian ancestors of which reached eastern Panama and instead of spreading north through similar humid forests in Central America, mysteriously turned south along the Pacific coast of Colombia. They may, of course, have spread into Central America at one time, but they were driven out by the increasing refrigeration of this period. Some of the more distinct genera and species of the Central American humid tropical forests today may well be the survivors of this invasion.

The close of the Ice Age saw a gradual change to modern temperature conditions. Geologically it is the modern period, zoögeographically it is the period of recapture or re-entry, the principle so clearly demonstrated by Matthew. The more vigorous, aggressive and adaptable Neotropical species pushed northward as suitable territory became available for occupancy, and we know, of course, that warblers, tanagers, vireos and flycatchers now occupy thousands of square miles in the eastern United States and Canada, which were deeply buried under ice. I am convinced that in Guatemala the great majority of the birds of the Tropical Zone belong to these recent arrivals, which have recaptured part of the territory from which their ancestors were driven.

In another way our little digression to the eastern United States is really germane to our theme. Here we have definite and incontrovertible evidence of the degree to which birds can recapture territory. Geologists tell us that the present avifauna in New England is roughly 40,000 years old. When we consider that the present climate is by no means so warm as Pliocene climate, and when we recall that the period of refrigeration lasted about ten times as long as the time elapsed since the close of the Ice Age, we can infer the probable magnitude of the southward migrations during Pleistocene time.

The wealth of bird-life in Guatemala is due then to (1) the antiquity of the country; (2) to its strategic position between two zoölogical

regions; (3) to the survival of some elements of its pre-Glacial avifauna; (4) to the arrival of fresh northern elements during the Pleistocene; and (5) the arrival from the south of tropical elements in post-Glacial time. These various elements in the bird-life have been so modified or influenced by time, the troubled topography, much local isolation, and six different climates, as to produce the 736 species and subspecies which we record from the country in the systematic portion of this paper in Part II.

Readers may decide for themselves whether the latent potencies in the germ plasm of these birds or the stresses of time and change in climate and environment were the compelling factors in their evolution. Personally, I decline to make such a choice, nor do I see the necessity of doing so. No systematic data can ever PROVE that environment originated a new character in a higher vertebrate; the most we can say is that it would seem inferentially probable. Experimental genetics on the other hand now presents overwhelming evidence of the impossibility of acquiring any characters or variations not latent in the germ plasm and hereditable. It insists that the capacity to vary must underlie environmental stresses. The systematist is primarily concerned with the study of variations and differences. He does not devote much time to the birds which do not vary or differ. And yet every faunal area possesses them, and they must have undergone the same environmental stresses which have caused speciation in other groups. There are also birds whose variations are obviously mutational, and wholly independent of change of environment, such as *Buarremon*, warblers on Polynesian archipelagos, and melanism in *Cœreba* in the Lesser Antilles. We should also reflect on the significance of the term "representative species," so often used by the systematist in his distributional analyses. I have already defined this term and contrasted such species with others which exhibit characters shared by no living relatives, with no racial variation regardless of environmental stresses. Consequently, his own special field of study supplies the systematist with some confirmation of the conclusions of experimental genetics, as some birds do not vary in spite of obvious environmental stresses, and others vary widely without obvious environmental stresses.

Let us grant then that variation in any bird is limited by the latent potencies in the germ plasm. The point of major biological importance, which is the outcome of systematic and zoögeographic study, is that these latent potencies are of no value with the great majority of birds, unless subjected to environmental stresses. It is the factors

which I have just recapitulated for Guatemala which give this little country its wealth of bird-life. Still other environmental stresses account for the extraordinary diversity in Colombia and Ecuador. Where these environmental stresses are reduced in number, or too severe, we get a relatively uniform and poverty-stricken avifauna, as in New England, which is just recovering from the Glacial Epoch.

Time, and ample time, is, therefore, a third essential factor in evolution. If my analysis of the avifauna of Guatemala be correct, it tallies exactly with the evidence of the palæontological record. Representative species and subspecies are 40,000 years old in Guatemala, and the races of some boreal birds in the mountains must go back to late Pleistocene at least. Very distinct specific types and genera are all pre-Glacial. The conclusions of the geneticist are consequently not open to attack on the ground that he has failed to evolve a new race of *Drosophila* in some twenty-five years of breeding experiments, involving at most a few hundred generations.

It will now perhaps be clear that the question, which of these factors is of primary importance, is puerile. If I may be permitted an analogy, the great pianist is born and not made, but if we grant that he is born, years of arduous practice are required to develop his latent capacity. There is no such thing as THE factor in evolution. In no species, genus, family, or order of birds, is the latent capacity to vary exactly the same as in any other. It is consequently impossible for the same environmental stresses to have had precisely the same effect on two different birds. Furthermore, it is quite unlikely that any two birds were ever subjected to exactly the same combination of environmental stresses for exactly the same length of time. It follows that the factors causing the evolution of any species of bird cannot be the same in any two cases. The validity of this chain of reasoning is proved by the whole class Aves. One of its outstanding characteristics is diversity, not uniformity, and the areas of the earth which contain the greatest diversity of bird-life are those which, like Guatemala, have been the arena for a maximum variety of environmental stresses with ample continuity of time.

Fig. 1. Pine growth near La Primavera. The only locality that yielded specimens of *Dendrocolaptes puncticollis*.

Fig. 2. Coffee "Finca" at Cipres. Some of the native forest left to furnish shade for the coffee. In such growth the avifauna was little, if any, different from its original condition.

Fig. 3. A trail at Progreso, the home of Road Runner and Cactus Wren.

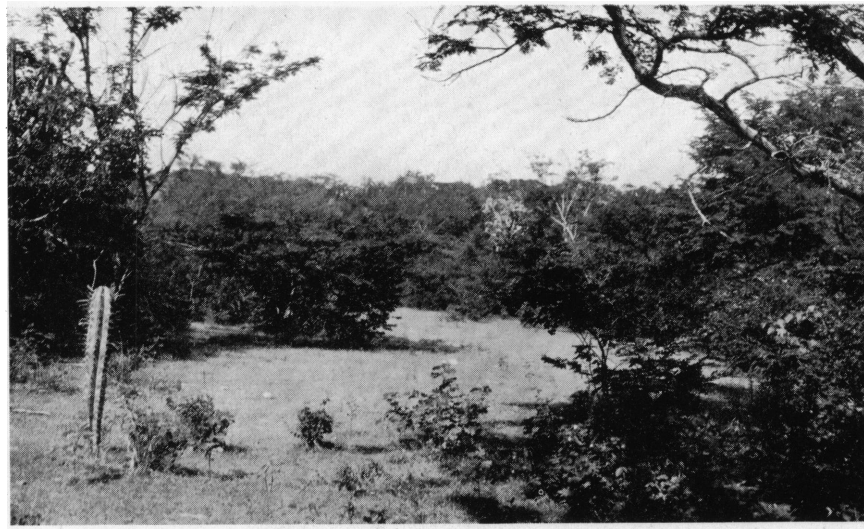

Fig. 4. Dry scrub near Progreso, typical of the arid belt of the Motagua Valley. *Polioptila albiloris* common in this brush.

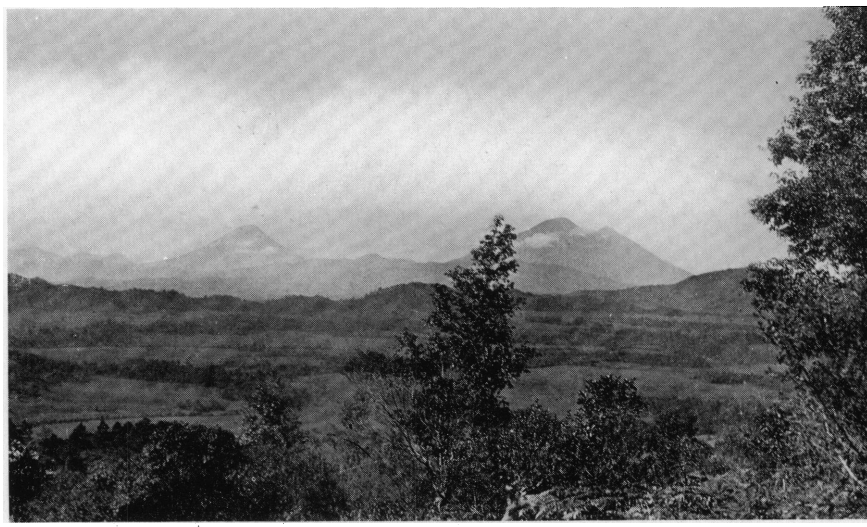

Fig. 5. Plains of Tecpam, the volcanoes of Agua, Fuego, and Acatenango. One of the few places where *Sturnella* was found.

Fig. 6. San Mateo. Heavy pine forest on the distant mountains. The natives cleared the nearby hills for fuel, and the growth is chiefly brush.

Fig. 7. Forest of cypress above Tecpam, 10,000 feet altitude. The home of *Regulus*, *Aphelocoma*, and *Lampornis*.

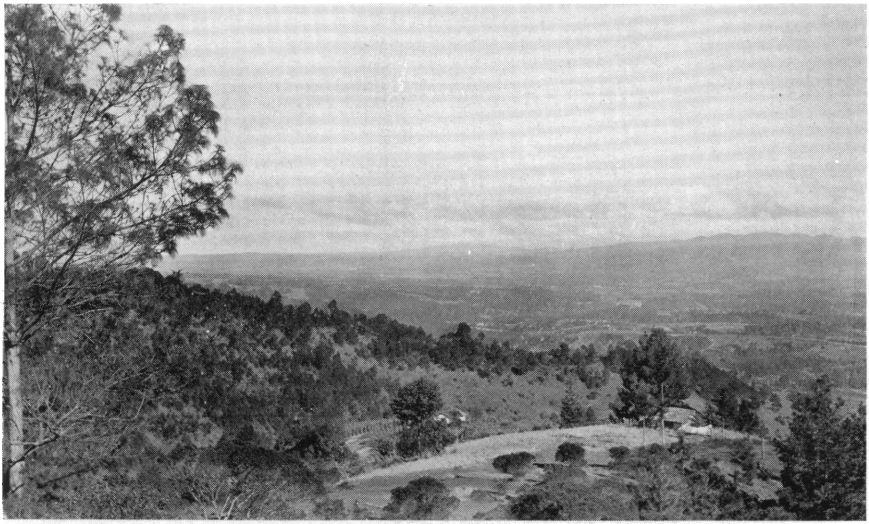

Fig. 8. Pine and oak forests near Chichicastenango, the white towers of Quiché showing in the distance.

Fig. 9. Mixed oak and pine woods east of Nenton.

Fig. 10. Lake Atitlan, near San Lucas. Least bitterns and grebes nesting in the tules.

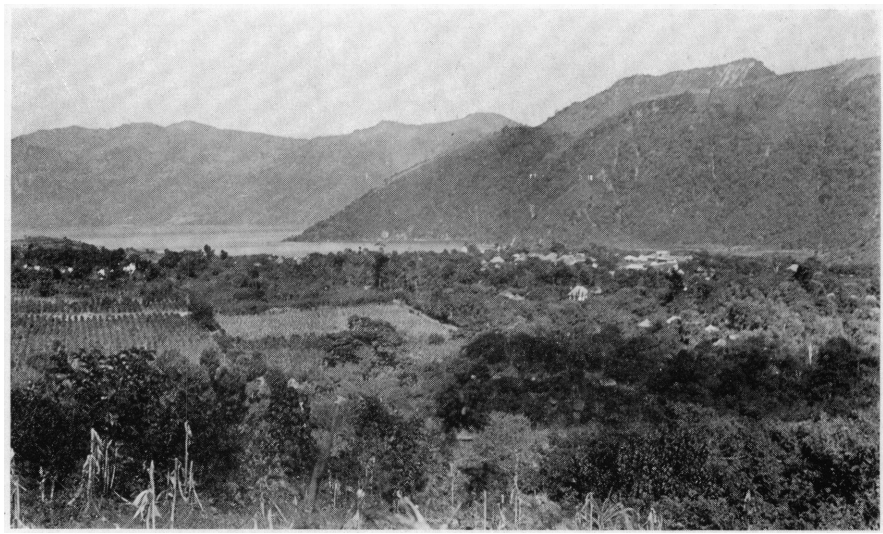

Fig. 11. Panajachel, at the north end of Lake Atitlan. The types of *Xenotriccus callizonus* were taken in the growth shown near the center of the photo.

PART II

A DISTRIBUTIONAL LIST OF THE BIRDS OF GUATEMALA

Classification and Nomenclature

The classification and sequence of orders and families employed follows that of Sharpe's 'Hand List of Birds,' and the treatment is as nearly uniform as possible with Dr. Chapman's 'Birds of Ecuador.' Concerning nomenclature, I must echo Dr. Chapman's lack of interest in it. I have made no attempt to determine whether any current name is correct, but have made an effort to adopt recently proposed changes, based on careful research by competent specialists, especially when these have been checked by some one other than the original proposer.

In the treatment of genera, I agree emphatically with Dr. Chapman that the genus was designed to show relationship, rather than slight structural differences. The multiplication of genera undoubtedly obscures relationships of great zoögeographic interest, and I have endeavored to be consistently conservative. In no case have I accepted the "splitting" of a genus like *Columba*, *Caprimulgus*, or *Turdus*, when it was based on an examination of a section of the species only. I have, however, followed Hellmayr in his monographic treatments of the New World Mesomyodi and Oligomyodi, based on an examination of practically every known form.

The treatment of subspecies is an even more difficult matter, and perfect consistency is scarcely possible. As a guiding principle I have, however, tried to follow the criteria laid down by Chapman (Auk, 1924, pp. 17–29), in reaching a conclusion regarding the status of representative forms, and I reject a "rule of thumb" which would treat all such as subspecies of one "Formenkreis."

The recognition of the finely drawn subspecies of the day is another question entirely. I wish clearly to distinguish between the bearing which systematic ornithology has upon geographical distribution and evolution (in which I am very much interested), and the purely taxonomic problem as to what degree of difference is worth recognizing as a subspecies (in which I am not at all interested). It will be apparent in the latter case that we are dealing with a matter of opinion, subject to a wide degree of individual or personal variation based in part at least on the particular interests of each one. What is more to the point, any such criterion is an artificial one, a mere rule of thumb, and the variations of

animals will not conform to any as yet proposed, nor will they even approach conformity.

Grinnell ('Distrib. Summation Orn. Lower Calif.,' Introd., p. 14, et seq.) has ably put the case for the bearing of systematics upon distribution and evolution. I agree that it is the relatively minute variations that, when correlated with isolation, environmental differences, or distance from a parent stock, throw light upon one factor in the origin of species. These variations will always be noted and studied by those interested, and if it be convenient to name them, I agree with Dr. Stone, that there is no reason why they should not be named.

In an area like Central America, which is relatively unexplored, only two or three museums in the world have an approximately adequate representation of the majority of the described forms, and collections from a new region are constantly reaching one or another institution, from which one or more local races are described. No other person can possibly judge the validity of such subspecies, until he examines the type material, which is often far from being an adequate series. I approve of the description of these forms, as it is an excellent way of putting facts on record and calling attention to the desirability of securing further material of that particular species from that particular place. Sooner or later adequate material does arrive, and sometimes the additional specimens show the inconstancy of the characters exhibited by the original series. This, to my mind, is the only sequence of events, which definitely proves the invalidity of a subspecies. I consequently recognize all proposed forms in these pages, unless I have been able to examine MORE specimens than were available to the describer, and these fail to show the ascribed characters. If they do show them, the race is recognized, no matter how slight the average differences may be. It follows that I disapprove of unfavorable criticism, when the critic has one or two specimens only from the range of the proposed form, which do not happen to show the characters brought out by better material available to the describer.

Number of Species Included

Recorded knowledge of the Guatemalan avifauna is so relatively extensive, that it has seemed desirable to give a complete enumeration of all the birds recorded from the country, regardless of whether Mr. Anthony obtained specimens or not. The discovery of a new genus like *Xenotriccus* at so well known a locality as Panajachel warns us, however,

not to conclude too rashly that we have approached finality in exhausting our knowledge of the bird-life of any part of Central America. There are also obvious gaps among water and sea birds, and certain North American species, well known as transient or winter visitants to Central America, which have not as yet been definitely collected in Guatemala.

Ninety-five described species are here added to the Guatemalan list, and practically all are land birds. The majority of these are actual discoveries. Others are range extensions of subspecies, based on a study of larger series than formerly available. The total is now 736 species and subspecies.

During the accumulation of the Anthony Collection and the work on its critical determination, I have described as new 1 genus, 3 species, and 39 subspecies. In only two cases was Dr. Dwight the senior author, and I gladly emphasize the fact that, had he lived, he would have been the senior author of all of them. In addition to these, Messrs. Dickey and Van Rossem have borrowed material from time to time in connection with their study of the birds of El Salvador. They have described a considerable number of subspecies common to Salvador and western Guatemala. Due to the fact that Guatemala was the first part of Central America to be intensively explored, it is the type locality for many species and subspecies of birds. The receipt of adequate topotypical material has led in many cases to the discovery that many representatives in Mexico or other parts of Central America were racially distinct. In this way the Dwight Collection of Guatemalan birds has increased our precise knowledge of birds of regions far beyond the boundaries of the country.

List of Guatemalan Birds Described as New

Columbigallina minuta interrupta
Claravis mondetoura salvini
Oreopeleia albifacies anthonyi
Podilymbus gigas
Rupornis magnirostris direptor (with J. L. Peters)
Cerchneis sparveria tropicalis
Cryptoglaux rostrata
Eumomota superciliosa vanrossemi
Nyctidromus albicollis intercedens
Caprimulgus ridgwayi troglodytes (originally described as *minor*)
Agyrtria candida pacifica
Selasphorus platycercus guatemalæ

Morococcyx erythropygus macrourus
Piculus rubiginosus maximus
Piculus rubiginosus differens
Synallaxis erythrothorax pacifica
Megarhynchus pitangua deserticola
Pitangus sulphuratus pallidus
Xenotriccus callizonus (with Dr. Dwight)
Heleodytes capistratus xerophilus
Pheugopedius maculipectus varians
Cinclus mexicanus anthonyi
Myadestes unicolor veraepacis
Turdus grayi umbrinus
Catharus mexicanus cantator
Vireo huttoni vulcani
Cardellina rubifrons bella
Sporophila morelleti mutanda
Saltator grandis hesperis
Aimophila ruficauda connectens
Aimophila rufescens gigas
Zonotrichia capensis septentrionalis
Passerina versicolor purpurascens
Pipilo maculatus repetens
Atlapetes gutturalis griseipectus (with Dr. Dwight)
Icterus gularis troglodytes
Icterus gularis gigas
Icterus gularis xerophilus
Icterus sclateri maximus
Icterus sclateri alticola (with W. DeW. Miller)
Icterus pectoralis anthonyi
Cyanocitta stelleri ridgwayi (with W. DeW. Miller)

North American Migrants

Guatemala has by far the largest list of any part of Central America, due to its greater geographic proximity to North America. A surprising number reach their southern known limits in this country. The pine forests of the Altos swarm in winter with many characteristic species of the Upper Sonoran and Canadian Zones in the Rocky Mountains, most of which are unknown farther south. Chapman, Todd and Carriker have already emphasized the lack of uniformity in the winter distribution of north temperate birds. This is less true in Guatemala than any other part of Central America. A sharp distinction must, however, be made between winter residents and those which are purely transients on migration. The latter class may occur almost anywhere, with a surprising altitudinal range. The winter residents on the other hand do divide into two general groups. Species and races of eastern North America

unquestionably predominate at lower altitudes in eastern and central Guatemala, while western species and races predominate in western Guatemala, particularly in the Altos.

Even so, there are plenty of exceptions. Any race of the Yellow Warbler, for instance, may be expected to occur in any part of Central America, though the species as a whole has a definite and continuous winter range. A much more surprising case is that of the thrush, *Hylocichla ustulata*. The eastern race, the Olive-backed, winters in South America east of the Andes, and is a transient only in Central America. The western Russet-backed, however, winters commonly in Central America, and has yet to be recorded definitely south of northwestern Costa Rica. We have here an anomalous situation, where the winter range of a species is split into two widely disconnected halves.

Finally, no generalization whatever is possible between the winter and breeding ranges of North American birds from the standpoint of latitudinal distribution.

Our records further emphasize the early arrival of many migrants in the Tropics and the lateness of their departure.

List of North American Migrants Found in Guatemala[1]

Zenaidura macroura carolinensis
" " *marginella*
**Rallus limicola limicola*
Porzana carolina
**Creciscus jamaicensis*
Gallinula chloropus cachinnans
**Colymbus nigricollis californianus*
Chlidonias nigra surinamensis—transient
Gelochelidon nilotica aranea
Sterna forsteri
" *hirundo*
Sterna antillarum antillarum
Larus pipixcan—transient
" *atricilla*
* " *heermanni*
Arenaria interpres
Squatarola squatarola
Pluvialis dominicus—transient
Oxyechus vociferus
Charadrius semipalmatus
Himantopus mexicanus
**Recurvirostra americana*

[1]Those marked with an asterisk reach their southern known limits here.

Numenius americanus
" *hudsonicus*
" *borealis*—transient
Limosa fedoa
Limnodromus griseus scolopaceus
Micropalama himantopus—transient
Catoptrophorus semipalmatus inornatus
Totanus melanoleucus
" *flavipes*
Tringa solitaria solitaria
Actitis macularia
Bartramia longicauda—transient
Ereunetes mauri
Crocethia alba
Pisobia minutilla
Pisobia maculata—transient
Gallinago delicata
Lobipes lobatus—transient
Steganopus tricolor—transient
Ardea herodias herodias
Nycticorax nycticorax hoactli
Butorides virescens virescens
**Ixobrychus exilis exilis*
Botaurus lentiginosus
Mareca americana
Dafila acuta
Querquedula discors
Spatula clypeata
**Nyroca valisineria*
" *affinis*
* " *collaris*
**Pelecanus erythrorhynchus*
Circus hudsonius
Accipiter cooperi
" *velox*
Buteo borealis calurus
" *swainsoni*—transient
" *platypterus*
Elanoides forficatus forficatus—transient
**Elanus leucurus majusculus*
**Ictinia mississippiensis*
**Falco peregrinus anatum*
* " *fusco-cærulescens septentrionalis*
Cerchneis sparveria sparveria
**Asio flammeus flammeus*
Speotyto cunicularia hypogæa
Megaceryle alcyon alcyon
Chordeiles virginianus subspecies—transient

Chordeiles acutipennis texensis
Antrostomus carolinensis
Caprimulgus vociferus vociferus
Archilochus colubris
Coccyzus americanus—transient
" *erythrophthalmus*—transient
Sphyrapicus varius varius
* " " *nuchalis*
Muscivora tyrannus
Tyrannus tyrannus—transient
" *vociferans*
* " *verticalis*
Myiarchus crinitus
* " *cinerascens*
Nuttallornis mesoleucus mesoleucus—transient
" " *majorinus*—transient
Myiochanes virens—transient
" *richardsonii richardsonii*—transient
" " *peninsulæ*—transient?
* " *pertinax pallidiventris*
**Empidonax flaviventris*
" *virescens*—transient
" *traillii traillii*—transient
" " *brewsteri*—transient
" *minimus*
* " *hammondi*
* " *wrightii*
Riparia riparia—transient
Iridoprocne bicolor
**Tachycineta thalassina lepida*
Hirundo erythrogaster
Petrochelidon albifrons melanogaster—transient
Stelgidopteryx ruficollis serripennis
**Regulus calendula*
**Polioptila cærulea cærulea*
Dumetella carolinensis
**Turdus migratorius*
Hylocichla mustelina
" *minima aliciæ*—casual on migration
" *ustulata ustulata*
" " *swainsoni*—transient
* " *guttata auduboni*
* " " *polionota*
Vireo olivaceus
" *philadelphicus*
* " *gilvus gilvus*
* " " *swainsoni*
" *flavifrons*

Vireo solitarius solitarius
* " " *cassini*
" *noveboracensis noveboracensis*
" *bellii bellii*
Bombycilla cedrorum
Mniotilta varia
Helmitheros vermivorus
Vermivora chrysoptera
" *pinus*
* " *ruficapilla ruficapilla*
* " " *ridgwayi*
* " *celata lutescens*
" *peregrina*
Dendroica æstiva æstiva
" " *sonorana*
" " *rubiginosa*
" " *brewsteri*
* " " *amnicola*
* " " *ineditus*
" *cærulescens*—accidental visitant
" *coronata coronata*
* " " *hooveri*
* " *auduboni auduboni*
* " " *memorabilis*
* " " *nigrifrons*
" *magnolia*
" *cerulea*—casual migrant
" *pensylvanica*—transient
" *castanea*—casual migrant
" *fusca*—transient
" *dominica albilora*
" *virens virens*
" *chrysoparia*
" *occidentalis*
" *townsendi*
Seiurus aurocapillus
" *motacilla*
" *noveboracensis noveboracensis*
" " *notabilis*
Oporornis formosa
" *philadelphia*—transient
" *tolmiei*
Geothlypis trichas brachidactyla
* " " *occidentalis*
Icteria virens virens
Wilsonia citrina
" *canadensis*—transient
" *pusilla pusilla*
" " *pileolata*

Wilsonia pusilla chryseola
Setophaga ruticilla
**Anthus rubescens*
Zamelodia ludoviciana
Guiraca cærulea cærulea
* " " *interfusa*
Spiza americana
**Poœcetes gramineus confinis*
**Chondestes grammacus strigatus*
**Passerculus sandvichensis alaudinus*
**Coturniculus savannarum australis*
" " *bimaculatus*
**Spizella pallida*
**Melospiza lincolnii lincolnii*
* " " *striata*
Passerina ciris ciris
" " *pallidior*
" *cyanea*
Piranga erythromelas—casual transient
" *ludoviciana*
" *rubra rubra*
Icterus galbula
* " *bullockii*
" *spurius*

SUMMARY

Winter Residents	161
Transients	30
Casual or accidental	5
Total	196

SCOPE OF DATA PRESENTED

Under each species in the following pages, the following data will be found:

(1) A reference to the original description, with the type locality.

(2) A list of the localities in Guatemala from which the species has been previously recorded. The references are almost entirely restricted to Salvin and Godman's 'Biologia Centrali-Americana' and Ridgway's 'Birds of North and Middle America.' Both works give all recorded localities with complete bibliographic references, and there seemed no point in repeating a lengthy list of citations for a third time. All papers dealing with the birds of Guatemala are, however, cited, which are not included in the volume of the 'Biologia' or Ridgway, or which appeared subsequent to their publication. Ridgway is not cited under a species unless locality records additional to those in the 'Biologia' are supplied. For sake of brevity, com-

plete references to both works are given only under the first species of each family. The citations under the other species are greatly abbreviated.

(3) The synonymy is restricted to the names used in the original description, the 'Biologia,' Ridgway, and recent papers.

(4) All specimens in the Dwight Collection are recorded. Unrecorded specimens in the Museum of Comparative Zoölogy are listed only when they furnish records of interest.

(5) A brief statement of the range of every species and subspecies outside of Guatemala.

(6) General discussion has been reduced to the minimum possible necessary to establish a proper identification or to bring out an interesting point in distribution.

(7) The exigencies of space have also compelled me to omit many field notes on habits. Salvin's earlier papers and the 'Biologia' are full of such notes. These are never repeated. Mr. Anthony forwarded a most interesting manuscript based on his preliminary identifications in the field. He is quoted almost verbatim in a separate paragraph in those cases where his notes were unique or supplementary to information already published. His notes have been omitted when they were a duplication of previously published data, or when they were merely a list of localities at which he had collected the specimens.

(8) No effort has been made to invent vernacular or English names.

(9) The systematic treatment and taxonomy used below was completed on January 1, 1931. No attempt has been made to include various proposed changes in classification and nomenclature recently validated in the new 'A. O. U. Check List,' or Peters, 'Birds of the World,' I.

DISTRIBUTIONAL LIST OF SPECIES AND SUBSPECIES

ORDER TINAMIFORMES

FAMILY **TINAMIDÆ.** TINAMOUS

(1) **Tinamus major robustus** Sclater

Tinamus robustus SCLATER, P. Z. S., 1860, p. 253 (Rio de la Pasion, Guatemala); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1904, p. 449 (Choctum, Yzabal, Sierra de las Minas); LANTZ, Trans. Kansas Acad. Sci., XVI, 1899, p. 218 (Santo Tomas).

RANGE.—Humid Tropical Zone: the species, from Amazonia to Mexico; the race, Caribbean rain forests from southeastern Mexico to northern Nicaragua.

I have nothing further to add to my review of the Central American races of this species (Bull. Mus. Comp. Zoöl., 1929, LXIX, No. 8, pp. 150–152). It is one of the many Neotropical forest birds which extend north into Central America wherever suitable conditions prevail, the variations of which are relatively trivial and unstable, particularly in western Colombia and west Ecuador. This tinamou can scarcely be called stable, and these facts consequently suggest a relatively recent arrival in the northern and western limits of its range.

Preëminently a species of dark, heavy rain forest, of shy and retiring habits, and disappearing when these conditions are destroyed. It is consequently unrecorded from the Pacific slope of Central America north of western Costa Rica, but might be expected to occur in northwestern Guatemala. Indeed, Anthony (MS.) writes that he feels convinced he flushed one in the rain forest near Finca El Espino. Throughout Central America it is assiduously hunted for food, and is unquestionably decreasing near settled districts. As is now well known, it is easily domesticated and becomes quite a pet.

(2) **Crypturus boucardi boucardi** (Sclater)

Tinamus boucardi SCLATER, P. Z. S., 1859, p. 391 (Vera Cruz, Mexico).

Crypturus boucardi, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1904, p. 457 (Choctum, Chisec; crit.)

Secanquim, 1 ♀.

RANGE.—Humid Tropical Zone: rain forests of northern Central America from southeastern Mexico to Nicaragua; a closely allied race in Costa Rica.

This species has no near allies in southern Central America, but is closely related to *kerriæ* Chapman and the little-known *columbianus* Salvadori of Colombia. We have here a possible example of a species formerly more widely dispersed, surviving only on the periphery of its former range, and well established in one section of it only.

A fairly common species in the rain forests of the Caribbean slope of Guatemala, with habits common to other forest-loving members of the family.

(3) **Crypturus soui meserythrus** (Sclater)

Tinamus meserythrus SCLATER, P. Z. S., 1859, p. 392 (Playa Vincente, Mexico).

Crypturus pileatus, SALVADORI, 'Cat. Birds Brit. Mus.,' XXVII, p. 522 (Choctum, Chisec).

Crypturus soui meserythrus, DEARBORN, Field Mus. Nat. Hist., Publ. 125, 1907, p. 76 (Los Amates).

Secanquim, 1 ♂, 1 ♀; Chipoc, 1 ♂; Finca Chamá, 1 ♀.

RANGE.—Tropical Zone: the species, from Brazil to Mexico with numerous subspecies; the present race, from southeastern Mexico to eastern Nicaragua.

This highly plastic species not only varies slightly, wherever local conditions vary, but also with mere distance from its ancestral home. Thus, there are at least three well-marked races in the Caribbean rain forest of Central America, where both climatic and ecological conditions

are as nearly uniform as is conceivable. The transition, for instance, from *meserythrus* to *modestus* along the Nicaragua-Costa Rica boundary is surprisingly abrupt, but cannot be correlated with a change in any environmental factor.

A common bird of the Caribbean lowlands, with a marked preference for thickets and bush on the edge of the forest, rather than in the dark forest itself, where only *C. boucardi* occurs.

(4) **Crypturus cinnamomeus cinnamomeus** (Lesson)

Tinamus (Nothura) cinnamomea LESSON, Rev. Zool., 1842, p. 210 (La Union, Salvador).

Tinamus sallæi, SALVIN, Ibis, 1866, p. 206 (Chisec); LANTZ, 1899, p. 218 (Naranjo).

Crypturus cinnamomeus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1904, p. 456 (Barranco Hondo, Medio Monte, Volcan de Agua, Zapote, Costa Grande).

RANGE.—Arid Tropical Zone of Mexico and Central America from northeastern Mexico to northwestern Costa Rica, with several representative forms; see comment below.

In default of specimens, the forms of this species in Guatemala await further study. It is by no means certain that the typical form occurs even on the Pacific slope, and *goldmani* might be expected, at least in Peten. So far as our present knowledge goes, typical *cinnamomeus* occurs definitely only in Salvador, Honduras, and Nicaragua, but may well extend northward to western Guatemala and southern Mexico. A very slight race, *præpes* Bangs and Peters, occurs in the extreme southern limits of the Zone in northwestern Costa Rica, and in the same Zone in Yucatan we find the distinct *goldmani* Nelson, to which the specimen from Chisec might belong. In Mexico, *occidentalis*, *inornatus*, and *mexicanus* are all related subspecies, and Nelson has pointed out that the resemblance of *mexicanus* to *occidentalis* on the opposite side of the continent, but living in similar climatic conditions, is much greater than that of *mexicanus* to *inornatus*, occupying a contiguous district, but reflecting the more humid climate in its darker coloration and reduction in barring. Indeed, it is not much of a jump to the slaty, unbarred *boucardi* of the true rain-forest areas. Proceeding southward I would point out the significance of the fact that an arid tropical climate reappears in northern Colombia and western Eucador, where we find species of *Crypturus* very closely related to *cinnamomeus*.

The species fairly swarms in favorable areas in western Nicaragua, but its status in western Guatemala remains to be determined.

ORDER GALLIFORMES

FAMILY **CRACIDÆ**, CURASSOWS, GUANS, CHACHALACAS

(5) **Crax globicera globicera** Linnæus

Crax globicera LINNÆUS, 'Syst. Nat.,' I, 1766, p. 270 ("Brasil"); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1902, p. 272 (Lake of Peten, Chilomo, Savana Grande, Raxché, Vera Paz); DEARBORN, 1907, p. 77 (Los Amates); LANTZ, 1899, p. 219 (Naranjo, Santo Tomas).

RANGE.—Tropical Zone: from southern Mexico to western Ecuador; a race on Cozumel Island.

The puzzling variations of this curassow have led to the description of several species, such as *panamensis* Grant and *chapmani* Nelson of Yucatan; a dwarf form occurs, however, on Cozumel Island.

A fairly common bird throughout the forested areas of Central America, and consequently occurring locally on the Pacific slope, even north of Costa Rica. It is rapidly decreasing near settlements, due to hunting.

"Met with in abundance on the trail between Sepacuite and Panzos, in late May. At this time it seemed to be feeding on the fruit of some tree, species unknown to me. Frequently several birds were seen in the same tree, only taking wing when I passed below, then flying but a short distance." (Anthony, MS.)

(6) **Oreophasis derbianus** Gray

Oreophasis derbianus GRAY, 'Genera of Birds,' III, 1844, p. 485, t. 121 (Guatemala); SCLATER AND SALVIN, Ibis, 1859, p. 224 (Volcan de Fuego); SALVIN, Ibis, 1860, pp. 43, 248 (habits); idem, 1874, p. 188 (Chicaman); SALVIN AND GODMAN 'Biol. Cent. Amer.,' III, 1902, p. 274 (Cerro Zunil).

Volcan San Lucas, 11,000 ft., 1 ♀.

RANGE.—A monotypic genus, confined to the high mountains of western Guatemala, in the Temperate Zone forests.

Judging from Salvin's account in the Ibis, this remarkable bird must have greatly decreased in numbers in the more settled districts, as it has not been found in many years in places where it was formerly common.

"Evidently well distributed on many of the higher peaks, but seldom if ever found below 7500 feet. From its habit of sticking to the heavy rain forest, it is easily overlooked. The Faisan, as it is known to the natives, was found on the higher elevations of the Volcan San Lucas, at

10,000 feet and above. Here they were feeding on the fruit of a large tree, were quite hard to discover, and still more difficult to secure. The natives described this bird to me as being on Zunil and other high volcanoes in Guatemala, including Tacana and Tajamulco, two huge peaks that rise like marine islands from a sea of low, tropical forest to an elevation of 14,000 feet. Pieces of the plumage of this species were seen at Tecpam, and were said to have been taken at Santa Ilania, about ten miles north of that town, and at about 10,000 feet altitude." (Anthony, MS.)

(7) **Penelope purpurascens purpurascens** Wagler

Penelope purpurascens WAGLER, Isis, 1830, p. 110 (Mexico); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1902, p. 276 (Retalhuleu; Raxché, Vera Paz; Savana Grande, Volcan de Fuego, Medio Monte); DEARBORN, 1907, p. 77 (Los Amates).

Penelope cristata, LANTZ, 1899, p. 219 (Naranjo, Santo Tomas).

Finca Sepacuite, 1(?).

RANGE.—Tropical Zone: the species, Mexico to west Ecuador; the race, southern Mexico to northern Nicaragua.

Intermediates from Nicaragua establish the racial rather than specific relationships of *cristata* and *purpurascens*, and I follow Chapman and Chubb in using *æquatorialis* as the first available name for the species long known as *cristata* Linnæus.

A tropical forest bird found on both slopes of Guatemala, and fairly common under wilderness conditions. It is one of the many cases of a species of recent arrival from the south, which has undergone minor variations only.

(8) **Penelopina nigra** (Fraser)

Penelope niger FRASER, P. Z. S., 1850, p. 246, t. 29 (Guatemala).

Penelopina nigra, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1902, p. 278 (Coban, Vera Paz; Volcan de Agua, Volcan de Fuego, El Rincon, San Marcos).

Chimoxan, 1 ♂ imm.

RANGE.—A monotypic genus, confined to the mountains of northern Central America, from Chiapas to northern Nicaragua, in the Subtropical Zone.

This bird is rare in collections, and it is as yet impossible to assemble, in this country, a series properly representing its range. It is by no meens certain that Nicaraguan specimens are the same as Guatemalan, and some day a series from Vera Paz should be compared with another from the Pacific cordillera.

"Well distributed in the high, forested parts of northern Guatemala. It was reported from the volcanoes near Antigua. At San Lucas the natives had parts of its plumage and assured me it was common on the volcanoes there. Near Barrillos and Nebaj the birds could be heard, but none were seen. A pair was shot near Sepacuite, where the birds were not rare but, as wherever found, very hard to secure. The natives state that they are always found in pairs, male and female, and if the male is shot, the female will linger in the near vicinity until she, too, falls, a statement sustained by my own limited experience. A pair of these beautiful birds was living with the fowls at La Primavera, and were much more tame than the chickens. They had the free run of the yard and often flew to the nearby forest, to be gone, perhaps, for hours, but always returned before night to roost in a tree in the dooryard. The native name, Kiyi, is supposed to be a more or less correct rendition of its note. However, I could not see much resemblance. The only cry that I ever felt sure came from this species was a sharp yelp, difficult to repeat." (Anthony, MS.)

(9) **Ortalis vetula plumbiceps** (Gray)

Ortalida plumbiceps GRAY, 'List Gallinæ Brit. Mus.,' 1867, p. 11 (Honduras and Guatemala).

Ortalis vetula plumbeiceps, DEARBORN, 1907, p. 78 (Gualan; Los Amates).

Virginia Plantation, near Puerto Barrios, 1 ♀ (M. C. Z.).

RANGE.—Chiefly Arid Tropical Zone: the species, from Texas to Nicaragua; the race, from extreme southern Guatemala to north central Nicaragua.

Confined to the most humid coastal forest areas of eastern Guatemala. For comment see the next form.

(10) **Ortalis vetula jalapensis** Miller and Griscom

Ortalis vetula jalapensis MILLER AND GRISCOM, Auk, 1921, p. 46 (Jalapa, Vera Cruz, Mexico).

Ortalis vetula, GRANT, 'Cat. Birds Brit. Mus.,' XXII, p. 512 (Coban).

Thirty-five specimens from Sepacuite, Secanquim, and Finca Chamá, localities in the Caribbean forest, 50 to 60 miles east of Coban, from 1800 to 3500 feet.

RANGE.—The race, from Vera Cruz and Oaxaca to north central Guatemala.

The study of so large a series from one geographical area, taken at the same season of the year, has been a great aid in understanding the variations of this plastic species. Some years ago when Miller and

Griscom (Auk, 1921, pp. 44–49) wrote a review of *Ortalis vetula*, the number of specimens available south of northern Mexico was considerably less than the series now before me. Before discussing the variations in this series, we must bear in mind the geographically central position of its place of origin. To the north, the country slopes gradually to the lowlands of Vera Cruz, to the northwest, to the lowlands of Oaxaca, and to the northeast, to the drier forests of northern British Honduras and Quintana Roo.

The outstanding fact in looking at the Coban series is the extraordinary degree of individual variation. I can make out no reliable sex differences, nor can I correlate any of these variations with age. Wear, which is extensive, makes a radical difference. The naturally harsh plumage of these birds is apparently very susceptible to wear from the thorny scrub in which they live, and on the back nearly one-half the feather can be worn away. In molt, fresh back and breast feathers are always browner than the old, some birds having consequently a spotted appearance. The tip of the fresh feather is always more olive-gray, the basal two-thirds browner. Undoubtedly, therefore, worn birds appear browner, and freshly molted, unworn birds also may appear browner than other specimens that are not too badly worn.

When every allowance for this state of affairs is made, however, it is absolutely impossible to explain away the great variation on any grounds of wear, age, or sex. Were it not for a perfectly connecting series of intermediates, one would suspect some such factor as dichromatism. Thus, a June male is even paler in coloration than *intermedia* Peters, suggesting an approach to *pallidiventris*. Another male, taken at the same place within three days, is an extreme of the *fulvicauda* type of coloration. The great majority of the specimens are like *jalapensis*, which is just what would be expected on geographical grounds. About eight are nearer *fulvicauda*, and one only is *intermedia* in color, but not in size. The tail-tips, however, are pale buffy to deep ochraceous or almost fox red, and some are strongly bicolored, thus suggesting the more southern *plumbiceps*. The variations in the color of the tail-tips do NOT keep pace with the body color, by which I mean that grayer birds will have more highly colored tail-tips, and browner birds will have grayer tail-tips. As a key character, therefore, the color of the tail-tips is worthless.

My conclusion is that the high degree of variability shown by this series is in part due to its central geographic position and the complete lack of any barrier between Coban and the ranges of *fulvicauda*, *jalapensis* and *intermedia*. The last is a relatively pale race, and in connec-

tion with its small size is unquestionably valid. As regards *jalapensis*, I have seen but two specimens from Jalapa, the type locality. All other specimens examined from the hotter lowlands of Vera Cruz are distinctly browner above and buffier below, and strongly approach the three birds described as *fulvicauda* from Oaxaca, which are the extremes in this direction. As all three types of coloration, however, occur together in Coban, I can see no grounds for the recognition of two races. As *jalapensis* has page priority over *fulvicauda*, the latter falls into synonymy, and its characters could only be regarded as subspecific, if it could be shown that some small area in Oaxaca produced only dark extremes. A male from Mountain Cow, Cayo District, British Honduras, near the Guatemalan border, is unquestionably *jalapensis* and not *intermedia*.

Turning now to the south, we must dispose of *plumbiceps*. Two specimens from eastern Honduras, three from north central Nicaragua, one from eastern Guatemala, and one from Little River, British Honduras, differ from all more northern specimens in having the olive-brown breast invaded by the isabelline of the belly, so that there is much less of a bicolored appearance to the underparts. Only the three Nicaraguan birds and one Honduras specimen have strongly bicolored tail-tips. For the present, therefore, *jalapensis* and *plumbiceps* are readily separable, on a character where shade of color is not involved. It is entirely conceivable, however, that another series of thirty-five specimens from Honduras might impugn this character also, making *jalapensis* a synonym of *plumbiceps*.

It is very strange that no Chachalaca has ever been recorded from any part of the drier central uplands of Guatemala.

In a restricted area in Santa Marta, Colombia, occurs *Ortalis ruficrissa* Sclater and Salvin, which is barely separable from some of the races of *vetula*. The whole of southern Central America is now occupied by the abundant *O. cinereiceps* Gray, primarily a bird of forest borders, while *vetula* is a scrub and thicket bird. In northern Nicaragua where the two species come together, their separation is an ecological one.

(11) **Ortalis vetula leucogastra** (Gould)

Penelope leucogastra Gould, P. Z. S., 1843, p. 105 (new name for *P. albiventer* Lesson (*nec* Wagler) from Realejo, Nicaragua).

Penelope albiventer Lesson, Rev. Zool., 1842, p. 174.

Ortalis leucogastra, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1903, p. 281 (Retalhuleu, Costa Grande); Dearborn, 1907, p. 78 (San José).

Ortalida leucogastra, Lantz, 1899, p. 219 (Naranjo).

Hacienda California, 1 ♂, 5 ♀; Finca Cipres, 2 ♀; Espina, 1 ♂.

RANGE.—Known only from the Pacific lowlands from western Guatemala to northwestern Nicaragua.

It is largely a matter of opinion whether *leucogastra* is regarded as a distinct species or not. In any case it is an obvious representative of *vetula*.

The actual northern limit of this Pacific lowland form is unknown. No member of the genus is recorded as yet from Chiapas, but its absence is improbable. A young bird is much richer brown on the breast, and quite buffy below.

"This species replaces the last on the Pacific side of Guatemala and is fairly common up to about 3500 feet. At Ocos, one of the inhabitants had a tame bird which had the run of the town and was as often seen at one end of the settlement as the other. It had the self-appointed position of police to all the poultry population, and any slight disturbance among the fowls was instantly a signal for the arrival of a tornado in gray, that put to flight any and all fighting cocks in the pueblo. Many times I was called to the door of my room, by a "kuk-kuk-kuk-kuk," to see a streak of gray darting up the road toward a pair of barnyard cocks in dispute a hundred yards away. Never, to my knowledge, did a cock-fight continue after the Chacha had given notice. Both fowls would depart in haste before his arrival, seemingly aware that trouble was due to happen if either was found on the spot when the officer arrived. I never saw the Chacha follow the retreating cocks; he seemed to consider that his duties had been fulfilled when the fight had been broken up." (Anthony, MS.)

FAMILY **MELEAGRIDÆ.** TURKEYS

(12) **Agriocharis ocellata** (Currier)

Meleagris ocellata CURRIER, Mém. Mus. d'Hist. Nat., VI, 1920, p. 1, t. 1 (British Honduras); GRANT, 'Cat. Birds Brit. Mus.,' XXII, p. 391 (Yashá, Peten); LANTZ, 1899, p. 219 (Yaxa, Peten, March, 1887).

RANGE.—A monotypic genus confined to the lowlands of Peten, adjacent parts of British Honduras and the Yucatan Peninsula.

The generic distinctness of this beautiful bird and the extraordinary hiatus in distribution between it and the other members of its family show that it is a relict from a relatively ancient past and could not possibly have originated in the area where it now occurs, a region primarily of Pleistocene age, which in times past has been almost completely submerged.

Family **Odontophoridæ**

American Quails and Partridges

(13) **Dendrortyx leucophrys leucophrys** (Gould)

Ortyx leucophrys Gould, P. Z. S., 1843, p. 132 (Coban, Guatemala).
Dendrortyx leucophrys, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1903, p. 289 (Coban, Dueñas, Panajachel, 5000 ft.; Sololá).

Sepacuite, 1 ♂.

Range.—A genus of at most three species peculiar to the Subtropical and Temperate Zones in the mountains of southern Mexico south to Costa Rica; the present species in Guatemala, with allied races in northern Nicaragua and Costa Rica.

The Long-tailed Partridges are a very distinct group which probably originated where the birds are now found. They are exceedingly difficult to secure and are rare in collections. It remains to be determined whether Vera Paz birds are the same as those from the Pacific cordillera.

"This species is by no means uncommon in the highlands of northern Guatemala, but one that is apt to pass unrecorded by many careful observers. Above 3000 feet elevation it was often heard calling, at all hours of the day, from the heavy undergrowth of the mountain sides, but we were unable to gain sight of a single bird. Natives, who told me that they could easily bring me specimens, were offered a full day's wages for each and every bird delivered, but they were unable to claim the reward. I was told that when hunted by dogs the birds would tree and, from a perch a few feet above the animals, sit and watch them, while the hunter crept up and shot the birds, one by one, or even captured them alive by snaring them with a noose at the end of a slender pole. My own experience with the native dog led me to think that it might be easy to shoot a few birds with the help of some good canines, but necessary to be provided with a charge of heavy shot in one chamber of the gun, to be first used on the dog, otherwise he would be sure of a bird dinner and the collector in danger of death from apoplexy! At Sepacuite, while hunting Chachas, a bird that I took to be of that species darted across the trail and into the undergrowth ahead of me; an instant later another followed and, warned by the first, I was not taken entirely by surprise and fired at the hole in the brush as the bird flashed from sight. A moment later I was admiring the only specimen of the Tree Quail I secured in Guatemala. This species was quite common on the hills about Barrillos and Nebaj, the calls being heard at all hours. The single note, which has gained it the native name of Guachoque, is

far reaching and melodious. On the lower slopes of Volcan San Lucas I heard the notes several times, and learned the species was found above Tecpam, but did not see the bird." (Anthony, MS.)

(14) **Colinus virginianus insignis** Nelson

Colinus insignis NELSON, Auk, XIV, p. 46 (Nenton, Guatemala).

This very distinct race or species of Bob-white has been found only in parts of Chiapas and the adjacent border of western Guatemala between 3000 to 6000 feet.

(15) **Colinus leucopogon hypoleucus** (Gould)

Eupsychortyx hypoleucus GOULD, P. Z. S., 1860, p. 62 ("Acajutla, Mexico," in error, = Guatemala); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1903, p. 298 (San Geronimo).

Colinus leylandi hypoleucus, GRISCOM, Amer. Mus. Novit., No. 379, 1929, pp. 2–3 (crit.).

Colinus leucopogon hypoleucus, DICKEY AND VAN ROSSEM, Condor, 1930, pp. 72–73 (crit.).

Progreso, 2 ♂, 1 ♀; also 5 others from "Guatemala" (M. C. Z.).

RANGE.—Arid Tropical Zone: the species, Guatemala to northwestern Costa Rica; the race, localized in the arid interior valleys of Guatemala.

Quail are among the most plastic of New World birds. While *virginianus* undoubtedly shows color variations that can be correlated with the relative humidity of the climate, the extraordinary variations in melanism, erythrism, and albinism, which characterize numerous forms in Mexico southward, can be explained only by mutations that have been perpetuated in local strains, none of which are quite alike, and where environment has played a very secondary rôle. The present form is an interesting case in point. The species occupies a limited and a very homogeneous area, but even in Salvador, the home of the typical form, individual variations tend toward *hypoleucus* and *leylandi*. The Guatemala race is chiefly characterized by the fact that 90 per cent of existing specimens are more or less albinistic.

The fact that quail are found in Cuba and occur in western Panama and Colombia, where open or semi-arid country reoccurs, and have penetrated even to New England since the last glacial period, argues for a virile stock and a relatively ancient origin for the genus. It is one of the many primarily Sonoran groups, which in variations and distribution contrast so vividly with the tropical rain-forest avifauna of Central

America, that the relatively recent arrival of the latter is an inescapable inference.

Mr. Anthony writes that this quail was relatively common at Progreso and was heard calling in other parts of the arid portion of the Rio Motagua Valley.

(16) **Cyrtonyx ocellatus** (Gould)

Ortyx ocellatus GOULD, P. Z. S., 1836, p. 75 (Guatemala).

Cyrtonyx ocellatus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1903, p. 307 (Quetzaltenango, Dueñas, Toliman 5000 ft.); DEARBORN, 1907, p. 77 (Tecpam).

Antigua, 1 ♂, 1 ♀; Nebaj, 1 ♂, 1 ♀; San Antonio, 1 ♂; Panajachel, 1 ♂ imm.; San Lucas, 1 ♀.

RANGE.—Extreme southern Mexico south in the highlands to northern Nicaragua.

This beautiful quail has been taken only in the drier parts of the central highlands to the east of the Pacific divide, at altitudes varying from 5000 to 6700 feet. A single male from Oaxaca and another from northern Nicaragua do not appear to differ appreciably. Dr. Friedmann writes me that there is an unrecorded specimen in the United States National Museum from Joyabaj, Quiché.

"A rather common species in most of the more open country above 4000 feet and up to 10,000, it being seen several times along the ridge between Chichicastenango and Totonicapam, at the last elevation. On the slopes of Volcan de Agua small flocks were flushed from the weeds in abandoned corn-fields. At Momostenango a flock was found in rather open pine forest. Common near Nebaj, where a few were taken. They lie well and have to be almost kicked out of the grass before taking wing; but once awing they are apt to fly for some distance and perhaps run after dropping to the ground, for I often failed to flush birds the second time, though well marked down. This partridge is easily shot over a dog, but after trying the sport with a dog of good blood, I concluded I would rather feed him on some other food and went home. The dog, however, could have eaten several more birds, had I been willing." (Anthony, MS.)

(17) **Dactylortyx thoracicus chiapensis** Nelson

Dactylortyx chiapensis NELSON, Proc. Biol. Soc. Wash., XII, 1898, pp. 66–68 (San Cristobal, Chiapas; Volcan de Santa Maria, Guatemala).

Dactylortyx thoracicus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1903, p. 308 (Volcan de Fuego, Quetzaltenango, Dueñas).

Tecpam, 2 ♂, 1 imm.; Quetzaltenango, 1 ♂.

RANGE.—Chiefly Subtropical Zone in the mountains from Jalisco and Vera Cruz to Salvador; the present race, Chiapas and Guatemala.

This little-known quail is a typical cloud-forest species of the Pacific cordillera, and most of the specimens have been taken from 7000 to 8500 feet. Salvin found it to be one of the commonest quail on the Volcan de Fuego, and shot most of his specimens on the ground, as the bird preferred to escape by sitting close or running, rather than taking wing. The immature bird is quite different from the adult in having a whitish throat, the chest, breast and sides a warm vinaceous, gradually passing to whitish on the abdomen. A few of the chest feathers have black bars.

This quail is one of the interesting cases of a Subtropical Zone species which has a representative at sea-level in the Yucatan Peninsula.

"A more or less common bird of the forests, seldom venturing into the open. Along the deep shaded trails in the rain forest of Volcan San Lucas one constantly finds where flocks of these quail have "dusted" in the damp leaves, leaving rounded depressions such as are made by barnyard fowls in the dry earth. The birds are so dark in color that they blend into the color scheme of the semi-dark forest and dead leaves, making it very difficult to see them until they take wing, whisk around the shoulder of the hill and are lost. Several flocks of ten or a dozen were seen above Tecpam, in the heavy oak and pine forest.

"At Finca Perla, two of these birds were kept in separate cages on different sides of the house. I was told that it was for the sake of their "song," which they would sing in the early morning, but that there would be no song, if the birds could see each other. I had often listened to the calls of this quail, from the edge of the forest, and wondered at its mellow richness, reminiscent of the flute-like call of the Plumbed Partridge of the Sierra Nevadas. I was not, however, expecting a duet, such as I witnessed several times at this place. In the early morning, when the calls were most frequent on the mountain sides, one of the cage birds would utter its invitation, "cua—cua—cua," at intervals of two or three seconds. Soon the second bird responded: "cua-kaka-wak—cua—kaka—wak"; while the other joined in perfectly in time and tone, "cua—cua—cua," both continuing for some twenty or thirty seconds and stopping in exact unison. It seemed hard to believe that two birds were calling, so perfect was the time and tone. I am unable to say whether the birds were of the same sex or not, the plumage was so worn and broken." (Anthony, MS.)

(18) **Odontophorus guttatus** (Gould)

Ortyx guttata Gould, P. Z. S., 1837, p. 79 (Bay of Honduras).

Odontophorus guttatus, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1903, p. 312 (Vera Paz, Dueñas, Volcan de Fuego, Volcan de Agua).

Secanquim, 1 ♂ (?), 1 ♀.

Range.—Humid Tropical and Subtropical Zones, from southern Mexico to western Panama (on the Caribbean slope).

I have seen all the specimens of this species in the Washington, New York, and Cambridge museums, and it does not appear to vary to any appreciable extent from Mexico to Panama, except in British Honduras, where a single male is strikingly grayer rather than browner throughout, and two females are distinctly paler below and a trifle grayer rather than buffier on the rump. The adult female differs from the male in having little or no rusty red in the crest, and the white ocelli of the underparts without a distinct black border. The *O. consobrinus* of Ridgway, the type of which I have examined, is an adult female and was described in the belief that the sexes of *O. guttatus* were alike.

This relatively common partridge is characteristic of heavy rain forest. In the northern part of its range it descends to lower levels, but from Nicaragua southward it is primarily characteristic of the cloud forest in the Subtropical Zone, and is replaced by *O. melanotis* Salvin in the Tropical Zone.

Order COLUMBIFORMES

Family **Columbidæ** Pigeons and Doves

(19) **Columba speciosa** Gmelin

Columba speciosa Gmelin, 'Syst. Nat.,' I, pt. 2, 1809, p. 783, (Cayenne); Salvin and Godman, 'Biol. Cent. Amer.,' III, 1902, p. 233 (Sakluk; Lake Peten).

Lepidoenas speciosa, Ridgway, 'Birds N. and Mid. Amer.,' pt. 7, 1916, p. 316.

Range.—Tropical Zone from Brazil and Guiana to southern Mexico.

This wide-ranging pigeon is characteristic, in Central America at least, of tropical rain forests at very low altitudes, and consequently has been found in Guatemala only in the Peten district. It is local and relatively uncommon north of western Panama. It is a typical illustration of a species which has penetrated into Central America from the south, in this case with no perceptible variation whatever.

(20) **Columba flavirostris flavirostris** Wagler

Columba flavirostris WAGLER, Isis, XXIV, 1831, p. 519 (Mexico); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1902, p. 235 (Escuintla, Retalhuleu, Volcan de Fuego, Zapote).

Chloroenas flavirostris flavirostris, RIDGWAY, *loc. cit.*, p. 320 (Naranjo, San José)

Hacienda California, near Ocos, 1 imm. (♂?).

RANGE.—Arizona and southern Texas to northern Nicaragua; a local race, southwards to northern Costa Rica.

The Red-billed Pigeon has a characteristic and familiar type of distribution. It is a Sonoran species, which ranges southward exclusively in the Arid Tropical Zone and consequently does not occur above 3500 feet. In Guatemala it is confined to the Pacific slope. Like many other species in Central America, it occurs on the Caribbean slope only in the Yucatan Peninsula, east of the rain-forest belt.

(21) **Columba rufina pallidicrissa** Chubb

Columba pallidicrissa CHUBB, Ibis, 1910, p. 60 (Costa Rica).

Columba rufina, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1902, p. 236 (Rio Dulce, Sayuchil, Cubilguitz); DEARBORN, 1907, p. 78 (Los Amates; crit.).

Chloroenas rufina pallidicrissa, RIDGWAY, *loc. cit.*, p. 305.

RANGE.—Humid Tropical Zone from Guiana and Amazonia to southeastern Mexico; the race, Central America and northwestern South America.

Another pigeon which is relatively uncommon north of Costa Rica. Its distribution is the same in principle as for *speciosa*, but there is some slight racial variation. Crosby and I saw several pairs near Puerto Barrios.

(22) **Columba fasciata fasciata** Say

Columba fasciata SAY, in Long's 'Exped. Rocky Mts.,' II, 1823, p. 10, note (Douglas Co., Colorado); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1902, p. 237 (Coban; Volcan de Fuego, Toliman); DEARBORN, 1907, p. 79 (Tecpam, 8400 feet).

Chloroenas fasciata fasciata, RIDGWAY, *loc. cit.*, p. 288.

Momostenango (6200 ft.), 1; Finca La Primavera, 30 miles southwest of Coban (3500 ft.), 1.

RANGE.—Western United States south to northern Nicaragua.

One of these females is quite indistinguishable from North American birds. The other is a darker, richer ruddy below than any other speci-

mens, and is distinctly a darker brown on the mantle and wings. It thus shows no approach whatever to the recently described *letonæ* Dickey and Van Rossem from Salvador.

The Band-tailed Pigeon lives in the pine and oak forest in the highlands of Guatemala from 3500 to 8400 feet. It is almost certainly of boreal origin, and its extension southward into Central America is almost coextensive with the limit of pine and oak woods. It furnishes consequently an excellent illustration of a species which can endure a very different climate, but requires similar ecological conditions.

"While this species seems to be resident in many parts of Guatemala, its presence is, to a great extent, governed by the food supply of the moment. At La Montañita I was told of the large flocks of this species that came to feed on the acorns in the season of plenty. A few were seen at Momostenango in January. They were not rare above Tecpam in July and August. In January a flock of forty to fifty came each night to roost in some large oaks, departing late the next morning to some feeding ground toward the west. Common at La Primavera in April." (Anthony, MS.)

(23) **Columba nigrirostris** Sclater

Columba nigrirostris SCLATER, P. Z. S., 1859, p. 390 (Oaxaca, Mexico); SALVIN, Ibis, 1866, p. 206 (hot region of Vera Paz, Choctum); DEARBORN, 1907, p. 79 (Puerto Barrios; Los Amates).

Œnœnas flavirostris, RIDGWAY, *loc. cit.*, p. 328.

Secanquim, 1 ♂; Finca Sepacuite, 1 ♀; Chimoxan, 1 ♂.

RANGE.—Humid Tropical Zone, Mexico to eastern Panama.

This pigeon is characteristic of hot tropical forests, and in Guatemala occurs only in Vera Paz, Peten and the Caribbean coastal strip. It is, however, common throughout its range, showing no signs of decreasing northward, and this fact can be correlated with its obvious specific distinctness from its closest allies in South America.

[*Columba subvinacea subvinacea* (Lawrence)

Chloroenus subvinacea LAWRENCE, Ann. Lyc. Nat. Hist. N. Y., IX, 1868, p. 135 (Dota, Costa Rica).

Œnœnas subvinacea subvinacea, RIDGWAY, *loc. cit.*, p. 327 (Guatemala, Puerto Barrios in range).

This pigeon is a Subtropical Zone species of Costa Rica and western Panama, and its occurrence at sea-level in eastern Guatemala would be extraordinary. I cannot help thinking that there is an error in locality or identification. Dr. Richmond has kindly written that there is a no specimen in the National Museum to support this record, and suspects some sort of clerical error. He thinks it "safe to treat the reference as a pure error."]

[*Ectopistes migratorius* (Linnæus)

SALVIN AND GODMAN ('Biol. Cent. Amer.,' III, 1902, p. 241) state that "we have reason to believe that *E. migratorius* wanders as far south as the table-lands near the city of Guatemala." They do not state, however, what these reasons are, and this cannot be regarded as a definite record.]

(24) **Zenaidura macroura carolinensis** (Linnæus)

Columba carolinensis LINNÆUS, 'Syst. Nat.,' I, 1766, p. 286 (Carolina).

Zenaidura carolinensis, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1902, p. 243 (San Martin de Quetzaltenango, Dueñas).

Zenaidura macroura, DEARBORN, 1907, p. 79 (Gualan to El Rancho).

La Montañita, 1 ♀.

RANGE.—North America, both races wintering south to Panama.

(25) **Zenaidura macroura marginella** (Woodhouse)

Ectopistes marginellus WOODHOUSE, Proc. Acad. Nat. Sci. Phila., VI, 1852, p. 104 (Oklahoma).

Zenaidura macroura marginella, RIDGWAY, *op. cit.*, p. 349 (El Rancho; Zapata).

La Montañita, 1 ♂.

The Mourning Dove is an abundant winter visitor to Guatemala, and is also resident according to Salvin and Godman. Both subspecies probably occur in numbers, and the references under *carolinensis* apply to the species only. Mr. Anthony records the arrival of the species in flocks at La Montañita October 20, and states that it is one of the standard game birds of the country.

(26) **Melopelia asiatica asiatica** (Linnæus)

Columba asiatica LINNÆUS, 'Syst. Nat.,' 10th Ed., I, 1758, p. 163 ("East Indies" =Jamaica?).

Melopelia leucoptera, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1902, p. 246 (San José, Sololá, Volcan de Agua, Dueñas, San Geronimo); DEARBORN, 1907, p. 79 (El Rancho, Tecpam).

Melopelia asiatica asiatica, RIDGWAY, *loc. cit.*, pp. 378–380 (distr.; crit.; syn.).

Sacapulas, 1 ♂, 1 ♀; Antigua, 1 ♂; Chanquejelve, 1 ♀; Panajachel, 1 ♀; Progreso, 1 ♀; Hacienda California, 1 ♀.

RANGE.—Greater Antilles, Old Providence Island, and southern United States to Nicaragua; a closely related race in northwestern Costa Rica, reappearing at Agua Dulce, western Panama. In Central America characteristic of the Arid Tropical Zone.

The White-winged Dove obviously has a relatively ancient origin, as is evidenced by its discontinuous distribution. Nevertheless, it occurs wherever the climatic and ecological conditions it requires are found, and a closely related species, *meloda*, appears in the Equatorial Arid Fauna of South America from western Ecuador to northern Chile. In Guatemala this dove consequently occurs on the Pacific slope and in great abundance in the arid interior valleys of the Rio Negro and Rio Motagua, wandering to higher altitudes in the cordillera.

(27) **Scardafella inca** (Lesson)

Chamaepelia inca Lesson, 'Descr. Mam. et Ois.,' 1847, p. 211 (Mexico).

Scardafella inca, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1902, p. 248 (San Geronimo, Choctum, Dueñas, Peten); Dearborn, 1907, p. 80 (El Rancho; Gualan); Ridgway, *loc. cit.*, pp. 390–392 (San José, etc.).

San José, 1 ♂, 1 ♀; Ocos, 2 ♂; Progreso, 1 ♂, 2(?); Finca La Primavera, 1 ♂, 1 ♀; Hacienda California, 1 ♂; Huehuetenango, 1 ♂; Finca El Espino, 1 ♀; San Antonio, 1 ♂.

Range.—Southern United States to Nicaragua in the Lower Sonoran and Arid Tropical Zones.

Found abundantly throughout the drier open country of Guatemala up to about 5000 feet (Anthony, MS.). It is one of the very few species, characteristic of the Arid Tropical Zone, which has failed o reach northwestern Costa Rica.[1] A closely related species occurs in the arid littoral of Colombia and Venezuela, reappearing in eastern Brazil south of the Amazon. It is very interesting to note that its representative in Peru and Chile is the generically distinct *Gymnopelia*, and the only other near relative is the Asian and Australian *Geopelia*. This distribution can be profitably contrasted with that of *Melopelia*. The inference is reasonable that *Scardafella* is an older stock, the modern descendants of which differ far more among themselves than the isolated stocks of *Melopelia*. While it might be argued that this contrast could be produced by the greater plasticity of *Scardafella*, there is no evidence to support it. The ranges in Mexico and Central America of *S. inca* and *M. asiatica* are practically the same, but the former shows no racial variation, and the latter is easily separable into three subspecies.

(28) **Columbigallina passerina pallescens** (Baird)

Chamæpelia var. *pallescens* Baird, Proc. Acad. Nat. Sci. Phila., 1859, p. 305 (Cape San Lucas).

Chamæpelia passerina, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1902, p. 251 (Dueñas, San Geronimo, Panajachel, Santa Maria near Quetzaltenango).

[1]Recently found there.

Chæmepelia passerina pallescens, DEARBORN, 1907, p. 80 (Gualan, Lake Atitlan); TODD, Ann. Carnegie Mus., VIII, 1913, pp. 534–540 (crit.); RIDGWAY, *loc. cit.*, p. 402.

Chæmepelia passerina neglecta, TODD (*nec* Carriker), *loc. cit.*, p. 596 (Dueñas, Toyabaj).

Panajachel, 1 ♂, 1 ♀; San Lucas, 2 ♂, 1 ♀; Antigua, 3 ♂, 2 ♀; Sacapulas, 1 ♂, 1 ♀, 1 nestling.

RANGE.—The species, West Indies, southern United States to Costa Rica, reappearing in South America to Paraguay; the race, Texas to Guatemala.

This excellent and representative series enables us, for the first time, to determine definitely what the Ground Dove in Guatemala really is. It is impossible to improve on Todd's critique cited above, and the two hundred specimens I have examined confirm his remarks in every particular. From Brownsville, Texas, south through eastern Mexico to Guatemala and British Honduras, a Ground Dove occurs which is not *neglecta*, but is by no means so pale as typical *pallescens* from Cape San Lucas. The males average almost exactly intermediate between topotypes of *pallescens* and *neglecta*, the females, however, are markedly nearer *pallescens*. There is a chance here for an enthusiast to describe a very poor intermediate race, but I agree with Todd that it is much simpler to call all these birds *pallescens* varying towards *neglecta*.

Turning now to the Guatemalan specimens in detail, the variation in the series is considerable. The great majority run almost exactly like a comparable series from Tamaulipas, but a male from Panajachel is almost as pale as extremes from Cape San Lucas. There is not a single specimen, however, which could be regarded as nearer *neglecta* than Tamaulipas specimens of *pallescens*. Todd's allocation of *neglecta* to Guatemala was based only on two old skins in the National Museum. The excellent series now available shows conclusively that on the whole the Guatemalan bird is the non-typical form of *pallescens*.

This little Gound Dove is one of the most widely distributed of New World land-birds, and its absence from southwestern Costa Rica and the whole of Panama is explicable only in terms of competition with the species *minuta*, as explained beyond. It, of course, does not occur in forested areas, and is consequently lacking on most of the Caribbean slope of Central America. In Guatemala it has been collected only in the unforested country on the eastern side of the cordillera east to the rain-forest belt. Its absence from the Pacific coast region may be due again to competition with *minuta*.

(29) **Columbigallina minuta interrupta** (Griscom)

Chæmepelia minuta interrupta GRISCOM, Amer. Mus. Nov., No. 379, 1929, p. 4 (Secanquim, Guatemala).

Chamæpelia minuta, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1902, p. 253 (Retalhuleu).

Chæmepelia minuta elæodes, RIDGWAY, *loc. cit.*, p. 246 (Peten, Los Amates, Yzabal, Paraiso, Virginia Plantation, near Puerto Barrios).

Secanquim, 1 ♂, 1 ♀; Chimoxan, 2 ♂, 1 ♀; Finca Chamá, 1 ♂; Chipoc, 1 ♀.

RANGE.—Tropical Zone, chiefly forested country: the species, southern Mexico to eastern South America generally; the race, southern Mexico, Guatemala, and British Honduras, rare and local.

The interrupted distribution of this species is worth noting in some detail. The typical form occupies the greater part of eastern South America and is also common in western Peru; the distinct species *buckleyi* represents it in west Ecuador, where *passerina* is absent; the race *elæodes* Todd occurs in a limited area in west central Colombia, and reappears in abundance from southwestern Costa Rica to the Canal Zone, a region in which *passerina* is again absent; the race *interrupta* occurs in the lowland forests of Guatemala (both slopes) and British Honduras, where *passerina* is also absent. There is here an interesting problem for the field naturalist. In Central America, at least, *passerina* and *rufipennis* live together in harmony, *rufipennis* and *minuta* occur together, but *passerina* and *minuta* never occur together.

(30) **Columbigallina rufipennis rufipennis** (Bonaparte)

Chamæpelia rufipennis BONAPARTE, Compt. Rend., XL, 1855, p. 22 (Cartagena, Colombia); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1902, p. 254 (Peten, Dueñas, Paraiso, Retalhuleu).

Chæmepelia rufipennis, DEARBORN, 1907, p. 80 (Los Amates, San José); RIDGWAY, *loc. cit.*, p. 424.

Pantaleon, Escuintla, 2 ♂; Finca El Cipres, 2 ♂; Hacienda California, 1 ♂; Ocos, 1 ♂, 1 ♀; San José, 1 ♂; Chimoxan, 1 ♂, 2 ♀.

RANGE.—Tropical Zone: the typical form, southeastern Mexico to Colombia and Guiana; a closely allied subspecies in southwestern Mexico.

All the specimens listed above from the Pacific slope show a strong approach to the pale *eluta* Bangs of southwestern Mexico. The birds from the Coban highlands do not differ from typical Colombian specimens.

The Ruddy Ground Dove occurs together with *passerina*, but is usually less numerous individually. It penetrates even into clearings in the rain forest, and in Central America at least is a little more adaptable than *passerina*.

(31) **Claravis pretiosa pretiosa** (Ferrari-Perez)

Peristera pretiosa Ferrari-Perez, Proc. U. S. Nat. Mus., IX, 1886, p. 175, (Jalapa, Vera Cruz).

Peristera cinerea, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1902, p. 255 (sources of the Rio de la Pasion, Yzabal, Choctum).

Claravis pretiosa, Dearborn, 1907, p. 79 (Los Amates); Ridgway, *loc. cit.*, p. 431.

Finca Chamá, 3 ♂; Chimoxan, 1 ♀.

Range.—Tropical Zone from eastern Mexico to Peru and Brazil: a local race in the Cauca Valley, Colombia.

A species of heavy forest exclusively. It has obviously penetrated into Central America from the south, is decidedly less common north of Costa Rica, and shows very little variation throughout its extensive range. In Guatemala it is found only in the Caribbean rain forest.

(32) **Claravis mondetoura salvini** Griscom

Claravis mondetoura salvini Griscom, Occ. Papers Boston Soc. Nat. Hist., V, 1930, p. 289 (Volcan San Lucas, Guatemala).

Peristera mondetoura, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1902, 256 (Calderas, Volcan de Fuego).

Claravis mondetoura, Ridgway, *loc. cit.*, p. 435.

San Lucas, 1 ♂.

Range.—A very rare species, known locally from Venezuela and eastern Peru to southern Mexico, in Central America at least exclusively in the Subtropical Zone; the race, southern Mexico and Guatemala.

The great rarity and discontinuous distribution of this lovely pigeon indicate a vanishing species which has not succeeded in maintaining a strong foothold in any of the localities where it survives. It is undoubtedly of South American origin and is an excellent illustration of the Central American extension of the Subtropical Zone (cf. Chapman, 'Distr. Bird-Life Colombia,' 1917, pp. 151–159; cf. also introduction, where the principle of the "Panama Fault" is extended to Guatemala).

(33) **Leptotila verreauxi fulviventris** Lawrence

Leptoptila fulviventris LAWRENCE, Ann. N. Y. Acad. Sci., II, No. 9, 1882, p. 287 (Yucatan).

Leptoptila brachyptera (part), SALVIN AND GODMAN, 'Biol. Amer. Cent.,' III, 1902, p. 258 (San Geronimo, Dueñas, Barranco Hondo, Toliman, Panajachel).

Leptotila fulviventris brachyptera (part), DEARBORN, 1907, p. 79 (Los Amates, Gualan, Lake Amatitlan, Atitlan, Tecpam); RIDGWAY, *loc. cit.*, p. 453.

Chichicastenango, 1 ♂; Finca La Primavera, 2 ♂, 1 ♀; Sacapulas, 2 ♀, Progreso, 1 ♀.

RANGE.—The species, southern Texas to Amazonia; the race, southern Mexico, Yucatan, and eastern Guatemala.

Specimens from Alta Vera Paz are clearly typical *fulviventris*, and series from the Pacific coast are clearly *bangsi*, as discussed beyond. Birds from the eastern slopes of the Pacific cordillera are variously intermediate. Nearly all the locality records cited above are from this region, and their proper subspecific allocation is questionable, in default of specimens.

(34) **Leptotila verreauxi bangsi** Dickey and Van Rossem

Leptotila fulviventris bangsi DICKEY AND VAN ROSSEM, Proc. Biol. Soc. Wash., XXXIX, 1926, p. 110 (Volcan San Miguel, El Salvador).

Leptoptila brachyptera (part), SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1902, p. 258 (Retalhuleu and Pacific coast).

Leptotila fulviventris brachyptera (part), DEARBORN, 1907, p. 79 (San José, Patulul).

Ocos, 1 ♂; Hacienda California, 1 ♂, 1 ♀; La Carolina, 1 ♀; Finca El Cipres, 2 ♀.

RANGE.—Pacific coast region of Guatemala, Salvador and Nicaragua.

Having been able to examine several hundred specimens representing the entire range of this dove, there is no doubt that *bangsi* is an excellent race. Dickey and Van Rossem are unquestionably correct in referring the bird of northern Nicaragua to *bangsi*, from which country I have seen a good series. The specimens from Guatemala listed above are quite indistinguishable from four specimens from Salvador, and easily separable from a multitude of *angelica* from Texas and northern Mexico. My study confirms the validity of *bangsi* in every particular, and I have nothing to add to the excellent diagnosis of Messrs. Dickey and Van Rossem. I shall discuss the relationship of this bird to *verreauxi*, in another connection.

The Ground Dove is primarily a species of the Arid Tropical Zone, but ranges into the Subtropical Zone, wherever the open scrubby country occurs, which its habits require. Indeed it has been recorded as high as 8500 feet. Throughout its range it is conspicuously common, and it is one of the few ground birds of relatively shy and retiring habits, which is never overlooked by the inexperienced collector.

While a study of Guatemalan birds is not the place to discuss its relationships with *L. verreauxi* of South and southern Central America, suffice it here to say that these two species intergrade in Nicaragua, and the races of *fulviventris* are really nothing but the northernmost outposts of the widely spread and highly variable *verreauxi*.

(35) **Leptotila plumbeiceps plumbeiceps** Sclater and Salvin

Leptoptila plumbeiceps Sclater and Salvin, P. Z. S., 1868, p. 59 (Vera Paz, Guatemala); Salvin and Godman, 'Biol. Cent. Amer.,' III, 1902, p. 262 (Choctum).
Leptotila plumbeiceps, Dearborn, 1907, p. 80 (Los Amates); Ridgway, *loc. cit.*, p. 462.

Range.—Tropical rain-forest areas from southern Mexico to northern Colombia, everywhere rare and local; three races in southern Central America.

This dove belongs to a group of species in the genus which are very distinct from each other and widely distributed. Its nearest relative is the variable *L. rufaxilla* of Amazonia, of which it is perhaps the northern representative. Certainly the proper selection of color variations among the subspecies of *rufaxilla* would make an excellent *plumbeiceps*. Its relations to *L. cassini*, a very distinct species, are interesting. The two birds occur together in heavy rain forest, and I have collected them only fifty yards apart. They illustrate a common principle in the tropics, where distinct species compete in exactly the same habitat. One or more are extraordinarily scarce, others will be common.

(36) **Leptotila cassini cerviniventris** Sclater and Salvin

Leptoptila cerviniventris Sclater and Salvin, P. Z. S., 1868, p. 59 (Vera Paz, Guatemala); Salvin and Godman, 'Biol. Cent. Amer.,' III, 1902, p. 263 (Choctum).
Leptotila cassini cerviniventris, Ridgway, *loc. cit.*, p. 458.

Secanquim, 3 ♀; Finca Chamá, 1 ♀.

Range.—Humid Tropical Zone: the species, Guatemala to northern Colombia; the race, Guatemala to western Panama.

A very common Ground Dove in southern Central America, less so in the Caribbean forest of Guatemala at the extreme northern limit of its range. It belongs to a group of very distinct species in the genus, with widely scattered distributions, and any conclusions regarding the origin of *cassini* would be pure speculation.

(37) **Oreopeleia montana** (Linnæus)

Columba montana LINNÆUS, 'Syst. Nat.,' 10th Ed., I, 1758, p. 163 (Jamaica).

Geotrygon montana, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1902, p. 266 (Vera Paz, Choctum, Savana Grande).

Oreopeleia montana, RIDGWAY, *loc. cit.*, p. 478.

Secanquim, 1 ♂.

RANGE.—Tropical Zone, Brazil to southern Mexico and the West Indies.

In Central America the Ruddy Quail Dove is uncommon, and found only in heavy forest. It occurs locally on the Pacific coast of Guatemala, as well as in the Caribbean rain forest.

This bird is an excellent illustration of the dangers of speculation in zoögeography. At first sight it might seem an analogous case with *Columba speciosa*, and we would call it another instance where a widely ranging South American bird has penetrated relatively recently into Central America, without any racial variation. The following facts, however, impugn the validity of this inference: (1) its occurrence in the Greater Antilles is evidence of considerable antiquity; (2) its only two close relatives in the genus are specifically distinct and occur in the Lesser Antilles; (3) its amazing lack of variation might be proof of the STABILITY of an ancient stock; (4) it does not decrease northward in Central America, and is recorded as common only in Cuba and Jamaica (formerly). It is consequently entirely reasonable to infer that its present distribution was attained long ago, and that it has altered only in response to prolonged and extreme insulation.

(38) **Oreopelia albifacies anthonyi** Griscom

Oreopeleia albifacies anthonyi GRISCOM, Amer. Mus. Novit., No. 379, 1929, p. 4 (San Lucas, Guatemala).

Geotrygon albifacies, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1902, p. 269 (forests of Vera Paz, Choctum, Volcan de Fuego, Savana Grande).

Oreopeleia albifacies albifacies, RIDGWAY, *loc. cit.*, p. 493.

San Lucas, 1 ♀.

RANGE.—Subtropical Zone: southern Mexico to northern Nicaragua; very variable, the present race definitely only in the Pacific cordillera of Guatemala.

Two specimens definitely from the Pacific cordillera of Guatemala exhibit the characters of this recently proposed form. Two old trade-skins from "Guatemala," which I saw in New York some years ago, were not satisfactorily separable from Mexican specimens. The chances are that they came from Vera Paz, via Coban, and it may well be that typical *albifacies* occurs there.

Mr. Anthony writes that this Quail Dove was not uncommon in the rain forest above San Lucas.

Order RALLIFORMES

Family **Rallidæ**. Rails, Gallinules, Coots

(39) **Rallus virginianus virginianus** Linnæus[1]

Rallus virginianus Linnæus, 'Syst. Nat.,' I, 1766, p. 263 (Virginia); Salvin and Godman, 'Biol. Cent. Amer.,' III, 1903, p. 317 (Dueñas, Antigua, Ciudad Vieja).

Range.—North America and locally in the Andes to Magellan.

The Virginia Rail has been taken in Guatemala only in September and October, by Salvin. Whether these were winter visitants or locally bred birds remains to be determined.

(40) **Aramides albiventris albiventris** Lawrence

Aramides albiventris Lawrence, Proc. Acad. Nat. Sci. Phila., 1867, p. 234 (Guatemala); Salvin and Godman, 'Biol. Cent. Amer.,' III, 1903, p. 319 (Choctum, mouth of Rio Samalá).

Range.—Tropical Zone; eastern Mexico to eastern Costa Rica, locally on the Pacific slope; the race, eastern Guatemala, Yucatan, and British Honduras.

The Wood Rails of northern Central America are specifically distinct from *cayannensis*, but obviously represent it, and are derived from the south. Like many other rails their habitat requirements render them very local. There are consequently numerous minor variations, which are, however, surprisingly constant, and there has been some discussion as to whether they are species or subspecies.

(41) **Aramides albiventris vanrossemi** Dickey

Aramides vanrossemi Dickey, Condor, XXXI, 1929, p. 33 (Barra de Santiago, Ahuachapan, Salvador).

Aramides albiventris, Sharpe, 'Cat. Birds Brit. Mus.,' XXIII, p. 59 (Retalhuleu); Lantz, 1899, p. 219 (San José).

[1]Now *R. limicola* Vieillot.

Aramides albiventris albiventris, BANGS, Amer. Nat., XLI, 1907, p. 184 (Chiapam, Guatemala).

Ocos, 2♂, 4♀.

RANGE.—Tropical Zone: Pacific coast of Guatemala and Salvador.

Thanks to the kindness of Messrs. Dickey and Van Rossem I have before me three topotypes of this rail from Salvador. Dickey's suspicion that it ranged northward to the Pacific coast of Guatemala is amply confirmed, as six specimens do not differ in the slightest detail. It follows, of course, that they show no approach to *mexicanus*, but this is not surprising, as the latter is confined to the Caribbean slope of Mexico, so far as known. *Aramides* has been recorded from Oaxaca, but these birds have never been critically determined, and are more likely to be *vanrossemi*. Whether these rails are treated as species or subspecies is, at present, a matter of opinion rather than fact. In 1921, Miller and I treated them as species on the ground that there were no known intergrades. I have since receded from this artificial position, and prefer to regard close representative forms as subspecies, even where certain types of intergradation cannot conceivably occur.

"Along the Pacific side in the mangrove jungles that border the many esteros and in the fresh-water marshes near the coast, this species is quite common, its call being heard at all times of the day and often during the night. At Ocos several were taken in the mangroves, where they were quite abundant." (Anthony, MS.)

(42) **Amaurolimnas concolor guatemalensis** (Lawrence)

Corethrura guatemalensis LAWRENCE, 1863, Proc. Acad. Nat. Sci., Phila., p. 106 (Guatemala).

Amaurolimnas concolor, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1903, p. 321 (Guatemala).

RANGE.—Tropical Zone: Jamaica, Guatemala to west Ecuador, Guiana, and Brazil, very rare and local; the race, Central America to west Ecuador.

This rail is obviously a relict species, and nothing is known of its habits. Typical *concolor* comes from Jamaica, and Central American birds are much smaller, more olive above and darker below. There is scarcely any material in America, however, from Guiana and Brazil, and the typical form is long since extinct in Jamaica, and is one of the rarest birds in the world. Birds from Amazonia might be *concolor*, or *guatemalensis*, or undescribed, but we shall possibly never know.

(43) **Porzana carolina** (Linnæus)

Rallus carolinus Linnæus, 'Syst. Nat.,' I, 1758, p. 153 (Hudson Bay).

Porzana carolina, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1903, p. 322 (Vera Paz, Coban, Dueñas); Dearborn, 1907, p. 75 (Amatitlan, Atitlan).

Range.—North America, south in winter to West Indies and Colombia.

Apparently a regular winter visitor to the few favorable localities in Guatemala. There is no record of seasonal occurrence.

(44) **Creciscus jamaicensis** (Gmelin)

Rallus jamaicensis Gmelin, 'Syst. Nat.,' I, 1789, p. 718 (Jamaica).

Creciscus jamaicensis, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1903, p. 323 (Dueñas).

Range.—Jamaica and United States, rare and local; three races have been proposed.

Status unknown; perhaps a winter visitant.

(45) **Creciscus ruber ruber** (Sclater and Salvin)

Corethrura rubra Sclater and Salvin, Ibis, 1860, p. 277 (Guatemala).

Creciscus ruber, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1903, p. 326 (Vera Paz, Coban, Choctum, Dueñas).

Secanquim, 1 ♂.

Range.—Tropical Zone: from eastern Mexico to north central Nicaragua, very local; the race, Guatemala, British Honduras, and perhaps Cozumel Island.

"Not uncommon on the Caribbean side of Guatemala, but very difficult to secure. At Chamá its call was to be heard every day, but hiding in the maze of weeds and brush, the natural home of the species, it was almost impossible to gain sight of the birds. One was seen as it "toe-nailed" its way up a dead corn-stalk, but, spying me, it dropped to the shelter of the grass and was not found again. It looked somewhat as if the bird was engaged in constructing a nest in a hollow formed by several dead leaves hanging from the corn but, if so, it had not reached a point where I could be sure. At Finca Concepcion a nest with two fresh eggs was found in the grass on a ridge, high above the river. The nest of dead leaves, a mere mat, damp and water-soaked, was typical of the genus. After flushing, the bird refused to return to the nest, though I spent an hour or more stalking it, and I failed to obtain the skin, so much to be desired. At Secanquim, a bird was shot from a bush, far above the river, on a dry hillside. Another was later seen near the same place. Not uncommon at Chimoxan, where it was found in the rain forest. One noted at Quirigua." (Anthony, MS.)

(46) **Gallinula chloropus cachinnans** Bangs

Gallinula chloropus cachinnans Bangs, Proc. N. E. Zoöl. Club, V, 1915, p. 96 (Arbuckle Creek, DeSoto Co., Florida).

Gallinula galeata, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1903, p. 327 (Dueñas); Dearborn, 1907, p. 75 (Amatitlan).

Range.—The species, locally throughout the New World, from Canada to Argentina.

Florida gallinules from the United States winter south to Panama, but also breed locally in the tropics. The status of the bird in Guatemala remains to be determined.

(47) **Ionornis martinica** (Linnæus)

Fulica martinica Linnæus, 'Syst. Nat.,' I, 1766, p. 259, (Martinique, W. I.).

Porphyriola martinica, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1903, p. 328 (lagoons near Lake Peten, Vera Paz).

Range.—Southern United States to Brazil; very local.

(48) **Fulica americana americana** Gmelin

Fulica americana Gmelin, 'Syst. Nat.,' I, 1789, p. 704 (North America); Salvin and Godman, 'Biol. Cent. Amer.,' III, 1903, p. 330 (Lake Peten, Lake Dueñas, Coban); Dearborn, 1907, p. 75 (Amatitlan, Atitlan).

San Lucas, 1 ♂, 1 ♀, 1(?), collected October 31, 1926.

Range.—North America, wintering south to western Panama, but breeding locally in the tropics.

Crosby and I found the coot breeding commonly on Lake Atitlan in August, 1930. I collected a breeding female, and saw two broods of downy chicks.

"Abundant as a winter resident, on all the larger lakes. At Lake Atitlan it first appeared October 20 and at once became abundant. It is only the more shallow shores along the southeast end and near the town of Atitlan, at the west end of the lake, that much feeding ground can be found to fill the requirements of this species. Here, large flocks may be seen until the spring migration in March or early April." (Anthony, MS.)

FAMILY **HELIORNITHIDÆ**. FINFEET

(49) **Heliornis fulica** (Boddaert)

Colymbus fulica BODDAERT, 'Tabl. Pl. Enl.,' 1783, p. 54 (Cayenne).

Heliornis fulica, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1903, p. 331 (Santana Mixtan, Chiapam); LANTZ, 1899, p. 219 (Puerto Barrios).

RANGE.—Tropical Zone: from southern Mexico to Brazil.

An exceedingly local species in Central America.

ORDER PODICIPEDIFORMES

FAMILY **PODICIPEDIDÆ**. GREBES

(50) **Colymbus nigricollis californicus** (Heerman)

Podiceps californicus HEERMAN, Proc. Acad. Nat. Sci. Phila., 1854, p. 179 (California).

Podiceps californicus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1904, p. 442 (Atitlan, Dueñas, Cubulco, Vera Paz).

Colymbus nigricollis californicus, DEARBORN, 1907, p. 74 (Atitlan, Amatitlan).

San Lucas, 1 ♂ (?), October 31, 1926.

RANGE.—Western North America; south in winter to Guatemala.

Reported as a common winter visitant, remaining until March 20 at least.

(51) **Colymbus dominicus brachypterus** Chapman

Colymbus dominicus brachypterus CHAPMAN, Bull. Amer. Mus. Nat. Hist., XII, 1899, p. 256 (Lomita Ranch, Lower Rio Grande, Texas); DEARBORN, 1907, p. 73 (Atitlan).

Podicipes dominicus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1904, p. 443 (Dueñas, Retalhuleu, Coban).

San Lucas, 1 ♂, 1 downy young; Hacienda California, 1 ♀, 1 downy young.

RANGE.—West Indies and Texas to Argentina; the race, Texas to Panama.

(52) **Podilymbus podiceps** subspecies

Colymbus podiceps LINNÆUS, 'Syst. Nat.,' I, 1758, p. 136 (Carolina).

Podilymbus podicipes, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1904, p. 433 (Lake Peten, Lake Dueñas).

RANGE.—The species, locally chiefly in temperate parts of the New World; the typical race, North America, south in winter to western Panama; a West Indian race is also reported in southern Mexico.

The typical North American bird undoubtedly occurs in winter, but I have no specimens, and these now require critical determination. The specimens recorded by Salvin and Godman from Lake Atitlan and commented upon by Grant and Godman are the next species. A Pied-billed Grebe breeds on the Lake of Dueñas, and apparently it is not *gigas*, judging again by the comments of the authors cited above. It might be *antillarum* Bangs, which Wetmore records as breeding in southern Mexico.

(53) **Podilymbus gigas** Griscom

Podilymbus gigas Griscom, Amer. Mus. Novit., No. 379, 1929, p. 5 (Panajachel, Lake Atitlan, Guatemala).

Podilymbus podicipes, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1904, p. 445 (as to Lake Atitlan specimens; crit.).

Panajachel, 3 ♀; also 2 ♂, 1 ♀ (M. C. Z.).

Range.—Known only from Lake Atitlan, altitude 5300 feet, and there confined to a few reed-beds.

This remarkable giant form is a very interesting illustration of variation correlated with isolation. Pied-billed Grebes occur locally in parts of South America, and they all differ from North American birds in having slightly longer, thicker bills, and darker underparts. These differences are carried to a remarkable extreme in *gigas*, which is no more isolated than many another colony of this grebe, but these and other mutations have become enormously developed and dominant, due to generations of in-breeding.

Crosby and I payed special attention to this grebe during nine days spent on Lake Atitlan. There are perhaps one hundred pairs on the lake. The bird is exceedingly difficult to secure, as the reed-beds grow in very deep water, and usually cannot be reached from shore by wading (Fig. 10.) It spends most of the day out in the lake, far from shore, and cannot be approached within gun-shot from a boat. Its extreme wariness is due to its being assiduously hunted by the natives. At a distance, the white bill and the mostly black head and neck make it appear like a coot, and we were much surprised to discover that half the birds at the southern end of the lake were actually coots, which had previously been recorded as a winter visitant only.

Order LARIFORMES

Family **Laridæ**. Terns, Skimmers, Gulls

(54) **Chlidonias nigra surinamensis** (Gmelin)

Sterna surinamensis Gmelin, 'Syst. Nat.,' I, 1789, p. 604 (Surinam).

Hydrochelidon surinamensis, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1903, p. 399 (Coban).

Hydrochelidon nigra surinamensis, Ridgway, 'Birds N. and Mid. Amer.,' pt. 8, 1919, p. 532.

Ocos, 1 ♀ (?), October 18.

Range.—Northern United States and southern Canada, wintering in South America, a transient visitant in Central American waters.

Common along the estero at Ocos, and usually a small flock might be seen at the mouth of the river (Anthony).

Crosby and I found hundreds in the bay off Puerto Barrios, August 12, 1930.

(55) **Gelochelidon nilotica aranea** (Wilson)

Sterna aranea Wilson, 'Amer. Orn.,' VIII, 1814, p. 6 (Cape May, N. J.).

Gelochelidon anglica, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1903, p. 400 (Chiapam Lagoon, Pacific coast).

Gelochelidon nilotica, Ridgway, *loc. cit.*, p. 479.

Range.—Nearly cosmopolitan; the race breeding locally in eastern United States and perhaps southward, wintering south to Patagonia.

Several seen near Puerto Barrios August 21, 1930 (Crosby and Griscom).

(56) **Sterna maxima maxima** Boddaert

Sterna maxima Boddaert, 'Tabl. Pl. Enl.,' 1783, p. 58 (Cayenne); Salvin and Godman, 'Biol. Cent. Amer.,' III, 1903, p. 406 (both coasts, Chiapam).

Thalasseus maximus, Ridgway, *loc. cit.*, p. 467.

Range.—Tropical coasts north to Virginia.

(57) **Sterna sandvicensis acuflavida** Cabot

Sterna sandvichensis acuflavida Cabot, Proc. Bost. Soc. N. H., II, 1847, p. 257 (Tancah, Yucatan).

Sterna cantiaca, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1903, p. 405 (both coasts, Chiapam).

Thalasseus sandvicensis acuflavidus, Ridgway, *loc. cit.*, p. 476.

Range.—Nearly cosmopolitan; the race, locally in United States; south in winter to West Indies and Central America.

Fairly common in the bay and along the coast near Puerto Barrios, August 21, 1930 (Crosby and Griscom).

(58) **Sterna forsteri** Nuttall

Sterna forsteri NUTTALL, 'Man. Orn.,' II, 1834, p. 274 (Saskatchewan River); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1903, p. 402 (Lake of Dueñas); RIDGWAY, *loc. cit.*, p. 490.

RANGE.—Breeds in North America, south in winter to South America.

(59) **Sterna hirundo** Linnæus

Sterna hirundo LINNÆUS, 'Syst. Nat.,' I, 1758, p. 137 (Sweden); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1903, p. 403 (San José); RIDGWAY, *loc. cit.*, p. 493.

RANGE.—Breeds in the northern hemisphere; winters south to the southern hemisphere.

At least one seen off the coast near Puerto Barrios, August 21, 1930 (Crosby and Griscom).

(60) **Sterna antillarum antillarum** (Lesson)

Sternula antillarum LESSON, 'Oeuvres compl. Buffon,' XX, 1847, p. 256 (Guadeloupe, Lesser Antilles).

RANGE.—Eastern United States to Venezuela and Brazil.

A pair of Least Terns were unmistakable among a flock of various species on a sand-bar at the mouth of a river near Puerto Barrios on August 21, 1930 (Crosby and Griscom). All five species were closely approached in a motor boat, far too near to use glasses.

(61) **Sterna antillarum browni** Mearns

Sterna antillarum browni MEARNS, Proc. Biol. Soc. Wash., XXIX, 1916, p. 71 (San Diego Co., California).

Sterna antillarum, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1903, p. 410 (Pacific coast).

Sternula antillarum browni, RIDGWAY, *loc. cit.*, p. 525.

RANGE.—Southern United States to Venezuela; the race, Pacific coast from California to Guatemala.

Anthony secured no specimens but reports Least Terns as common at Champerico, September 10, and at Ocos the last part of that month.

(62) **Anous stolidus ridgwayi** Anthony

Anous stolidus ridgwayi ANTHONY, Auk, 1898, p. 36 (Socorro Isl., off west Mexico); RIDGWAY, *loc. cit.*, p. 550.

Anous pileatus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1903, p. 413 (Pacific coast).

RANGE.—The species, tropical seas of the world; the race, islands and coasts of Pacific from west Mexico to Cocos Island.

(63) **Rynchops nigra** subspecies

Rhynchops nigra, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1903, p. 417 (Acapam, Pacific coast).

RANGE.—New Jersey to Argentina; the races in some confusion.

The skimmers of the New World are badly in need of revision, and proper material is still lacking. Typical *nigra* with white axillars, under tail-coverts, etc., gradually passes into *cinerascens* Spix of South America, in which these parts are brownish gray. An intermediate form, *intercedens* Saunders, was described from southern Brazil, Paraguay, and Argentina, where *cinerascens* is common, and redescribed as *intermedia* Rendahl from eastern Nicaragua. Specimens from the Pacific coast of Mexico and Guatemala are apparently intermediate also. This form thus has a preposterous distribution, and a particularly dark bird from Cozumel Island has been recorded as *cinerascens*, as an accidental visitant! The conservative course would be to recognize two forms only.

(64) **Larus pipixcan** Wagler

Larus pipixcan WAGLER, Isis, 1831, p. 151 (Mexico).

Larus franklini, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1903, p. 420 (Champerico, Chiapam).

Chroicocephalus franklinii, RIDGWAY, *loc. cit.*, p. 641.

RANGE.—Interior of North America, south in winter to Chile; in Central America chiefly as a transient on the Pacific coast.

(65) **Larus atricilla** Linnæus

Larus atricilla LINNÆUS, 'Syst. Nat.,' I, 1758, p. 136 (Bahamas); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1903, p. 421 (both coasts, Chiapam, Champerico).

Chroicocephalus atricilla, RIDGWAY, *loc. cit.*, p. 636.

RANGE.—Eastern United States, south to Peru and Brazil in winter.

An abundant winter visitant, which has been taken in full breeding plumage on the Atlantic coast. Several were seen in the harbor of Puerto Barrios, August 21, 1930 (Crosby and Griscom).

(66) **Larus heermanni** Cassin

Larus heermanni CASSIN, Proc. Acad. Nat. Sci. Phila., VI, 1852, p. 187 (San Diego, California); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1903, p. 422 (Chiapam, San José).

Blasipus heermanni, RIDGWAY, *loc. cit.*, p. 654.

RANGE.—Pacific coast, from Canada south to Guatemala in winter.

[*Larus occidentalis* Audubon

The Western Gull has occurred in winter as far as Tepic. Boucard, 1878, records it as abundant on the Pacific coast of Guatemala, but fails to record *atricilla*. As stated in the bibliography, this paper contains numerous errors of identification and mis-statements of fact, and was completely ignored by Salvin. I do not think this record should be accepted.]

[No specimens of petrels or shearwaters have ever been taken off the coasts of Guatemala, but several species of both groups unquestionably occur regularly.]

ORDER CHARADRIIFORMES

FAMILY **CHARADRIIDÆ**. SHORE-BIRDS

(67) **Arenaria interpres** subspecies

Arenaria interpres, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1903, p. 346 (both coasts, Chiapam); RIDGWAY, 'Birds N. and Mid. Amer.,' pt. 8, 1919, pp. 45–53.

RANGE.—Nearly cosmopolitan, breeding in the Arctic, wintering chiefly in tropical and subtropical regions.

The subspecies of turnstones are now in some uncertainty, due to differences of opinion. A distinct form, *morinella*, is found in eastern North America and is almost certainly the one found on the Caribbean coast of Central America; one body of opinion regards all New World turnstones as *morinella*. Others recognize an intermediate Pacific race, *oahuensis* Mathews, which, according to some, is the principal race of the Pacific coast of the New World. Still others, not recognizing *oahuensis*, have claimed that Pacific-region birds were really nearer to the European *morinella*.

Anthony found several small flocks on the beach at Champerico.

(68) **Aphriza virgata** (Gmelin)

Tringa virgata GMELIN, 'Syst. Nat.,' I, 1789, p. 674 (Prince William Sound, Alaska).

Aphriza virgata, RIDGWAY, *loc. cit.*, p. 58.

RANGE.—Interior of Alaska, wintering on the Pacific coast of America south to Magellan.

The Surf Bird has never been collected in Central America, but certainly occurs as a transient. Mr. Anthony, who has been familiar with the bird for decades, encountered a flight at Champerico on September 10, when it was quite common, but saw only two others the following week.

(69) **Hæmatopus palliatus** subspecies

Hæmatopus palliatus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1903, p. 347 (Pacific coast, Nagualate, Chiapam); RIDGWAY, *loc. cit.*, p. 32.

RANGE.—The species, locally from New Jersey to Patagonia; several local races.

Oyster-catchers occur locally on the Pacific coast from central Mexico to Guatemala. The species reappears as a resident on the Pearl Islands, and curiously enough these are typical *palliatus*. It follows that the Guatemala bird might also be *palliatus*, or *frazari* Brewster of Lower California.

Seen several times along the beach at Champerico in early September (Anthony).

(70) **Squatarola squatarola** (Linnæus)

Tringa squatarola LINNÆUS, 'Syst. Nat.,' I, 1758, p. 149 (Europe).

Squatarola helvetica, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1903, p. 361 (Chiapam).

Squatarola squatarola, RIDGWAY, *loc. cit.*, p. 72.

RANGE.—Breeds in Arctic regions, south in winter in America to Peru and Brazil.

A few were found on the beach at Champerico, September 10 (Anthony).

(71) **Pluvialis dominicus dominicus** (Müller)

Charadrius dominicus MÜLLER, 'Natursyst.,' Suppl., 1776, p. 116 (Santo Domingo, West Indies); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1903, p. 352, Dueñas, 2nd week in April, 1858).

Pluvialis dominicus dominicus, RIDGWAY, *loc. cit.*, p. 83.

RANGE.—Arctic region, wintering in southern South America; in Central America on spring migration only.

(72) **Pagolla wilsonia beldingi** Ridgway

Pagolla wilsonia beldingi RIDGWAY, 'Birds N. and Mid. Amer.,' pt. 8, 1919, p. 112 (La Paz, Lower California).

Ochthodromus wilsoni, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1903, p. 354 (Chiapam).

RANGE.—The species, southern United States to Peru and Brazil; the race, Pacific coast, from Lower California to Peru.

(73) **Oxyechus vociferus vociferus** (Linnæus)

Charadrius vociferus Linnæus, 'Syst. Nat.,' I, 1758, p. 150 (Virginia and Carolina).

Oxyechus vociferus, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1903, p. 356 (Dueñas, Quezaltenango, San Geronimo, Panajachel, Atitlan); Ridgway, *loc. cit.*, p. 99.

Sacapulas, 2 ♀.

Range.—The species, Canada to Chile; the race breeds in North America and winters south to South America.

"Common as a winter resident in all suitable parts, especially the pasture-lands above 3000 feet altitude. Quite common at Guatemala City from October 15 to April. Along most of the larger watercourses of the uplands this species is not rare, though perhaps not seen in flocks. At Sacapulas it was quite well distributed along the river and sandbars; also at Momostenango, the river below Chichicastenango, etc." (Anthony, MS.)

(74) **Charadrius semipalmatus** Bonaparte

Charadrius semipalmatus Bonaparte, Journ. Acad. Nat. Sci. Phila., 1825, p. 98 (coast of New Jersey); Ridgway, *loc. cit.*, p. 116.

Ægialeus semipalmatus, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1903, p. 358 (Chiapam).

Range.—Breeds in northern North America, south in winter to Chile.

(75) **Charadrius collaris** Vieillot

Charadrius collaris Vieillot, 'Nouv. Dict. d'Hist. Nat.,' XXXVII, 1817, p. 136 (Paraguay); Ridgway, *loc. cit.*, p. 140.

Ægialitis collaris, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1903, p. 359 (Chiapam).

Ocos, 1 ♂, 1 ♀.

Range.—Tropical Zone: Argentine to Mexico.

Not uncommon along the ocean beach at Ocos in early October (Anthony). A pair found on a beach near Puerto Barrios, August 21, 1930 (Crosby and Griscom).

(76) **Himantopus mexicanus** (Müller)

Charadrius mexicanus Müller, 'Natursyst.,' Suppl., 1776, p. 117 (Mexico).

Himantopus mexicanus, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1903, p. 362 (Chiapam, San José); Ridgway, *loc. cit.*, p. 442.

Range.—Southern United States to Peru and northern Brazil.

Common at Champerico and Ocos in September and October (Anthony).

(77) **Recurvirostra americana** Gmelin

Recurvirostra americana GMELIN, 'Syst. Nat.,' I, 1789, p. 693 (North America); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1903, p. 363 (Chiapam); RIDGWAY, *loc. cit.*, p. 437.

RANGE.—Chiefly western North America; south in winter to Guatemala.

Several seen along the lagoon near Champerico September 10 and in similar situations at Ocos in late September and October (Anthony).

(78) **Numenius americanus** Bechstein

Numenius americanus BECHSTEIN, in Latham, 'Allg. Ueb. Vögel.,' IV, 1812, p. 432 (New York); RIDGWAY, *loc. cit.*, p. 390.

Numenius longirostris, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1903, p. 365 (Dueñas, Chiapam).

RANGE.—Interior of North America, south in winter to Guatemala.

(79) **Numenius hudsonicus** Latham

Numenius hudsonicus LATHAM, 'Index Orn.,' II, 1790, p. 712 (Hudson Bay); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1903, p. 366 (Chiapam).

Phaeopus hudsonicus, RIDGWAY, *loc. cit.*, p. 402.

Ocos, 1 ♂.

RANGE.—Arctic America, south in winter to Chile and Amazonia.

Several seen both at Champerico and Ocos (Anthony).

(80) **Numenius borealis** (Forster)

Scolopax borealis FORSTER, Philos. Trans., XLII, 1772, p. 411 (Albany Fort, Keewatin).

Numenius borealis, SALVIN, Ibis, 1861, p. 356 (San Geronimo, April).

Mesoscolopax borealis, RIDGWAY, *loc. cit.*, p. 412.

RANGE.—Arctic America, south in winter to southern South America; now practically extinct.

(81) **Limosa fedoa** (Linnæus)

Scolopax fedoa LINNÆUS, 'Syst. Nat., I, 1758, p. 146 (Hudson Bay).

Limosa fedoa, SALVIN AND GODMAN, 'Biol. Amer. Cent.,' III, 1903, p. 367 (Chiapam).

Vetola fedoa, RIDGWAY, *loc. cit.*, p. 184.

RANGE.—Interior of North America, south in winter to Guatemala.

Several seen on the beach at Champerico September 10 (Anthony).

(82) **Limnodromus griseus scolopaceus** (Say)

Limosa scolopacea SAY, in Long's 'Exped. Rocky Mts.' I, 1823, p. 170 (near Council Bluffs, Iowa).

Macrorhamphus griseus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1903, p. 368 (Chiapam, Lake of Dueñas, San Gerónimo).

Limnodromus griseus scolopaceus, RIDGWAY, *loc. cit.*, p. 201.

RANGE.—Northwestern Arctic America, south in winter to Ecuador.

In default of specimens, the subspecies is based on geographic probabilities.

(83) **Micropalama himantopus** (Bonaparte)

Tringa himantopus BONAPARTE, Ann. Lyc. Nat. Hist. N. Y., II, 1826, p. 157 (Long Branch, New Jersey).

Micropalama himantopus, SALVIN AND GODMAN, 'Biol. Amer. Cent.,' III, 1903, p. 370 (Dueñas); RIDGWAY, *loc. cit.*, p. 205.

RANGE.—Arctic America; winters south to Chile and Uruguay; a transient only in Central America, rarely recorded.

Salvin shot one at Dueñas out of a flock of Pectoral Sandpipers.

(84) **Catoptrophorus semipalmatus inornatus** (Brewster)

Symphemia semipalmata inornata BREWSTER, Auk, 1887, p. 145 (Larimer Co., Utah).

Symphemia semipalmata, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1903, p. 371 (Chiapam, San José).

Catoptrophorus semipalmatus inornatus, RIDGWAY, *loc. cit.*, p. 319.

Ocos, 1 (?).

RANGE.—Western United States, migrating south to Ecuador.

Several seen on the beach at Champerico, September 10 (Anthony).

(85) **Totanus melanoleucus** (Gmelin)

Scolopax melanoleuca GMELIN, 'Syst. Nat.,' I, 1789, p. 659 (Labrador).

Totanus melanoleucus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1903, p. 373 (Dueñas, Chiapam, Atitlan).

Neoglottis melanoleuca, RIDGWAY, *loc. cit.*, p. 330.

RANGE.—Arctic America, south to Patagonia in winter.

Found by Anthony on the Pacific coast at Champerico and Ocos. "Not rare."

(86) **Totanus flavipes** (Gmelin)

Scolopax flavipes GMELIN, 'Syst. Nat.,' I, 1789, p. 659 (New York).

Totanus flavipes, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1903, p. 374 (Dueñas).

Neoglottis flavipes, RIDGWAY, *loc. cit.*, p. 337.

RANGE.—Arctic America, migrating south to Chile and Patagonia; chiefly a transient in Central America.

(87) **Tringa solitaria solitaria** Wilson

Tringa solitaria WILSON, 'Amer. Orn.,' VII, 1913, p. 53 (Pennsylvania); RIDGWAY, *loc. cit.*, p. 358.

Helodromas solitarius, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1903, p. 376 (San Gerónimo, Dueñas); DEARBORN, 1907, p. 76 (Los Amates).

Finca Sepacuite, 1 ♂ (December 16).

RANGE.—America, breeding chiefly north of the United States, migrating south to Argentina.

Not uncommon during the winter months. Seen several times at Chimoxan in September and early October and at Finca Chama in early May (Anthony). August 11, 1930 at Panajachel (Griscom).

N. B.—The western race *cinnamomea* Brewster migrates down the Pacific coast at least to Ecuador. It will certainly be found in western Guatemala.

(88) **Actitis macularia** (Linnæus)

Tringa macularia LINNÆUS, 'Syst. Nat.,' I, 1766, p. 249 (Pennsylvania).

Tringoides macularia, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1903, p. 379 (Yzabal, Dueñas, Panajachel, San Geronimo).

Actitis macularia, DEARBORN, 1907, p. 76 (Atitlan, Amatitlan, El Rancho); RIDGWAY, *loc. cit.*, p. 372.

Panajachel, 2 ♂, 1 ♀, 1 imm.; La Primavera, 1 ♀.

RANGE.—North America, migrating south to Brazil and Peru.

A common species on nearly all the streams and lakes of Guatemala from early September to May (Anthony). Seen August 4, 1930, along the Rio Motagua and almost daily thereafter throughout the country (Crosby and Griscom).

(89) **Bartramia longicauda** (Bechstein)

Tringa longicauda BECHSTEIN, in Latham, 'Allg. Ueb. Vögel,' IV, 1812, p. 453 (North America).

Bartramia longicauda, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1093, p. 381 (Dueñas, Sakluk); RIDGWAY, *loc. cit.*, p. 379.

RANGE.—North America, wintering in southern South America, a transient elsewhere.

(90) **Ereunetes mauri** Cabanis

Ereunetes mauri CABANIS, Journ. für Orn., 1856, p. 419 (Cuba); RIDGWAY, *loc. cit.*, p. 215.

Ereunetes pusillus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1903, p. 383 (Dueñas, Chiapam, Carranza, San José).

RANGE.—Northwestern Alaska, migrating south to Ecuador at least.

Practically all specimens of "Peep" from Central America are *mauri*, but *pusillus* might occur. As Chapman says, the identification of many winter specimens is far from satisfactory.

(91) **Crocethia alba** (Pallas)

Tringa alba PALLAS, in Vroeg's 'Catal.,' 1764, p. 7 (North Sea).

Calidris arenaria, SALVIN AND GODMAN 'Biol. Cent. Amer.,' III, 1903, p. 386 (Carranza, Chiapam, Rio Nagualate).

Calidris alba, RIDGWAY, *loc. cit.*, p. 308.

RANGE.—Arctic regions, migrating to Patagonia.

Common on the beach at Ocos in September and October (Anthony).

(92) **Pisobia minutilla** (Vieillot)

Tringa minutilla VIEILLOT, 'Nouv. Dict. d'Hist. Nat.,' XXXIV, 1819, p. 466 Nova Scotia to Antilles).

Limonites minutilla, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1903, p. 388 (Dueñas, Chiapam, Rio Nagualate).

Actodromus minutilla, DEARBORN, 1907, p. 76 (Los Amates).

Pisobia minutilla, RIDGWAY, *loc. cit.*, p. 294.

RANGE.—Arctic America, migrating south to Chile.

(93) **Pisobia maculata** (Vieillot)[1]

Tringa maculata VIEILLOT, 'Nouv. Dict. d'Hist. Nat.,' XXXIV, 1819, p. 465 (Antilles or southern United States).

Heteropygia maculata, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1903, p. 389 (Dueñas).

Pisobia maculata, RIDGWAY, *loc. cit.*, p. 269.

[1]Now *melanotos* (Vieillot).

RANGE.—Arctic America, wintering in southern South America; a transient only in Central America.

The most abundant member of the family at Dueñas in early April, according to Salvin.

N. B.—*Pisobia bairdi* and *P. fuscicollis* certainly occur on migration in Guatemala, but have never been collected. The Knot (*Canutus canutus* Linnæus) has never been recorded from any part of Central America, but surely occurs. Anthony found it with Marbled Godwits at Champerico on September 10, and saw it several times at Ocos in September and October.

(94) **Gallinago delicata** Ord

Scolopax delicata ORD, reprint of Wilson's 'Amer. Orn.,' IX, 1825, p. 218 (Pennsylvania).

Gallinago delicata, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1903, p. 392 (Guatemala City, Dueñas, Coban, Choctum, Tactic, San Geronimo, Atitlan); RIDGWAY, *loc. cit.*, p. 171.

RANGE.—Northern United States and Canada, reaching South America on migration.

A common winter visitant in suitable localities, according to Salvin.

(95) **Lobipes lobatus** (Linnæus)

Tringa lobata LINNÆUS, 'Syst. Nat.,' I, 1758, p. 824 (Hudson Bay).

Phalaropus hyperboreus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1903, p. 395 (Dueñas).

Lobipes lobatus, RIDGWAY, *loc. cit.*, p. 424.

RANGE.—Arctic regions, wintering at sea chiefly south of the equator; little known in the New World south of North America.

Salvin shot four specimens on Lake Dueñas in August, 1855.

(96) **Steganopus tricolor** Vieillot

Steganopus tricolor VIEILLOT, 'Nouv. Dict. d'Hist. Nat.,' XXXII, 1819, p. 136 (Paraguay); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1903, p. 396 (Dueñas); RIDGWAY, *loc. cit.*, p. 431.

RANGE.—Interior of North America, wintering in southern South America; almost unknown in the intervening area.

FAMILY **JACANIDÆ.** JACANAS

(97) **Jacana spinosa spinosa** (Linnæus)

Fulica spinosa LINNÆUS, 'Syst. Nat.,' I, 1758, p. 152 ("Cartagena").
Asarcia variabilis, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1903, p. 343 (Santana Mixtan, Huamachal, Lake of Peten, Lake of Amatitlan).
Jacana spinosa spinosa, RIDGWAY, 'Birds N. and Mid. Amer.,' pt. 8, 1919, p. 9.

Hacienda California, 1 ♂, 1 ♀.

RANGE.—Tropical Zone: the race, Guatemala to western Panama; other races in Mexico and Greater Antilles.

"Abundant at Hacienda California, where it was always to be found along the lagoons bordering the river. At Pajapita, a station on the railroad, near the border of Chiapas, a large flock was seen along the shores of a small pond." (Anthony, MS.)

FAMILY **ŒDICNEMIDÆ.** THICK-KNEES, STONE CURLEW

(98) **Œdicnemus bistriatus bistriatus** (Wagler)

Charadrius bistriatus WAGLER, Isis, 1829, p. 648 (Mexico).
Œdicnemus bistriatus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1903, p. 339 (Huamachal, San Geronimo); RIDGWAY, 'Birds N. and Mid. Amer.,' pt. 8, 1919, p. 20.

Ocos, 1 ♂.

RANGE.—Arid Tropical Zone, locally from southern Mexico to Western Panama; a closely allied race in the savannas of eastern South America.

It is worth noting that the only other species of this ancient family in the New World occur in Santo Domingo and the Pacific-coast region of Peru and southern Ecuador. We are dealing with isolated relicts, and this Thick-knee is evidence for the age of the Arid Tropical Fauna in Central America.

ORDER GRUIFORMES

FAMILY **EURYPYGIDÆ.** SUN-BITTERNS

(99) **Eurypyga major major** Hartlaub

Eurypyga major HARTLAUB, 'Syst. Verz. Mus. Brem.,' 1844, p. 108 (Colombia); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1903, p. 335 (Vera Paz, mountains southeast of Coban); LANTZ, 1899, p. 219 (Santo Tomas).

RANGE.—Tropical Zone: Guatemala to Peru.

In Central America it is found only in rain forest and decidedly uncommon. In Guatemala it has consequently been found only on the Caribbean slope. True *major* is really the northern representative of *helias*, which ranges from Venezuela to Brazil.

Order ARDEIFORMES

Family **Threskiornithidæ**. Ibises

(100) **Guara alba** (Linnæus)

Scolopax alba Linnæus, 'Syst. Nat.,' I, 1758, p. 145 (Carolina).
Eudocimus albus, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1901, p. 192 (Chiapam).
Guara alba, Lantz, 1899, p. 219 (San José).

Range.—Locally throughout the warmer parts of the New World.

Common along the estero at Ocos (Anthony).

Family **Plataleidæ**. Spoonbills

(101) **Ajaia ajaja** (Linnæus)

Platalea ajaja Linnæus, 'Syst. Nat.,' I, 1758, p. 140 ("America australi"); Salvin and Godman, 'Biol. Cent. Amer.,' III, 1901, p. 190 (Lake of Dueñas, Chiapam, Huamachal).
Ajaja ajaja, Lantz, 1899, p. 219 (San José).

Range.—Warmer parts of the New World.

"Several seen near Ocos. A small flock noted at the head of Lake Yzabal." (Anthony, MS.)

Family **Ciconiidæ**. Storks

(102) **Mycteria americana** Linnæus

Mycteria americana Linnæus, 'Syst. Nat.,' I, 1758, p. 140 (Brazil).
Tantalus loculator, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1901, p. 188 (Chiapam, Huamachal, Coban).

Range.—Warmer parts of the New World.

"Abundant at Ocos. Seen once or twice on the Rio Motagua near Quiriguá." (Anthony, MS.)

(103) **Jabiru mycteria** (Lichtenstein)

Ciconia mycteria Lichtenstein, Abh. K. Acad. Wiss. Berlin, for 1816–1817, 1819, p. 163 (Brazil).

Mycteria americana, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1901, p. 187 (Huamachal).

Range.—Tropical Zone, Guatemala to Brazil; exceedingly local in Central America.

Family **Ardeidæ**. Herons, Boatbills, Bitterns

(104) **Ardea herodias herodias** Linnæus

Ardea herodias Linnæus, 'Syst. Nat.,' I, 1758, p. 143 (Hudson Bay); Salvin and Godman, 'Biol. Cent. Amer.,' I, 1901, p. 160 (Dueñas, Rio Guacalate, Chiapam, San Gerónimo).

Range.—Eastern North America, wintering south to Colombia.

Apparently a common winter visitant. "Blue Herons were seen on all the larger rivers and lakes on both sides of the Republic." (Anthony, MS.).

(105) **Casmerodias egretta** (Gmelin)

Ardea egretta Gmelin, 'Syst. Nat.,' I, 1789, p. 629 (Cayenne); Salvin and Godman, 'Biol. Cent. Amer.,' I, 1901, p. 161 (Lake of Dueñas, Yzabal).

Range.—Warmer parts of the New World.

"Rather common on both coasts and often seen inland, on the rivers Polochic and Motagua. At Ocos a number were kept in a state of semi-domestication, the plumes being harvested for the market, which is quite brisk, so long as there are any birds to furnish the feathers. In all parts of the country the egrets were shot, wherever they could be found, and the plumes sold to the nearest trader. One woman, an American missionary who was doing a brisk trade in these plumes, said that it paid her better than missionary work and if it came to the point where she had to give up the feather trade, she would quit her post as missionary and go home!" (Anthony, MS.)

(106) **Florida cærulea** (Linnæus)

Ardea cærulea Linnæus, 'Syst. Nat.,' I, 1758, p. 143 (Carolina); Salvin and Godman, 'Biol. Cent. Amer.,' III, 1901, p. 166 (Coban, Rio Nagualate, Dueñas, Chiapam); Lantz, 1899, p. 219 (San José).

Finca Sepacuite, 1 ♂; Ocos, 2 ♀.

Range.—Warmer parts of the New World.

"Common along the Rio Polichic and the estero at Ocos. A few were seen along the larger streams inland and at Sepacuite." (Anthony, MS.)

(107) **Dichromanassa rufescens** subspecies

Ardea rufescens GMELIN, 'Syst. Nat.,' I, 1789, p. 628 (Louisiana).

Ardea rufa, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1901, p. 168 (Chiapam, Istan).

RANGE.—The species, locally from Florida and Lower California to the Greater Antilles, Yucatan and Guatemala; three recognizable races.

Thought by Salvin to be a winter visitant only. Several seen on the Rio Polochic, near Lake Yzabal, by Anthony.

(108) **Egretta thula thula** (Molina)

Ardea thula MOLINA 'Sagg. Stor. Nat. Chili,' 1782, p. 325 (Chile).

Ardea candidissima, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1901, p. 163 (Chiapam, Lake of Dueñas, Coban, Yzabal).

RANGE.—Warmer parts of the New World; a local race in Lower California and other parts of the southwestern United States.

Formerly abundant, now rare and local. A few seen along the Rio Polochic (Anthony).

(109) **Hydranassa tricolor ruficollis** (Gosse)

Egretta ruficollis GOSSE, 'Birds Jamaica,' 1847, p. 338 (Jamaica).

Ardea tricolor, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1901, p. 165 (Chiapam, San José, Huamachal).

Ocos, 1 ♀.

RANGE.—Southern United States and West Indies to western Ecuador; the typical form in eastern South America.

Common on the Pacific coast of Guatemala. Anthony saw a few below Panzos on the Rio Polochic.

(110) **Nyctanassa violacea** (Linnæus)

Ardea violacea LINNÆUS, 'Syst. Nat.,' I, 1788, p. 143 (Carolina).

Nyctanassa violacea, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1901, p. 175 (Chiapam).

RANGE.—Southern United States to Brazil.

Seen at Ocos and along the Rio Polochic (Anthony).

(111) **Agamia agami** (Gmelin)

Ardea agami GMELIN, 'Syst. Nat.,' I, 1789, p. 629 (Cayenne); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1901, p. 171 (Peten).

RANGE.—Humid Tropical Zone, southern Mexico to Brazil.

A rare and local heron in Central America, found only in heavy rain forest.

(112) **Nycticorax nycticorax nævius** (Boddaert)[1]

Ardea nævia BODDAERT, 'Tabl. Pl. Enl.,' 1783, p. 56 (Cayenne).

Nycticorax griseus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1901, p. 173 (Choctum, Lake of Peten).

RANGE.—Most of the New World, except southern South America.

A curiously local bird, which is not definitely known to breed anywhere in Central America, occurring as a winter visitant. Abundant along the Rio Polochic and in the mangroves at Ocos (Anthony).

(113) **Cochlearius cochlearius zeledoni** (Ridgway)

Canchroma zeledoni RIDGWAY, Proc. U. S. Nat. Mus., VIII, 1885, p. 93 (Mazatlan, Mexico); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1901, p. 186 (Atlantic coast, Pacific coast, Las Salinas).

Cochlearius zeledoni, DEARBORN, 1907, p. 75 (Gualan); LANTZ, 1899, p. 219 (San José).

Hacienda California, 3 ♀; Ocos, 1 ♂, 1 ♀.

RANGE.—Tropical Zone, western Ecuador to Mexico; a race from Panama southward.

A closely related form is primarily Amazonian.

"At Hacienda California a flock of these night herons spent the day in some trees of heavy foliage, overhanging the river, and the discordant cries were frequently heard at all hours. Along the estero at Ocos the species was quite common, in the mangroves. Their habits seemed to be very similar to those of our common night-herons." (Anthony, MS.)

(114) **Butorides virescens virescens** (Linnæus)

Ardea virescens LINNÆUS, 'Syst. Nat.,' 1758, I, p. 144 ("America"); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1901, p. 170 (Dueñas, Chiapam, Atitlan).

Butorides virescens virescens, OBERHOLSER, Proc. U. S. Nat. Mus, XLII, 1912, p. 539 (Choctum, Vera Paz, in range).

Butorides virescens, DEARBORN, 1907, p. 75 (generally distributed).

Nebaj, 1 ♀; Panajachel, 2 ♂, 2 ♀; Ocos, 1 ♀ imm.

RANGE.—Eastern North America, south in winter to Colombia.

The North American Green Heron is, of course, a common winter visitant to Guatemala, but few specimens have been criticially determined. The five listed above are referred here with some doubt, but none are typical *maculatus* in either color or size. The records cited above unquestionably refer to both races.

Anthony found Green Herons common wherever there was a little water.

[1]Now *hoactli* (Gmelin).

(115) **Butorides virescens maculatus** (Boddaert)

Cancroma maculata Boddaert, 'Tabl. Pl. Enl.,' 1783, p. 54 (Martinique).

Ocos, 1 ♀, 1 ♂.

Range.—West Indies and Central America south to the Canal Zone.

Green Herons breed abundantly along both coasts of Guatemala, and undoubtedly belong to this race which cannot, I believe, be satisfactorily divided. There are dark and light phases, as well as a reddish one, and these are variously combined. Colonies here and there often tend to show one of these combinations to the exclusion of others. These variations are characteristic of the genus throughout the world, and there is no such thing as a color character which is clearly specific or clearly racial. The taxomony of the group is a matter, therefore, of relatively little consequence, though the facts, or rather the variations themselves are particularly interesting, as they are comparatively unusual in birds as compared with plants.

(116) **Tigrisoma cabanisi** Heine

Tigrisoma cabanisi Heine, Journ. für Orn., 1859, p. 407 (Mexico); Salvin and Godman, 'Biol. Cent. Amer.,' III, 1901, p. 180 (Chiapam; Juntecholol, Peten).

Heterocnus cabanisi, Dearborn, 1907, p. 75 (Los Amates).

Ocos, 1 ♀ (?), imm.

Range.—Tropical Zone: southern Mexico to eastern Panama.

(117) **Ixobrychus exilis exilis** (Gmelin)

Ardea exilis Gmelin, 'Syst. Nat.,' I, 1788, p. 645 (Jamaica).

Ardetta exilis, Salvin, Ibis, 1866, p. 196 (Coban, perhaps this subspecies).

"Guatemala" trade-skin, 1 ad. in winter plumage; San Lucas, 2, October 31.

Two of these specimens are well below the minimum measurements of *hesperis*, and the trade-skin is very near the minimum for *exilis*. One male from San Lucas is exactly on the border-line between the two races, and might be referred to either.

(118) **Ixobrychus exilis hesperis** Dickey and Van Rossem

Ixobrychus exilis hesperis Dickey and Van Rossem, Bull. So. Calif. Acad. Sci., XXIII, 1924, pp. 11–12 (Buena Vista Lake, Kern Co., California).

Ardetta exilis, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1901, p. 182 (Lakes of Dueñas and Atitlan, as to breeding bird).

San Lucas, Lake Atitlan, 5 ♂, 5 ♀, 5 juvenals and immatures; many shot off the nest.

RANGE.—The species, United States to northern South America; the race, Lower California and western Guatemala.

This series is of great interest, as pale-colored birds below, with little or no buffy, and sandy-buff wing-patches, greatly predominate. In fact, only one male and one female are in the normal phase. The young birds show the same tendency to paleness below, but the majority are more blackish brown, less rufous on the back. All agree in the larger measurements of *hesperis* but, as both white and buffy birds occur in a large series from Lower California, there is no real character upon which to separate the Guatemalan bird.

In the few West Indian specimens examined the majority are in the light phase. The very large number of birds examined from the United States would seem to indicate that the light phase was extremely uncommon.

A breeding male from Tampico, Mexico, and another from Los Sabalos, southeastern Nicaragua, in The American Museum of Natural History, are so deeply and richly colored below and on the wings, as to require separation, should additional material confirm their characters. They connect *exilis* with *bogotensis* Chapman as regards color, but have the larger size of *hesperis*. From the Canal Zone, northern and eastern South America, a small extreme occurs, the most richly and deeply colored of all, in which the chestnut of the eyebrow in adult males tends to invade the sides of the head. Females are less different than males, but are darker maroon-chestnut on the back. Immatures are scarcely different from *bogotensis*. This bird should be known as *Ixobrychus exilis erythromelas* (Vieillot), and it has had a checkered career. Sharpe, in the 'Catalogue of Birds,' XXVI, treats it, of course, as a distinct species, but his principal character, "the rufous tips to the primary coverts and secondary quills almost obsolete," does not hold. He was, however, partly correct in assigning a breeding bird from the Canal Zone to this form. In America all our standard bird books, including the latest[1] 'A. O. U. Check list,' give *exilis* as ranging south to Brazil. This conception seems to go back to Baird, Brewer and Ridgway, in their 'Water Birds of North America,' who did not know what *erythromelas* was, and thought it might be a synonym of *involucris*, a totally different species. All supposed specimens of *exilis* south of Guatemala and the Greater Antilles should be carefully and critically determined and compared. As might be expected, the Canal Zone is the intermediate

[1]Now the fourth, which appeared long after this was written.

point, and Least Bitterns from there are nontypical. So far as I know, there are only three: a female in the British Museum which Sharpe called *erythromelas*, another female which Sharpe called *exilis*, and an immature in New York which is nearer *erythromelas*. Incidentally, Salvin and Godman completely overlooked Sharpe's determination and do not mention *erythromelas* in the 'Biologia.'

"A very common species at Lake Atitlan and on similar bodies of water furnishing rushes or other suitable cover. At San Lucas the nests were seen many times in the thick tules and half a dozen or more birds could be seen in an hour or less. (Fig. 10.) Also seen during the nesting season at Lake Dueñas, near Antigua." (Anthony, MS.)

(119) **Botaurus lentiginosus** Montagu

Botaurus lentiginosus Montagu, 'Supp. Orn. Dict.,' 1813, test and plate (England); Salvin and Godman, 'Biol. Cent. Amer.,' III, 1901, p. 183 (Coban, Dueñas).

Range.—North America, south in winter to Panama.

"Often seen along the estero at Ocos. Also noted on the Rio Polochic." (Anthony, MS.)

Order ANSERIFORMES

Family **Anatidæ.** Swans, Ducks, Geese

(120) **Cairina moschata** (Linnæus)

Anas moschata Linnæus, 'Syst. Nat.,' I, 1758, p. 124 (Brazil).

Cairina moschata, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1901, p. 198 (Lake of Peten, Huamachal, Chiapam, Santana Mixtan); Lantz, 1899, p. 218 (Naranjo).

Hacienda California, 1 ♂.

"Only met with on the fresh-water marshes at Hacienda California, where a few were to be found at any season of the year. The habit that this species has, of taking refuge in the trees when disturbed on the water, is quite surprising to one familiar with only the ducks of the north." (Anthony, MS.)

(121) **Dendrocygna autumnalis** (Linnæus)

Anas autumnalis Linnæus, 'Syst. Nat.,' I, 1758, p. 127 (West Indies).

Dendrocycna autumnalis, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1902, p. 206 (Acapam, Huamachal).

Range.—Southern United States to Panama.

"Rather common in the fresh-water marshes at Ocos and Hacienda California. The natives often have these ducks as pets." (Anthony, MS.)

(122) **Mareca americana** (Gmelin)

Anas americana Gmelin, 'Syst. Nat.,' I, 1789, p. 526 (Louisiana and New York).
Mareca americana, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1902, p. 211 (Dueñas, Chiapam, Lake Atitlan, Laguna, Acapam, San Geronimo).

Range.—Northern North America, south in winter to Panama and Trinidad.

Salvin found the Baldpate "common" on Lake Atitlan in May.

(123) **Dafila acuta tzitzihoa** (Vieillot)

Anas tzitzihoa Vieillot, 'Nouv. Dict. d'Hist. Nat.,' V, 1816, p. 163 (Mexico).
Dafila acuta, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1902, p. 214 (Lake of Dueñas).

Range.—Holarctic region, south in the New World to Panama in winter.

(124) **Querquedula discors** (Linnæus)

Anas discors Linnæus, 'Syst. Nat.,' I, 1766, p. 205 (Virginia).
Querquedula discors, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1902, p. 216 (Acapam, Coban, Dueñas, Santana Mixtan); Dearborn, 1907, p. 74 (Lake Atitlan).

Range.—North Temperate Zone, south in winter to Brazil and Chile.

(125) **Spatula clypeata** (Linnæus)

Anas clypeata Linnæus, 'Syst. Nat.,' I, 1758, p. 124 (Southern Sweden).
Spatula clypeata, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1902, p. 219 (Dueñas, Huamachal).

Range.—North Temperate Zone, south in winter in the New World to Colombia.

(126) **Marila valisineria** (Wilson)

Anas valisineria Wilson, 'Amer. Orn.,' VIII, 1814, p. 103 (Eastern U. S.).
Nyroca vallisneria, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1902, p. 221 (Dueñas).

Range.—Interior of north America, south in winter to Mexico, casually to Guatemala.

(127) **Marila affinis** (Eyton)

Fuligula affinis Eyton, 'Monogr. Anatidæ,' 1838, p. 157 (North America); Salvin and Godman, 'Biol. Cent. Amer.,' III, 1902, p. 223 (Lakes of Dueñas and Atitlan).

Range.—Northern North America, south in winter to northern South America.

(128) **Marila collaris** (Donovan)

Anas collaris Donovan, 'Brit. Birds,' VI, 1809, Pl. 147 (Lincolnshire, England? Found in a London market).

Fuligula collaris, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1902, p. 224 (Coban, Lake of Dueñas).

Range.—Interior of North America, south in winter to Guatemala.

(129) **Nomonyx dominicus** (Linnæus)

Anas dominica Linnæus, 'Syst. Nat.,' I, 1766, p. 201 (Santo Domingo).

Nomonyx dominicus, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1902, p. 227 (Guatemala, old trade-skin without locality).

Range.—Tropical Zone, Greater Antilles, southern Mexico to Chile and Argentina, exceedingly local.

(130) **Erismatura jamaicensis** (Gmelin)

Anas jamaicensis Gmelin, 'Syst. Nat.,' I, 1789, p. 519 (Jamaica).

Erismatura jamaicensis, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1902, p. 229 (Dueñas, Lake of Atitlan).

Range.—North and Central America to Colombia and West Indies; breeding in both Temperate and Tropical Zones, and migratory in north Temperate Zone.

Order PELECANIFORMES

Family **Phalacrocoracidæ.** Cormorants

(131) **Phalacrocorax olivaceus mexicanus** Brandt

Carbo mexicanus Brandt, Bull. Sci. Acad. Imp. Sci. St. Petersb., III, 1837, p. 56 (Mexico).

Phalacrocorax vigua, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1901, p. 154 (Lake of Peten, Huamachal).

Phalacrocorax mexicanus, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1901, p. 155 (Lake of Peten, Lake of Yzabal, Dueñas, Chiapam).

Range.—The species, southern United States, Greater Antilles and Mexico to Argentina; the race, Guatemala and Mexico northward.

The races of this Cormorant have been badly confused, and Ogilvie-Grant thought that the two "species" occurred together in Mexico, Guatemala, and southern Texas, calling smaller birds with green eyes *mexicanus*, and larger birds with blue eyes *vigua*. In this he was followed by Godman in the 'Biologia.' Just what are the characters and range of *mexicanus* remain to be determined.

Family **Anhingidæ**. Darters

(132) **Anhinga anhinga** (Linnæus)

Plotus anhinga Linnæus, 'Syst. Nat.,' I, 1766, p. 218 (Brazil); Salvin and Godman, 'Biol. Cent. Amer.,' III, 1901, p. 157 (Lake of Peten, Lake of Yzabal).

Ocos, 1 ♀.

Range.—Southern United States to Brazil; very local in Central America.

Quite common on the Rio Polochic below Panzos and along the estero east of Ocos (Anthony).

Family **Sulidæ**. Gannets, Boobies

(133) **Sula leucogastra** (Boddaert)

Pelecanus leucogaster Boddaert, 'Tabl. Pl. Enl.,' 1783, p. 57 (Cayenne).

Range.—Atlantic coasts of tropical America.

Several seen off the coast within three miles of Puerto Barrios in August, 1930 (Crosby and Griscom).

Family **Fregatidæ**. Frigate-Birds

(134) **Fregata magnificens** subspecies

Fregata aquila Salvin and Godman, 'Biol. Cent. Amer.,' III, 1901, p. 140 (both coasts, Champerico).

Range.—Tropical and subtropical coasts, the number of races in dispute.

The latest reviser of this group, Dr. P. R. Lowe, refers specimens from Florida to Peru and Brazil to *rothschildi* Mathews. It is common on both coasts of Central America.

Family **Pelecanidæ**. Pelicans

(135) **Pelecanus occidentalis** Linnæus

Pelecanus onocrotalus β. *occidentalis* Linnæus, 'Syst. Nat.,' I, 1766, p. 215 (West Indies).

Pelecanus fuscus, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1901, p. 142 (Chiapam).

Range.—The species, Florida and California, West Indies, Central America to west Ecuador and Galapagos; various races awaiting competent revision.

Brown Pelicans are common off both coasts of Guatemala. The Caribbean bird is unquestionably typical *fuscus* and the Pacific coast bird probably so, but it might be *californicus* Ridgway.

(136) **Pelecanus erythrorhynchus** Gmelin

Pelecanus erythrorhynchus GMELIN, 'Syst. Nat.,' I, 1789, p. 571 (Hudson Bay); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1901, p. 144 (Mazatenango, Huamachal).

RANGE.—Western half of North America, wintering south to Florida and Guatemala.

ORDER CATHARTIFORMES

FAMILY **CATHARTIDÆ.** CONDORS, NEW WORLD VULTURES

(137) **Sarcorhamphus papa** (Linnæus)

Vultur papa LINNÆUS, 'Syst. Nat.,' I, 1758, p. 86 ("India occidentali" = Brazil).

Gypagus papa, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1901, p. 131 (Tierra Caliente of both coasts, Coban, Vera Paz, San Geronimo, Escuintla, Masagua); DEARBORN, 1907, p. 80 (Los Amates); LANTZ, 1899, p. 219 (Naranjo).

RANGE.—Whole of tropical America.

A common bird along both coasts below 3000 feet (Anthony).

(138) **Coragyps urubu** (Vieillot)[1]

Vultur urubu VIEILLOT, 'Ois. Amer. Sept.,' 1807, p. 23 (Carolina and Florida).

Catharista atrata, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1901, p. 133 (generally distributed, San Geronimo, Coban, Dueñas).

Catharista urubu, DEARBORN, 1907, p. 81 (abundant throughout, particularly in the towns).

RANGE.—Southern United States to Chile.

Abundant in all parts of the Republic, somewhat rare in the highest ranges, where the following species replaces it (Anthony).

(139) **Cathartes aura aura** (Linnæus)

Vultur aura LINNÆUS, 'Syst. Nat.,' I, 1758, p. 86 (Vera Cruz, Mexico, designated by Nelson).

Cathartes aura, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1901, p. 135 (generally distributed from sea-level to a height of 13,000 ft.); DEARBORN, 1907, p. 81 (found at all altitudes, frequenting the mountains and open country, leaving the towns to the black vultures).

RANGE.—The species, Canada to Patagonia; the race, southern Mexico to northern Colombia.

[1]Now *atratus* (Meyer).

Order ACCIPITRIFORMES[1]

Family **FALCONIDÆ**. Birds of Prey

(140) **Polyborus cheriway cheriway** (Jacquin)

Falco cheriway Jacquin, 'Beyt. Gesch. Vögel,' 1784, p. 17, Pl. iv (Aruba Island and coast of Venezuela).

Polyborus cheriway, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1901, p. 126 (Dueñas, Escuintla, San José, San Geronimo); Dearborn, 1907, p. 84 (El Rancho, Gualan, San José).

Finca El Cipres, 2 ♂, 1 ♀, 2 (?); no locality, 1 adult.

Range.—The species, Texas and Florida to northern South America; the race, in the Tropical Zone.

Specimens from Panama, Nicaragua and Guatemala approach the northern *audubonì* Cassin in size, but in color characters they are more nearly typical *cheriway*. Birds shot thirty or more years ago have faded to a brown and are less jet-black. There is a striking contrast between old specimens from southern Texas collected by Sennett and a recently killed adult in the Dwight Collection, which is as jet-black as any South American specimen.

In Central America the caracara is abundant in the arid tropics and very rare or absent from the rain forest of the Caribbean slope. In Guatemala, consequently, it is common on the Pacific slope, and in the arid part of the Rio Motagua Valley it is somewhat less common, according to Anthony.

"At Ocos, when an invasion of grasshoppers visited that settlement, I counted twelve, all feeding on the insects. Their method of capturing them was about the same as practised by turkeys: simply stalking along and grasping them with the bill, before the insect had an opportunity to jump." (Anthony, MS.)

(141) **Ibycter americanus guatimalensis** Swann

Ibycter americanus guatimalensis Swann, 'Synop. Accipitres,' 1922, p. 24 (Guatemala).

Ibycter americanus, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1901, p. 129 (Pacific coast region, Savana Grande, Retalhuleu); Lantz, 1899, p. 219 (Naranjo).

Finca El Espino, 2 ♂.

Range.—Tropical Zone, Guatemala to Cayenne and Ecuador; the race, Central America.

[1] In type before appearance of Peters 'Birds of the World,' I.

This Carrion-hawk is equally at home in scrub country or rain forest, but in Guatemala, at the extreme northern limits of its range, it has been found only on the Pacific slope. The Central American race is slightly different from the South American, averaging a little larger.

(142) **Circus hudsonius** (Linnæus)

Falco hudsonius LINNÆUS, 'Syst. Nat.,' I, 1766, p. 128 (Hudson Bay).

Circus hudsonius, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1899, p. 43 (Dueñas, Quetzaltenango, San Geronimo, Atitlan, Panajachel).

RANGE.—North America, south in winter to Colombia.

"Not uncommon in the higher parts of the Republic, during the winter months. As might be expected, it was found only near or over the open areas, where the habits were the same as when in the northern hunting grounds. Several were near Huehuetenango, San Lucas and Chichicastenango." (Anthony, MS.)

(143) **Micrastur melanoleucus naso** (Lesson)

Carnifex naso LESSON, Rev. Zool., 1842, p. 378 (Realejo, Nicaragua).

Micrastur melanoleucus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1901, p. 108 (Retalhuleu, Medio Monte, Savana Grande); DEARBORN, 1907, p. 83 (San José).

Hacienda California, 1 ♂ imm.; Finca El Cipres, 1 ♀ imm.

RANGE.—Tropical Zone: the species, Mexico to Paraguay; the race, Mexico to western Ecuador.

There is no reasonable doubt that Lesson's excellent description refers to this hawk, as was correctly surmised by Sharpe in Vol. I of the 'Catalogue of Birds.' Now that the Central American bird is regarded as subspecifically separable, the name *naso* has several years priority over *percontator* Cabot.

This hawk is comparatively uncommon in Central America and is a forest species. The lack of records from the Caribbean lowlands of Guatemala is probably of no distributional significance.

(144) **Micrastur guerilla guerilla** Cassin

Micrastur guerilla CASSIN, Proc. Acad. Nat. Sci. Phila., 1848, p. 87 (Jalapa, Mexico); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1901, p. 110 (Vera Paz, Choctum); DEARBORN, 1907, p. 84 (Los Amates).

RANGE.—Tropical Zone: Mexico to Ecuador and Venezuela; the race, Mexico to Honduras.

One of the many Tropical Zone species of birds which decreases northward in Central America. It is rare north of Costa Rica.

(145) **Geranospizias cærulescens niger** (Du Bus)

Ischnosceles niger Du Bus, Bull. Acad. Roy. Brux., XVI, 1847, p. 103 (Mexico).
Geranospizias niger, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1899, p. 53 (Dueñas, Savana Grande, Escuintla).

Range.—The species, Mexico to Argentina; the race, southern Mexico to western Panama.

A rare forest hawk in Central America.

(146) **Parabuteo unicinctus harrisi** (Audubon)

Buteo harrisi Audubon, 'Birds Amer.,' IV, 1837, Pl. 392 (Mississippi); Salvin and Godman, 'Biol. Cent. Amer.,' III, 1899; p. 56 ("Guatemala," taken by Skinner).

Range.—From the South Temperate to the North Temperate Zone; the race, Louisiana to northern South America.

Harris' Hawk is a species of open plains and savannas, and is consequently exceedingly local in the mountainous country of Central America.

(147) **Accipiter cooperi mexicanus** Swainson[1]

Accipiter mexicanus Swainson, 'Fauna Bor.-Amer.,' 1845 p. 45 (Mexico).
Accipiter cooperi, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1899, p. 47 (Coban, Dueñas).

Range.—Temperate North America, south in winter to Costa Rica; the race, western North America.

(148) **Accipiter bicolor bicolor** (Vieillot)

Sparvius bicolor Vieillot, 'Nouv. Dict. d'Hist. Nat.,' X, 1817, p. 325 (Cayenne).
Accipiter bicolor, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1899, p. 48 (Vera Paz, Cubilguitz, Dueñas, Savana Grande); Lantz, 1899, p. 219 (Naranjo).

Range.—Mexico to Amazonia; a little-known race in northern Mexico.

In Central America this hawk is uncommon and occurs chiefly in the Tropical Zone on both sides of the continent.

(149) **Accipiter velox velox** (Wilson)

Falco velox Wilson, 'Amer. Orn.,' V, 1812, p. 116 (near Philadelphia, Pa.).
Accipiter velox, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1899, p. 49 (Choctum, Cahabon, Coban, San Geronimo, Dueñas, Pacific coast).

Finca La Primavera, 1 ♂, April 16.

Range.—North America, south in winter to western Panama.

According to Salvin, a common winter visitant occuring at least as high as 5000 feet.

[1]The race not recognized by recent revisers.

(150) **Accipiter chionogaster chionogaster** (Kaup)

Nisus chionogaster KAUP, P. Z. S., 1851, p. 41 (Coban, Guatemala).

Accipiter chionogaster, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1899, p. 50 (Coban, Choctum, Lanquin, San Geronimo, Volcan de Fuego (8000 ft.), Medio Monte, Savana Grande); DEARBORN, 1907, p. 82 (Tecpam).

Finca La Primavera, 2 ♂, 1 ♀; Momostenango, 1 ♂.

RANGE.—Guatemala to northern Nicaragua; a closely related race reappearing in the mountains of Venezuela.

The interrupted distribution of this pretty little Sparrow-Hawk, and its great rarity in Venezuela, is evidence of a relict species. This is further confirmed by its failure to conform to general principles of zonal distribution in Central America. It is a pine-forest species there, and perhaps has survived because of lack of competition, there being no other small hawk characteristic of this habitat. Consequently, it occurs wherever pine forests occur, and is found locally in the Tropical Zone on both coasts, commonly in the Subtropical Zone, and on the high mountains of western Guatemala it occurs in the pine forests of the Temperate Zone. This little hawk is the same in all these zones, though at least three distinct species of pines are involved. In Venezuela there are no pine forests, and the rarity of the species is perhaps due in part to competition with a very close relative, *erythrocnemius salvini* Ridgway, which has a wider distribution in Colombia and Ecuador.

Salvin's field work shows that *A. chionogaster* is not uncommon in the proper situations in Guatemala.

(151) **Buteo albicaudatus sennetti** Allen[1]

Buteo albicaudatus sennetti ALLEN, Bull. Amer. Mus. Nat. Hist., V, 1893, p. 144 (Lower Rio Grande, Texas).

Buteo albicaudatus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1900, p. 58 (Antigua, Dueñas, El Baoul, San Geronimo).

Progreso, 1 ♂, 1 ♀.

RANGE.—The species, Texas to Argentina; the race, Texas to Venezuela.

Like Harris' Hawk, the White-tailed Hawk prefers open or savanna country, and is rare and local in Central America.

"Two specimens of this beautiful hawk were taken at Progreso, where one or two others were seen along the cactus fences bordering the corn-fields and pastures. At Sacapulas this species was noted several

[1]Now *hypospodius* Gurney.

times, but as it was always near the same spot, the same bird may have been responsible for all the records. From the data it would seem to be a bird of the more dry, open areas." (Anthony, MS.)

(152) **Buteo albonotatus albonotatus** Kaup

Buteo albonotatus Kaup, Isis, 1847, Pl. 329 (Mexico).

Buteo abbreviatus, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1900, p. 60 (Guatemala).

Ocos, 1 ♂ (?).

Range.—Very poorly understood; the typical race, southern United States to Costa Rica, chiefly in the highlands; reappearing as the race *abbreviatus* in South America, chiefly in the Tropical Zone, widely scattered and very rare, recorded from the Pearl Islands, coast of Peru, Venezuela, and British Guiana.

The Zone-tailed Hawk, as outlined above, has a very remarkable distribution, and the two races are poorly defined. It has undoubtedly been overlooked to some extent in Central America, and there are very few records. Indeed the latest treatment of the species (Swann and Wetmore, 'Monog. of the Birds of Prey,' part 7) does not contain a hint that the species occurs in Central America.

It is chiefly a summer resident in the southern United States, and is generally distributed in Mexico. Salvin never met with it in Guatemala, but found a moth-eaten specimen in a little museum at Escuintla, and both Constancia and Skinner obtained specimens somewhere in Guatemala. In Nicaragua, Miller and I found it generally distributed in the pine forests of the north central highlands and collected breeding specimens in April and May. There are apparently four definite records for Costa Rica, where Carriker regarded it as a migrant, assuming that South American records represented its winter range. This view is probably untenable, but may be correct as regards Costa Rica.

(153) **Buteo borealis calurus** Cassin

Buteo calurus Cassin, Proc. Acad. Nat. Sci. Phila., VII, 1855, p. 281 (near Fort Webster, Rio Mimbres, New Mexico).

Buteo borealis, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1900, pp. 61–64 (Dueñas, San Geronimo, San Martin, Quetzaltenango; crit.).

Momostenango, 1 fine adult ♀. An unsexed immature specimen from San Lucas may belong here also.

Range.—Western North America, south in winter to northern Nicaragua.

The Western Red-tailed Hawk is a regular winter visitor to Central America, as far south as the mountains of northern Nicaragua. The adult listed above unquestionably belongs here. I follow Taverner's recent study of this hawk, but am inclined to doubt the propriety of recognizing even *calurus*.

Salvin and Godman have a long critique of the Red-tailed Hawks of Central America, cited above. It is quite clear that they distinguished *calurus* as a winter visitant to Guatemala from the resident form *costaricensis*, but the locality records are not allocated subspecifically. Both races are recorded only in the mountains.

Mr. Anthony reports the Red-tail as not uncommon in the higher parts of Guatemala, and thought it was perhaps somewhat more common in winter.

(154) **Buteo borealis costaricensis** Ridgway

Buteo borealis costaricensis Ridgway, 'Hist. N. Amer. Birds,' III, 1874, p. 285 (Costa Rica).

Tecpam, 1 ♀ ad., July; San Lucas, 1 ♂, dark phase, 1 ♀ ad., June, 1 imm. ♀; Panajachel, 1 ♀ imm., September, referred here on the basis of size only.

Range.—Resident in the mountains of Central America from Guatemala to western Panama.

All the breeding adult Red-tailed Hawks, normal phase, that I have seen from the mountains of Guatemala, Nicaragua, Costa Rica and western Panama, differ from North American birds in having dark heads and upperparts, with the rufous spotting greatly reduced or wanting. Below, they tend to be conspicuously whiter, often immaculate on throat, breast and abdomen, the breast-band always wanting, the shaft-streaks on the belly and barring of thighs greatly reduced or wanting. They also average about an inch shorter wing. I cannot identify melanistic adults or immature ones, unless they happen to be particularly small. Most of Swann's characters in his 'Synopsis' are imaginary.

(155) **Buteo swainsoni** Bonaparte

Buteo swainsoni Bonaparte, 'Geog. and Comp. List.,' 1838, p. 3 (near the Columbia River); Salvin and Godman, 'Biol. Cent. Amer.,' III, 1900, p. 68 (Dueñas).

Range.—Western North America, wintering in South America, chiefly south of the equator; on migrations in Central America.

The remarkable flights of Swainson's Hawk on migrations in Central America are one of the sights of the bird world, to the few who have been

fortunate enough to see one. I have seen three myself, and Mr. Anthony describes one below at second hand. Apparently the great majority of the individuals in existence pass over Central America in a comparatively few days in a few enormous flocks, which take hours to pass a given point. The birds alight only casually, and only three specimens have been collected in Central America.

"There is a very remarkable flight of hawks, passing to the south in October and returning in April, that has often been described to me in different parts of Guatemala, the species described agreeing quite well with this bird. I was told that this flight was all to be seen in one flock, taking hours to pass and the flock consisting of hundreds of thousands of birds. The only chance that I had of observing this interesting migration was when it passed to the south, October 25, 1925. I happened to be hunting in the heavy growth of the coffee plantation, where it was well nigh out of the question to observe what was passing overhead, and it was only when I returned to the hacienda, at noon, that I learned of the southward flight that took some three hours in passing." (Anthony, MS.)

(156) **Buteo platypterus platypterus** (Vieillot)

Sparvius platypterus Vieillot, 'Tabl. Encycl. Méth.,' III, 1823, p. 1273 (near Philadelphia, Pa.).

Buteo latissimus, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1900, p. 70 (above Salamá, Dueñas, San Geronimo).

Secanquim, 1 ♀; Barillos, 1 ♂.

Range.—Eastern North America, south to Brazil in winter; two local races in the Lesser Antilles.

A fairly common winter visitant, more numerous on migration.

(157) **Buteola brachyura** (Vieillot)

Buteo brachyurus Vieillot, 'Nouv. Dict. d'Hist. Nat.,' IV, 1816, p. 477 (Cayenne?); Salvin and Godman, 'Biol. Cent. Amer.,' III, 1900, p. 72 (Coban).

Range.—Florida to Brazil.

(158) **Asturina plagiata micrus** Miller and Griscom

Asturina plagiata micrus Miller and Griscom, Amer. Mus. Novit., No. 25, 1921, p. 4 (Chinandega, Nicaragua).

Asturina plagiata, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1900, p. 74 (Chimalapa, San Geronimo, Escuintla, Savana Grande, Retalhuleu); Dearborn, 1907, p. 82 (Gualan, Patulul); Lantz, 1899, p. 219 (Naranjo).

Finca Carolina, 4♂, 1♀; Finca El Cipres, 4♂, 5♀; Finca El Espina, 1♂; Puebla, 1♂, 1♀; Hacienda California 1 (?); San Lucas, 1♂, 1♀.

RANGE.—Texas and Arizona to northwestern Costa Rica; the race, Guatemala southward.

This excellent series definitely shows, I think, that the boundary between the two extremes of this common hawk is the Isthmus of Tehuantepec. These Guatemala birds are, of course, intermediate, but in color and size they are distinctly nearer the smaller southern race. The wings of the males, for instance, are 238–248 mm.

In Central America this hawk is found primarily in the Arid Tropical Zone and is rare or absent elsewhere. It is consequently abundant on the Pacific slope of Guatemala, and occurs in the arid country in the interior, as at San Geronimo and the Rio Motagua Valley. It is most exceptional to find it above 3500 feet.

(159) **Rupornis magnirostris direptor** Peters and Griscom

Rupornis magnirostris direptor PETERS AND GRISCOM, Proc. N. E. Zoöl. Club, XI, 1929, p. 46 (Finca El Cipres, near Mazatenango, Pacific slope, Guatemala).

Rupornis ruficauda, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1900, p. 77, (Santo Toribio, Peten; Teleman, Polochic Valley; Chimalapa, Motagua Valley; Savana Grande, Escuintla, between San Antonio and Paramos (6000 ft.) Sierra de las Minas).

Rupornis ruficauda griseocauda, DEARBORN, 1907, p. 82 (Los Amates, San José).

Puebla 1♀; Hacienda Carolina, 1♂, 2♀; Hacienda California, 1♀; Finca El Cipres, 7♂, 6♀; Virginia Plantation, near Puerto Barrios, 1♀; Ocos, 1♂, 3♀.

RANGE.—The species, Mexico to Paraguay; highly variable; at least fourteen subspecies, the present one in Guatemala and Salvador.

The most abundant hawk in Central America, but relatively uncommon in heavy rain forest, where it occurs locally in clearings. It is entirely possible that Peten birds might prove referable to *griseocauda* or show an approach to *conspecta* Peters of Yucatan. In open country, especially where there is much thorny scrub or saw-grass savanna-land, specimens of this hawk have the tail worn and frayed to a mere stump.

(160) **Busarellus nigricollis** (Latham)

Falco nigricollis LATHAM, 'Index Orn.,' I, 1790, p. 35 (Cayenne).

Busarellus nigricollis, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1900, p. 86 (Huamuchal, Santana Mixtan, Dueñas, Lake Peten).

Hacienda California, 1 (?); Ocos, 1♂.

RANGE.—Southern Mexico to Paraguay.

While there is nothing that could be called an adequate series of this local fish-eating hawk in any Museum, the specimens available show that subspecific lines in this species have been founded on individual vagaries. The type of *macropus* Swann from British Honduras is large and pale, the Guatemala specimen is dark and large also, but another Guatemala specimen is less than the minimum given by Swann for typical *nigricollis*. Two Nicaraguan specimens are dark and intermediate in size. Six specimens from South America, supposedly *nigricollis*, show both extremes of color variation. As a female from Paraguay is indistinguishable from a British Honduras specimen, I fail to see how any subspecies can be maintained.

(161) **Urubitinga**[1] **urubitinga ridgwayi** Gurney

Urubitinga ridgwayi Gurney, 'List Diurn. Birds Prey,' 1884, p. 77 (Guatemala); Salvin and Godman, 'Biol. Cent. Amer.,' III, 1900, p. 80 (Coban, San Geronimo, Savana Grande).

Hacienda California, 1 ♀; Chimoxan 1 (?).

Range.—Mexico to Argentina; the race *ridgwayi* of Central America is often regarded as specifically distinct.

(162) **Urubitinga anthracina anthracina** (Lichtenstein)

Falco anthracinus Lichtenstein, 'Preis-Verz. Mex. Vögel,' 1830, p. 3 (Mexico).
Urubitinga anthracina, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1900, p. 81, (Vera Paz, Dueñas, Chiapam, San Geronimo); Dearborn, 1907, p. 82 (San José; generally distributed).

Finca Sepacuite, 1 ♀; La Montañita, 1 ♀; San Antonio 1 ♂; Finca El Cipres, 2 ♂, 3 ♀, 1 (?); Ocos, 3 ♂, 6 ♀, 1 (?).

Range.—Texas and Arizona to northern South America and Lesser Antilles; a well-marked race, eastern Panama to west Ecuador.

Probably the commonest large hawk in Central America, chiefly in the lowlands, but ranging to 5000 feet. It is quite unique in being equally at home in mangrove swamps along the coast. At Ocos, Mr. Anthony records it as waxing fat on crabs caught on the mud flats. It is most interesting to note that the subspecies *subtilis* Thayer and Bangs is almost exclusively a mangrove dweller, and the isolated representative in Cuba, *gundlachi*, is exclusively so.

[1] I am aware that *Morphnus* is now generally accepted as the proper name of this genus. This leaves the Crested Eagle, currently called *Morphnus*, without a name, so I follow Chapman in retaining the better-known nomenclature, until the matter is finally settled.

(163) **Leucopternis ghiesbreghti ghiesbreghti** Du Bus

Buteo ghiesbreghti Du Bus, 'Esquiss. Orn.,' 1845, Pl. I (S. Mexico).

Leucopternis ghiesbreghti, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1900, p. 83 (Choctum, Medio Monte, Savana Grande, Aguna).

Finca Sepur, 1 (?); Finca Sepacuite, 1 ♂, 1 ♀; Secanquim, 1 ♂, 1 ♀.

Range.—Tropical Zone, Southern Mexico to eastern Panama; a subspecies, *costaricensis* Sclater, from Nicaragua southward.

The beautiful Snow Hawk belongs to a group of species which is widely distributed in tropical South America, The Central American representative is the whitest of all, but will probably be found to intergrade with *albicollis* in the unexplored area between their ranges.

"Not uncommon in Alta Vera Paz. At Sepacuite and Secanquim they were frequently seen, either sailing over the forest or perched on the top of a lofty tree, where they were apt to remain for hours, frequently uttering their shrill, discordant cry. Several were secured, all being filled to capacity with either small snakes or lizards. One was noted at Carolina, where I was told that it was rare, but seen at times. The nearly pure-white plumage renders this species very conspicuous, even at a distance. A bird sailing over the forest a mile or more from the observer is as apt to be noted as at one hundred yards." (Anthony, MS.)

(164) **Urubitornis solitarius** (Tschudi)

Circaëtus solitarius Tschudi, Arch. für Naturg., 1844, p. 246 (Peru).

Harpyhaliaëtus solitarius, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1900, p. 88 (San Geronimo).

Range.—Argentina to southern Mexico; rare and little-known.

There are less than six recorded specimens of this eagle from Central America.

(165) **Harpia harpyja** (Linnæus)

Vultur harpyja Linnæus, 'Syst. Nat.,' I, 1758, p. 86 (Mexico).

Thrasaëtus harpyia, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1901, p. 90 (Vera Paz).

Range.—Paraguay to southern Mexico, in tropical rain forest.

The Harpy Eagle is fairly common in Panama, and there are several records for Costa Rica, but farther north it is a very rare bird. In Guatemala City, Mr. Anthony saw a specimen said to have been taken in Coban, and he believes he saw one, or a pair, soaring over the forest at Secanquim.

(166) **Spiziastur melanoleucus** (Vieillot)

Buteo melanoleucus VIEILLOT, 'Nouv. Dict. d'Hist. Nat.,' IV, 1816, p. 482 (Guiana).

Spiziastur melanoleucus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1901, p. 94 (Huamuchal, Savana Grande).

RANGE.—Tropical Zone in heavy forest, from Brazil to southern Mexico; rare and local in Central America.

(167) **Spizaëtus ornatus** (Daudin)

Falco ornatus DAUDIN, 'Traité,' II, 1800, p. 77 (Cayenne).

Spizaëtus ornatus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1901, p. 92 (Coban, Cahabon, Choctum, Costa Grande); DEARBORN, 1907, p. 83, (Patulul); LANTZ, 1899, p. 219 (Chocan River).

RANGE.—Paraguay to Mexico, in heavy rain forest.

(168) **Spizaëtus tyrannus** (Wied)

Falco tyrannus WIED, 'Reise n. Bras.,' I, 1831, p. 360 (Brazil).

Spizaëtus tyrannus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1901, p. 93, (Choctum, Savana Grande, Dueñas).

RANGE.—Tropical Zone, in heavy forest, Brazil to southern Mexico.

I entirely agree with Todd ('Birds Santa Marta,' p. 157) that *tyrannus* is a distinct species and not a melanism of *ornatus*. The two species occur together throughout their ranges, but *tyrannus* is much rarer everywhere.

(169) **Herpetotheres cachinnans cachinnans** (Linnæus)

Falco cachinnans LINNÆUS, 'Syst. Nat.,' I, 1758, p. 90 (Surinam).

Herpetotheres cachinnans, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1901, p. 112 (Chimalapa, Choctum, Escuintla, Retalhuleu); DEARBORN, 1907, p. 82 (Los Amates, Mazatenango); LANTZ, 1899, p. 219 (Naranjo).

Progreso, 1 ♀; La Carolina, 1 ♀; Finca El Cipres, 1 ♂, 2 ♀; Hacienda California, 2 ♂, 1 ♀; Virginia Plantation, near Puerto Barrios, 1 ♂ (M.C.Z.).

RANGE.—The species, Tropical Zone, Argentina to Mexico; several slight subspecies, their validity and exact ranges subject to dispute.

Like many widely ranging Neotropical hawks, the Laughing Falcon shows characteristic size variation. Specimens from Mexico, south in the mountains to northern Nicaragua, are large and whiter (wing, 15 specimens, 268–303 mm.). Four from southern Brazil, Paraguay and

northwestern Argentina are equally large; one is very pale, and three are colored like Surinam birds; these represent *queribundus* Bangs and Penard. It is apparent, however, that northern and southern extremes are scarcely separable from each other. The smallest birds of all occur in northwestern Peru, western Ecuador and western Colombia, 25 specimens from this range averaging 247–274 mm. Several specimens from Bellavista, Peru, are paler and were described as *mæstus* Bangs and Noble. Four specimens in New York, however, from Perico, only a few miles from Bellavista, are not either paler or smaller than Surinam birds. A richly colored buff extreme, *fulvescens* Chapman, is characteristic of western Ecuador to eastern Panama, where paler or normal specimens also occur. Farther north in Central America the majority of specimens are normal, but buffy individuals occur as far north as southeastern Mexico. I have already discussed this situation (Bull. Mus. Comp. Zoöl., (LXIX, 1929, p. 158) and have suggested that the name *fulvescens* be restricted to the area where a clear majority of individuals are buffy. It should be noted that the buffiest extreme from Central America nowhere nearly approaches the cinnamon-buff extremes of western Colombia.

In northern Central America we encounter further nomenclatural problems. Swann, in his latest 'Synopsis of Accipitres,' recognized the larger and paler birds of Mexico, etc., and stretched the name *chapmani* Bangs and Penard to cover them. It is exceedingly doubtful if this stretch can be made. It happens that the type of *chapmani* is a particularly small bird from the lowlands of Quintana Roo. I have, myself, collected two Laughing Falcons in Quintana Roo, which could not be distinguished from typical *cachinnans*, and small birds with no pallor of coloration whatever are in New York and the British Museum from Oaxaca and the hot lowlands of Vera Cruz.

Having examined both the Cambridge and the New York collections, it is abundantly clear that radically different conclusions would be reached by those who had seen one of them only. The distinctness of several of the proposed forms is greatly reduced when both are examined, and it is certain that *fulvescens* is far more distinct than any other subspecies, although there is ample room for difference of opinion as to its range. The facts are that the Laughing Falcon, within narrow limits of size and color, is a highly variable bird, with an unusual amount of inconstancy of characters in any one part of its range. Under these circumstances the discrimination of subspecies can never be as satisfactory or as definite as it is with the great majority of variable Neotropical birds.

The available specimens from Guatemala all come from the lowlands, and, consequently, none happens to be particularly large and pale. Such specimens will, however, surely be collected in the future.

The Laughing Falcon is much commoner on the Caribbean slope of Central America than on the Pacific slope, and Salvin found this to be the case in Guatemala. Mr. Anthony, however, in his field experience, reports far more on the Pacific slope.

(170) **Elanoides forficatus forficatus** (Linnæus)

Falco forficatus Linnæus, 'Syst. Nat.,' I, 1758, p. 89 (Carolina).

Elanoides furcatus, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1901, p. 96 (Vera Paz, Tactic, Kokak, Lanquin, Raxché, Cahabon).

Range.—Southern United States, south in winter at least to Ecuador; chiefly a migrant in Central America.

Large flocks of migrating Swallow-tailed Kites have been noted in eastern Guatemala, up to the middle of May, but the species has not been recorded between December and the middle of March.

(171) **Elanoides forficatus yetapa** Bonnaterre and Vieillot

Elanoides yetapa Bonnaterre and Vieillot, 'Encycl. Méth.,' III, 1823, p. 1205 (Paraguay).

Finca Sepacuite, 2 breeding males.

Range.—Tropical Zone, Guatemala to Paraguay.

The meager evidence available shows that this distinct race breeds regularly as far north as western Panama and Costa Rica. North of this point *Elanoides* has been found nesting near Belize, and breeding birds have been forwarded by Mr. Anthony from eastern Guatemala, which are unquestionably the bottle-green *yetapa*. So far as we know, *yetapa* is purely a summer visitor to Central America, wintering in South America.

(172) **Rostrhamus sociabilis plumbeus** Ridgway

Rostrhamus sociabilis var. *plumbeus*, Ridgway, 'Hist. N. Amer. Birds,' III, 1874, p. 209 (Everglades, Florida).

Rostrhamus sociabilis, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1901, p. 99 (Peten).

Range.—Florida to Paraguay; the race, Florida and Central America.

Everglade Kites from Florida are distinctly larger than South American examples, but there are no definite color characters. The very

few specimens in existence from Central America are also relatively large. This hawk is so highly specialized in its feeding habits that it is extremely local, but tends to be fairly numerous where it occurs.

(173) **Chondrohierax uncinatus** (Illiger)

Falco uncinatus Illiger, in Temminck, 'Pl. Col.,' I, 1824, Pls. 103–105 (Brazil).

Regerhinus uncinatus, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1901, p. 102. ("Guatemala," coll. by Skinner).

Hacienda California, 1 ♀.

Range.—Mexico to Bolivia.

This kite is also primarily a marsh or swamp-loving bird and consequently is exceedingly local in Central America. The ancient record for Guatemala is advantageously supplemented by Mr. Anthony's definite locality record.

(174) **Odontriorchis palliatus** (Wied)

Falco palliatus Wied, in Temminck, 'Pl. Col.,' I, 1823, Pl. 204 (Brazil).

Hacienda California, 1 ♀.

Range.—Mexico to southern Brazil.

I am unable to endorse the subspecies *guianensis* and *mexicanus* proposed by Swann. The color characters used can all be found in Brazilian or Trinidad series, and a specimen from Costa Rica is much smaller than any South American example. The type of *palliatus* Wied is in the American Museum, and Swann erred in designating Matto Grosso as the type locality, with the type in the Leyden Museum, no doubt misled by Dr. J. A. Allen who failed to find the specimen when he described the Maximilian types. As Wied speaks in his 'Beitrage' (III, p. 152) of having obtained but a single specimen on the Rio Peruhypé, near Villa Viçoza, this may be accepted as the true type locality.

This kite is uncommon in Central America, but much less so than the two last species.

(175) **Elanus leucurus majusculus** Bangs and Penard

Elanus leucurus majusculus Bangs and Penard, Proc. N.E. Zoöl. Club, VII, 1920, p. 46 (San Rafael, California).

Elanus leucurus, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1901, p. 97 ("Guatemala," coll. by Skinner).

Range.—Breeding locally in southern United States, south in winter to Guatemala,; the typical race from Patagonia and Chile to Venezuela and Guiana, probably migratory.

(176) **Ictinia plumbea** (Gmelin)

Falco plumbeus GMELIN, 'Syst. Nat.,' I, 1758, p. 283 (Cayenne).

Ictinia plumbea, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1901, p. 104 (Peten, Lanquin, Cahabon, Sierra de las Minas, Paraiso); DEARBORN, 1907, p. 83 (Los Amates).

RANGE.—Tropical Zone: Mexico to Paraguay.

This pretty little kite is chiefly migratory in Central America, although a few individuals winter in the Caribbean lowlands; from late March to the middle of May flocks containing as many as fifty birds have been noted occasionally drifting northward, and I have frequently seen such myself in Nicaragua and Panama.

(177) **Ictinia mississippiensis** (Wilson)

Falco mississippiensis WILSON, 'Amer. Orn.,' III, 1811, p. 80 (Natchez, Mississippi).

Ictinia mississippiensis, SALVIN AND GODMAN, 1901, p. 105 (near Coban).

RANGE.—Southern United States, south in winter to Guatemala; now greatly reduced in numbers, and very local.

(178) **Harpagus fasciatus** Lawrence

Harpagus fasciatus LAWRENCE, Proc. Acad. Nat. Sci., Phila., XX, 1868, p. 429 (Guatemala); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1901, p. 106 (Vera Paz).

RANGE.—Tropical Zone, Panama to Mexico.

This rare little kite is very closely related to the South American *H. bidentatus* and may be only subspecifically distinct. Like many other birds of heavy rain-forest, it decreases northward in Central America.

(179) **Falco peregrinus anatum** Bonaparte

Falco anatum BONAPARTE, 'Geog. and Comp. List,' 1838, p. 4 (Egg Harbor, New Jersey).

Falco peregrinus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1901, p. 115 (Dueñas).

RANGE.—The species, nearly cosmopolitan; the race, most of North America, south in winter to West Indies and Panama and perhaps farther; recorded throughout the year in Ecuador and other parts of South America, except the extreme south.

One seen flying along the estero at Ocos (Anthony).

(180) **Falco deiroleucus** Temminck

Falco deiroleucus Temminck, 'Pl. Col.,' I, 1825, Pl. 348 (Brazil); Salvin and Godman, 'Biol. Cent. Amer.,' III, 1901, p. 118 (Vera Paz).

Finca El Cipres, 1 (?).

Range.—Brazil to Mexico.

Judging by museum collections, this beautiful falcon is a rare bird everywhere, and is very rare in Central America. Field experience, however, somewhat impugns the force of this evidence. Both in Nicaragua and western Panama, the bird nests in cathedral and church towers and belfries in the heart of towns and cities; in other words, in places where it is impossible to collect it without committing sacrilege!

(181) **Falco albigularis** Daudin

Falco albigularis Daudin, 'Traité,' II, 1800, p. 131 (Cayenne); Dearborn, 1907, p. 83 (Patulul, Mazatenango); Lantz, 1899, p. 219 (Escuintla, San Tomas).

Falco rufigularis, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1901, p. 117 ("Guatemala," coll. by Constancia and Skinner).

Hacienda California, 1 ♂, 2 ♀; Panajachel, 1 ♀; Finca El Cipres, 4 ♂, 3 ♀.

Range.—Argentina to Mexico, in the Tropical Zone.

It is undoubtedly pure chance that this species has not been collected in the Caribbean lowlands of Guatemala. It is a forest bird, preferring clearings or the borders of rivers, and nests in holes in dead trees. It is quite common throughout Central America.

I am quite unable to confirm either of Swann's two proposed subspecies, having examined large series from every part of the range.

(182) **Falco fusco-cærulescens septentrionalis** Todd

Falco fusco-cærulescens septentrionalis Todd, Proc. Biol. Soc. Wash., XXIX, 1916, p. 98 (Fort Huachuca, Arizona).

Falco fusco-cærulescens, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1901, p. 119 ("Guatemala," coll. by Skinner; San Agustin).

Range.—Remarkably disconnected; the present race, southwestern United States, south in winter to Guatemala; another race in northern South America, reappearing near Agua Dulce in western Panama[1]; a third in the high Andes of Ecuador; the typical form in southern South America.

[1]Often merged with the typical form, probably correctly.

(The Pigeon Hawk, *Falco columbarius*, is a regular winter visitant to Central America, reaching Panama and even Colombia. It unquestionably occurs in Guatemala.)

(183) **Cerchneis sparveria sparveria** (Linnæus)

Falco sparverius Linnæus, 'Syst. Nat.,' I, 1758, p. 90 (Carolina); Dearborn, 1907, p. 83 (Tecpam, Los Amates, Gualan).

Tinnunculus sparverius, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1901, p. 123 (Coban, Volcan de Agua, San Geronimo, Tactic, Iguana, Motagua Valley, Dueñas).

La Montañita, 3♂; Finca Carolina, 1♂; La Perla, 1♂; San Lucas, 2♂; Barrillos, 1♀; Secanquim, 1♀; Capetillo, 1♂ (=type of *guatemalensis* Swann).

Range.—Most of North America, south in winter to Panama; numerous allied races throughout the New World.

An abundant winter visitant. On the status of this form in Central America, see my remarks under the description of the following form.

(184) **Cerchneis sparveria tropicalis** Griscom

Cerchneis sparveria tropicalis Griscom, Amer. Mus. Novit., No. 414, 1930, p. 1 (Antigua, Guatemala).

Antigua, 2♂ ad., 1♂ imm., 1♀ ad., 2♀ imm., 1 fledgeling, May 19–21.

Range.—Resident in the pine forests of the Altos of Guatemala, at lower elevations.

Mr. Anthony's notes, received since the description was sent to press, show that this Sparrow Hawk breeds in the pines and not in the arid portion of the Motagua Valley, as incorrectly stated. He writes that he found others in July in the pine woods in northern Honduras, south of Quiriguá, Guatemala. Crosby and I found Sparrow Hawks at Panajachel and Lake Amatitlan early in August, 1930. One collected proved to be a female of this well-marked form.

(185) **Pandion haliaëtus carolinensis** (Gmelin)

Falco carolinensis Gmelin, 'Syst. Nat.,' I, 1788, p. 263 (Carolina).

Pandion haliaëtus, Salvin and Godman, 'Biol. Cent. Amer.,' III, 1899, p. 40 (both Atlantic and Pacific coasts, Acapam).

Range.—The species, nearly cosmopolitan; the race, western hemisphere, south in winter to Chile.

An abundant winter visitant. Salvin found the osprey breeding commonly on the Pacific coast in 1863 from San José and Champerico north to the frontier of Soconusco. These breeding birds might be the tropical form *ridgwayi* Maynard (see Griscom, Amer. Mus. Novit. No. 235, 1926, p. 13).

ORDER STRIGIFORMES

FAMILY **BUBONIDÆ.** OWLS

(186) **Asio stygius** (Wagler)

Nyctalops stygius WAGLER, Isis, 1832, p. 1221 (Brazil).
Asio stygius, RIDGWAY, 'Birds N. and Mid. Amer.,' pt. 6, 1914, p. 660 (Coban, Guatemala).

RANGE.—Cuba and southern Mexico to Argentina, both in Tropical Zones.

There are scarcely any Central American records for this rare owl. The one given above is based on a specimen forwarded to the U. S. National Museum in 1897 by the Rev. H. Th. Heyde.

(187) **Asio flammeus flammeus** (Pontoppidan)

Strix flammea PONTOPPIDAN, 'Danske Atlas,' I, 1763, p. 617 (Sweden).
Brachyotis cassini, SALVIN, Ibis, 1866, p. 196 (Volcan de Agua, at 10,000 ft.).
Asio flammeus, RIDGWAY, *loc. cit.*, p. 661.

RANGE.—Nearly cosmopolitan; the race, northern hemisphere, south in the New World in winter to Guatemala.

Indians brought the specimens to Salvin, which they claimed to have shot in the rough grass among scattered pines near tree-level on the Volcan de Agua. This remains the only Central American record for this cosmopolitan owl.

(188) **Rhinoptynx clamator clamator** (Vieillot)

Bubo clamator VIEILLOT, 'Ois. Amer. Sept.,' I, 1807, p. 52 (Cayenne, by subs. desig.).
Asio mexicanus, BOUCARD, 'Liste Ois. recolt. Guat.,' 1878, p. 22 (Guatemala).
Rhinoptynx clamator, RIDGWAY, *loc. cit.*, p. 671.

RANGE.—Tropical Zone, Paraguay to Guatemala; a race in southern Brazil, southward.

Lack of records for this owl in Guatemala probably indicates little or nothing. Salvin and Godman, however, entirely overlooked the only

one there is, but they may have thought that Boucard's *Asio mexicanus* was something else.

In extreme southeastern Brazil and Paraguay southward, specimens of this owl are very much larger and paler and should apparently be known as *R. clamator maculatus* Vieillot, 1817, of which Otus *midas* Schlegel is a synonym. The occurrence of this owl in Mexico has always been doubted, for two excellent reasons. In the first place, the original *Strix mexicana* Gmelin does not apply definitely to this species, and subsequent authors, in using this specific name, recorded the bird from elsewhere or merely copied the old record for Mexico. Sclater and Salvin took no stock in it whatever, as they never found the species north of Panama. Nevertheless, in the American Museum there was a mounted specimen in the old Verreaux Collection from "Mexico" labelled *mexicanus* Kaup. It may yet be found there.

(189) **Strix fulvescens** (Sclater and Salvin)

Syrnium fulvescens SCLATER AND SALVIN, P. Z. S., 1868, p. 58 (Cahabon, Guatemala); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1897, p. 10 (Dueñas, Antigua, Volcan de Fuego, Volcan de Tacaná); RIDGWAY, *loc. cit.*, p. 647.

RANGE.—Known only from the mountains of western Guatemala, chiefly in the Temperate Zone, from 7000 to 8000 feet.

An obvious representative of the North American Barred Owl, *Strix varia*, and of northern origin.

(190) **Cryptoglaux rostrata** Griscom

Cryptoglaux rostrata GRISCOM, Amer. Mus. Novit., No. 438, 1930, p. 1 (Sacapulas, Rio Negro Valley, Guatemala).

Nyctala acadica, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1897, p. 11 (Quetzaltenango).

Sacapulas, 1 ♀.

RANGE.—Known only from Guatemala.

As discussed in the original description, it is an open question whether this species should not be referred to *Gisella* rather than *Cryptoglaux*, or whether the two genera can be maintained. The occurrence of this bird definitely in the Arid Tropical Zone in itself arouses suspicion. The record of Salvin and Godman was based on a specimen, now destroyed, in the old Museum at Guatemala City, which was said to be from Quetzaltenango. This specimen is also in the "immature" plumage, and one wonders if Central American Saw-whet Owls ever acquire the "adult" plumage.

(191) **Bubo virginianus melancerus** (Oberholser)

Asio magellanicus melancerus OBERHOLSER, Proc. U. S. Nat. Mus., XXVII, 1904, p. 180 (Tehuantepec City, Oaxaca).

Bubo virginianus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1897, p. 753.

San Lucas, 1 ♂, 1 ♀; Panajachel, 2 ♂.

RANGE.—The species, almost the entire New World; the race, central Mexico to Guatemala, and perhaps northern Nicaragua.

The Great Horned Owl is exceedingly plastic and variable, and at least sixteen subspecies are recognizable. Almost any kind of isolation, change of climate, or type of habitat produces a local race. It is primarily a Temperate Zone bird, and wherever it occurs in the Tropical Zone, it shrinks notably in size.

Salvin constantly met with these owls in Guatemala, and heard them calling almost nightly during the breeding season. Anthony's field experience apparently confirms this.

(192) **Pulsatrix perspicillata saturata** Ridgway

Pulsatrix perspicillata saturata RIDGWAY, 'Birds N. and Mid. Amer.,' part 6, 1914, p. 758 (Santo Domingo, Oaxaca).

Ciccaba perspicillata, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1897, p. 28 (Choctum, Escuintla).

Hacienda California, 4 ♂, 1 ♀.

RANGE.—Tropical Zone, Mexico to Brazil; the race, Mexico to west Ecuador.

A common owl in the lowland forests of the whole of Central America.

"Not uncommon at Hacienda California. One given to me by a native of this place was killed when it entered the house and attempted to carry off a parrot. When delivered, the owl still had a collection of green feathers to show for its trouble. On June 25 an adult and downy young, evidently but recently from the nest, were shot in the heavy forest. During all of my stay at this station I heard the calls of some night bird, but was not able to identify it. The notes were something like the rapid tapping of a woodpecker—chuck chuck chuck—long continued and, often seemed to be two birds in duet, the notes being on slightly different tone. It was not until about the time that I was to leave that I was able to clearly attach the calls to this owl. A pair was heard and at last discovered in a tall tree near the house, by aid of the light of a flash lamp. The calls were given in unison in but slightly different tones, at

intervals of half a minute, and the notes blended so nearly that at a little distance they might be considered as produced by one bird. A similar note was heard several times at Cipres, when night hunting, but at no time did I manage to find the bird." (Anthony, MS.)

(193) **Otus trichopsis trichopsis** (Wagler)

Scops trichopsis WAGLER, Isis, 1832, p. 276 (Mexico); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1897, p. 16 (Villa Maria, Joyabaj, Uspantan, Dueñas, Volcan de Fuego above Calderas, San Bernardo in the Motagua Valley, Coban).

Otus trichopsis, RIDGWAY, *loc. cit.*, p. 704.

Chichicastenango, 1 ♂, 1 ♀; San Lucas, 1 ♀; loc. ?, 1 (?); also three specimens in the U. S. Nat. Museum, from Villanueva, Uspantan, and Joyabaj, Quiché.

RANGE.—Temperate Zone, Arizona to Guatemala.

With the gradual accumulation of fair series from Arizona and northwestern Mexico, it is apparent that there are two races involved, when northern birds are compared with specimens from Guatemala. The latter average larger and are distinctly browner in the gray phase, especially on the head. There are, however, nomenclatural difficulties. Wagler's type is not available for comparison, and "Mexico" is indefinite; but it is quite possibly Vera Cruz. Under these circumstances, it is more probable that Guatemalan and Vera Cruz specimens would resemble each other, and *aspersus* Brewster is available for the northwestern race.

The spotted Screech Owl is characteristic of the pine forests at higher altitudes.

It is probable that the specimen from San Bernardo is incorrectly determined. If a Screech Owl occurs in the arid Motagua Valley, it should be *O. cooperi* (Ridgway), the species of the Arid Tropical Zone, which is unrecorded between Oaxaca and Salvador.

(194) **Otus guatemalæ guatemalæ** (Sharpe)

Scops guatemalæ SHARPE, 'Cat. Birds Brit. Mus.,' II, 1875, p. 112 (Guatemala); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1897, p. 21 (Coban, Choctum, Las Salinas, Cahabon).

Otus guatemalæ, RIDGWAY, *loc. cit.*, p. 715.

Secanquim, 1 ♀; Alta Vera Paz, 1 ♀ (U. S. Nat. Mus.).

RANGE.—Subtropical Zone in the mountains of Guatemala, to northern Nicaragua; probable representative forms in Vera Cruz, Costa Rica and Panama.

Ridgway's last treatment of the Screech Owls laid great emphasis on the degree to which the tarsus and toes were fully feathered; but it is

more than likely that this was overdone. A case in point is the relationship of this species to *O. vermiculatus* of the Subtropical Zone of Costa Rica and Panama. Specimens received in recent years completely break down the distinction of the feathering of the tarsus, just as Salvin claimed years ago, and birds from both regions are so variable in details of coloration that one would be hard-put to it to give constant subspecific characters. In northern Peru, *Otus roboratus* Bangs and Noble excellently illustrates a representative form which is probably specifically distinct. It is quite likely that *Otus cassini* Ridgway is best treated as a subspecies of *O. guatemalæ* in Vera Cruz, where it occurs in the Subtropical Zone. On this basis, the species increases in size southward and becomes more finely vermiculated below southward, as a slight average character.

(195) **Otus barbarus** (Sclater and Salvin)

Scops barbarus Sclater and Salvin, P. Z. S., 1868, p. 56 (Santa Barbara, Vera Paz, Guatemala); Salvin and Godman, 'Biol. Cent. Amer.,' III, 1897, p. 24 (crit.).
Otus barbarus, Ridgway, *loc. cit.*, pp. 723–724 (crit.).

Uspantan, Quiché, 1 ♂ (U. S. Nat. Mus.).

Range.—Known only from the Subtropical and Humid Temperate Zones in the mountains of northern Guatemala.

Only five specimens of this very distinct species are recorded. It occurs with *O. guatemalæ* and excellently illustrates specific differences between two Screech Owls. The case is paralleled by *O. trichopsis* and *O. flammeolus*, a large and a very rare small species which occur together in the pine forest areas, chiefly in the Temperate Zone.

(196) **Otus flammeolus** (Kaup)

Scops flammeola Kaup, Trans. Zool. Soc. London, IV, 1859, p. 226 (Mexico); Salvin and Godman, 'Biol. Cent. Amer.,' III, 1897 (Dueñas, Cerro de Paramos).
Otus flammeolus, Dearborn, 1907, p. 84 (Tecpam); Ridgway, *loc. cit.*, p. 728.

Range.—Temperate Zone: in pine forests from British Colombia to western Guatemala.

While very rare in collections, this little Screech Owl is so difficult to find that it is probably far commoner than the records would indicate.

(197) **Lophostrix stricklandi stricklandi** Sclater and Salvin

Lophostrix stricklandi Sclater and Salvin, Ibis, 1859, p. 221 (Vera Paz, Guatemala); Salvin and Godman, 'Biol. Cent. Amer.,' III, 1897, p. 14 (Coban, San Pedro Martir); Ridgway, *loc. cit.*, p. 735 (Escuintla).

RANGE.—Tropical Zone: Amazonia to southern Mexico; the race, Mexico to western Colombia.

As is usual with South American birds, the Central American representative is only slightly different, and decreases northward. Strickland's Owl is fairly common in Panama and Costa Rica, but has been collected scarcely a dozen times beyond these points.

(198) **Ciccaba virgata centralis** Griscom

Ciccaba virgata centralis GRISCOM, Bull. Mus. Comp. Zoöl., LXVI, 1929, p. 159 (Chivelá, Oaxaca, Mexico).

Ciccaba virgata, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1897, p. 29 (Choctum, Coban, Calderas, Due as, Savana Grande, Retalhuleu).

Ciccaba virgata virgata, RIDGWAY, *loc. cit.*, p. 763.

Finca Cipres, 4♂, 10♀, 1 (?); Hacienda California, 1♂; La Carolina, 1 (?); Finca Sepur, 1♂, 1♀; Barrillos, 1♂.

RANGE.—Tropical Zone: southern Mexico to Ecuador; the race, Mexico to western Panama.

"An abundant species in most of the region explored up to 5500 feet altitude. At Finca Cipres these owls were abundant in the coffee plantation, hiding in the banana growth which is used in places as shade. A similar banana patch at Hacienda California sheltered a colony of this species. At Sepur and Sepacuite it was often heard calling and several were seen." (Anthony, MS.)

(199) **Ciccaba nigrolineata** Sclater

Ciccaba nigrolineata SCLATER, P. Z. S., 1859, p. 131 (S. Mexico); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1897, p. 27 (Mazatenango, Cahabon); RIDGWAY, *loc. cit.*, p. 760.

RANGE.—Tropical Zone: southern Mexico to western Ecuador.

A very uncommon owl, belonging to a different group in the genus, and representing *C. huhula* of Amazonia.

(200) **Speotyto cunicularia hypogæa** (Bonaparte)

Strix hypogæa BONAPARTE, 'Amer. Orn.,' I, 1825, p. 72 (note) (Western United States).

Speotyto cunicularia, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1897, p. 32 (Chiapam, San José, Dueñas, San Geronimo).

Speotyto cunicularia hypogæa, DEARBORN, 1907, p. 84 (Gualan, El Rancho); RIDGWAY, *loc. cit.*, p. 814.

Huehuetenango, 1♀; San Lucas, 2♀.

RANGE.—Western United States and Mexico, south in winter to Guatemala' accidentally to western Panama.

There is no definite evidence to show that the Burrowing Owl is anything but a winter visitant to Guatemala, where it naturally occurs in arid or open country. Both Dearborn and Anthony found it in winter only, and the latter regarded it as not uncommon locally.

(201) **Glaucidium brasilianum ridgwayi** Sharpe

Glaucidium ridgwayi SHARPE, Ibis, 1875, p. 55 (Mexico).

Glaucidium phalaenoides, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1897, p. 34, (Laguna, San Geronimo, Dueñas, Volcan de Agua, El Paraiso); LANTZ, 1899, p. 219 (Naranjo).

Glaucidium brasilianum ridgwayi, DEARBORN, 1907, p. 84 (El Rancho; Patulul); RIDGWAY, *loc. cit.*, p. 798.

Finca El Cipres, 2♂; Secanquim, 2♂; Antigua, 1♀; La Montañita, 1♂; Progreso, 2♂, 3♀; Hacienda California, 4♂, 4♀; Finca Concepcion, 1♂, 2♀.

RANGE.—Tropical Zone: Argentina to United States; the race, Texas and Arizona, at least to western Panama.

(202) **Glaucidium minutissimum cobanense** Sharpe

Glaucidium cobanense SHARPE, Ibis, 1875, p. 259 (Coban).

Glaucidium gnoma, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1897, p. 35, (Choctum, Dueñas, Coban, Volcan de Fuego).

Glaucidium gnoma gnoma, RIDGWAY, *loc. cit.*, p. 785.

Glaucidium minutissimum cobanense, GRISCOM, Proc. N.E. Zoöl. Club, XII, 1931, pp. 37–43 (range; crit.).

Above Panajachel (6000 ft.) 1 ♀ (Griscom, M.C.Z.).

RANGE.—The species, British Columbia to southern Brazil, with numerous representative forms in the Temperate and Tropical Zones; the race, *cobanense* in the mountains of Guatemala.

As pointed out in my review of the group, cited above, this little owl is known only in the extreme hepatic phase. Five specimens come from the Altos of western Guatemala, and there are two at least in the British Museum from Alta Vera Paz. On the other hand, I doubt the correctness of some of the records in the 'Biologia.' Salvin and Godman did not understand the supposed specific differences between *gnoma* and *griseiceps*, and never suspected that *cobanense* had intermediate characters. Some of the Coban trade-skins in Europe may prove upon re-examination to be intermediate between *cobanense* and *griseiceps*.

(203) **Glaucidium minutissimum griseiceps** Sharpe

Glaucidium griseiceps SHARPE, Ibis, 1875, p. 41 (Guatemala); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1897, p. 36 (Choctum, Chisec).

Glaucidium pumilum griseiceps, RIDGWAY, *loc. cit.*, p. 795.

Glaucidium minutissimum griseiceps, GRISCOM, Proc. N. E. Zoöl. Club, XII, 1931, pp. 37–43 (crit.; status; range).

RANGE.—Humid Tropical Zone: known only from eastern Guatemala, British Honduras and eastern Honduras.

I have nothing to add to my review cited above of this littlePygmy Owl. Thanks to the old trade in bird-skins of Vera Paz, more specimens of this owl exist from Guatemala than any other part of the American tropics. I am convinced that its rarity is more apparent than real, and that its distribution in Central America will prove to be continuous.

FAMILY **TYTONIDÆ**. BARN OWLS

(204) **Tyto perlata guatemalæ** (Ridgway)

Strix flammea var. *guatemalæ* RIDGWAY, Bull. Essex. Inst., V, 1873, p. 200 ("Panama to Guatemala").

Strix perlata, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' III, 1897, p. 2 (Dueñas San Geronimo).

Tyto perlata guatemalæ, RIDGWAY, 'Birds N. and Mid. Amer.,' pt. 6, 1914, p. 610.

RANGE.—The species, widely scattered throughout the New World, except in cold temperate regions; the race, central and western Guatemala to Panama, and perhaps to western Ecuador at lower altitudes.

Mr. Anthony saw two young Barn Owls in a cage at Huehuetenango, and noted the very dark tawny coloring. It is highly probable that the whiter *pratincola* will be found in eastern Guatemala, as it is well known in Yucatan, and has been found in eastern Nicaragua.

ORDER PSITTACIFORMES

FAMILY **PSITTACIDÆ**. MACAWS, PARROTS, PARRAKEETS

(205) **Ara macao** (Linnæus)

Psittacus macao, LINNÆUS, 'Syst. Nat.,' I, 1758, p. 96 (Pernambuco, *ex* Marcgrave).

Ara macao, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1897, p. 565 (Aguna, Savana Grande, San Agustin, Huamuchal, Plain of Salamá, Choctum, Pine-ridge of Poctun); DEARBORN, 1907, p. 85 (Los Amates); LANTZ, 1899, p. 219 (Naranjo); RIDGWAY, 'Birds N. and Mid. Amer.,' pt. 7, 1916, p. 128.

RANGE.—Southern Mexico to Amazonia.

"No specimens of *Ara* were taken in Guatemala. At Quiriguá macaws were often seen flying over, their discordant cries attracting attention, even at considerable distance. None were seen in the forest along the river, and I was told that the birds were to be found only in the pines along the ridges, well back from the settlements. When passing down the Rio Polochic, the species was frequently seen and heard in the forests bordering that river. I was told at Sepacuite that at times large flocks (200) were seen in the pines somewhat below the plantations, but that they never ranged as high as the hacienda, at 3200 feet. On the Pacific side macaws were seen daily at La Espina, as they passed to and from their feeding grounds, morning and evening. In the interior of northern Guatemala macaws were noted on several of the rivers which empty into the Usumacinto, but none above 3000 feet altitude." (Anthony, MS.).

[*Ara chloroptera* Gray

A South American species which has been found on a few occasions as far north as eastern Panama. Guatemala has been inadvertently included in its range, recent statements reviving a very old erroneous report.]

[*Ara militaris* Linnæus

Ara militaris BOUCARD, Amer. Soc. Linn. Lyon, 1878, p. 32 (Guatemala).

The Mexican Green Macaw has never been found south of southwestern Mexico in northern Oaxaca. Boucard claims to have found several of these birds in a very wild place in a river gorge entering fissures in the rocks, where he thought they were nesting. This remarkable account cannot apply to a macaw, and should be ignored, just as Salvin did. Boucard's list is full of palpable errors. The bird is not easily collected, but could scarcely have been overlooked by the many excellent naturalists who have visited Guatemala. Ridgway included Guatemala in the range of this species, on the basis of Boucard's report.]

(206) **Aratinga strenua** (Ridgway)

Conurus holochlorus strenuus RIDGWAY, Proc. Biol. Soc. Wash., XXVII, 1915, p. 106 (Omotepe, Nicaragua).

Conurus holochlorus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1897, p. 572, (El Rincon, Santa Maria de Quetzaltenango, Dueñas, San Geronimo.)

Aratinga holochlora strenua, RIDGWAY, *loc. cit.*, p. 158.

Finca El Cipres, 3♂, 3♀; Sacapulas, 4♀; Chichicastenango, 1♂; San Lucas, 3♂; Antigua, 1♂, 1♀.

RANGE.—Pacific slope, southern Mexico to Nicaragua.

This excellent series shows conclusively that the green paroquet of the Pacific slope and central plateau is *strenua* and not *holochlora*. It also endorses the specific distinctness of the two birds, as recently suggested

by Bangs and Peters (Bull. Mus. Comp. Zoöl., LXVIII, 1928, p. 388). The ordinary measurements fail to bring out the real differences between them. A heavier bill is not the same thing as a longer culmen, nor is the length of the tarsus a proper measure of heavier and more powerful feet. The wing measurement in my series of *strenua* is 171 to 178, at most a slightly larger average than *holochlora*. The culmen varies from 25 to 28, with the majority 27 or more. Certain specimens of *holochlora* run as high as 26.5, and we would assume consequently that they intergrade. As a matter of fact, however, the longest bill of *holochlora* nowhere nearly approaches the heavy proportions of *strenua* and there is an absolute difference, if immature specimens are disregarded. Young parrots often have smaller and less powerful bills than adults. The maximum width of the lower mandible is a much better index of proportions of the bill. Using this index, *holochlora* runs 16.5 to 17.5, and *strenua* runs 18.5 to 22 mm. The maximum depth of the bill averages 27 in *holochlora*, 32 in strenua.

A common to locally abundant parrot, ranging from sea-level to 7000 feet in the Pacific and central uplands. I have seen no authentic specimens from the northern highlands of Coban and Vera Paz. These locality records probably are based upon old trade-skins, which were sent out from these places, but not collected there.

(207) **Aratinga rubritorquis** (Sclater)

Conurus rubritorquis SCLATER, P. Z. S., 1886, p. 538, ("South America" or "West Indies").

Conurus holochlorus rubritorquis, DEARBORN, 1907, p. 85 (Gualan).

Aratinga rubritorquis, RIDGWAY, *loc. cit.*, p. 157 (Iguana).

Gualan, 2 ♂, 1 ♀; Iguana, 1 ♂ (M. C. Z.).

RANGE.—Known only from eastern Guatemala and the pine forests of Salvador and north central Nicaragua.

It is almost impossible to interpret the characters of this so-called species, which is an obvious mutant of *holochlora*, with an unusual number of red feathers on the throat and foreneck. Immature birds naturally lack these red feathers, and are consequently distinguishable from *holochlora* only in averaging smaller. It will be recalled that many green parrots have a few scattered red feathers in the capital area, and this tendency intensified and constant in certain localities has produced what we call *A. rubritorquis*. Its distribution, however, defies analysis. In Nicaragua, *rubritorquis* was fairly common in the pine forests of the

north central highlands, from 3500 to 5000 feet. *A. strenua* did not occur there but was common in the Pacific lowlands. The two birds thus had logical and definite ranges. This distinction completely breaks down in Guatemala, where *strenua* ranges over the highlands up to 7000 feet, while *rubritorquis* occurs only in the arid sections of the Rio Motagua Valley.

(208) **Aratinga canicularis canicularis** (Linnæus)

Psittacus canicularis Linnæus, 'Syst. Nat.,' I, 1758, p. 98 (America; western Costa Rica by Bangs and Peters).

Conurus canicularis, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1897, p. 577, (Retalhuleu, Rio Motagua valley); Dearborn, 1907, p. 85 (Gualan, El Rancho, Mazatenango, San José).

Eupsittula canicularis, Ridgway, *loc. cit.*, p. 168.

Ocos, 9 ♂, 2 ♀; Pantaleon, Escuintla, 1 ♂, 1 ♀; Progreso, 4 ♂, 4 ♀; Iguana, 1 ♂; Gualan, 1 ♂.

Range.—Arid Tropical Zone: southern Mexico to western Costa Rica; the race, *eburneirostris* Lesson from Sinaloa to Guerrero.

The only near ally of this species is *A. aureus* of eastern South America.

"Not uncommon at Progreso in October. At Ocos this paroquet was very abundant in October, flying in large flocks to the west each morning, returning in the evening to its roosting ground somewhere in the mangrove forest, bordering the estero east of the town." (Anthony, MS.)

(209) **Aratinga astec astec** (Souancé)

Conurus astec, Souancé, Rev. et Mag. de Zool., (2) IX, 1857, p. 97 (Mexico).

Conurus aztec, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1897, p. 575 (Peten, Cahabon); Dearborn, 1907, p. 85 (Los Amates).

Eupsittula astec, Ridgway, *loc. cit.*, p. 171.

Secanquim, 3 ♂. 2 ♀; Chimoxan, 2 ♀; Chipoc, 1 ♂.

Range.—Humid Tropical Zone, southern Mexico to western Panama; a race in northeastern Mexico.

"Rather common at Secanquim in February and March. At Chimoxan the species was feeding on corn in October and was quite common but very wild owing to its being driven from the corn-fields by Indian boys, set to protect the crops." (Anthony, MS.)

(210) **Bolborhynchus lineola** (Cassin)

Psittacula lineola Cassin, Proc. Acad. Nat. Sci. Phila., 1853, p. 372 (Puente Nacional, Vera Cruz, Mexico).

Bolborhynchus lineolatus, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1897, p. 580 (Volcan de Fuego, Chiquimula).

Bolborhynchus lineola lineola, Ridgway, *loc. cit.*, p. 179.

Range.—Subtropical Zone: mountains of southern Mexico and Central America; reported very doubtfully from Venezuela and "eastern Peru."

The isolated northern representative of a group of species in the Andes from Peru southward, characteristic of the Subtropical and Temperate Zones. It is consequently very distinct, and is rare and little known.

(211) **Brotogerys jugularis jugularis** (Müller)

Psittacus jugularis Müller, 'Syst. Nat.,' Suppl., 1776, p. 801 ("America," by subseq. design, Bonda, Colombia).

Brotogerys jugularis, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1897, p. 582 (La Concepcion, Chiapam, Retalhuleu); Dearborn, 1907, p. 85 (San José); Ridgway, *loc. cit.*, p. 183.

Hacienda California, 9 ♂, 7 ♀; Pantaleon, 2 ♀; San José, 1 ♂, 1 ♀.

Range.—Tropical Zone: Mexico to Venezuela; a race, in Venezuela.

In Central America this paroquet is exclusively confined to the Arid Tropical Zone of the Pacific slope, and never occurs in heavy forest. It spreads freely, however, to areas where the forest has been destroyed. In Guatemala, as elsewhere in Central America, it is abundant.

(212) **Amazona auropalliata** (Lesson)

Psittacus auropalliatus Lesson, Rev. Zool., 1842, p. 135 (Realejo, Nicaragua).

Chrysotis auropalliata, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1897, p. 587 (Huamuchal, Retalhuleu, La Grande, San José); Lantz, 1899, p. 220 (Naranjo).

Amazona auropalliata, Dearborn, 1907, p. 86 (San José); Ridgway, *loc. cit.*, p. 231.

Finca El Cipres, 1 ♂, 3 ♀; Hacienda California, 2 ♀, San José, 1 ♂.

Range.—Arid Tropical Zone: Oaxaca to northwest Costa Rica.

Common to abundant throughout the Pacific slope.

(213) **Amazona autumnalis autumnalis** (Linnæus)

Psittacus autumnalis Linnæus, 'Syst. Nat.,' I, 1758, p. 102.

Chrysotis autumnalis, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1897, p. 591, (Choctum, Las Salinas).

Amazona autumnalis, DEARBORN, 1907, p. 86 (Los Amates); LANTZ, 1899, p. 220 (Santo Tomas); RIDGWAY, *loc. cit.*, p. 234.

RANGE.—Humid Tropical Zone: southern Mexico to Brazil, the race, northern Central America.

A common bird in the Caribbean rain forest of Guatemala.

(214) **Amazona farinosa guatemalæ** (Sclater)

Chrysotis guatemalæ, SCLATER, Ibis, 1860, p. 44 (Guatemala and Honduras); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1897, p. 584 (Rio de la Pasion, Choctum).

Amazona farinosa guatemalæ, RIDGWAY, *loc. cit.*, p. 241.

RANGE.—Humid Tropical Zone: southern Mexico to Amazonia; the race, Mexico to Honduras.

Occurring with *A. autumnalis*, often in mixed flocks; it is the commoner species in Panama, but is distinctly less common in the northern part of its range.

(215) **Amazona albifrons albifrons** (Sparrmann)

Psittacus albifrons SPARRMANN, 'Mus. Carls.,' fasc. 3, No. 52, 1787, Pl. LII.

Ocos, 1 ♂, 1 ♀; Hacienda California, 2 ♂, 3 ♀.

RANGE.—Arid Tropical Zone: western Mexico to northwestern Guatemala.

It has long been known that there is a remarkable decrease in size in this parrot as we go south and east in Central America. Absent in eastern Mexico, the species crosses over from the west coast at the Isthmus of Tehuantepec, and specimens from eastern Chiapas, Campeche, and Yucatan are abruptly smaller, wing of adult males averaging 155–170 mm. Specimens from Costa Rica and Nicaragua have similar measurements. On the Pacific coast the transition is more gradual. Bangs and Peters are unquestionably correct in referring Oaxaca specimens to *albifrons*. The wings of males listed above from localities only three miles from the Mexican border in Guatemala are 180–185 mm. and should obviously be referred to typical *albifrons* also, though the females are not quite so large relatively. A single female from San José, much farther down the coast, is 10 mm. shorter, and must be *nana*.

(216) **Amazona albifrons nana** Miller

Amazona albifrons nana Miller, Bull. Amer. Mus. Nat. Hist., XXI, 1905, p. 349 (Calotmul, Yucatan); Ridgway, *loc. cit.*, p. 257.

Chrysotis albifrons, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1897, p. 593 (Retalhuleu, Rio Chiguate, Agua Caliente, Peten, Volcan de Fuego).

Amazona albifrons, Dearborn, 1907, p. 86 (Gualan, San José).

San José, 1 ♀; Gualan, 2 ♂ (M.C.Z.).

Range.—Arid Tropical Zone: Yucatan to western Costa Rica.

This species inhabits those parts of the Atlantic slope of Central America which are relatively arid, due to local conditions. Thus it occurs in the arid Rio Motagua Valley of eastern Guatemala, almost throughout Yucatan and locally in British Honduras and eastern Honduras. These birds are all very small. The two Gualan males are 20 mm. shorter in the wing than the Ocos specimens, and it is impossible to refer all Guatemala birds to the same subspecies.

An abundant species on the Pacific slope, locally common in the arid portions of the Rio Motagua Valley.

(217) **Pionus senilis senilis** (Spix)

Psittacus senilis Spix, 'Aves Bras.,' I, 1824, p. 42 (Vera Cruz, Mexico, desig. by Griscom).

Pionus senilis, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1897, p. 596 (Chisec, Choctum, Coban, Lanquin); Dearborn, 1907, p. 86 (Gualan); Ridgway, *loc. cit.*, p. 214.

Finca La Primavera, 1 ♂, 1 ♀; La Montañita, 2 ♀; Chipoc, 1 ♀; near Quiriguá, 1 ♂.

Range.—Humid Tropical Zone: southern Mexico to western Panama; a race, from Costa Rica and Panama.

Both Salvin and Anthony found this species abundant in the Caribbean rain forest.

(218) **Pyrilia haematotis haematotis** (Sclater and Salvin)

Pionus haematotis Sclater and Salvin, P.Z.S., 1860, p. 300 (Vera Paz, Guatemala).

Pionus haematotis, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1897, p. 597 (Raxché, Choctum, Yaxcamnal, near Chimuchuch).

Caica haematotis, Lantz, 1899, p. 220 (Chocan River, Santo Tomas).

Pyrilia haematotis haematotis, Ridgway, *loc. cit.*, p. 208.

RANGE.—Humid Tropical Zone: southern Mexico to eastern Panama; a race, in eastern Panama.

The Red-eared Parrot belongs to a widely spread Amazonian group and is the sole representative in Central America. It is common in eastern Panama, but steadily decreases northward.

ORDER CORACIIFORMES

FAMILY **ALCEDINIDÆ** KINGFISHERS

(219) **Megaceryle torquata torquata** (Linnæus)

Alcedo torquata LINNÆUS, 'Syst. Nat.,' I, 1766, p. 180 (Mexico and Martinique).

Ceryle torquata, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1895, p. 474 (Rio Dulce, Lanquin, Choctum, Huamuchal, San José, Peten); DEARBORN, 1907, p. 89 (Los Amates).

Streptoceryle torquata torquata, RIDGWAY, 'Birds N. and Mid. Amer.,' pt. 6, 1914, p. 409.

Ocos, 2 ♂, 2 ♀.

RANGE.—Mexico to Argentina; the race, Mexico to Peru and Bolivia.

Abundant in the tropical lowlands of both coasts (Salvin and Anthony).

(220) **Megaceryle alcyon alcyon** (Linnæus)

Alcedo alcyon LINNÆUS, 'Syst. Nat.,' I, 1758, p. 115 (Carolina).

Ceryle alcyon, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1895, p. 473 (Rio Dulce, San Geronimo, Dueñas, San José, Huamuchal, Santana Mixtan); DEARBORN, 1907, p. 89 (Lake Atitlan).

Streptoceryle alcyon alcyon, RIDGWAY, *loc. cit.*, p. 415.

Panajachel, 1 ♂.

RANGE.—North America, south in winter to Colombia and the West Indies.

An abundant winter visitant from October (Anthony) to April 10 (Dearborn).

(221) **Chloroceryle amazona** (Latham)

Alcedo amazona LATHAM, 'Index Orn.,' I, 1790, p. 257 (Cayenne).

Ceryle amazona, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1895, p. 476 (Vera Paz, San Geronimo, San José, Huamuchal); DEARBORN, 1907, p. 89, (Los Amates); LANTZ, 1899, p. 220 (Naranjo, Santo Tomas).

Chloroceryle amazona, RIDGWAY, *loc. cit.*, p. 424.

Progreso, 1 ♀.

RANGE.—Argentina to southern Mexico, lacking in the Lesser Antilles and western Ecuador.

An equally common species of the Tropical Zone, but not quite so widely dispersed as *torquata*.

(222) **Chloroceryle americana isthmica** (Goldman)

Ceryle americana isthmica GOLDMAN, Smiths. Misc. Coll., LVI, No. 27, 1911, p. 1 (Rio Indio, Canal Zone).

Ceryle septentrionalis, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1895, p. 477 (Rio Dulce, Toliman, Dueñas, Rio Guacalate, San Geronimo, Huamuchal).

Ceryle americana septentrionalis, DEARBORN, 1907, p. 90 (Los Amates, Lake Atitlan); LANTZ, 1899, p. 220 (Palin, San José, Lake Amatitlan).

Chloroceryle americana isthmica, RIDGWAY, *loc. cit.*, p. 428.

Finca Sepacuite, 2 ♀; Chimoxan, 1 ♀; Puebla, 1 ♀; Barillos, 1 ♂; Chichicastenango, 1 ♀; San Lucas, 3 ♂; Panajachel, 2 ♀; Ocos, 2 ♂, 1 ♀; San José, 1 ♂, 2 ♀.

RANGE.—Southern United States to Argentina; the race, southern Mexico to Panama.

As might be expected, none of this large series is really typical of *isthmica*. The color characters show little or no variation towards *septentrionalis*, but in size they might as well be referred to one race as the other.

An abundant species on all waters to about 6000 feet (Anthony).

(223) **Chloroceryle æenea stictoptera** (Ridgway)

Ceryle superciliosa stictoptera, RIDGWAY, Proc. Biol. Soc. Wash., II, 1885, p. 95 (Sisal, Yucatan).

Ceryle superciliosa, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1895, p. 479 (Peten, Choctum, mouth of Rio Samalá); LANTZ, 1899, p. 220 (San José).

Ceryle æenea strictoptera, DEARBORN, 1907, p. 90 (San José).

Chloroceryle aenea stictoptera, RIDGWAY, *loc. cit.*, p. 440.

Ocos, 2 ♂.

RANGE.—Mexico to Brazil; the race, Mexico and northern Central America, intergrading with *æenea* in Nicaragua.

Much less common than the larger New World Kingfishers, and almost exclusively confined to heavy rain forest. Crosby and I found this little species on a river near Puerto Barrios.

FAMILY **MOMOTIDÆ**. MOTMOTS

(224) **Momotus lessonii lessonii** Lesson

Momotus lessonii LESSON, Rev. Zool., V, 1842, p. 174 (Realejo, Nicaragua); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1895, p. 457 (Pié de la Cuesta in San Marcos, Retalhuleu, Toliman, Savana Grande, Alotenango, Dueñas, San Geronimo, Coban, Lanquin, Choctum, Chisec); DEARBORN, 1907, p. 89 (San José, Patulul,

Mazatenango, Los Amates); LANTZ, 1899, p. 220 (Naranjo, Santo Tomas); RIDGWAY, 'Birds N. and Mid. Amer.,' pt. 6, 1914, p. 457.

a. Typical *lessonii.*—Finca El Cipres, 11 ♂, 9 ♀, 1 (?); Hacienda California 3 ♂, 2 ♀; Finca Carolina, 2 ♂, 5 ♀; Pantaleon, 4 ♂.

b. Intermediates.—La Montañita, 1 ♂; Finca La Primavera, 3 ♂, 2 ♀; Barrillos, 1 ♂.

c. Nearer *goldmani.*—Alta Vera Paz: Finca Chamá, 2 ♂, 3 ♀; Finca Sepur, 1 ♀; Finca Concepcion, 1 ♀; Chipoc, 1 ♀; Finca Sepacuite, 7 ♂, 2 ♀; Secanquim, 5 ♂. 4 ♀.

RANGE.—Tropical and Subtropical Zones: southern Mexico to Western Panama; the race, Central America.

The magnificent series of 71 specimens before me from Guatemala alone, and the examination of at least 300 others from various parts of Central America, shows the necessity of redefining the proposed races of this common species. As I have emphasized before, motmots are dichromatic, there being a greener phase with little or no tawny below, and a tawny phase. Proposed greener or tawnier subspecies, therefore, must be carefully checked with ample series to prove the existence of genuine racial characters. In the light of the material before me the color characters of the three proposed races of *lessoni* prove to be of little or no diagnostic value. The smaller size of the Yucatan *exiguus* and its very slightly paler coloration serve to render it a perfectly tenable subspecies, though I take no stock in the other color characters which have been claimed for it.

When we come to the race *goldmani* Nelson from Vera Cruz, Oaxaca, and Tabasco, the situation becomes much more complicated. In size the wing averages 3 mm. longer than *lessoni* and, as the individual variation in the species is nearly 20 mm., this difference is utterly trivial. The color characters claimed are the generally greener, less tawny, coloration below, and the blue nuchal crescent with very little, usually no violet posterior margin. Neither of these characters is absolute or anywhere near it. The tawny phase of *goldmani* is far tawnier than the green phase of *lessoni*, and one-third of the forty specimens before me have violet margins to the crown-patch. While none has as much violet as many specimens of *lessoni*, four are just as tawny beneath as the tawny extremes of *lessoni*. Conversely I can find a few green birds with no violet in the crown, extremes of the *goldmani* type of coloration, in western Panama.

What is true is that, matching phase for phase, birds from Vera Cruz and north central Guatemala have a higher percentage of greener birds, and a much lower percentage of very tawny ones. There is also a very

high percentage of birds with no violet in the crown, and a fairly high percentage with but little violet. The great majority of birds are also near the maximum size of *lessoni* or a little larger. While, therefore, there is no difference whatever between extremes of coloration in the two races, there is a marked difference in the number of individuals, which in *lessoni* are massed nearer the tawnier extreme, and in *goldmani* are nearer the green extreme of our imaginary scale. Reduced to figures, a good two-thirds of the birds I call *goldmani* are more than fifty per cent of the way towards the green extreme, and ninety per cent of the birds I call *lessoni* are nearer the *lessoni* extreme. It should be emphasized, however, that not one single individual could possibly be definitely determined subspecifically unless the locality were known. It is obviously a matter of opinion whether such an average difference as this is worth recognizing in nomenclature, but the case is interesting as affording an unusual type of variation.

To sum up as regards my Guatemalan material: the bird of the Pacific slope is obviously typical *lessoni*; the bird of Alta Vera Paz in north central Guatemala is much nearer *goldmani*; and birds from Huehuetenango, Quiché and Vera Paz are intermediate.

As regards the distribution of this species and other motmots, Chapman's important paper (Bull. Amer. Mus. Nat. Hist., XLVIII, pp. 27–59) should be consulted. I here accept his major conclusions, and throughly agree that the motmots originated in northern Central America and spread southward. The present species has one anomalous peculiarity in that as we go southward in Central America it becomes less and less frequent in the Tropical Zone and finally occurs in the Subtropical Zone only. Thus it is unknown in the Caribbean rain forest of Costa Rica and western Panama, and on the Pacific slope disappears from sea-level tropical forests beyond extreme western Chiriqui. In Veraguas, for instance, it occurs only in the mountains above 3000 feet, including an isolated colony in the center of the Cape Mala Peninsula. My own field experience inclines me to the view that this absence from the Tropical Zone is correlated with the presence there of two other motmots, *Urospatha martii* and *Electron platyrhynchum*. The northern limit of these two species is eastern Nicaragua, where they are both rare and local, and where *Momotus lessoni* is far less common than farther north. As we proceed southward these two genera increase in number, *Electron* rapidly becoming a common bird, and at the same time *M. lessonii* disappears entirely.

I am unable to see any good reason for maintaining *M. cæruleiceps* specifically distinct from *lessoni*.

(225) **Momotus lessonii goldmani** Nelson

Momotus lessonii goldmani NELSON, Auk, 1900, p. 256 (Motzorongo, Vera Cruz).

RANGE.—Vera Cruz, Oaxaca, Tabasco and Peten, in Humid Tropical Zone.

Confined to Alta Vera Paz. For comments and list of specimens see the preceding species.

(226) **Momotus castaneiceps** Gould

Momotus castaneiceps GOULD, P. Z. S., 1854, p. 154 (Guatemala); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1895, p. 461 (valley of the Rio Motagua from Guastatoya and La Magdalena to Gualan).

Progreso, 12 ♂, 9 ♀.

RANGE.—Arid Tropical Zone: known only from the Rio Motagua Valley, central Guatemala.

An obvious representative of *M. mexicanus* of western Mexico, and many systematists today would not keep it specifically distinct. We have here a striking illustration of how misleading nomenclature can be. The differences between *lessoni* and *castaneiceps* are immeasurably greater than those between *lessoni* and *momota*, *æquatorialis* or *subrufescens*. It is quite probable, as Chapman argues, that the last three are all direct and relatively recent derivatives of *lessoni*, but no one could so argue as regards *lessoni* and *castaneiceps*. We have here genuine endemic species, which still exist in the general region of their origin, and which for long periods of time have occupied sharply different climatic and ecological areas, no matter how approximate in terms of miles. Many thousand miles, on the other hand, separate *lessoni* from *momota pilcomajensis* of northern Argentina, a distinct species only taxonomically. No matter how far the ancestors of the latter may have traveled, they never left humid rain forest, and in the evolutionary sense never changed their environment.

"I had expected to find this species at Sacapulas, where conditions were quite similar to those in the valley of the Motagua, but the only form met with was *Eumomota*. Unlike *lessonii*, which seeks the dark isles of the forest or coffee plantation, *castaneiceps* is usually found in the scrub and cactus, where cactus wrens and gnatcatchers are enjoying the sunlight of the tropics." (Anthony, MS.)

(227) **Electron carinatus** (Du Bus)

Prionites carinatus Du Bus, Bull. Acad. Roy. Belg., XIV, 1847, p. 108 (Guatemala).

Prionornis carinatus, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1895, p. 469 (Chixoy Valley near Santa Ana, sight record only, by Salvin).

Electron carinatus carinatus, Ridgway, *loc. cit.*, p. 474.

Range.—Humid Tropical Zone: eastern Guatemala to Costa Rica.

There are relatively few records for this very distinct species, and it is quite remarkable that there is no definite locality record for Guatemala, all specimens being trade-skins. There are five skins from eastern Nicaragua in the American Museum, and one of these is greener than the unique type of *E. carinatus viridis* Bangs, with which it has been directly compared. Like many other motmots, the species has two color phases. It probably originated in the general region where it is now found.

(228) **Eumomota superciliosa bipartita** Ridgway

Eumomota superciliaris bipartitus Ridgway, Proc. Biol. Soc. Wash., XXV, 1912, p. 90 (Cacoprieto, Oaxaca).

Eumomota superciliaris part, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1895, p. 464 (Retalhuleu, San José to Escuintla and Palin, Medio Monte); Lantz, 1899, p. 220 (Naranjo).

Eumomota superciliosa bipartita, Ridgway, *loc. cit.*, p. 480; Griscom, Proc. N. E. Zoöl. Club, XI, 1929, pp. 52–53 (crit.; dist. in Guatemala).

Finca El Espino, 1 ♀; Finca El Cipres, 1 ♂; Hacienda California, 4 ♂, 4 ♀; Pantaleon, 3 ♂, 1 ♀.

Range.—Western Vera Cruz, and Pacific slope of Oaxaca, Chiapas and Guatemala.

Very common along the Pacific slope of Guatemala according to Salvin.

(229) **Eumomota superciliosa vanrossemi** Griscom

Eumomota superciliosa vanrossemi Griscom, Proc. N. E. Zoöl. Club, XI, 1929, p. 55 (Sacapulas, Rio Negro Valley, interior of Guatemala).

Eumomota superciliaris part, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1895, p. 464 (Zacapa and Motagua Valley, San Geronimo); Dearborn, 1907, p. 88 (El Rancho and Los Amates).

Sacapulas, 14; Progreso, 4 ♂, 2 ♀; Gualan, 1 (M.C.Z.).

Range.—Arid interior valleys of Guatemala.

Judging by Dearborn's comments, the darker specimens from the humid lowlands near Los Amates cannot be *vanrossemi*. They would either be typical *superciliosa* or *euroaustris*.

This local subspecies is apparently quite common. The genus is endemic in northern Central America and originated in the general region where it now occurs.

(230) **Aspatha gularis** (Lafresnaye)

Prionites gularis LAFRESNAYE, Rev. Zool., VII, 1840, p. 130 (Guatemala).

Aspatha gularis, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1895, p. 470 (Santa Maria near Quetzaltenango, Volcan de Fuego, Dueñas, Barranca Hondo, near Alotenango, Cunen); RIDGWAY, *loc. cit.*, p. 483.

Finca La Primavera 1 ♂, 1 ♀; Nebaj, 1 ♀; San Antonio, 1 ♂.

RANGE.—Endemic in the Subtropical Zone in the mountains of Guatemala and Chiapas, chiefly in oak forest, where it is not uncommon (Salvin, Anthony).

(231) **Hylomanes momotula momotula** Lichtenstein

Hylomanes momotula LICHTENSTEIN, Abh. König., Akad. Wissensch. Berlin, 1838, p. 449 (Valle Real, Mexico); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1895, p. 471 (Choctum, Cubilguitz, Khamkal, Volcan de Agua above San Diego, La Trinidad on the slope of the Volcan de Fuego, Savana Grande).

Hylomanes momotula momotula, RIDGWAY, *loc. cit.*, p. 485.

Secanquim, 1 ♂; Finca Chamá, 1 ♀.

RANGE.—Humid Tropical Zone: southern Mexico to northern Colombia; the race, northern Central America.

The little Tody Motmot is commoner in eastern Guatemala than anywhere else in its range, and the older museums have large numbers of Coban trade-skins. It is much rarer in the southern part of its range. These facts and its approach to the todies of the West Indies have already induced Chapman to suggest that it originated in northern Central America and spread southward at a relatively early date.

"A few were seen and taken at Chamá, Secanquim, and at Chimoxan. This species seems to be confined to the darkest isles of the forest where, perched on a twig in some low undergrowth, it allows a person to approach to almost arm's length before taking wing, then flying only to some nearby perch to stare in silence. I never heard a note that I felt could be credited to this bird, and from its silence and habit of remaining so quietly in the semidarkness of the thickets, would think that it was more common than would seem from those observed." (Anthony, MS.)

FAMILY **NYCTIBIIDÆ**. POTOOS

(232) **Nyctibius griseus mexicanus** Nelson

Nyctibius jamaicensis mexicanus NELSON, Auk, 1900, p. 260 (Metlaltoyuca, Puebla).

Nyctibius jamaicensis, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1894, p. 399 (near Guatemala City, Vera Paz, Tactic).

Nyctibius griseus mexicanus, RIDGWAY, 'Bird. N. and Mid. Amer.,' pt. 6, 1914, p. 592.

Finca El Cipres, 2 ♂ (gray phase), 2 ♀ (brown phase), 1 ♀ imm., 1? juv.

RANGE.—The species, Paraguay to Mexico and Jamaica; the race, Mexico and Guatemala.

Having now seen over thirty specimens of this species from the range of three proposed Central American races, several facts are quite definite. In the first place, there is a gray phase and a rusty-brown phase, the latter in Central America at least seeming much the scarcer. A half-grown juvenal from Guatemala is largely WHITE as a ground color, most of the contour feathers having black shaft stripes only, with a little very pale vermiculation. An immature female is actually molting into the brown phase, the older feathers very white, however, showing conclusively that these paler birds are immature.

Taking up geographic variation next, in Mexico and Guatemala we have a very large, relatively pale bird, the wing from 290–305 mm. In Nicaragua and Costa Rica, we have an obviously darker bird, which averages minutely smaller (wing, 280–300 mm.), a perfectly valid subspecies, *costaricensis* Ridgway. Curiously enough eight specimens from Jamaica are barely separable from *mexicanus* in color, though like *costaricensis* in size. Were it not for their geographic isolation, one of these subspecies would be untenable. From Veraguas (Pacific slope) and the Canal Zone, south through Colombia to Ecuador and northwest Peru, we have a SMALL, dark bird, the wing 265–280 mm., and this bird is *panamensis* of Ridgway, which, in addition, has the bars on the inner webs of the primaries much less distinct, this character increasing in definiteness southward, so that a specimen from Perico, Peru, has these bars barely perceptible.

The relations of *panamensis* to other South American forms is, however, more complicated, and here my material is inadequate. I have seen a total of six specimens from southern Brazil and Argentina, presumably representing *cornutus*. In neither size nor general color do they differ in the slightest degree from *panamensis*. Three have com-

paratively distinct bars on the primaries, but three others do not differ in any way which could be regarded as racial from Panama specimens. I know no way, therefore, of distinguishing these two races and am forced, provisionally, at least, to regard *pectoralis* Gould and *panamensis* Ridgway as synonyms of *cornutus* (Vieillot). Typical *griseus* from the Guianas and Trinidad is the dwarf of the group, the wing averaging below 250 mm. It also appears to be slightly paler. Wetmore has recently suggested that *cornutus* was inseparable from *griseus*, comparing a Paraguay specimen with one from Pará, The latter, however, in both size and color obviously does not represent typical *griseus*, as he assumed (cf. Bull. U. S. Nat. Mus., No. 133, 1926, p. 202).

"Not at all rare at Cipres, where it evidently nests, as young were taken there on July 3 and 30. These young birds were pointed out to me by Indians and otherwise would have been passed as being nothing more than an extension of a dead stick, so closely did the plumage of the birds correspond with the color of the wood. In perching, the birds were nearly upright, with the head extended in line with the body, as if gazing at the moon. Three specimens were taken in an hour one night, at Cipres, with the aid of a hunting lamp on the hat. The eyes could be seen at a distance of one hundred yards, glowing like bright ruby lamps. On a nearer approach, the outline of the bird was to be seen, perched on a fence-post or top of a corn-stalk, nearly upright and staring at the lamp as if unable to move. One, shot from the top of a tall tree, was only winged, and as it fell it gave voice to a shrill discordant cry that might have been heard a mile or more. Owing to the large yellow eyes, perhaps, the native name for the bird in this secton is 'Lechusa' (owl) while the true owls are all grouped under the collective name of 'Tecelote.'" (Anthony, MS.)

Family **Caprimulgidæ**. Nighthawks, Whippoorwills, etc.

(233) **Chordeiles virginianus** subspecies

Chordeiles virginianus, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1894, p. 396 (Coban, La Grande).

Nighthawks of several currently recognized subspecies are abundant transients in Central America. My own field experience inclines me to the belief that in any one locality they tend to pass through very rapidly in great "flights." On such occasions they are almost invariably out of gun-shot, and even the species cannot be positively identified. This accounts for the paucity of actual records from Central America. Mr.

Anthony witnessed a "flight" of nighthawks at Ocos on October 15. This flight "began during a rain storm at about 4 P.M. and was still strong at dusk."

(234) **Chordeiles acutipennis micromeris** Oberholser

Chordeiles acutipennis micromeris OBERHOLSER, Bull. U. S. Nat. Mus., No. 86, 1914, p. 100 (Xbac, Yucatan); RIDGWAY, 'Birds N. and Mid. Amer.,' p. 6, 1914, p. 577.

Chordeiles acutipennis (including both subspecies), SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1894, p. 397 (Dueñas, San Geronimo, Coban); DEARBORN, 1907, p. 95 (Lake Atitlan, April 7–10, recorded as *texensis*, but *micromeris* was not described at this time).

Virginia Plantation, near Puerto Barrios, 1 ♂ (M.C.Z.); Ocos, 1 ♂ (wing, 171 mm.).

RANGE.—The species, southern United States to Amazonia; the race, resident from southern Mexico to Western Panama.

The breeding race in Central America, averaging darker and smaller than *texensis*. Too many individuals are, however, indeterminable; specimens from California, southern Mexico and Guatemala are often absolutely indistinguishable.

Ridgway ('Birds N. and Mid. Amer.,' pt. 6, 1914, p. 579) allocates all Salvin's Guatemala records to *micromeris*, as "breeding" records. There is no warrant whatever for doing so.

Mr. Anthony flushed a flock at Progreso in late July, which was presumably this race.

(235) **Chordeiles acutipennis texensis** Lawrence

Chordeiles texensis LAWRENCE, Ann. Lyc. Nat. Hist. N. Y., VI, 1858, p. 167 (Texas).

Chordeiles acutipennis texensis, RIDGWAY, *loc. cit.*, p. 581.

Chanquejelve, 1 ♂ (January, wing 179); Ocos, 1 ♂ (wing 179, nearest *texensis*); 1 ♂, (wing 174, might belong to either race).

RANGE.—Breeding in southern United States and northern half of Mexico, in winter south to the Canal Zone and Darien.

Undoubtedly a common winter visitant throughout the country at lower altitudes, as it is common as far south as the Canal Zone in winter.

(236) **Nyctidromus albicollis yucatanensis** Nelson

Nyctidromus albicollis yucatanensis NELSON, Proc. Biol. Soc. Wash., XIV, 1901, p. 171 (Tunkas, Yucatan); GRISCOM, Amer. Mus. Novit., No. 379, 1929, pp. 6–10 (crit. of the Mexican and Central American forms; revised range of *yucatanensis* includes all of Guatemala, except the Pacific lowlands).

Nyctidromus albicollis part, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1894, p. 394 (Poctum, Chisec, Choctum, Coban, Cahabon, Teleman, San Geronimo, Dueñas); DEARBORN, 1907, p. 95 (Los Amates, Gualan, Lake Amatitlan).

Forty-one specimens from Secanquim, Finca Sepacuite, Finca La Primavera and Puebla; Virginia Plantation, near Puerto Barrios, 3 (M.C.Z.); also numerous trade-skins.

RANGE.—The species, southern Texas to southern Brazil; the race, most of southern Mexico, eastern and central Guatemala.

As pointed out in the revision cited above, a small percentage of Guatemalan specimens from the humid rain-forest areas of the Caribbean slope are minutely darker, and the name *sumichrasti* Ridgway is available for those students who prefer to recognize such minute color differences in nomenclature. This course, however, would not prevent the necessity of also recording *yucatanensis* from Guatemala. Neither would have a definite range, and future workers could identify specimens only if the annual rainfall of their locality of origin were known!

The Parauque is abundant throughout, up to 5000 feet.

(237) **Nyctidromus albicollis intercedens** Griscom

Nyctidromus albicollis intercedens GRISCOM, Amer. Mus. Novit., No. 379, 1929, p. 8 (Tela, Honduras; crit.; range in Guatemala).

Nyctidromus albicollis part, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1894, p. 394 (Retalhuleu); DEARBORN, 1907, p. 95 (Patulul, San José).

Hacienda California, 3 ♂, 1 juv.; Finca El Espino, 2 ♂; Finca El Cipres, 1 ♀.

RANGE.—Tropical Zone: Pacific slope of Guatemala southward to eastern Panama, probably to western Colombia and possibly farther.

The Parauques of Central America have long been called typical *albicollis* of Guiana, but are much larger birds with slight average color differences. Birds from eastern Guatemala northward are abruptly larger again, either as dark as or paler than *intercedens* according to the humidity of their environment. No Neotropical bird responds more closely in its coloration to this factor. So much is this the case that one closely familiar with the variations of the species could be shown a series of six specimens in the gray-brown phase and he could in the majority of cases tell whether they come from a region which had more or less than one hundred inches of rain per annum.

(238) **Setochalcis carolinensis** (Gmelin)

Caprimulgus carolinensis GMELIN, 'Syst. Nat.,' I, 1789, p. 1028 (Carolina); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1894, p. 384 (Dueñas).

Antrostomus carolinensis, RIDGWAY, *loc. cit.*, p. 506.

Guatemala City, 1 ♂ (November).

RANGE.—Southern United States, wintering in the West Indies and Central America to Colombia.

The nocturnal habits of the Chuck-will's-widow and its silence during the winter months are quite sufficient to account for the paucity of records from its winter range.

(239) **Caprimulgus vociferus vociferus** Wilson

Caprimulgus vociferus WILSON, 'Amer. Orn.,' V, 1812, p. 71 (Eastern United States); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1894, p. 386, (Coban, Sonteh, San Geronimo).

Antrostomus vociferus vociferus, RIDGWAY, *loc. cit.*, p. 515.

RANGE.—Eastern United States, south in winter to Costa Rica.

(240) **Caprimulgus vociferus chiapensis** (Nelson)

Antrostomus chiapensis NELSON, Auk, 1900, p. 261 (Comitan, Chiapas); DEARBORN, 1907, p. 94 (Lake Atitlan, Tecpam).

Caprimulgus macromystax, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1894, p. 386, (Santa Barbara in Vera Paz, Coban, Volcan de Fuego).

Antrostomus (vociferus?) chiapensis, RIDGWAY, *loc. cit.*, p. 522.

Quetzaltenango (8000 ft.), 2 ♂; San Lucas, 1 ♀; San Mateo, 1 ♀.

RANGE.—Chiapas and the highlands of Guatemala.

This little-known whippoorwill is nothing but a subspecies of *vociferus*, and is a richly colored southern extreme of *arizonæ* Brewster. Large series show that east Mexican birds from Tamaulipas to the mountains of Vera Cruz are blacker than *arizonæ* or *vociferus*, and this form is undoubtedly *macromystax* Wagler, from what we know of his travels and the birds he obtained. One of the four specimens listed above is spotted on the breast and has smaller, more triangular spots on the pileum. It thus exactly conforms to the description of *Antrostomus oaxacæ* Nelson which, as Ridgway suggested, is probably not even subspecifically separable.

I have seen no specimens from Coban. These are far more likely to be *macromystax* than *chiapensis*.

(241) **Caprimulgus salvini badius** (Bangs and Peck)

Antrostomus badius BANGS AND PECK, Proc. Biol. Soc. Wash., XXI, 1908, p. 44 (Toledo District, British Honduras); RIDGWAY, *loc. cit.*, p. 529.

Guatemala: two trade-skins of the usual Coban or Vera Paz make (M.C.Z.), presumably from somewhere in the lowlands of eastern Guatemala.

RANGE.—Tropical Zone: in Mexico and northern Central America; the race, known only from the type locality and the specimens recorded here.

An exceedingly rare and little-known bird, but clearly a representative form only of *salvini*. The American Museum has a female collected April 13, 1917, by Waldron de W. Miller, near Matagalpa, Nicaragua.

(242) **Caprimulgus ridgwayi troglodytes** Griscom

Caprimulgus ridgwayi troglodytes GRISCOM, Auk, 1930, p. 85 (new name to replace *minor*, preoccupied).

Caprimulgus ridgwayi minor, GRISCOM, Amer. Mus. Novit., No. 379, 1929, p. 10 (Progreso, Guatemala).

Progreso, 1 ♂.

RANGE.—A very rare species, known only from Sinaloa, Guerrero, Michoacan, and the race *troglodytes* from the interior of Guatemala.

I very greatly doubt the specific distinctness of *ridgwayi* from *salvini*. The western birds are smaller and paler representatives. The real specific character is the conspicuous unbroken (rufous or buff) collar, common to all the members of this little-known group.

FAMILY **MICROPODIDÆ**. SWIFTS

(243) **Aëronautes saxatilis nigrior** Dickey and Van Rossem

Aëronautes saxatilis nigrior DICKEY AND VAN ROSSEM, Condor, 1928, p. 193 (Los Esemiles, Chalatenango, Salvador; also Dueñas, Guatemala, in range).

Aëronautes melanoleucus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1892, p. 368 (Gorge of Rio Guacalate, near Dueñas); RIDGWAY, 'Birds N. and Mid-Amer.,' pt. 5, 1911, p. 687.

Above Panajachel, 1 ♀ (Griscom and Crosby, M.C.Z.).

RANGE.—Western United States to Salvador; the race, southern Mexico southward.

I follow Dickey and Van Rossem's treatment, as the specimen listed above fully confirms the characters claimed for the subspecies. A flock of nearly one hundred birds lived in some cliffs 2500 feet above

Panajachel. They flew high over the mountains by day and went to roost at sunset. One cloudy afternoon, while they were flying lower than usual, we climbed to the foot of the cliffs and a lucky shot brought down one bird, which fell in an open corn-field where it could be retrieved, instead of in the dense forest where it would have disappeared in the tree-tops.

(244) **Panyptila sancti-hieronymi** Salvin

Panyptila sancti-hieronymi Salvin, P.Z.S., 1863, p. 190 (San Geronimo, Vera Paz, Guatemala); Salvin and Godman, 'Biol. Cent. Amer.,' II, 1893, p. 371 (Volcan de Fuego, vicinity of Antigua); Ridgway, *loc. cit.*, p. 692.

Range.—Endemic in the mountains of western Guatemala in the Arid Temperate Zone.

A remarkable isolated relict. The only other member of the genus is widely distributed in the humid tropics from Nicaragua to Amazonia.

"While this species was not taken, I have no hesitation in listing it and placing my records on file. Along the eastern slopes of the Volcan de Agua, near Antigua, are many deep and well-nigh inaccessible 'barrancas,' the sides of which are hung with vines masking the sharp perpendicular sides which are pierced with numberless cracks and holes suitable for nesting of such species as this one. During the month of May, several times I watched flocks of swifts, which I am sure were this species, dashing about over and into these chasms, where I have no doubt they were nesting. In my work in Alta Vera Paz, I did not meet with anything that could have by any means been confounded with this species." (Anthony, MS.)

(245) **Streptoprocne zonaris mexicana** Ridgway

Streptoprocne zonaris mexicana Ridgway, Proc. Biol. Soc. Wash., XXII, 1909, p. 53 (Rio Seco, near Cordova, Vera Cruz, Mexico); idem, 'Birds N. and Mid. Amer.,' pt. 5, 1911, p. 700.

Chætura zonaris, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1893, p. 373 (Retalhuleu, Patzicia, Calderas, Dueñas, San José).

Finca Chamá, 2 ♂, 7 ♀; Finca La Primavera, 1 ♂, 1 ♀; Barillos, 1 ♂; Progreso, 2 ♂, 2 ♀; San José, 1 ♂; Pantaleon, 2 ♀; Finca Carolina, 1 ♂, 2 ♀.

Range.—Argentina to Mexico and Greater Antilles; the race, southern Mexico, Guatemala and British Honduras, and perhaps farther south.

This northern race of the Collared Swift differs from *albicincta* in averaging about 8 mm. longer in the wing. In color characters it

averages duller, and the majority of specimens have sooty brown instead of black foreheads. These characters are by no means absolute, however, in either subspecies. A few specimens of *mexicana* have appreciably developed white supraloral streaks, and such birds are distinguishable from the West Indian *pallidifrons* only by their much larger size. There is a perfectly good average difference, however, and as a general summary of large series it would be correct to say that *mexicana* was in color intermediate between *albicincta* and *pallidifrons*.

Several alleged characters in these swifts have proved to be questions of immaturity. The whitish terminal margins to the feathers of the underparts is one character, but the commonest is the great reduction in the width of the white collar below. In extreme cases there are a few white tips only. In adults these feathers are sooty black for the basal third only, in younger birds the black area affects one-half to two-thirds of the feather. The description of *bouchelli* Huber (Auk, 1923, p. 302) from Nicaragua is based solely on this character, and his specimens are young *albicincta*.

This swift breeds commonly throughout the mountains of Guatemala, preferring cliffs and ravines. At other seasons it descends freely to lower levels, and young birds seem to predominate in these flocks. Certainly the great majority of specimens I have seen from the Tropical Zone have been immature.

"Common and of quite general distribution. During the winter months none were met with in some parts, where they had been common but a short time before. The migration, however, is not, seemingly, to the south to warmer climes. At Chichicastenango, February 2 and 14, flocks, estimated at 200 to 250, were seen coming from the north, passing over the ridges toward the valley of the Rio Motagua, where the species had been common in July but absent in October. The flocks were of close formation, bunched very much as sandpipers dash about over the water, and their wings 'whistled' as do those of a large flock of ducks; at the same time a sharp 'squealing' note was constantly heard. In a deep barranca between Tecpam and Panajachel, my attention was called to a large nesting site, abandoned at that time (August). The nests must have been deep in the holes excavated in the face of a high cliff of soft sandstone. The holes were quite large for the size of the bird, estimated as about five to six inches in diameter. At one point a slab of stone had fallen away, exposing a burrow in section for at least ten feet but not to its end." (Anthony, MS.)

[*Nephœcetes niger borealis*

Ridgway ('Birds of N. and Mid. America,' pt. 5, 1911, p. 708) cites several localities in Guatemala for this species, though the subspecies is presumed only. In the synonymy he cites the same localities under a reference to the 'Biol. Cent.' Amer.,' II, 1894, p. 379. An examination of this work, however, shows that the text on p. 379 deals with something else. Guatemala is NOT given in the range of this species, and the localities given by Ridgway really pertain to *Chætura vauxi*, and must have been ascribed to the Black Swift by some slip.]

(246) **Cypseloides brunneitorques brunneitorques** (Lafresnaye)

Chætura brunneitorques, LAFRESNAYE, Rev. Zool., 1844, p. 81 (Colombia); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1894, p. 378 (Plains near Dueñas).

Cypseloides brunneitorques brunneitorques, RIDGWAY, *loc. cit.*, p. 712.

Nebaj, 1 ♂.

RANGE.—Chiefly Subtropical Zone: Peru to Mexico; a poorly known race in southwestern Mexico.

Another mountain swift which is difficult to secure and is much commoner than the records of specimens collected would indicate. The species is remarkably constant throughout an extensive range.

"Taken but once, at Nebaj, where a flock was met with April 24 and on several subsequent occasions; the species seemed to be well distributed in the uplands but, owing to its habit of flying high, quite difficult to secure. A large flock was seen between Santa Rosa and Gracias, Honduras, in July." (Anthony, MS.)

[*Chætura pelagica* Linnæus

Chætura pelagica, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1894, p. 375 (Guatemala (?); based on a specimen in the British Museum, formerly in Lord Tweeddale's Collection, and said to be from Guatemala).

Until a specimen with an authentic and definite locality is collected, the Chimney Swift should be placed in the hypothetical list of Guatemala birds.]

(247) **Chætura vauxii vauxii** (Townsend)

Cypselus vauxii TOWNSEND, Journ. Acad. Nat. Sci. Phila., VIII, 1839, p. 148 (Fort Vancouver, Columbia River).

Chætura vauxi (part), SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1894, p. 376 (Raxche, Coban, Dueñas, Alotenango, and Tierra Caliente generally); DEARBORN, 1907, p. 96 (Mazatenango, March 19); RIDGWAY, *loc. cit.*, p. 722.

San Lucas, 4 ♂, 1 ♀; Finca Carolina, 1 ♂.

RANGE.—Western North America, south in winter to western Guatemala.

Undoubtedly a regular winter visitor, at least to the whole of western Guatemala. The relationships of this bird to *C. richmondi* are discussed beyond. Older references to this species from tropical localities, by Salvin and others, probably belong to the next.

(248) **Chætura vauxii richmondi** Ridgway

Chætura richmondi Ridgway, Proc. Biol. Soc. Wash., XXIII, 1910, p. 53 (Guayabo, Costa Rica); idem, 'Birds N. and Mid. Amer.,' pt. 5, 1911, p. 720 (Gualan, Yzabal, Los Amates).

Chætura vauxi, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1894, p. 396 (lowland tropical localities probably belong here).

Chætura gaumeri, Dearborn, 1907, p. 96 (Los Amates).

Typical.—Secanquim, 3♂, 1♀; Finca Chamá, 1♂; Chipoc, 6♂, 8♀; Finca Carolina, 1♂, 6♀.

Intermediates.—Finca Carolina, 1♂, nearer *richmondi* in size, nearer *vauxii* in color; San Lucas, 1♂, 1♀, nearer *richmondi* in color, nearer *vauxii* in size.

Range.—Humid Tropical Zone: eastern Mexico to western Panama, chiefly Caribbean slope, but also Pacific slope of Guatemala and southern Costa Rica.

For some time several people have suspected that *Chætura vauxii*, *richmondi*, and *gaumeri* were merely representative forms, and the present splendid series from Guatemala affords definite evidence of the soundness of this viewpoint, as it contains obvious intermediates. We have a large, pale, northern migratory form, *vauxii;* a small, dark, resident, tropical form *richmondi;* and a small, pale, resident, tropical form in arid Yucatan, *gaumeri*. The very large series available of *richmondi* shows that spring birds have a much bluer gloss on the wing than fall birds, which are often bottle-green.

Apparently a fairly common bird at low altitudes, on both coasts. It has been recorded as *C. gaumeri* by Dearborn and, unquestionably, older records of *C. vauxii* from lowland localities belong here.

Mr. Anthony found small swifts common and generally distributed, but he was naturally unable to separate the two forms.

Family **Trochilidæ**. Hummingbirds

(249) **Phœthornis superciliosus longirostris** (Delattre)

Ornismya longirostris Delattre, 'Echo du Monde Savant,' I, 1843, No. 5, col. 1070 (Guatemala).

Phæthornis longirostris, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1892, p. 318 (Yzabal, Choctum, track to Peten); Dearborn, 1907, p. 96 (Los Amates).

Phœthornis longirostris longirostris, Ridgway, 'Birds N. and Mid. Amer.,' pt. 5, 1911, p. 319.

RANGE.—Tropical Zone: the species, Bolivia to Mexico; the race, Mexico to Honduras.

One of the many hummingbirds of the tropical rain-forest areas in Central America, which is closely related to a South American species. No family of birds illustrates better the sharp contrast between the two elements in the avifauna of Central America. The tropical rain-forest forms are nearly all species or races of obvious South American origin. Chiefly in the mountains do we find the numerous endemic genera, many of them with several distinct species in various parts of the area.

A very rare hummingbird in Mexico, more common in Guatemala, and ubiquitous in the rain forest in southern Central America.

(250) **Phœthornis adolphi saturatus** Ridgway

Phæthornis adolphi saturatus RIDGWAY, Proc. Biol. Soc. Wash., XXIII, 1910, p. 54(El Hogar, Costa Rica); idem, 'Birds N. and Mid. Amer.,' pt. 5, 1911, p. 326[1] (Coban, Kamkhal, Lanquin, Yzabal, Puerto Barrios, Secanquim).

Pygmornis adolphi, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1892, p. 320 (localities and status).

Phæthornis adolphi, DEARBORN, 1907, p. 96 (Puerto Barrios).

Secanquim, 3 ♂, 1 ♀.

RANGE.—Humid Tropical Zone: Mexico to eastern Panama; the race, Guatemala to western Panama.

Freshly collected specimens show that Ridgway was entirely correct in restricting typical *adolphi* to Vera Cruz. These four specimens from Alta Vera Paz are much nearer *saturatus*. Old, faded, Guatemala trade-skins, however, appear much more like recently collected *adolphi*. The single specimen from British Honduras examined is not as dark as the Secanquim birds.

A close representative of *P. striigularis* of South America. Its distributional features in Central America are an exact repetition of the last species.

(251) **Pampa pampa pampa** (Lesson)

Ornismya pampa LESSON, 'Hist. Nat. des Oiseaux-Mouches,' Suppl., 1830–31, p. 127 ("Paraguay").

Sphenoproctus pampa, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1892, p. 322 (Coban, Choctum, Chisec).

Pampa pampa pampa, RIDGWAY, *loc. cit.*, p. 354.

RANGE.—Southern Mexico, Yucatan, and northern Guatemala; the race *curvipennis* in southern Mexico.

[1]Recorded also from Guatemala City, the specimen unquestionably erroneously labeled.

This monotypic genus is very closely related to *Campylopterus*, and an ultra-conservative systematist would not recognize it. The alleged character of different coloration is apparent only to Central American workers, who deal with *C. rufus* and *C. hemileucurus*, but is essentially the same as in *largipennis* (the type species) and *obscurus*. Technical characters can be found to divide *Campylopterus* into four genera. The group, as a whole, illustrates the remarkable degree of specialization in hummingbirds, and the length of time which must have been required to evolve the three species now existing in Guatemala. The scattered and irregular distribution of the various species in these subgeneric groups is further evidence of it. I am strongly inclined to regard *Pampa* as a relict form, an off-shoot of the same stock which produced *largipennis* and *obscurus* in South America. Its distribution is unique, and is approached only by the Ocellated Turkey and the warbler, *Granatellus*, two unquestioned relict types.

(252) **Campylopterus hemileucurus** (Lichtenstein)

Trochilus hemileucurus LICHTENSTEIN, 'Preis-Verz. Mex. Vög.,' 1830, p. 1 (Mexico).

Campylopterus hemileucurus SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1892, p. 324 (Coban, Kamkal, Choctum, Totonicapam, Volcan de Fuego, Volcan de Agua, Retalhuleu); RIDGWAY, *loc. cit.*, p. 358.

Finca Sepacuite, 1 ♂; Finca La Carolina, 8 ♂; San Felipe, Retalhuleu, 1 ♀.

RANGE.—Subtropical Zone: southern Mexico to Veraguas, Panama.

One of the most ubiquitous birds of the Subtropical Zone in the mountains of Central America, always occurring at the very lowest levels reached by this Zone, and at certain seasons of the year descending to the Tropical Zone for a month or two.

(253) **Campylopterus rufus** Lesson

Campylopterus rufus LESSON, Rev. Zool., 1840, p. 73 (*loc. ignot.*); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1892, p. 325 (Dueñas, Volcan de Fuego, plains near Pacicia and Patzum); DEARBORN, 1907, p. 96 (near Panajachel); RIDGWAY, *loc. cit.*, p. 361.

San Lucas, 4 ♂, 5 ♀, 1 (?); Antigua, 2 ♂; Panajachel, 1 ♂.

RANGE.—Localized in the mountains of western Guatemala and Salvador.

A very distinct endemic species for which the genus *Platystylopterus* has been proposed. It has no near relative in the group. In Guatemala

it is confined to a narrow district from Lake Atitlan to the great volcanoes near Dueñas from 5000 to 6000 feet. Collectors have found it in the coffee plantations, when the trees were in bloom.

(254) **Florisuga mellivora mellivora** (Linnæus)

Trochilus mellivorus Linnæus, 'Syst. Nat.,' I, 1758, p. 121 (Guiana).

Florisuga mellivora, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1892, p. 340 (Choctum, near Peten); Ridgway, *loc. cit.*, p. 576.

Puebla, 6 ♂, 1 ♀; Secanquim, 3 ♂.

Range.—Humid Tropical Zone: Bolivia and Guiana to southern Mexico; a local race in Tobago.

This widely distributed hummingbird is a typical example of the many rain-forest birds in Central America, which came in from the south, and decrease northward.

(255) **Phæochroa cuvierii roberti** (Salvin)

Aphantochroa roberti Salvin, P.Z.S., 1861, p. 203 (tierra caliente of Vera Paz, east Guatemala).

Phæochroa roberti, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1892, p. 327 (Choctum, Cantoöloc); Ridgway, *loc. cit.*, p. 365.

Finca Sepacuite, 3 ♂.

Range.—Tropical Zone: the race *roberti* in rain forest from Guatemala to southern Nicaragua; the race *cuvieri* in open gallery forest, Pacific slope of Costa Rica and Panama; other races in the arid districts of northern Colombia.

I can see no point in maintaining that *roberti* is anything but a well-marked northern extreme of *cuvierii*.

The genus, a very slight one, is closely related to *Aphantochroa cirrhochloris* of eastern Brazil, of which it is undoubtedly a northern relict, the various races occupying disconnected areas, which are faunally quite different.

(256) **Agyrtria candida candida** (Bourcier and Mulsant)

Trochilus candidus Bourcier and Mulsant., Ann. Sci. Phys. et Nat. Lyons, IX, 1846, p. 326 (Coban, Guatemala).

Agyrtria candida, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1892, p. 286 (Coban, Choctum, Yzabal); Dearborn, 1907, p. 97 (Los Amates); Ridgway, *loc. cit.*, p. 432.

Secanquim, 11 ♂, 3 ♀; Puebla, 6 ♂.

Range.—Humid Tropical Zone: southern Mexico to Costa Rica.

With this species we come to a group of hummingbirds, the taxonomy of which is practically hopeless from the ordinary systematic viewpoint. *Agyrtria*, *Amazilis* and *Saucerottia* are three familiar generic names, but lack trenchant characters. Ridgway has put the case excellently ('Birds N. and Mid. Amer.,' pt. 5, 1911, p. 406). "Either the three so-called genera must be combined into one, or each of them must be further restricted and a considerable number of genera recognized before their definition can be made more precise . . . apparently, no matter whether they are combined into a single genus or divided into several, the definition of the group or groups is equally difficult in either case." Having examined all but three of the existing and described species concerned, I heartily concur in this summary. No two "Trochilidists" have ever agreed. To combine them, however, would involve, for consistency's sake, the elimination of many genera in other groups, and this is not the place to propose a conservative classification of the Trochilidæ. I wish only to register my objection to such inosculating genera, and to point out, in zoögeographical studies, the fallacy of basing hypotheses upon the ranges and distribution of such artificial and indefinite group concepts.

Agyrtria candida is the only representative in Central America of a group of tropical forest hummingbirds, widely dispersed in South America, and which is consequently lacking in southern Central America. I omit from consideration *Arenella boucardi* of western Costa Rica, unquestionably a valid genus, if any segregates of *Amazilis* are regarded as genera. I also omit from consideration the unique *A. luciæ* based on a trade-skin said to come from Honduras, which is probably an abnormal specimen of *A. versicolor*.

The species *candida* is reported as abundant or uncommon according to the fortune of collectors in visiting its haunts, when the proper flowers were in bloom.

(257) **Agyrtria candida pacifica** Griscom

Agyrtria candida pacifica Griscom, Amer. Mus. Novit., No. 379, 1929, p. 10 (Finca Carolina, near Tumbador, Pacific slope of Guatemala).

Finca Carolina, 11 ♂, 3 ♀, 1 (?).

Range.—Localized in the rain forests of the Pacific slope of Guatemala.

This slightly differentiated form is one of the few cases where a rain-forest species occurs on the Pacific slope of northern Central America.

(258) **Saucerottia cyanura guatemalæ** Dearborn

Saucerottea (sic) cyanura gautemalæ (sic) Dearborn, Field Mus. Nat. Hist., Publ. 126, 1907, p. 97 (Mazatenango, Dept. of Suchitepequez, Guatemala; also Patulul in range).

Amazilia cyanura, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1892, p. 297 (Retalhuleu, Mazatenango).

Finca La Carolina, 5♂, 3♀, 1 (?); Finca El Cipres, 4♂, 2♀; Finca El Espino, 1♂; San Felipe, Retalhuleu, 1♂, 1♀.

Range.—Arid Tropical Zone: Chiapas to western Costa Rica; the race, Chiapas and western Guatemala.

Ridgway has recorded a hybrid between this species and the next taken at Patulul ('Birds N. and Mid. Amer.,' pt. 5, 1911, p. 448, footnote).

An endemic and very distinct species, which is often very common.

(259) **Saucerottia beryllina devillei** (Bourcier and Mulsant)

Trochilus devillei Bourcier and Mulsant, Rev. Zool., 1848, p. 272 (Guatemala).

Amazilia devillii, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1892, p. 296 (Choctum, Yzabal, Dueñas, Volcan de Fuego, La Trinidad).

Saucerottea devillii, Dearborn, 1907, p. 98 (Patulul, Lake Amatitlan); Ridgway, *loc. cit.*, p. 447.

Palin, Amatitlan, 1♂; Panajachel, 1♂; Escuintla, 1♂, 3♀; Gualan, 1♂; Quiriguá, 1♂.

Range.—Southern half of Mexico to Salvador; the race, Chiapas to Salvador.

This so-called species is a well-marked southern race of the common Mexican *beryllina*. The male from Quiriguá is much darker and more richly colored than Pacific slope specimens, and the tail is much more purple. As this is much farther east than the species has previously been known, the character may prove to be of subspecific value.

Abundant from sea-level to 5000 feet.

(260) **Amazilis tzacatl tzacatl** (De la Llave)

Trochilus tzacatl De la Llave, 'Registro Trimeste,' II, 1833, p. 48 (Mexico).

Amazilia riefferi, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1892, p. 301 (Santa Ana in Peten, Choctum, Coban, Lanquin, Yzabal).

Amazilis tzacatl, Dearborn, 1907, p. 98 (Los Amates).

Amizilis tzacatl tzacatl, Ridgway, *loc. cit.*, p. 408.

Secanquim, 5♂, 5♀; Puebla, 4♀; Finca El Cipres, 1♀.

Range.—Mexico to west Ecuador; the typical form, Mexico to Colombia.

The most abundant and generally distributed hummingbird in the rain-forest areas of Central America.

(261) **Amazilis yucatanensis yucatanensis** (Cabot)

Trochilus yucatanensis CABOT, Proc. Bost. Soc. Nat. Hist., II, 1845, p. 74 (Yucatan).

Amazilia yucatanensis, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1892, p. 299 (Santa Ana in Peten).

Amazilis yucatanensis, RIDGWAY, *loc. cit.*, p. 412.

RANGE.—Chiefly Arid Tropical Zone: Texas to British Honduras; the race, Tabasco, Campeche, Yucatan, Peten and British Honduras.

A member of the Yucatan avifauna which barely reaches our limits in Peten.

(262) **Amazilis rutila rutila** (Delattre)

Ornismya rutila DELATTRE, 'Echo du Monde Savant,' I, 1843, No. 5, col. 1069 (Acapulco, Guerrero).

Amazilia cinnamomea, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1892, p. 294 (San Geronimo only).

Amazilis cinnamomeus, DEARBORN, 1907, p. 98 (Gualan; El Rancho).

Amizilis rutila rutila, RIDGWAY, *loc. cit.*, p. 416.

Puebla, 2♂; Progreso, 2♂, 1♀.

RANGE.—Arid Tropical Zone: western Mexico to northwest Costa Rica.

An interesting hummingbird from the standpoint of distribution. It is ubiquitous in the Arid Tropics of Central America, and is consequently isolated in the Yucatan Peninsula and the arid valleys of the interior of Guatemala. In a narrow area on the Pacific coast from southern Chiapas to western Guatemala, where exceptionally humid conditions prevail locally, the species is represented by a race, *corallirostris*, which is more deeply and richly colored, just the characters to have been expected.

(263) **Amizilis rutila corallirostris** (Bourcier and Mulsant)

Trochilus corallirostris BOURCIER AND MULSANT, Ann. Sci. Phys. et Nat. Lyons, IX, 1846, p. 328 (Escuintla, Guatemala).

Amizilis rutila corallirostris, RIDGWAY, *loc. cit.*, p. 419 (Escuintla, Mazatenango, Patulul, Retalhuleu, Santana Mixtan).

Amazilis rutila saturatus, DEARBORN, 1907, p. 98 (San José, Patulul, Mazatenango).

Pantaleon, Escuintla, 4♂; Finca El Cipres, 2♂, 3♀; Finca El Espina, 1♂; Hacienda California, 3♂, 1♀; Finca La Carolina, 11♂, 4♀.

RANGE.—Localized on the Pacific coast in southern Chiapas and western Guatemala.

(264) **Amizilis cyanocephala cyanocephala** (Lesson)

Ornismya cyanocephalus Lesson, 'Hist. Nat. des Oiseaux-Mouches,' 1829, p. 45 ("Bresil").

Barrillos, 6 ♂, 1 ♀, 1(?); La Perla, 1 ♂, 3 ♀; Chanquejelve, 1 ♂, 1 ♀.

Range.—Pine forests of southern Mexico and extreme northwestern Guatemala.

This series, as a whole, is distinctly intermediate, but a trifle nearer typical *cyanocephala* than *guatemalensis*. The majority of the specimens have little or no suggestion of bronze in the tail or tail-coverts.

(265) **Amazilis cyanocephala guatemalensis** (Gould)

Cyanomyia guatemalensis Gould, 'Introd. Troch.,' 1861, p. 148 (Guatemala); Salvin and Godman, 'Biol. Cent. Amer.,' II, 1892, p. 292 (Pine-ridge of Poctun, Coban, mountains of Chilasco and San Geronimo, Dueñas, Panajachel).

Amizilis cyanocephala guatimalensis, Ridgway, *loc. cit.*, p. 427.

Secanquim, 1 ♂; Finca La Primavera, 3 ♂, 4 ♀; Finca Sepacuite, 9 ♂, 2 ♀; Finca El Soche, 1 ♂; Chichicastenango, 1 ♂, 1 ♀; Huehuetenango, 1 ♂; Puebla, 1 ♀; Progreso, 1 ♂; La Montañita, 1 ♀; Amatitlan, 1 ♀; San Lucas, 1 ♂, 4 ♀; Panajachel, 2 ♂, 2 ♀; La Carolina, 3 ♂.

Range.—Pine forests from Guatemala to northern Nicaragua.

The large series available shows that while extremes are easily recognizable at a glance, worn, molting, or post-breeding specimens of *guatemalæ* tend to lose nearly all signs of their bronzy color on tail and tail-coverts. The material from northwestern Guatemala and Alta Vera Paz has been particularly hard to allocate, but on the whole the former belong with *cyanocephala* and the latter with *guatemalensis*. Birds from Chichicastenango and Huehuetenango are also far from typical. Even in northern Nicaragua occasional specimens are almost devoid of bronzy color. A male from Quintana Roo and a pair from British Honduras are intermediate as regards the tail, but differ from all others examined in being more grass-green, less golden green above, particularly on the back. A series might show the existence of a slightly characterized form.

This is one of the commonest and most characteristic hummingbirds of the pine forests of Central America and, if anything, is even more abundant than *Basillina*. Like many other Subtropical Zone hummingbirds, it occasionally descends to lower levels in the non-breeding season, as is shown by the specimens from Progreso and Puebla below the pine belt, and La Carolina in the Pacific lowlands.

The species belongs to a group which is endemic in the mountains of Mexico and northern Central America. Many specialists regard them as a separate genus, variously called *Cyanomyia* or *Uranomitra*, and even Salvin, who was conservative in genera, maintained it, while not recognizing *Saucerottia*. It is really a connecting link between *Agyrtria* and *Amazilis*, and is one of several excellent subgenera of the genus *Amazilis*.

(266) **Hylocharis leucotis leucotis** (Vieillot)

Trochilus leucotis VIEILLOT, 'Nouv. Dict. d'Hist. Nat.,' 2d Ed., XXIII, 1818, p. 428 ("Brazil," error; I designate Orizaba, Vera Cruz, Mexico).

Basilinna leucotis, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1892, p. 313 (Quetzaltenango, Totonicapam, Santa Maria, Chuipaché, Volcan de Fuego, Volcan de Agua, Chilasco, Santa Rosa above Salamá, San Geronimo, Santa Barbara, Coban); RIDGWAY, *loc. cit.*, p. 378.

Hylocharis leucotis, DEARBORN, 1907, p. 98 (Lake Atitlan, Tecpam).

Hylocharis leucotis leucotis, GRISCOM, Amer. Mus. Novit., No. 379, 1929, p. 10–11 (crit.; range).

Barrillos, 2♂, 2♀; La Perla, 1♂, 1♀; Tecpam, 1♂; Nebaj, 1♂, 2♀; Uspantan, 1♀; Momostenango, 8♂, 4♀; Chichicastenango, 11♂, 3♀; Finca Sepacuite, 2♂; Quetzaltenango, 2♂, 1♀; San Lucas, 1♂; Antigua, 1♂; La Montañita, 1♂; San Antonio, 4♂.

RANGE.—Chiefly in pine forests; mountains of southern Arizona to northern Nicaragua; the race, in southern Mexico and Guatemala.

Perhaps the most generally abundant hummingbird in the pine forests of northern Central America. *Basilinna* is a subgenus of *Hylocharis*, and is endemic in the mountains of the Sonoran subregion.

(267) **Hylocharis eliciæ** (Bourcier and Mulsant)

Trochilus eliciæ BOURCIER AND MULSANT, Ann. Sci. Phys. et Nat. Lyons, IX, 1846, p. 314 (locality unknown).

Chrysuronia eliciæ, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1892, p. 311 (Coban, Choctum, Masagua, Retalhuleu).

Hylocharis eliciæ, RIDGWAY, *loc. cit.*, p. 384.

RANGE.—Humid Tropical Zone: Chiapas to western Panama, very local on the Pacific slope.

This species is the northern representative of a large group of South American species, included in *Eucephala*, *Chrysuronia* and *Hylocharis*. It is uncommon to rare in the northern half of its range.

(268) **Chlorostilbon canivetii canivetii** (Lesson)

Ornismya canivetii Lesson, 'Hist. Nat. Colibris,' Suppl., 1830–1831, p. 174 ("Brasil").

Chlorostilbon caniveti, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1892, p. 264 (Coban and Lanquin, probably).

Chlorostilbon canivetii canivetii, Ridgway, *loc. cit.*, p. 553.

Secanquim, 4♂, 5♀; Chanquejelve, 1♀.

Range.—Tropical Zone: the species, southern Mexico to northern Costa Rica; the typical race, in Mexico and northern Guatemala.

This series is much nearer typical *canivetii*, in the more deeply forked, longer tails, with broad, brownish-gray tips. In fact the only way it differs from a Mexican series is in having the tail of intermediate length, the outer feather not reaching the maximum length. The line of demarcation between the two races is interesting. Secanquim is in the pine belt at an altitude of 1800 feet at the northeastern base of the Vera Paz highlands. A specimen from Sepacuite, ten miles farther south, at an altitude of 3500 feet, is typical *osberti*.

(269) **Chlorostilbon canivetii osberti** Gould

Chlorostilbon osberti Gould, P.Z.S., 1860, p. 309 (Guatemala).

Chlorostilbon caniveti, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1892, p. 264 (Dueñas, Volcan de Fuego, San Geronimo); Dearborn, 1907, p. 99 (Gualan, San José).

Chlorostilbon canivetii osberti, Ridgway, *loc. cit.*, p. 556.

Sepacuite, 1♂; Finca La Primavera, 15♂, 3♀; Puebla, 1♂; Lake Amatitlan, 1♀; Finca El Cipres, 1♂, 1♀; San José, 1♂.

Range.—Guatemala to northern Nicaragua.

This well-marked form ranges throughout the central and Pacific sections of Guatemala. I have seen no specimens from Salvador or Honduras, but six specimens in The American Museum of Natural History from the highlands of northern Nicaragua unquestionably belong here also. Still farther south the less distinct but perfectly tenable race *salvini* Cabanis and Heine forms a partial connecting link with *Chlorostilbon assimilis* of Panama.

(270) **Thalurania colombica townsendi** Ridgway

Thalurania townsendi Ridgway, Proc. U. S. Nat. Mus., X, 1888, p. 590 (Segovia River, Honduras); idem, 'Birds N. and Mid. Amer.,' pt. 5, 1911, p. 536 (Gualan, Guatemala).

Range.—Humid Tropical Zone: the species, Colombia to southern Mexico; the race, eastern Guatemala to southeastern Honduras.

One of the many South American species which has spread northward in the Caribbean forests of Central America, and which decreases rapidly northward. The American Museum has intergrades between *venusta* and *townsendi* from the Nicaragua-Honduras boundary.

(271) **Eupherusa eximia eximia** (Delattre)

Ornismya eximia Delattre, 'Echo du Monde Savant,' 1843, col. 1069 (Coban, Guatemala).

Eupherusa eximia, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1892, p. 271 (Coban, Kamkhal, Choctum, track between Cahabon and San Luis); Ridgway, *loc. cit.*, p. 394.

Finca Sepacuite, 9 ♂; Finca Sepur, 1 ♂, 1 ♀.

Range.—Subtropical Zone: southern Mexico to northern Nicaragua; a local race in Mexico.

This genus with three distinct species is endemic in the mountains of Mexico and Central America.

(272) **Colibri delphinæ** (Lesson)

Ornismya delphinæ Lesson, Rev. Zool., 1839, p. 44 (unknown).

Petasophora delphinæ, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1892, p. 283 (Coban; also collected by Skinner).

Colibri delphinæ, Ridgway, *loc. cit.*, p. 486.

Finca Sepacuite, 2 ♀.

Range.—Peru and Guiana to Guatemala.

This widely distributed hummingbird has been collected less than a dozen times in Central America and would appear to be very rare. All the records come from rain-forest areas.

(273) **Colibri thalassinus** (Swainson)

Trochilus thalassinus Swainson, Philos. Mag., (N. S.) I, 1827, p. 441 (Temascaltepec, Mexico).

Petasophora thalassina, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1892, p. 281 (Quetzaltenango, San Martin, Chuipache, Toliman, Dueñas, Volcan de Fuego, Chilasco, Coban).

Colibri thalassinus, Ridgway, *loc. cit.*, p. 482.

Chichicastenango, 2 ♀; Momostenango, 1 ♀; Finca Sepacuite, 4 ♂, 1 ♀; Quetzaltenango, 1 ♂, 1 ♀.

Range.—Subtropical and Temperate Zones: Mexico and Guatemala.

I can detect no racial variation in this hummingbird over its extensive range. W. W. Brown in 1926 collected a large series at Alvarez, San Luis Potosi, a slight northward extension.

The northern representative of the group containing *cyanotus* and *iolatus*, and abundantly distinct, as is the case with Subtropical Zone species, but not with Humid Tropical Zone species. It is a common and characteristic bird of the oak forests.

(274) **Anthracothorax prevostii prevostii** (Lesson)

Trochilus prevostii LESSON, 'Hist. Nat. Colibris,' 1830–1831, p. 87 (locality unknown).

Lampornis prevosti, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1892, p. 278 (Santa Ana near Peten, Escuintla).

Anthracothorax prevostii prevostii, RIDGWAY, *loc. cit.*, p. 463.

San José, 1 ♂; Antigua, 1 ♀.

RANGE.—Tropical Zone: Mexico to northern Costa Rica and on Old Providence Island; the race, Mexico to Honduras.

This Mango Hummer has a remarkable distribution, as it is common only in Vera Cruz, and on the islands off the coast of Central America. On the mainland it is everywhere uncommon or rare, but nevertheless has been found on the Pacific slope as well as the eastern. It is most closely related to *A. nigricollis* of South America generally, which ranges north to eastern Panama, and astonishingly enough occurs on St. Andrew's Island. The hiatus between the two species in Central America is only partly filled by the endemic *A. veraguensis*, which is related to species of the Greater Antilles. I conclude, therefore, that the genus is a relict one in Central America, and that its origin dates back to a time when Central America extended much farther to the east, and there was less Caribbean Sea.

(275) **Eugenes fulgens** (Swainson)

Trochilus fulgens SWAINSON, Philos. Mag., (N. S.) I, 1827, p. 441 (Temascaltepec, Mexico).

Eugenes fulgens, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1892, p. 328 (El Rincon, Santa Maria, San Martin, Chuipaché, Volcan de Fuego, Dueñas, mountains of Chilasco, Tactic, Coban); DEARBORN, 1907, p. 99 (Tecpam; RIDGWAY, *loc. cit.*, p. 565.

Eugenes viridiceps BOUCARD, Ann. Soc. Linn. Lyon, XXV, p. 55 (Coban, Guatemala).

Chichicastenango, 1 ♀; Momostenango, 4 ♂ ad., 1 ♂ imm., 1 ♀; San Lucas, 2 ♂; Tecpam, 5 ♂.

RANGE.—Subtropical and Temperate Zones: Arizona to northern Nicaragua.

Another genus which is endemic in the mountains of Mexico and Central America, *E. spectabilis* occurring in Costa Rica and western Panama.

Specimens from Guatemala and northern Nicaragua have the bill averaging about 2–2.5 mm. longer and a little wider at the base. For those who wish to recognize so minute a difference, the name *viridiceps* Boucard is available, based on an abnormally colored specimen, the longer bill of which was specially noted by Salvin.

The Rivoli Hummingbird is abundant locally in Guatemala, when the proper flowers are in bloom.

(276) **Lampornis amethystinus salvini** (Ridgway)

Delattria henrica salvini RIDGWAY, Proc. Biol. Soc. Wash., XXI, 1908, p. 195 (Calderas, Volcan de Fuego, Guatemala).

Delattria henrici, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1892, p. 335 (El Rincon, Cuipaché, San Martin, Quetzaltenango, Totonicapam, Calderas).

Lampornis amethystinus, DEARBORN, 1907, p. 99 (Tecpam).

Lampornis amethystinus salvini, RIDGWAY, *loc. cit.*, p. 498.

Tecpam, 4 ♂, 1 ♀; Volcan San Lucas, 1 ♂, 3 ♀; Santa Ilania, 3 ♂; Quetzaltenango, 1 ♂; Volcan de Fuego, 1 ♂.

RANGE.—Subtropical and Temperate Zones: southern Mexico and Guatemala; the race, southwestern Mexico and western Guatemala.

A well-marked form, when compared with typical *amethystinus* of southeastern Mexico. The female of *salvini* differs from *amethystinus* in being slightly darker below, the auriculars darker, the white postocular stripe better developed posteriorly, and the sides and flanks more extensively washed with green. When Ridgway described *salvini* and *brevirostris* of western Mexico, he apparently had but two males of each, and later expressed great doubt as to the validity of the latter. I have a male *brevirostris* from Santiago, Tepic, before me, which does not differ minutely from the series of Guatemala males now available either in color or measurements. *Salvini* has line anteriority over *brevirostris*. *L. margaritæ* (Salvin and Godman) and *L. pringlei* (Nelson) are certainly representative forms, and it is very doubtful if they are specifically distinct from *L. amethystinus*.

The whole group of Cacique Hummingbirds or Mountain Gems is another case where unsatisfactory generic characters exist. The genera *Cyanolæmus* and *Oreopyra* would serve their purpose equally well, if regarded as subgenera only. The group as a whole is endemic in the

mountains of Mexico and Central America, with numerous distinct species.

The present species is quite common in the mountains of western Guatemala, chiefly from 8000 to 10,000 feet.

(277) **Lampornis (Oreopyra) viridipallens viridipallens** (Bourcier and Mulsant)

Trochilus viridipallens Bourcier and Mulsant, Ann. Sci. Phys. et Nat. Lyon, IX, 1846, p. 321 (Coban, Vera Paz, Guatemala).

Delattria viridipallens, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1892, p. 336 (Coban, Chilasco, Volcan de Fuego, Pié de la Cuesta, Santa Maria, Toliman).

Oreopyra viridipallens, Ridgway, *loc. cit.*, p. 509.

Finca Sepacuite, 1 ♂; Finca Sepur., 1 ♀; Volcan Zunil (5000 feet), 1 ♀.

Range.—Endemic in mountain oak and pine forests from southern Chiapas to northern Nicaragua; the race, Chiapas and Guatemala.

This species connects *Lampornis* (=*Delattria*) with *Oreopyra* and is bandied about from one to the other, according to which distinction the several authorities have chosen to make the separating character.

Messrs. Dickey and Van Rossem (Proc. Biol. Soc. Wash., 1929, pp. 202–212) have recently described two races from Salvador, one of which clearly connects *sybillæ* of northern Nicaragua with *viridipallens*.

(278) **Lamprolaima rhami** (Lesson)

Ornismya rhami Lesson, Rev. Zool., 1838, p. 315 (Mexico).

Lamprolaima rhami, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1892, p. 338 (El Rincon, Santa Maria, San Marcos, Calderas, Chilasco); Dearborn, 1907, p. 99 (Tecpam); Ridgway, *loc. cit.*, p. 489.

Tecpam, 3 ♂, 1 ♀; Santa Ilania, 3 ♂; Volc. de Fuego, 2 ♂.

Range.—An endemic, monotypic genus of the Subtropical and Temperate Zones in the mountains of southern Mexico and Guatemala.

(279) **Heliothryx barroti** (Bourcier and Mulsant)

Ornismya barroti Bourcier and Mulsant, Ann. Soc. d'Agric. Lyon, V, 1843, p. 48 (Cartagena, Colombia).

Heliothrix barroti, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1892, p. 251 (Las Salinas, Choctum, track between Cahabon and San Luis, Polochic Valley between Teleman and Panzos); Ridgway, *loc. cit.*, p. 562.

Range.—Tropical Zone: west Ecuador to Guatemala.

Another characteristic rain-forest species of South American origin, which is uncommon in Central America north of Costa Rica.

(280) **Anthoscenus longirostris pallidiceps** (Gould)

Heliomaster pallidiceps GOULD, 'Introd. Troch.,' 1861, p. 139 (Jalapa, Vera Cruz).

Floricola longirostris, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1892, p. 305 (Santa Ana, Las Salinas, Dueñas, Retalhuleu, Naranjo).

Anthoscenus superbus pallidiceps, DEARBORN, 1907, p. 99 (Mazatenango, Patulul).

Anthoscenus longirostris pallidiceps, RIDGWAY, *loc. cit.*, p. 349.

San Lucas, 1 ♂; Finca El Cipres, 1 ♀; Pantaleon, 1 ♂, 1 ♀; La Carolina, 4 ♂, 8 ♀.

RANGE.—Tropical Zone: Amazonia and west Ecuador to southern Mexico; the race, southern Mexico to Nicaragua.

A South American species, which is abundant in Panama and Costa Rica, but uncommon to rare farther north. It occurs locally in forested regions on the Pacific slope.

(281) **Anthoscenus constantii leocadiæ** (Bourcier and Mulsant)

Trochilus leocadiæ BOURCIER AND MULSANT, Ann. Sci. Phys. et Nat. d'Agric. Lyon, IV, 1852, p. 141 (Mexico).

Floricola constanti, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1892, p. 306 (San Geronimo).

Progreso, 3 ♂, 2 ♀.

RANGE.—Arid Tropical Zone: western Mexico to northern Costa Rica; the race, Mexico and Guatemala.

This fresh series raises an interesting point in nomenclature, first discussed by Ridgway ('Birds N. and Mid. Amer.,' pt. 5, 1911, pp. 350–351, footnote). They are radically paler below than a large series from Costa Rica, with the red of the throat slightly more restricted, the chin sooty gray rather than blackish. In other words they are practically indistinguishable from a series of *leocadiæ*, the west Mexican form. The only appreciable difference is the greater amount of red on the throat, in which respect they certainly are nearer the Costa Rican form. I do not agree, however, with Ridgway that such an intermediate race has sufficiently definite characters for formal separation. The difficulty is that the type of *constantii* Delattre in The American Museum of Natural History, said to be from "Guatemala," is clearly the same as the Costa Rican form, and clearly not the same as all other specimens from Guatemala. In such a case it seems reasonable to suppose that the supposed type locality was an error (of frequent occurrence by the French ornithologists in those days), and I propose Bolson, Costa Rica, as a cor-

rected type locality. The typical form thus occurs in Costa Rica and Nicaragua, and *leocadiæ* in western Mexico and western Guatemala, the birds of the latter country being about eighty per cent like *leocadiæ*. In cases where the type is in existence and well preserved, surely its characters are more important than its alleged source of origin, and the adoption of this view preserves names long in use.

This very distinct species is endemic in the Arid Tropical Zone of western Mexico and western Central America. It occurs locally in the arid interior valleys of Guatemala, but appears to avoid the Pacific coast region, which in Guatemala is an area locally far more humid than the balance of its Central American range.

(282) **Doricha enicura** (Vieillot)

Trochilus enicurus VIEILLOT, 'Nouv. Dict. d'Hist. Nat.,' XXIII, 1818, p. 429 ("Brazil").

Doricha enicura, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1892, p. 345 (Dueñas, Coban, Atitlan, Panajachel); RIDGWAY, *loc. cit.*, p. 648.

Chanquejelve, 1 ♂ imm.; San Lucas, 1 ♂; Finca La Primavera, 1 ♂ imm., 2 ♀; Finca Sepacuite, 6 ♂; 1 ♀.

RANGE.—Endemic in the Subtropical Zone, mountains of Guatemala.

The only other species of this genus, *eliza*, occurs curiously enough in Vera Cruz and the tip of the Yucatan Peninsula. The closely related genus *Calothorax* has two species in the mountains of western Mexico, and *Nesophlox* is found in the Bahamas and the mountains of Costa Rica and western Panama. The nearest relative to all three is *Calliphlox* in South America. The whole group is one of the most highly specialized in hummingbirds, and this fact in connection with its scattered and erratic distribution indicates its relative antiquity. How different is this situation from the hundreds of species in the Caribbean rain forest, which range continuously from Amazonia to Guatemala and where the representative in Central America is in most cases only subspecifically distinct!

(283) **Tilmatura dupontii** (Lesson)

Ornismya duponti LESSON, 'Hist. Nat. Colibris,' Suppl., 1830, p. 100 (Mexico).

Tilmatura duponti, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1892, p. 349 (Coban, San Geronimo, Volcan de Santa Maria); RIDGWAY, *loc. cit.*, p. 638.

La Perla, 2 ♂, 1 ♀; Panajachel, 9 ♂, 1 ♀; Barrillos, 1 ♂ yg.; Finca La Primavera, 2 ♂ yg., 1 ♀, 1 (?); Finca Sepacuite, 1 ♂, 1 ♂ yg., 1 ♀.

RANGE.—An endemic, monotypic genus of the Subtropical Zone in the mountains from southern Mexico to northern Nicaragua.

(284) **Archilochus colubris** (Linnæus)

Trochilus colubris Linnæus, 'Syst. Nat.,' I, 1758, p. 120 (Carolina to New England); Salvin and Godman, 'Biol. Cent. Amer.,' II, 1892, p. 358 (Santa Ana in Peten, Coban, San Geronimo, Dueñas, Acatenango, Rincon in San Marcos, Panajachel); Dearborn, 1907, p. 99 (Gualan, Lake Atitlan).

Archilochus colubris, Ridgway, *loc. cit.*, p. 629.

Panajachel, 1 ♂ imm.; Progreso, 2 ♂, 3 ♂ imm., 1 ♀; San Lucas, 2 ♂ imm., 2 ♀. Earliest fall date September 19, 1924.

Range.—Eastern North America, wintering south to Chiriqui.

A common winter visitant, extreme dates September 19 to April 10.

(285) **Selasphorus platycercus guatemalæ** Griscom

Selasphorus platycercus guatemalæ Griscom, Proc. N. E. Zoöl. Club, XII, 1930, p. 2 (Quetzaltenango, Guatemala; crit., range).

Selasphorus platycercus, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1892, p. 355 (Cuipaché, San Martin, Rincon in San Marcos, mountains above Totonicapam, Paramos); Ridgway, *loc. cit.*, p. 597.

Tecpam, 1 imm. (?); Barrillos, 1 ♀.

Range.—Temperate Zone: western United States to Guatemala; the race in Guatemala.

Thanks to Dr. Lowe's courtesy in sending me material from the British Museum, I was enabled to describe this well-marked local race. According to Salvin, it occurs only on the high volcanoes of northwestern Guatemala. Here it is almost certainly a recent arrival from the North, perhaps during the last glacial epoch. The genus, however, is an ancient and highly specialized type, which has one group of species in the United States, and another (5) in the mountains of Costa Rica and Panama, and it probably originated in Central America.

Crosby and I found this hummingbird fairly common in the alpine meadows (10,000–11,000 feet) in the mountains south of Totonicapam.

(286) **Atthis heloisa ellioti** Ridgway

Atthis ellioti Ridgway, Proc. U. S. Nat. Mus., I, 1878, p. 9 (Volcan de Fuego, Guatemala); Salvin and Godman, 'Biol. Cent. Amer.,' II, 1892, p. 361 (El Rincon, Cuipaché, Volcan de Santa Maria, Atitlan, Volcan de Fuego, Chilasco, Coban).

Atthis heloisa ellioti, Ridgway, 'Birds N. and Mid. America,' pt. 5, 1911, p. 597.

Range.—A monotypic genus, endemic in the mountains of Mexico and Guatemala; the race, in Guatemala.,

(287) **Abeillia abeillei abeillei** (Delattre and Lesson)

Ornismya abeillei DELATTRE AND LESSON, Rev. Zool. 1839, p. 16 (Mexico).
Abeillia typica, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1892, p. 342 (Coban, Volcan de Fuego, Pié de la Cuesta, Toliman).
Abeillia abeillei, RIDGWAY, *loc. cit.*, p. 517.

Finca Sepacuite, 3 ♂, 1 ♀; Volcan Zunil, 1 ♂.

RANGE.—Another monotypic genus in the Subtropical Zone from southern Mexico to northern Nicaragua (the local race *aurea*).

(288) **Lophornis helenae** (Delattre)

Ornismya helenæ DELATTRE, 'Echo du Monde Savant,' 1833, p. 1068 ("Petinck," Guatemala).
Lophornis helenæ, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1892, p. 364 (Coban); RIDGWAY, *loc. cit.*, p. 673.

Volcan Zunil (4800 feet), 1 ♀; Finca Sepacuite, 1 ♀; Secanquim, 1 ♂.

RANGE.—Humid Tropical Zone: southern Mexico to eastern Costa Rica.

Mr. Anthony's discovery of this species on the Pacific slope of Guatemala is of considerable interest. The genus is an ancient and remarkably specialized one, so it is not surprising that three very distinct species occur in Central America.

ORDER TROGONES

FAMILY **TROGONIDÆ.** TROGONS

(289) **Pharomachrus mocinno mocinno** De la Llave

Pharomachrus mocinno DE LA LLAVE, 'Registro Trimestre,' I, 1832, p. 48 (Guatemala, Chiapas); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1896, p. 482 (San Martin, Pié de la Cuesta, Cerro Zunil, Volcan de Agua, Volcan de Fuego, Chacaman in the Chiantla range, vicinity of Coban and the higher forests of Vera Paz, Raxché, Chilasco, Santa Cruz Mts.).
Pharomachrus mocinno mocinno, RIDGWAY, 'Birds N. and Mid. Amer.,' pt. 5, 1911, p. 736.

RANGE.—Subtropical Zone: mountains of Chiapas to northern Nicaragua; a race, in Costa Rica and western Panama.

Formerly a common bird in the cloud forest throughout the mountains of Guatemala. These forests have been greatly reduced in the last fifty years by clearing for coffee plantations, and the Quetzal retires as soon as primeval conditions are destroyed. It has also been unmercifully persecuted for its plumes, and untold thousands were ex-

ported for decades. It is now protected by law, and a genuine effort is made to prevent its exportation.

"Protected by law and its capture forbidden, one might expect it to be somewhat common. Such, however, is not the case. There are a few localities where it is still more or less common, but constant persecution has greatly reduced it in most of its former haunts, and in many it is quite extinct. There are still many to be found in Alta Vera Paz, where I saw several on the Finca Sepacuite. At this locality they were confined to the virgin forest, well away from such sections as might be often visited by man, and all seen were in giant trees, well above the range of such guns as used by the native Indians. I was told by the proprietor of the finca, that when they cut the road through the forest, the Quetzal was abundant but very soon retired to the forest, well away from travel. At Nebaj this species was quite common in some of the forest near the town, though I did not see it. Several were killed and offered to me by the Indians, who claimed to have killed them with their blow-guns, using balls of clay. I often met Indians on the trail with such weapons and the long, green plumes of the trogon wound around their hats." (Anthony, MS.)

(290) **Trogon mexicanus** Swainson

Trogon mexicanus Swainson, Philos. Mag., (N.S.) I, 1827, p. 440 (Temiscaltepec, Mexico); Salvin and Godman, 'Biol. Cent. Amer.,' II, 1896, p. 488 (Santa Cruz mts., San Geronimo, Chuacus, Volcan de Fuego, Santa Maria, San Martin, Cuipaché); Dearborn, 1907, p. 87 (Tecpam).

Trogonurus mexicanus, Ridgway, *loc. cit.*, p. 765.

Chanquejelve, 1 ♂; San Mateo, 1 ♂, 1 ♀; Tecpam, 1 ♀; Momostenango, 3 ♂, 1 ♀; Quetzaltenango, 1 ♂; La Montañita, 1 ♂ imm., 2 ♀.

Range.—Endemic in the Subtropical and Temperate Zones: Mexico and Guatemala.

This is the common trogon of the high mountains of western Guatemala, with a marked preference for the oak and cypress belt.

"This species has a call-note so closely resembling that of the local Pygmy Owl, *Glaucidium ridgwayi*, that it is out of the question to be at all certain which bird is the author. Even the Indians confess their inability to distinguish any difference. Perhaps the call can best be said to resemble the yelping of a young puppy." (Anthony, MS.)

(291) **Trogon elegans elegans** Gould

Trogon elegans GOULD, P. Z. S., 1834, p. 26 (Guatemala or Mexico); DEARBORN, 1907, p. 88 (El Rancho).

Trogon elegans elegans, GRISCOM, Proc. N. E. Zoöl. Club, XII, 1930, p. 3 (crit.; range of the races, etc.).

Trogonurus elegans, RIDGWAY, *loc. cit.*, p. 773.

Progreso, 1 ♂ ad., 1 ♂ imm.

RANGE.—Arid Tropical Zone: known only from the Rio Motagua Valley, Guatemala; the race *australis*, Honduras to northwestern Costa Rica.

Trogon elegans was described from "Guatemala" by Gould in 1834, and was practically a lost species for forty years. In 1869 when Gould rewrote his account of this species in his second edition of his 'Monograph of the Trogonidæ,' only one specimen from Honduras was in England. The species was subsequently found in Salvador, Nicaragua and northwestern Costa Rica. Accordingly Salvin and Godman in the 'Biologia' (1896) doubted its occurrence in Guatemala. It was rediscovered by Dearborn, who was apparently unaware of having done so. Anthony obtained two specimens at Progreso, so the species is apparently restricted to a very small area in the arid upper end of the Rio Motagua Valley.

It is largely a matter of opinion whether *elegans* and *ambiguus* are regarded as conspecific or not (cf. Griscom, *loc. cit.*).

(292) **Trogon collaris puella** Gould

Trogon puella GOULD, P. Z. S., 1845, p. 18 (Escuintla, Guatemala); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1896, p. 492 (Pié de la Cuesta, Santa Maria, Retalhuleu, Toliman, Medio Monte, Alotenango, Dueñas, Volcan de Fuego, Chiriquyu near Coban, Yaxcamnal, Choctum, Teleman); DEARBORN, 1907, p. 88 (Patulul).

Trogonurus puella, RIDGWAY, *loc. cit.*, p. 775.

Finca Sepacuite, 1 ♂, 1 ♀; Finca La Primavera, 1 ♂; Secanquim, 1 ♀; Finca Concepcion, 1 ♀; San Lucas, 1 ♀; Chimoxan, 1 ♂.

RANGE.—Subtropical Zone: Ecuador to southern Mexico; the race, Mexico to western Panama.

A trogon with a very restricted altitudinal range. It is commonest in the lower levels only of the Subtropical Zone, but ranges into the Tropical Zone in northern Central America, wherever rain forest is continuous. It is lacking in the true cloud-forest of the upper half of the Subtropical Zone, and occurs at this altitude only when this forest has been destroyed.

[*Trogon aurantiiventris* Gould

Trogon aurantiiventris Gould, P.Z.S., 1856, p. 107 (near David, Veragua (=Chiriqui), W. Panama); Salvin, Ibis, 1866, p. 194 (Choctum, Vera Paz, Guatemala).

Field experience with both *puella* and *aurantiiventris* convinces me that they are two distinct species, in spite of the slight color difference that separates them. It has yet to be proved, however, that *aurantiiventris* ranges north of northwestern Costa Rica. The old record of Salvin was ignored by him in later years, as he treated *aurantiiventris* as a color phase of *puella* in the 'Biologia.' Every one knows how highly fugacious the red in trogons is. A poorly cleaned skin of *puella* or one exposed to light could easily fade to approximate the color of *aurantiiventris*, when freshly killed.]

(293) **Trogon melanocephalus melanocephalus** Gould

Trogon melanocephalus Gould, 'Mon. Trogonidæ,' 1st Ed., 1838, Pl. xii (Tamaulipas, Mexico); Salvin and Godman, 'Biol. Cent. Amer.,' II, 1896, p. 499 (Choctum); Lantz, 1899, p. 220 (Santo Tomas); Dearborn, 1907, p. 88 (Los Amates, Gualan).

Trogon melanocephalus melanocephalus, Ridgway, *loc. cit.*, p. 756.

Puebla, 1 ♂.

Range.—Tropical Zone: eastern Mexico to northwest Costa Rica, absent from heavy rain-forest, and common in Central America only in the gallery forest of the Arid Tropical Fauna.

Large series from western Nicaragua in the American Museum show that the race *illætabilis* Bangs must be restricted to Costa Rica.

It is surprising that this trogon has never been found on the Pacific coast of Guatemala.

(294) **Trogon violaceus braccatus** (Cabanis and Heine)

Aganus braccatus Cabanis and Heine, 'Mus. Hein.,' IV, 1863, p. 184, (Mexico).

Trogon caligatus, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1896, p. 500 (Choctum, Yaxcamnal, Chisec, Teleman, Dueñas, Volcan de Fuego, Alotenango, Retalhuleu, Toliman); Dearborn, 1907, p. 88 (Gualan, Mazatenango, Patulul); Lantz, 1899, p. 220 (Naranjo).

Chrysotrogon caligatus, Ridgway, *loc. cit.*, p. 786.

Secanquim, 2 ♂; Finca Sepur, 1 ♂; San Lucas, 1 ♂; Finca Carolina, 1 ♂, 1 ♀; Hacienda California, 1 ♂, 1 ♀; Finca El Cipres, 2 ♂, 1 ♀; Finca Chamá, 1 ♂.

Range.—Humid Tropical Zone: southern Mexico to west Ecuador and Guiana; the race, Mexico and northern Central America.

The commonest and most generally distributed trogon in the tropical lowland forests of Guatemala, ranging as high as 4500 feet.

(295) **Trogon massena massena** Gould

Trogon massena Gould, 'Mon. Trogonidæ, 1st Ed., 1838, Pl. xvi (Guatemala); Salvin and Godman, 'Biol. Cent. Amer.,' II, 1896, p. 503 (Chisec, Choctum, Raxché, Teleman); Dearborn, 1907, p. 88 (Los Amates).

Curucujus massena, Ridgway, *loc. cit.*, p. 744.

Range.—Humid Tropical Zone: southern Mexico to Panama; a local race in northern Colombia.

Common, according to Salvin, in the heavy rain-forest of Vera Paz.

Order COCCYZES

Family **Cuculidæ**. Cuckoos, Anis

(296) **Coccyzus americanus americanus** (Linnæus)

Cuculus americanus Linnæus, 'Syst. Nat.,' 1758, p. 111 (South Carolina).

Coccyzus americanus, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1896, p. 525 (Coban, Dueñas).

Coccyzus americanus americanus, Ridgway, 'Birds N. and Mid. Amer.,' pt. 7, 1916, p. 12.

Finca Cipres, 1 ♂ (Sept. 5, 1925); Progreso, 1 ♂ (Sept. 26, 1924).

Range.—Eastern North America, wintering in South America; on migration only in Central America.

(297) **Coccyzus erythropthalmus** (Wilson)

Cuculus erythrophthalmus Wilson, 'Amer. Orn.,' IV, 1811, p. 16 (Pennsylvania).

Coccyzus erythrophthalmus, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1896, p. 527 (Dueñas); Ridgway, *loc. cit.*, p. 38.

Finca Cipres, 1 ♀ (Sept. 4, 1925).

Range.—Eastern North America, wintering in South America; a transient only in Central America.

(298) **Coccyzus minor** subspecies

Hacienda California, 1 ♀ (wing 129.5).

Range.—The species, coasts and islands of West Indies, Central America, and northern South America; numerous critical subspecies.

The Mangrove Cuckoo is unrecorded from Guatemala, but its occurrence on the Pacific slope might well have been expected, seeing that a large, pale subspecies (*palloris* Ridgway) ranges very locally from northwestern Costa Rica to Tepic. The single specimen before me, however, can by no possible stretch of the imagination be referred to

palloris on any other than purely geographic grounds. It is a small, dark, richly colored extreme of the Caribbean coast form, currently referred to typical *minor*, and should a series prove uniform, it would be separable from *minor* on characters diametrically opposite to those of *palloris*. While the Pacific slope of Central America on the whole is dry, this specimen comes from a local area in Guatemala, which has a very hot and humid climate. It is interesting to see so plastic a species apparently reflecting local conditions.

(299) **Piaya cayana thermophila** Sclater

Piaya thermophila Sclater, P. Z. S., 1859, p. 368 (Jalapa, Vera Cruz).

Piaya cayana, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1896, p. 528 (Peten, Coban, Yzabal, Chisec, Cahabon, San Geronimo, Dueñas, Retalhuleu).

Piaya cayana mehleri, Dearborn, 1907, p. 87 (Los Amates, Gualan, Patulul, San José, Lake Amatitlan).

Piaya cayana thermophila, Ridgway, *loc. cit.*, p. 47.

Finca Sepacuite, 1 ♂; Finca La Primavera, 2 ♂; Finca Sepur, 1 ♀; Finca Chamá, 1 ♀; Progreso, 1 ♂; San Felipe, Retalhuleu, 1 ♂; Pantaleon, Escuintla, 5 ♀; Finca La Carolina, 1 ♂, 1 ♀, 1?; Finca El Cipres, 7 ♂, 3 ♀; Hacienda California, 4 ♂, 3 ♀.

Range.—Chiefly Tropical Zone: Paraguay to Mexico; the race, Mexico to eastern Panama.

Almost ubiquitous in the tropical lowlands of Central America.

The large series from the entire Pacific slope shows conclusively that the recently described *stirtoni* Dickey and Van Rossem from Salvador does not range into Guatemala.

(300) **Geococcyx velox** (A. Wagner)

Cuculus velox A. Wagner, Munch. Gelehrte Anzeig., III, 1836, p. 96.

Geococcyx affinis, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1896, p. 537 (Vera Paz, hills above Quiché, Rio Chixoy, Dueñas, San Geronimo, Toliman); Dearborn, 1907, p. 87 (El Rancho, Lake Atitlan); Lantz, 1899, p. 220 (Amatitlan); Ridgway, *loc. cit.*, p. 80.

Sacapulas, 1 ♂, 2 ♀; San Lucas, 2 ♂, 2 ♀, 1(?); Chichicastenango, 1 ♀; Chanquejelve, 1 ♀; Nebaj, 1 ♂; La Perla, 1 ♂; Tecpam, 1 ♂, 1 ♀; Palin, Amatitlan, 1 ♂; San Antonio, 2 ♀; Antigua, 1 ♀; Panajachel, 6 ♂, 5 ♀; Finca La Primavera, 1 ♂, 2 ♀; Progreso, 7 ♂, 6 ♀.

Range.—Upper levels of Tropical Zone and Subtropical Zone in arid regions, western Mexico to northern Nicaragua; reappearing at sea-level, outer third of Yucatan Peninsula.

Abundant throughout the more arid and open country of the interior of Guatemala.

(301) **Morococcyx erythropygus erythropygus** (Lesson)

Coccyzus erythropyga Lesson, Rev. Zool., 1842, p. 210 ("San Carlos, Central America").

Morococcyx erythropygus part, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1896, p. 539 (Pacific slope, Volcan de Fuego); Ridgway, *loc. cit.*, p. 71.

Hacienda California, 1 ♀; Ocos, 1 ♂.

Range.—Arid Tropical Zone: Sinaloa to northwestern Costa Rica; the race, Oaxaca to Costa Rica.

This interesting little cuckoo is a monotypic genus endemic in the Arid Tropical Fauna of Mexico and Central America. In the breeding season its presence is indicated by the curious song which sounds like a weak policeman's rattle. Otherwise it is easily overlooked, as it lives in dense cactus thickets and is shy and secretive.

(302) **Morococcyx erythropygus macrourus** Griscom

Morococcyx erythropygus macrourus Griscom, Amer. Mus. Novit., No. 414, 1930, p. 2 (Progreso, Guatemala).

Morococcyx erythropygus part, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1896, p. 538 (Laguna, valley of the Rio Motagua); Dearborn, 1907, p. 87 (Gualan).

Progreso, 1 ♂, 1 ♀.

Range.—Localized in the arid interior valleys of Guatemala.

(303) **Tapera nævia excellens** (Sclater)

Diplopterus excellens Sclater, P. Z. S., 1857, p. 229 (s. Mexico).

Diplopterus nævius, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1896, p. 540 (Retalhuleu, Dueñas, Savana Grande).

Tapera nævius, Dearborn, 1907, p. 87 (Gualan).

Tapera nævia excellens, Ridgway, *loc. cit.*, p. 67.

Range.—Tropical Zone: Paraguay to southern Mexico; the race, western Ecuador northward.

A ground cuckoo found in scrubby woods, never in heavy rain-forest. It is a very uncommon bird in Central America, north of Costa Rica.

(304) **Dromococcyx phasianellus** (Spix)

Macropus phasianellus Spix, 'Aves Bras.,' I, 1824, p. 53 (Rio Tocantins, Amazon Valley).

Dromococcyx phasianellus, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1896, p. 542 (Coban, Cahabon, Choctum, Mirandilla); Ridgway, *loc. cit.*, p. 87.

Range.—Tropical Zone: Brazil to southern Mexico.

One of the rarest of those Central American birds which are widely distributed in the Tropical Zone.

(305) **Crotophaga sulcirostris sulcirostris** Swainson

Crotophaga sulcirostris SWAINSON, Philos. Mag., (N.S.) I, 1827, p. 440 (Mexico); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1896, p. 545 (general, Dueñas); DEARBORN, 1907, p. 86 (abundant in the low country and up to 4000 feet; Gualan, El Rancho, Lake Amatitlan, Patulul); LANTZ, 1899, p. 220 (Naranjo); RIDGWAY, *loc. cit.*, p. 94.

Chanquejelve, 1 ♂, 4 ♀; Progreso, 2 ♂, 1 ♀; San Lucas, 1 ♂, 1 ♀; Barrillos, 2 ♂, 2 ♀; Puebla, 1 ♂, 1 ♀; Hacienda California, 1 ♂, 1 ♀; Finca La Primavera, 1 ♂, 1 ♀; La Carolina, 1 ♀; San Antonio, 1 ♂; Antigua, 1 ♀; Finca El Soche, 1 ♂, 1 ♀; Secanquim, 3 ♂; Finca El Cipres, 3 ♂, 3 ♀; Finca Sepacuite, 3 ♂, 4 ♀; Sacapulas, 1 ♂, 1 ♀; Finca Concepcion, 2 ♀.

RANGE.—Tropical Zone: Lower California and Texas to coast of Peru and Guiana; a race in Lower California.

ORDER SCANSORES

FAMILY **RAMPHASTIDÆ.** TOUCANS

(306) **Ramphastos sulphuratus brevicarinatus** Gould

Ramphastos brevicarinatus GOULD, 'Mon. Ramphastidæ,' 2d Ed., 1854, Pl. III (Panama).

Ramphastos carinatus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1896, p. 552 (Choctum, sources of Rio de la Pasion, Lanquin, Yzabal, Rio Dulce); DEARBORN, 1907, p. 90 (Los Amates).

Ramphastos piscivorus brevicarinatus, RIDGWAY, 'Birds, N. and Mid. Amer.,' pt. 6, 1914, p. 334.

Secanquim, 1 ♂; Puebla, 2 ♂.

RANGE.—Humid Tropical Zone: southern Mexico to Colombia; the typical form here restricted to Mexico.

In the red border to the yellow breast, all Guatemalan specimens, even from Alta Vera Paz, are definitely the southern race. In size of the bill, variation is enormous in this family, and none of the Guatemala specimens attains even the maximum size recorded for examples from much farther south. I see no point, therefore, in including Guatemala in the range of *sulphuratus*.

Abundant in the lowland rain-forest throughout its range.

(307) **Pteroglossus torquatus torquatus** (Gmelin)

Rhamphastos torquatus GMELIN, 'Syst. Nat.,' I, 1788, p. 354.

Pteroglossus torquatus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1896, p. 556 (Savana Grande, Retalhuleu, Patio Bolas, Choctum, Rio Dulce); DEARBORN, 1907, p. 90 (Los Amates, Mazatenango, San José); LANTZ, 1899, p. 220 (Naranjo).

Pteroglossus torquatus torquatus, RIDGWAY, *loc. cit.*, p. 342.

Secanquim, 3 ♂, 4 ♀; Finca Chamá, 2 ♂, 3 ♀; Pantaleon, Escuintla, 1 ♀; Finca Salache, 1 ♂; Hacienda California, 1 ♂, 1 ♀; Finca El Cipres, 3 ♂, 6 ♀, 1 yg.; Finca Carolina 2 ♀, 1 yg.

RANGE.—Tropical Zone: southern Mexico to Panama; a local race in Yucatan.

The Pacific coast specimens have a distinct tendency to the development of more red on the underparts, but individual variation is great, and the difference is too minute and inconstant for formal characterization.

The Aracari is far more widely distributed in Guatemala than the big Toucan, as it occurs in gallery forest as well as rain forest and ranges to a higher altitude.

(308) **Aulacorhynchus prasinus stenorhabdus** Dickey and Van Rossem

Aulacorhynchus prasinus stenorhabdus, DICKEY AND VAN ROSSEM, Ibis, 1929, p. 52 (Cerro Los Naranjos, Volcan Santa Ana, Sonsonate, Salvador).

Aulacorhamphus prasinus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1896, p. 560 (Coban, Chilasco, Raxché, Cerro Zunil, Las Nubes, Totonicapam, Volcan de Fuego, Calderas); DEARBORN, 1907, p. 90 (Tecpam).

Aulacorhynchus prasinus prasinus RIDGWAY, *loc. cit.*, p. 355.

Finca Sepacuite, 2 ♂, 4 ♀; Finca La Primavera, 5 ♂, 2 ♀; Barrillos, 1 ♂, 2 ♀; La Perla, 1 ♂, 1 ♀; Tecpam, 1 ♂; Antigua, 1 ♀.

RANGE.—Subtropical Zone: Vera Cruz to northern Nicaragua; the race, Guatemala and Salvador.

Not having seen Salvador material, I accept Messrs. Dickey and Van Rossem's conclusions, but certainly agree that birds from Vera Paz are very near *prasinus*.

ORDER PICIFORMES

FAMILY **GALBULIDÆ.** JACAMARS

(309) **Galbula melanogenia** Sclater

Galbula melanogenia SCLATER, Jardine's 'Contrib. Orn.,' 1852, p. 61 (no locality); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1896, p. 506 (Coban, Chisec, Choctum, Teleman, Yzabal); DEARBORN, 1907, p. 91 (Los Amates); RIDGWAY, 'Birds N. and Mid. America,' pt. 6, 1914, p. 366.

Secanquim, 1 ♂, 1 ♀; Chimoxan, 1 ♂; Finca Chamá, 1 ♂.

RANGE.—Humid Tropical Zone: southern Mexico to west Ecuador.

This jacamar is the only representative of a widely distributed Amazonian genus in Central America.

"Not rare at Secanquim, where it was found along the edges of the forest, in the higher underbrush. At times flocks of six or eight were seen, and it would seem that the bird was somewhat gregarious, though often seen, alone or in pairs. At one time, hearing the thin, high-pitched call of this bird, from the forest below, I repeated the note, to the best of my ability, and before I could call the second time the bird appeared, and only avoided flying into my face by a quick turn and lit within ten feet of me." (Anthony, MS.)

FAMILY **BUCCONIDÆ.** PUFFBIRDS

(310) **Notharcus hyperrhynchus dysoni** Sclater

Bucco dysoni SCLATER, P. Z. S., 1855, p. 193 (Honduras); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1896, p. 511 (forests of northern Vera Paz; Escuintla); LANTZ, 1899, p. 220 (Naranjo, Chocan River).

Notharchus hyperrhynchus dysoni, RIDGWAY, 'Birds N. and Mid. Amer.,' pt. 6, 1914, p. 376.

San Felipe, Retalhuleu, 1 ♂.

RANGE.—Tropical Zone: Amazonia to southern Mexico; the race, Canal Zone to Mexico.

This widely distributed Puffbird occurs on both coasts of Central America, but is an uncommon to rare bird north of Costa Rica. It is the most northern representative of a group which is unquestionably South American. Crosby and I found two sitting motionless on top of tall dead trees in river-jungle, near Puerto Barrios.

(311) **Malacoptila panamensis inornata** (Du Bus)

Monasa inornata DUBUS, Bull. Acad. Roy. Belg., XIV, 1847, p. 107 (Guatemala).

Malacoptila inornata, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1896, p. 517 (Coban, Choctum, Chisec); DEARBORN, 1907, p. 91 (Los Amates).

Malacoptila panamensis inornata, RIDGWAY, *loc. cit.*, p. 388.

Secanquim, 1 ♀.

RANGE.—Tropical Zone: west Ecuador to Tabasco; the race, Mexico to Caribbean slope of Costa Rica.

The species *panamensis* is very closely related to *mystacalis* of Venezuela. Color differences in the sexes, dichromatism and melanism account for the several species which have been proposed in times past. Like many other tropical rain-forest birds in Central America, it decreases rapidly northward, and is not really common anywhere north of Costa Rica.

Family **Picidæ**. Woodpeckers, Piculets

(312) **Colaptes mexicanoides mexicanoides** Lafresnaye

Colaptes mexicanoides Lafresnaye, Rev. Zool., 1844, p. 42 (Mexico); Salvin and Godman, 'Biol. Cent. Amer.,' II, 1895, p. 404 (Coban, Tactic, El Rincon, Cuipaché, San Martin, Plain of Quetzaltenango, ridges above Totonicapam, Barranco de los Chocoyos, Calderas and Pajal Grande on Volcan de Fuego); Dearborn, 1907, p. 94 (Lake Atitlan, Tecpam); Ridgway, 'Birds N. and Mid. Amer.,' pt. 6, 1914, p. 37.

Villa Nueva, 1 ♀; Zanjon, 1 ♂, 1 ♀; Momostenango, 4 ♂, 6 ♀; Chichicastenango, 2 ♂, 1 ♀; San Antonio, 1 ♀; Chanquejelve, 1 ♀; San Mateo, 2 ♂, 2 ♀; Tecpam, 2 ♂, 1 ♀; Nebaj, 1 ♂, 4 ♀; Panajachel, 2 ♂, 2 ♀; Antigua, 3 imm.; Uspantan, 1 ♂, 1 ♀; La Montañita, 1 ♀; Quetzaltenango, 1 ♀; Finca La Primavera, 1 ♂, 1 ♀.

Range.—Highlands of Chiapas to northern Nicaragua, chiefly in pine and oak forests; a race in Salvador.

A generally abundant flicker in the highlands of Guatemala from 5000 feet to timber-line. It is of undoubted boreal origin.

(313) **Piculus rubiginosus yucatanensis** (Cabot)

Picus yucatanensis Cabot, Proc. Bost. Soc. N. H., I, 1844, p. 164 (Yucatan).

Chloronerpes yucatanensis, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1895, p. 407 (Chisec, Coban, Tactic, San Geronimo, Dueñas, Barranco Hondo, Savana Grande, Volcan de Agua, Toliman, Retalhuleu).

Chloronerpes rubiginosus yucatanensis, Ridgway, *loc. cit.*, p. 131.

Piculus rubiginosus yucatanensis, Griscom, Amer., Mus. Novit., No. 379, 1929, p. 12 (crit; range in Guatemala).

Alta Vera Paz.; Secanquim, 3 ♀; Chimoxan, 2 ♂, 2 ♀; Finca Sepacuite, 3 ♂, 1 ♀; Finca Concepcion, 2 ♂, 1 ♀; Finca Chamá, 1 ♂, 2 ♀; also 4 (Coban?) trade-skins.

Intermediates approaching *maximus*.—Finca La Primavera, 5 ♂, 5 ♀; Finca El Soche, 1 ♂; also 1 trade-skin.

Range.—Tropical and lower levels of Subtropical Zone: northern Argentina to Mexico; the race, Yucatan and Vera Cruz south along Caribbean slope to Nicaragua, almost wholly in the Tropical Zone.

One of the most variable and plastic of Neotropical birds, divided into innumerable races. Represented by *auricularis* Salvin and Godman in southwestern Mexico and *aeruginosus* Malherbe in eastern Mexico, two forms which are scarcely specifically distinct.

All older Guatemala localities for the species are given above, no attempt being made to assign them to the three races recognized here.

(314) **Piculus rubiginosus maximus** Griscom

Piculus rubiginosus maximus Griscom, Amer. Mus. Novit., No. 379, 1929, p. 11 (Chanquejelve, Huehuetenango, Guatemala).

Chanquejelve, 1 ♂, 1 ♀; Chichicastenango, 2 ♂; Panajachel, 1 ♂, 1 ♀; San Lucas, 3 ♂, 1 ♀.

Range.—Eastern and central portions of the Pacific highlands of Guatemala from 5000 to 6000 feet. Perhaps also in adjacent portions of Chiapas and Salvador.

The large size and green underparts of this race render it very distinct.

(315) **Piculus rubiginosus differens** Griscom

Piculus rubiginosus differens Griscom, Amer. Mus. Novit., No. 379, 1929, p. 11 (Finca Carolina, 10 miles south of Tumbador, District of San Marcos, Pacific slope of Guatemala).

Finca El Cipres, 3 ♂, 2 ♀; Finca Carolina, 2 ♂, 4 ♀; Pantaleon, Escuintla, 1 ♂; San Felipe, 2 ♂.

Range.—Pacific slope of Guatemala below 3500 feet. Perhaps also in adjacent portions of Chiapas and Salvador.

(316) **Balanosphyra formicivora lineata** Dickey and Van Rossem

Balanosphyra formicivora lineata Dickey and Van Rossem, Proc. Biol. Soc. Wash., XL, 1927, p. 1 (Mt. Cacaguatique, Dept. San Miguel, El Salvador).

Melanerpes formicivorus, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1895, p. 413 (Chilasco, Rabinal, above Totonicapam, Calderas, Volcan de Fuego and Agua, Alotepeque, Toliman); Dearborn, 1907, p. 92 (between Lake Atitlan and Tecpam).

Balanosphyra formicivora formicivora, Ridgway, *loc. cit.*, p. 102.

Sacapulas, 1 ♀; La Perla, 3 ♂, 1 ♀; Chanquejelve, 7 ♂, 5 ♀; Tecpam, 4 ♂, 2 ♀; Huehuetenango, 3 ♂; Panajachel, 3 ♂, 1 ♀; La Montañita, 3 ♂, 6 ♀; Finca La Primavera, 3 ♂, 2 ♀; Chipoc, 1 ♀.

Range.—Western North America, south in the mountains of Central America to western Panama; the race, Guatemala, Salvador and probably northern Nicaragua.

The forty-five specimens before me, chiefly from the Pacific and central highlands of Guatemala, differ from a large series of true *formi-*

civora from Mexico in having a more or less completely streaked chest, in that one respect resembling another large series of *striatipectus*. In other words, they are intermediate between these two very distinct subspecies, combining certain of the characters of both. While I have seen no material from El Salvador, there is no doubt but that my Guatemala material agrees minutely with the very clear and critical description of *lineata*. Some of this series have also been examined by Mr. Van Rossem, as I find "*lineata*" with his initials on the back of one of the labels. This race, therefore, is easily recognizable, and has an extensive range in the pine and oak forests of the Pacific cordillera of Central America. It undoubtedly ranges into southern Chiapas, and perhaps also into Honduras, though no specimens exist. In Nicaragua the species is absent from the Pacific slope. It is rather interesting that the single specimen from Chipoc in the lowlands of Alta Vera Paz is just like more western specimens and shows no approach to either *formicivora* or *albeola* Todd of British Honduras. Birds from southeastern Honduras and eastern Nicaragua should be carefully re-determined. They pass currently as *striatipectus*, but are far more likely to be either *lineata* or *albeola*. I notice also that birds from Guatemala and southern Mexico are considerably larger than a series from Tamaulipas. Typical *formicivora* might be subdivided on size. Certainly *lineata* averages larger than *formicivora*.

Thanks to Mr. Todd of the Carnegie Museum, I have before me four out of the five specimens of his *albeola* from the coast region of British Honduras. This race proves to be a small bird with a very pale yellow throat. The character in the streaking of the underparts does not appear to hold as regards *striatipectus* and *lineata*, as *albeola* was based on very worn material. The Salvador race *lineata* is, therefore, much closer to *albeola* than Dickey and Van Rossem were led to believe from the original description. Five specimens from the Cayo District of British Honduras recorded by Austin as *albeola* prove to be *lineata*, though approaching *albeola* in size.

The Ant-eating Woodpecker occurs chiefly in the pine and oak forests of the mountains. Where pines reach sea-level, as in British Honduras and northeastern Nicaragua, the woodpecker occurs too.

The whole group of *Melanerpes*-like woodpeckers is probably a very ancient one, as it has representatives almost throughout the New World, some of them appearing in the West Indies. Many of these have evolved into genera or subgenera. Such a group is *Balanosphyra*, which probably originated in the Sonoran Subregion and has spread southward in relatively recent geologic time, with an isolated representative, *flavigula*, in Colombia.

(317) **Centurus pucherani perileucus** (Todd)

Melanerpes pucherani perileucus TODD, Proc. Biol. Soc. Wash., XXIII, 1910, p. 153 (near Manatee, British Honduras).

Melanerpes pucherani, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1895, p. 415 (Coban, Choctum, Chisec, Yzabal).

Tripsurus pucherani perileucus, RIDGWAY, *loc. cit.*, p. 122.

Chimoxan, 1 ♂; Finca Chamá, 2 ♂, 2 ♀.

RANGE.—Tropical Zone: western Ecuador to southern Mexico; the race, Mexico to northern Honduras.

The subgenus *Tripsurus* is a group of *Melanerpes*-like woodpeckers, which are primarily tropical-rain forest species, with their headquarters in South America. The present species is the northernmost, and in Central America is confined to the rain forests of the Caribbean slope. A local area of heavy forest on the Pacific slope from southwest Costa Rica to Veraguas is occupied by the closely allied *C. chrysauchen* (Salvin).

[*Centurus aurifrons dubius* Cabot

The occurrence of this form in Guatemala appears to be based solely on Ridgway's 'Birds of North and Middle America,' pt. 6, 1914, p. 67, where "adjacent lowlands of Guatemala" is added to the definite range. In the synonymy the only Guatemalan reference is Salvin's *Centurus albifrons* in his 'Catalogue of the Strickland Collection,' in 1882. At this time the identity of Swainson's *Picus albifrons* was not settled, and this reference was transferred by Salvin himself to *Centurus santacruzi* in 1895 in the 'Biologia Centrali Americana.' It is more than likely, however, that this form might occur in the lowlands of Peten, adjacent to Campeche or Yucatan.]

(318) **Centurus aurifrons grateloupensis** (Lesson)

Picus grateloupensis LESSON, Rev. Zool., 1839, p. 41 (Mexico).

Centurus dubius veraecrucis NELSON, Auk, 1900, p. 259 (Coatzocoalcos, Vera Cruz); RIDGWAY, *loc. cit.*, p. 69 ("adjacent parts of Guatemala" in range; measurements of three males from "Guatemala" given in footnote).

RANGE.—Tropical Zone: Vera Cruz to northern Guatemala.

Our knowledge of this form in Guatemala is based solely on the reference cited above.

(319) **Centurus aurifrons santacruzi** Bonaparte

Centurus santacruzi BONAPARTE, P. Z. S., 1837, p. 116 (Guatemala; I designate Santa Cruz de Quiché as a more exact locality); DEARBORN, 1907, p. 93 (El Rancho, Lake Atitlan, Lake Amatitlan, Patulul); RIDGWAY, *loc. cit.*, p. 84.

Centurus santa-cruzi fumosus DEARBORN, 1907, p. 94 (San José).

Melanerpes santacruzi, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1895, p. 420 (Santa Maria de Quetzaltenango, Salamá, San Geronimo, Retalhuleu, Escuintla, El Baoul, Dueñas, Toliman, Panajachel).

Sacapulas, 3♂, 9♀; San Lucas, 9♂, 5♀; Panajachel, 3♂, 5♀; Antigua, 4♂, 7♀; Progreso, 5♀; Gualan, 1♂, 1♀; Puebla, 1♂, 1♀. Pacific slope: Finca El Cipres, 13♂, 6♀; Finca Carolina, 4♂, 7♀; Hacienda California, 4♀; Pantaleon, 2♂, 4♀; San Felipe, 1♀; San José, 3♂.

RANGE.—Chiefly arid Tropical Zone: Texas to northern Nicaragua; numerous local races, the present one, Guatemala to northern Nicaragua.

With over one hundred specimens from Guatemala alone before me, it is obvious that there is marked geographic variation in this country, as well as in adjacent parts of Mexico and Central America. The first step is to determine just what typical *santacruzi* is. This is impossible from Bonaparte's description, but the name can be restricted to the highland form, which ranges south to the highlands of northern Nicaragua, thus causing the least disturbance in nomenclature.

The series listed above is of great interest in the amount of individual variation shown. One or two specimens are narrowly barred on the back, suggesting *pauper*. Many are orange, rather than yellow on the abdomen, while several are distinctly orange-red. The upper tail-coverts often have black shaft-streaks. Nearly one-third of the series have some white on the inner webs of the central rectrices, but in no case does it reach the shaft. One specimen from San Lucas (No. 62853, Dwight Collection) and several from the Pacific slope, in addition to having a maximum amount of white in the tail, have a distinct and continuous occipital band of gray separating the red crown-patch from the nuchal area. If these specimens were without locality labels, they might just as reasonably be determined *polygrammus* as *santacruzi*. Finally the nuchal area varies from red with a minute orange border to orange throughout.

This detail is given, as I wish to emphasize the point that the INDIVIDUAL variations in this series show, at least incipiently, every one of the characters which are regarded as diagnostic of the species *dubius* and *polygrammus* and their races. It will follow that all of these latter birds are races of *santacruzi*.

The chief stumbling block in our understanding of *santacruzi* and *dubius* has been the anomalous situation in parts of southeastern Mexico, where *santacruzi grateloupensis* and *dubius verærucis* (Nelson) occur together. As a matter of fact, the only difference between these birds is that the former has the colored parts more orange and the latter has them red. Intermediates have, however, been on record for decades, and three are before me as I write. How is this evidence to be interpreted? Either we are dealing with two species occupying the same area,

which hybridize, or we are dealing with intergrading mutants. In default of experimental evidence we can only infer, but there are two facts which strongly incline me to the latter interpretation. In the first place red is a highly mutational character in woodpeckers throughout the world. It may be present or absent, or greatly restricted or replaced by orange. Wherever one of these tendencies has become fixed over a definite geographic area, it is used as a racial or specific character, and quite properly so. But a large series of almost any woodpecker will show occasional mutants, where the red is orange, or where either sex has more than the normal amount of red for the species. Returning to the case before us, we note in addition that while *dubius* in Yucatan is apparently constantly red, *santacruzi* is not constant. It may be orange or yellow on the abdomen, occasionally orange-red. The nuchal patch may be red with a little orange or wholly orange. It is not surprising, therefore, in this type of variation, to find an intermediate area, where birds variously red, orange, or orange-red occur together, and we shall probably look in vain, for an intermediate area, where all the individuals would be orange-red. I have no hesitation therefore in stating that *santacruzi grateloupensis* and *dubius veræcrucis* are one and the same thing, and it is a moot point whether this type of inconstant intermediate should be recognized in nomenclature at all. The name *grateloupensis* is far the older.

Proceeding northward the red element gradually fades out, and at Tampico intermediates between *aurifrons* and *santacruzi* are recorded by Salvin, which have orange-yellow napes, broader white bars on the back and a great reduction in the amount of white in the central rectrices. We thus see that the best way to treat the facts outlined above is to regard *Centurus aurifrons* as a polymorphic species with at least six types of variation. Wherever one or more of these combinations occurs fairly constantly over a definite range, we have a well-marked form or subspecies, but we need not be surprised that intermediate areas produce individuals showing several types of variation. This is exactly the classification advocated by Ridgway in 1881 (Proc. U. S. Nat. Mus., 1881, pp. 98–116). Large modern series merely confirm his original findings, based on a mere handful of specimens.

Returning now to our Guatemala material, large series from the Pacific slope indorse Ridgway's conclusion that *fumosus* Nelson is inseparable, the characters upon which it was based proving to be individual and by no means confined to adjacent areas. If anything, however, Pacific lowland birds tend to have more white in the tail, and

more specimens have a constriction between the red of the occiput and nuchal region. Intergradation is here clearly shown with *polygrammus*, through *frontalis* Nelson. There is a slight average difference in size between Pacific and highland specimens, as the following table, based on males only, will show:

	WING	TAIL
Central Highlands	126–142(131)	65–83(73.3)
Pacific Slope	121–131(127)	64–71(67.9)

This difference is so slight, and the amount of overlapping is so great, that it should not be formally recognized. All it amounts to is that thirty per cent of the highland birds are larger than any lowland birds, and the great majority of individuals of both races have the same size limits within a narrow range of 5 mm. in the wing. As Dr. Friedmann points out to me, either the tendency of the environment selects smaller birds in the highlands and larger birds in the lowlands, in which case in time the two incipient forms would tend to become identical, or we have a larger highland form in the making, which has not developed to the same degree as the highland *Chloronerpes*. The lowland birds show a distinct approach in proportions to *Centurus hoffmani* of Nicaragua and Costa Rica. I have seen no specimens from the lowlands of Salvador or western Honduras. It remains to be determined whether intergrades will turn up in some part of this area, or whether *hoffmanni* is isolated from its close relatives. Salvin, however, claims that Salvador specimens "diverge" towards *hoffmanni*.

Proceeding eastward from the highlands of Guatemala, I note that five females from Progreso are distinctly paler yellow than any others. A pale race in this arid district is entirely possible, but my specimens are worn, and may have faded. Two skins from Gualan are intermediate, and near Quiriguá, the western limit of the rain forest, we find a smaller bird with a narrowly barred back, which is obviously nearer *pauper* Ridgway.

(320) **Centurus aurifrons pauper** Ridgway

Centurus santacruzi pauper RIDGWAY, Proc. U. S. Nat. Mus., X, 1888, p. 582 (Truxillo, Honduras); DEARBORN, 1907, p. 93 (Los Amates).

Near Quiriguá, 1 ♀; Virginia Plantation near Puerto Barrios, 2 ♂. (All in M. C. Z.)

RANGE.—Tropical Zone: eastern Guatemala to Honduras.

These three specimens in the M. C. Z. collection closely resemble in color a large series of *pauper* from Honduras. Size difference does not

amount to much in this race, being of the same kind as the Pacific lowland series of *santacruzi* discussed above. In the narrow white bars on the back this form is more nearly related to *dubius*, just to the north.

(321) **Sphyrapicus varius varius** (Linnæus)

Picus varius Linnæus, 'Syst. Nat.,' I, 1766, p. 176 (Carolina).

Sphyrapicus varius, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1895, p. 428 (Coban, San Geronimo, Dueñas, Volcan de Agua, upper pine region of Volcan de Fuego, 10,000–11,000 feet, Toliman); Dearborn, 1907, p. 92 (Tecpam, Lake Atitlan, Los Amates); Ridgway, 'Birds N. and Mid. America,' pt. 6, 1914, p. 274.

Zanzon, 1 ♀; Sacapulas, 1 ♂, 2 ♀ (one on March 11); Momostenango, 1 ♂, 1 ♀; Panajachel, 1 ♀; San Lucas, 2 ♀; Guatemala City, 1 ♀.

Range.—Boreal America, south in winter to western Panama.

A common winter visitant, except in tropical rain-forest.

(322) **Sphyrapicus varius nuchalis** Baird

Sphyrapicus varius nuchalis Baird, 'Reports of Explorations and Surveys for R. R. from Miss. R. to Pacific Ocean,' IX, 1858, p. 103 (Mimbres River, New Mexico).

Sphyropicus nuchalis, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1895, p. 429 (Panajachel).

Range.—Western North America, south in winter to western Guatemala.

(323) **Dryobates villosus sanctorum** Nelson

Dryobates sanctorum Nelson, Auk, 1897, p. 50 (Todos Santos, Guatemala).

Dryobates villosus sanctorum, Dearborn, 1907, p. 92 (Tecpam); Ridgway, *loc. cit.*, p. 225.

Dendrocopus jardinii, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1895, p. 433 (El Rincon, Santa Maria, Cuipaché, Toliman, Chilasco, San Geronimo, Dueñas, Volcan de Fuego).

Finca Concepcion, 1 ♀; Finca Sepacuite, 5 ♂; Finca La Primavera, 1 ♀; Tecpam, 1 ♂, 1 ♀; San Mateo, 1 ♀; Santa Ilania, 1 ♀; Uspantan, 1 ♂; Quetzaltenango, 1 ♀.

Range.—Whole of North America, south in the mountains to western Panama; numerous races, the present one Chiapas to Honduras.

While there is no doubt that *sanctorum* is an excellent race, very distinct from *jardini* (Malherbe) of southeastern Mexico, the present series does not endorse the distinctness of either *fumeus* of Nicaragua or *extimus* of Costa Rica and Panama, of both of which I have seen fair series, and personally collected. Four of my specimens have white or whitish dorsal stripes, and some of the males have far more red on the occiput and

nape than any specimen of *extimus*. Not a single one of my males reaches the MINIMUM given by Ridgway for the wing of *sanctorum*. In other words, they are exactly like *extimus* in this respect. The average color of the underparts is darker in both *extimus* and *sanctorum* than in *fumeus*, by which I mean that more individuals are dark in the first and more individuals are light in *fumeus*. The light and dark individuals of all three races are, however, indistinguishable. I suspect that when large series from Guatemala and Nicaragua are available, these various differences will prove to be matters of individual variation.

The Hairy Woodpecker is unquestionably of relatively recent boreal origin in Central America.

(324) **Veniliornis oleaginus sanguinolentus** (Sclater)

Chloronerpes sanguinolentus SCLATER, P. Z. S., 1859, p. 60 (Omoa, Honduras).

Dendrobates caboti, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1895, p. 439 (Choctum, Saonchil, Savana Grande, Retalhuleu, Pié de la Cuesta).

Veniliornis caboti, DEARBORN, 1907, p. 92 (San José, Los Amates).

Veniliornis oleaginus sanguinolentus, RIDGWAY, *loc. cit.*, p. 190.

Secanquim, 1 ♀; Ocos, 1 ♂; Hacienda California, 1 ♀; Finca Espino, 1 ♀.

RANGE.—Tropical and Subtropical Zones: Bolivia and Venezuela to Mexico; the race, Vera Cruz to Panama; lacking in the Isthmus.

This little woodpecker is primarily a species of the Subtropical Zone in South America, according to Chapman, but in the northern part of its range it occurs only in the lowlands. In Costa Rica and western Panama it occupies an intermediate area, the majority of individuals collected between 1000–3000 feet. In Mexico true *oleaginus* has, however, been taken even in the Temperate Zone. Like so many birds of South American origin, it is rare to uncommon in most of Central America.

(325) **Celeus castaneus** (Wagler)

Picus castaneus WAGLER, Isis, 1829, p. 515 (no locality).

Celeus castaneus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1895, p. 441 (Teleman, Choctum); DEARBORN, 1907, p. 91 (Los Amates); RIDGWAY, *loc. cit.*, p. 141.

Chimoxan, 2 ♀.

RANGE.—Humid Tropical Zone: southern Mexico to western Panama.

The genus *Celeus* is widely distributed in the forests of South America. The genus is represented by *loricatus* in Panama and Costa Rica, and by *castaneus* northward, which has no near allies. It is uncommon to rare throughout its range.

(326) **Phlœoceastes guatemalensis guatemalensis** (Hartlaub)

Picus guatemalensis HARTLAUB, Rev. Zool., 1844, p. 214 (Guatemala).

Campophilus guatemalensis, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1895, p. 447 (Rabinal, San Geronimo, Volcan de Fuego, Savana Grande, Medio Monte, Retalhuleu); DEARBORN, 1907, p. 91 (Los Amates, Patulul); LANTZ, 1899, p. 220 (Naranjo).

Scapaneus guatemalensis guatemalensis, RIDGWAY, *loc. cit.*, p. 174.

Finca Chamá, 1 ♀; Puebla, 1 ♀; Hacienda California, 2 ♂, 1 ♀.

RANGE.—Tropical Zone: eastern Mexico to western Panama; the race, from Guatemala southward.

A very common woodpecker throughout its range in woodland or forest.

(327) **Ceophlœus lineatus similis** (Lesson)

Picus similis LESSON, 'Compl. Œuvres Buffon,' XX, 1847, p. 204 (San Carlos, Central America).

Ceophlœus scapularis, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1895, p. 450, (Vera Paz, San Geronimo, Dueñas, Savana Grande, Retalhuleu); DEARBORN, 1907, p. 91 (Los Amates); LANTZ, 1899, p. 220 (Santo Tomas).

Ceophlœus lineatus similis, RIDGWAY, *loc. cit.*, p. 150.

Secanquim, 1 ♂, 1 ♀; Finca Sepacuite, 1 ♂; Progreso, 2 ♂, 2 ♀; Finca El Socha, 1 ♀; Hacienda California, 2 ♂, 1 ♀; Finca Carolina, 3 ♂, 1 ♀; Finca El Cipres, 3 ♂, 3 ♀; San Felipe, 1 ♂; Pantaleon, 1 ♂.

RANGE.—Tropical Zone: Paraguay to Mexico; the race, eastern Mexico to Costa Rica.

Even commoner than the Ivory-billed Woodpecker in all types of tropical woodland throughout its range.

ORDER PASSERIFORMES

FAMILY **FORMICARIIDÆ.**[1] ANT-BIRDS

(328) **Taraba major melanocrissus** (Sclater)

Thamnophilus melanocrissus SCLATER, P. Z. S., 1860, p. 252 (Orizaba, Vera Cruz, Mexico); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1892, p. 197 (Choctum, Chisec).

[1]Hellmayr's treatment followed here ('Cat. Birds Americas,' pt. 3, Field Mus. Pub., No. 223).

Taraba transandeana transandeana, RIDGWAY, 'Birds N. and Mid. Amer.,' pt. 5, 1911, p. 30 (sources of Rio de la Pasion).

Finca Chamá, 4♂, 2♀.

RANGE.—Tropical Zone: Argentina to Mexico; the race, northern Central America.

When a series from Guatemala is compared with a series from west Ecuador (type locality of *transandeana*) I fully agree with the suspicion of Hellmayr that two distinct races are involved (cf. 'Birds of the Americas,' pt. 3, p. 52, footnote *c*), and Salvin and Godman were undoubtedly correct in recognizing both races. Southern specimens are mostly broadly barred or tipped with white on the under tail-coverts. Northern birds are solid black, an occasional specimen being minutely tipped with white. From every part of the combined ranges of the two forms I have seen far more material than Ridgway, and it must be admitted that there is a large area in southern Central America occupied by birds which are not absolutely typical of either race. Specimens from the Caribbean slope of Central America from Honduras south to Almirante are nearer *melanocrissus*. Specimens nearer *transandeanus* range north on the Pacific slope to Costa Rica, the northern limit of the bird's range on that slope.

"Not uncommon at Chamá but, owing to its habits of keeping to the thickest undergrowth it was quite difficult to discover. The notes are somewhat similar to those of *Thamnophilus doliatus*, but quite distinctive, once identified, somewhat suggestive of those of *Chamæa*, but naturally 'heavier.' The unmistakable call of *Taraba* was noted at Chimoxan and at Rosario, a station on the railroad west of Lake Yzabal, where a male bird was seen." (Anthony, MS.)

(329) **Thamnophilus doliatus intermedius** Ridgway

Thamnophilus intermedius RIDGWAY, Proc. U. S. Nat. Mus., X, 1888, p. 581 (Truxillo, Honduras).

Thamnophilus doliatus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1892, p. 203 (Choctum, Chisec, Cahabon, Coban, San Geronimo, Savana Grande, Escuintla road, Volcan de Fuego, Retalhuleu).

Thamnophilus doliatus mexicanus, RIDGWAY, 'Birds N. and Mid. Amer.,' pt. 5, 1911, p. 42.

Thamnophilus doliatus pacificus, RIDGWAY, *loc. cit.*, p. 43 (as to Naranjo, San José, Lake Amatitlan).

Chimoxan, 1♂; Finca La Primavera, 5♂, 2♀; Finca Chamá, 3♂; Secanquim, 14♂, 11♀; Chipoc, 2♂, 1♀; Finca Concepcion, 1♀; Finca Sepacuite, 4♂, 3♀;

Chanquejelve, 1 ♂; La Carolina, 1 ♂, 1 ♀; Pantaleon, 1 ♂, 1 ♀; San José, 3 ♂, 2 ♀; Finca El Espino, 7 ♂, 2 ♀; Hacienda California, 12 ♂, 5 ♀.

RANGE.—Tropical Zone: Paraguay to Mexico; innumerable races, at least four in Central America, *intermedius*, southern Mexico to western Panama on Caribbean slope, and Pacific coast of Guatemala.

The splendid series of thirty-six specimens from the Pacific slope of Guatemala, when compared with eighty-five specimens of *intermedius* and seventy-five specimens of *pacificus* from western Nicaragua and Costa Rica, proves beyond any possible doubt that *pacificus* does not range into Guatemala, and not a single specimen from western Guatemala can even be regarded as intermediate. As here understood, *intermedius* is a variable bird, and my material shows that specimens from northern Vera Cruz develop a maximum percentage of heavy barring.

"Ant-shrikes were common in all suitable cover below 3500 feet as far to the east as Sepacuite and Secanquim, where they were very abundant. They are strictly an inhabitant of the brushy thickets, where the bird is far more often heard than seen. The rattling call is suggestive of the song of our *Chamæa* of the coast of California, but louder. The notes of the present species end with a quick rising inflection, while those of *Taraba* are a monotone. A nest and set of two eggs, incubation but just beginning, was taken at Finca Carolina, May 11. The nest was quite like that of some of our vireos, hung by its edge to several twigs that were growing from the high bank of a ditch of running water, and well-masked by overhanging vines. The nest was firm but quite thin, composed of fine grass-stems which harmonized well with the surroundings. The female sat very close to the nest, only leaving when the vines were disturbed.

"Ant-shrikes were rare at Chanquejelve, the highest record I have being 5000 feet. At Hacienda California they were abundant, as also at El Espino and La Primavera." (Anthony, MS.)

(330) **Thamnistes anabatinus anabatinus** Sclater and Salvin

Thamnistes anabatinus SCLATER AND SALVIN, P. Z. S., 1860, p. 299 (Choctum, Vera Paz, Guatemala); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1892, p. 205 (Choctum, Cahabon, Teleman); RIDGWAY, *loc. cit.*, p. 22.

Secanquim, 2 ♀.

RANGE.—Humid Tropical Zone: Peru to southern Mexico; the race, Mexico to northern Nicaragua.

A rare and little-known bird in Central America north of Costa Rica, not common beyond eastern Panama.

(331) **Dysithamnus mentalis septentrionalis** Ridgway

Dysithamnus mentalis septentrionalis Ridgway, Proc. Biol. Soc. Wash., XXI, 1908, p. 192 (Choctum, Vera Paz, Guatemala); idem, 'Birds N. and Mid. Amer.,' pt. 5, 1911, p. 57 (Chisec, sources of Rio de la Pasion).

Dysithamnus semicinereus, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1892, p. 206.

Range.—Tropical Zone: Paraguay to Guatemala; the race, Central America.

A rare and little-known bird north of Costa Rica.

(332) **Myrmotherula schisticolor schisticolor** (Lawrence)

Formicivora schisticolor Lawrence, Ann. Lyc. Nat. Hist. N. Y., VIII, 1867, p. 172 (Costa Rica).

Myrmotherula menetriesi, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1892, p. 212 (Choctum, Vera Paz).

Myrmopagis schisticolor, Ridgway, *loc. cit.*, p. 71.

Range.—Tropical Zone: Venezuela and Peru to Guatemala; the race, western Ecuador to Guatemala.

An exceedingly rare and little-known bird in Central America north of Nicaragua.

(333) **Microrhopias boucardi boucardi** (Sclater)

Formicivora boucardi Sclater, P. Z. S., 1858, p. 300 (Acatepec, Oaxaca); Salvin and Godman, 'Biol. Cent. Amer.,' II, 1892, p. 216 (Choctum, Yzabal, Teleman).

Microrhopias boucardi boucardi, Ridgway, *loc. cit.*, p. 79, (sources of Rio de la Pasion, Los Amates; Uspantan, Quiché).

Range.—Tropical Zone: Bolivia to eastern Mexico; the race, northern Central America.

According to Hellmayr's recent treatment of this family, *boucardi* is a race of *quixensis*. I follow Chapman ('Birds Ecuador,' 1926, p. 396) in regarding *quixensis* as a distinct species.

This Ant-wren is fairly common in the Caribbean lowlands of Guatemala.

(334) **Cercomacra tyrannina crepera** Bangs

Cercomacra crepera Bangs, Auk, 1901, p. 365 (Divalá, Chiriqui, Panama).

Cercomacra tyrannina, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1892, p. 214 (Chisec, Choctum, Coban, Yzabal).

Cercomacra tyrannina crepera, Ridgway, *loc. cit.*, p. 96 (sources of Rio de la Pasion, Los Amates, Teleman).

Finca Chamá, 3 ♂, 2 ♀; Finca Sepacuite, 1 ♂; Chipoc, 1 ♀; Secanquim, 3 ♂, 6 ♀.

Range.—Humid Tropical Zone: Amazonia to southern Mexico; the race, Mexico to western Panama.

A fairly common species in the rain forest of eastern Guatemala.

(335) **Gymnocichla nudiceps chiroleuca** Sclater and Salvin

Gymnocichla chiroleuca SCLATER AND SALVIN, P. Z. S., 1869, p. 417, (Omoa, Honduras); DEARBORN, 1907, p. 190 (Los Amates); RIDGWAY, *loc. cit.*, p. 103.

RANGE.—Tropical Zone: Guatemala to northern Colombia; the race, Guatemala to eastern Costa Rica.

A monotypic genus with very slight characters, closely related to an enormous group of South American forms, variously divided into arbitrary genera.

This species has been collected only three times north of Nicaragua.

(336) **Formicarius analis moniliger** Sclater

Formicarius moniliger, SCLATER, P. Z. S., 1856, p. 294, (Cordova, Vera Cruz, Mexico); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1892, p. 233 (Forests of Vera Paz, Chisec, Kampamac, Choctum, Tactic).

Formicarius moniliger moniliger, RIDGWAY, *loc. cit.*, p. 120 (sources of Rio de la Pasion; Nebaj, Quiché).

RANGE.—Tropical Zone: Amazonia to southern Mexico; the race, northern Central America.

This widely ranging and highly variable Ant-thrush is fairly common in dense rain-forest throughout eastern Central America.

(337) **Grallaria guatimalensis guatimalensis** Prevost and Des Murs

Grallaria guatimalensis PREVOST AND DES MURS, 'Voy. "Vénus,"' Zool., p. 199 (Guatemala); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1892, p. 240 (Coban, forests of northern Vera Paz, Choctum, Yaxcamnal, Calderas, Savana Grande, Barranco Hondo, Pajal Grande, Volcan de Fuego).

Grallaria guatimalensis guatimalensis, RIDGWAY, *loc. cit.*, p. 148.

Finca Sepacuite, 4 ♂; Santa Ilania, 1 juv.; Tecpam, 1 ♂ imm.; Panajachel, 2 ♂, 2 ♀, 2 nestlings in down.

RANGE.—Subtropical Zone (sometimes Tropical, more rarely Temperate): Guiana and eastern Peru to Mexico; the race, Guatemala to northern Nicaragua.

The variations of this bird are poorly understood, due to its rarity in collections, and the great preponderance of unsexed specimens or old trade-skins to represent the typical form. At one time or another I have seen all the specimens in the big eastern museums, and have had as much as seventy-five per cent before me at one time. In the first place, the female averages larger and is a little less richly colored below than the fully adult male. I suspect also that older males are more highly colored than younger males (showing no signs of the well-known immature

plumage), as this is the only thing which can account for the great variation in series of properly sexed specimens of the same subspecies.

With the advantage of a good series of modern, sexed typical *guatimalensis* before me, I can make the following comments on the various proposed races.

1. *Grallaria guatimalensis ochraceiventris* Nelson.—A well-marked pale form of southwestern and central Mexico. The inclusion of specimens of this form under *mexicana* was largely the factor which induced Salvin and Godman to retain *mexicana* as a "northern" form. I have seen the type and five other specimens in the Biological Survey Collection.

2. *Grallaria guatimalensis mexicana* Sclater.—Described as *larger* with a paler belly. The series of Mexican birds in the national collections, which I examined some years ago, averages SMALLER than *guatimalensis*, but is separable on the basis of the paler bellies. Another series from the mountains of northern Nicaragua, in New York, is quite inseparable from the Mexican material discussed above. Mexican specimens in Cambridge, however, are quite inseparable in color characters from the Dwight series from Guatemala. All come from the lowlands of extreme southern Vera Cruz and all are small. Turning now to the series of *guatimalensis*, birds from lower altitudes in Alta Vera Paz are smaller, exactly resembling lowland Mexican birds in size, and birds from high altitudes (up to 10,000 feet) in the Pacific cordillera average 5 mm.longer winged and 3 mm. longer tarsus. It is highly likely, therefore, that the large type of *mexicana* came from a relatively higher altitude. We thus see that the so-called race *mexicana* is nothing but a combination of two tendencies. Birds from lower altitudes at southern Vera Cruz are absolutely inseparable from the smaller specimens of *guatimalensis* from lower altitudes. Birds from higher altitudes in northern and western Vera Cruz are similar in size to *guatimalensis*, but in their tendency to paler bellies approach the distinct *ochraceiventris* of western Mexico. I, therefore, would favor regarding *mexicana* as a synonym of *guatimalensis*, which ranges south to northern Nicaragua.

A case could well be made out for a lowland and a highland form based on the size differences recorded above. There is no means of knowing which the original type of *guatimalensis* was, but assuming that it was a trade-skin from Vera Paz, the most likely probability, the name *guatimalensis* would apply to the smaller form. The name *mexicana* would then be available for the large form of northern Vera Cruz. This large form would have an interrupted distribution, reappearing in

the mountains of western Guatemala, or the latter birds would have to be described on very slight size characters. Neither alternative appears satisfactory, as in neither case would we have subspecific characters anything like so trenchant as in *ochraceiventris*, or *princeps* or *chocoensis* farther south.

"Not uncommon at Sepacuite, where it was found in the abandoned coffee plantation. At Tecpam immature birds were taken in late July and early August from heavy forests at about 9500 feet altitude. At Panajachel several were seen and taken in rather open forest, where they were engaged in turning over the dead leaves in search of food. A nest, with two young, was found on September 11 and was, I think, the third 'setting,' to judge from immature birds taken earlier in the season. The nest was on top of an old alder stump, some two feet from the ground and somewhat sheltered by overhanging twigs of alder. Very little can be said of the nest itself: a mere platform or pad of dead leaves, to keep the eggs from the wet wood. The young were about to leave the nest on my second visit, the eighteenth, and both were taken, together with the parent. A second nest, with two nearly fresh eggs, was taken on the same date, from some alders not far from the above. In this case the nest was in the fork of a tree, about seven feet from the ground. As in the first-mentioned, the nest was quite crude, a handful of dead leaves, with little if any attempt toward structure. A single bird was seen above Chichicastenango, in thick forest." (Anthony, MS.)

Family **Furnariidæ**.[1] Ovenbirds

(338) **Synallaxis erythrothorax erythrothorax** Sclater

Synallaxis erythrothorax (part) Sclater, P. Z. S., 1855, p. 75 (Coban, Guatemala); Salvin and Godman, 'Biol. Cent. Amer.,' II, 1891, p. 150 (Coban, Choctum, Chisec, Kamkhal, Yzabal); Ridgway, 'Birds N. and Mid. Amer.,' pt. 5, 1911, p. 189 (Los Amates).

Secanquim, 6 ♂, 6 ♀ 1(?); Chimoxan, 3 imm.; Finca Chamá, 5 ♂, 1 ♀, 1 imm.; Puebla, 1 ♂.

Range.—Tropical Zone: southern Mexico to eastern Honduras; the race, Guatemala to Honduras, Caribbean slope.

A very common bird in the lowlands below 3500 feet. A very distinct species with no near allies.

[1]Hellmayr's arrangement followed here ('Cat. Birds Americas,' pt. 4, Field Mus. Pub., No. 224).

(339) **Synallaxis erythrothorax pacifica** Griscom

Synallaxis erythrothorax pacifica Griscom, Amer. Mus. Novit., No. 414, 1930, p. 3 (San Felipe, Retalhuleu, Pacific slope of Guatemala).

Synallaxis erythrothorax part, Salvin and Godman, 'Biol. Cent. Amer.,' p. 150 (Retalhuleu); Ridgway, *loc. cit.*, p. 190 (Naranjo, Patulul, San José); Lantz, 1899, p. 221 (Naranjo).

Hacienda California, 8 ♂, 3 ♀, 1(?); San José, 1 ♂; Retalhuleu, 1 ♂; Pantaleon, Escuintla, 3 ♂; Finca El Cipres, 9 ♂, 5 ♀; Finca El Espino, 3 ♂, 1 ♀.

Range.—Localized in the Pacific lowlands of Guatemala.

A very distinct local race, which is reported as abundant. One specimen is a partial albino. The tail is pure white, the primaries are mostly white, the crown is mostly white, and white feathers are liberally scattered over the remainder of the upperparts.

(340) **Xenicopsoides montanus variegaticeps** (Sclater)

Anabazenops variegaticeps Sclater, P. Z. S., 1856, p. 289 (Cordova, Vera Cruz, Mexico); Salvin and Godman, 'Biol. Cent. Amer.,' II, 1891, p. 162 (Pié de la Cuesta, Santa Maria, Barranco Hondo, Savana Grande, Choctum, Kamkhal).

Xenicopsis variegaticeps Ridgway, *loc. cit.*, p. 207.

Finca Sepacuite, 1 ♂, 1 ♀; Volcan Zunil, 2 ♂.

Range.—Subtropical Zone: Bolivia and Venezuela to Mexico; the race, mountains of southern Mexico to western Panama.

One of the many Subtropical Zone birds, which appears north of the "Panama Fault" as a very distinct form and ranges north all the way to Mexico. It is comparatively uncommon throughout its Central American range.

(341) **Automolus rubiginosus veræpacis** Salvin and Godman

Automolus veræpacis Salvin and Godman, 'Biol. Cent. Amer.,' II, 1891, p. 156 (Coban, Guatemala; also Tactic, Choctum).

Automolus veræpacis veræpacis, Ridgway, *loc. cit.*, p. 214.

Finca Sepacuite, 5 ♂, 2 ♀; La Perla, 1 ♂.

Range.—Subtropical Zone: southern Peru and Guiana to southern Mexico; the race, highlands of Vera Paz, Guatemala.

An immature male is much lighter, less tawny on the breast and abdomen. It thus suggests the Pacific race, *umbrinus*, but the latter differs in the coloration of the upperparts.

This species has a reputation for great rarity, as there are few specimens of any of the races in collections. Nevertheless, Mr. Anthony found it "common" at Sepacuite and discovered a nesting hole in a high bank.

(342) **Automolus rubiginosus umbrinus** Salvin and Godman

Automolus umbrinus SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1891, p. 157 (Santa Maria near Quetzaltenango, Volcan de Agua, Volcan de Fuego, Savana Grande, Barranco Hondo).

Automolus veraepacis umbrinus, RIDGWAY, *loc. cit.*, p. 215.

RANGE.—Subtropical Zone: Pacific cordillera of Guatemala.

(343) **Automolus ochrolæmus cervinigularis** (Sclater)

Anabates cervinigularis, SCLATER, P. Z. S., 1856, p. 288 (Cordova, Vera Cruz, Mexico).

Automolus cervinigularis, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1891, p. 159 (Coban, Choctum).

Automolus cervinigularis cervinigularis, RIDGWAY, *loc. cit.*, p. 217.

Secanquim, 5 ♂, 4 ♀; Chipoc, 1(?); Puebla, 1 ♀; San Lucas, 1(?).

RANGE.—Humid Tropical Zone: Amazonia to southern Mexico; the race, Mexico to eastern Nicaragua.

"Common at Secanquim" (Anthony). The specimen from San Lucas constitutes the first record for the Pacific slope.

These specimens come a little nearer *cervinigularis* than the recently described *amusos* Peters. The latter form is recorded from British Honduras, and is to be expected in the lowlands of southeastern Guatemala. The species has not as yet been recorded from that district, but this is without significance.

(344) **Xenops minutus mexicanus** Sclater

Xenops mexicanus SCLATER, P. Z. S., 1856, p. 289 (Cordova, Vera Cruz, Mexico).

Xenops genibarbis, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1891, p. 164 (Choctum); LANTZ, 1899, p. 221 (Santo Tomas).

Xenops genibarbis mexicanus, RIDGWAY, *loc. cit.*, p. 174 (sources of Rio de la Pasion).

Secanquim, 2 ♀.

RANGE.—Tropical Zone: Paraguay to Mexico; the race, Mexico to northern Nicaragua.

An uncommon to rare species in northern Central America, found only in lowland rain-forest.

(345) **Sclerurus mexicanus mexicanus** Sclater

Sclerurus mexicanus SCLATER, P. Z. S., 1856, p. 290 (Cordoba, Vera Cruz, Mexico); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1891, p. 167 (Coban, Raxché, Savana Grande, Volcan de Agua, above San Diego); RIDGWAY, *loc. cit.*, p. 166.

Sclerurus mexicanus certus, CHUBB, Bull. Brit. Orn. Club., XXXIX, 1919, p. 41 (Volcan de Agua, above San Diego); HELLMAYR, 'Birds of Americas,' pt. 4, 1925, p. 248, footnote.

RANGE.—Humid Tropical Zone: Brazil to southern Mexico; the race, Mexico to Honduras.

An uncommon to rare bird in the whole of Central America north of the Canal Zone, unrecorded from Nicaragua, and only one record for Honduras.

(346) **Sclerurus guatemalensis guatemalensis** (Hartlaub)

Tinactor guatemalensis HARTLAUB, Rev. Zool., 1844, p. 370 (Guatemala).

Sclerurus guatemalensis, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1891, p. 168 (Choctum); RIDGWAY, *loc. cit.*, p. 169.

Chimoxan, 1 ♂.

RANGE.—Humid Tropical Zone: west Ecuador to Guatemala.

The relations between these two species are of interest, as both occur together in the same type of forest. The present species is common as far north as Costa Rica, and is not uncommon in Nicaragua and eastern Honduras. In Guatemala only three specimens have been collected. It is just here that more specimens of *mexicanus* have been collected than all the rest of Central America combined. I suggest that *mexicanus* may have arrived first, and that it has been largely displaced by *guatemalensis*, the dominant species, and that it survives in some numbers only at the extreme northern limit of the latter's range. We note also that *S. guatemalensis* is quite uniform throughout its Central American range, while the "northern colony" of *mexicanus* is subspecifically distinct from the scattered birds in eastern Costa Rica and Almirante (=*pullus* Bangs), while still another race, *anomalus* Bangs and Barbour, appears in eastern Panama.

FAMILY **DENDROCOLAPTIDÆ.**[1] WOODHEWERS

(347) **Dendrocolaptes certhia sancti-thomæ** (Lafresnaye)

Dendrocops sancti-thomæ, LAFRESNAYE, Rev. Mag. Zool., 1852, p. 466 (corrected to Santo Tomas, near Omoa, Honduras, now Guatemala).

Dendrocolaptes sancti-thomæ, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1892, p. 192 (Vera Paz); RIDGWAY, 'Birds N. and Mid. Amer.,' pt. 5, 1911, p. 229.

Puebla, 1 ♂.

[1]Hellmayr's arrangement followed here ('Cat. Birds Americas,' pt. 4, Field Mus. Pub., No. 224)

RANGE.—Tropical Zone: Bolivia and Brazil to southern Mexico; the race, Colombia and northwestern Ecuador northward.

This big woodhewer is uncommon to rare north of Costa Rica.

(348) **Dendrocolaptes picumnus puncticollis** Sclater and Salvin

Dendrocolaptes puncticollis SCLATER AND SALVIN, P. Z. S., 1868, p. 54 (Tactic and San Geronimo, Vera Paz, Guatemala); RIDGWAY, *loc. cit.*, p. 232.

Finca La Primavera, 2 ♂, 1 ♀.

RANGE.—Tropical and Subtropical Zones: Amazonia to Guatemala; the race, eastern Guatemala and Honduras.

Only four specimens of this race have been previously recorded. This species is one of the rarest of Central American birds, and is one of the many of South American origin, which either attained only a feeble foothold in Central America, or is dying out due to competition with the autochthonous avifauna. All three Central American races are Subtropical Zone birds, and the Guatemala records all come from pine forest above 3500 feet (see Fig. 1).

(349) **Xiphocolaptes promeropirhynchus emigrans** Sclater and Salvin

Xiphocolaptes emigrans SCLATER AND SALVIN, Ibis, 1859, p. 118 (San Geronimo, Vera Paz, Guatemala); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1891, p. 183 (Poctum, Cahabon); RIDGWAY, *loc. cit.*, p. 237.

Finca La Primavera, 1 ♂, 2 ♀.

RANGE.—Subtropical and Temperate Zones: Bolivia to Mexico, the race, Chiapas to northern Nicaragua.

Chiefly a pine-forest species in northern Central America, and consequently found near sea-level in British Honduras and as high as 8000 feet in Mexico. In Costa Rica and western Panama, where there are no pines, it is strictly a Subtropical Zone bird, living in the cloud forest. It is everywhere rare to uncommon.

(350) **Xiphorhynchus guttatus confinis** (Bangs)

Dendrornis nana confinis BANGS, Bull. Mus. Comp. Zoöl., XXXIX, 1903, p. 150 (Ceiba, coast of Honduras); DEARBORN, 1907, p. 108 (Los Amates).

Dendrornis nana, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1891, p. 180.

Xiphorhynchus nanus confinis, RIDGWAY, *loc. cit.*, p. 253 (Santo Tomas, Chapulco).

RANGE.—Tropical Zone: Brazil to eastern Guatemala; the race, eastern Guatemala and Honduras.

An exceedingly rare bird north of Costa Rica.

(351) **Xiphorhynchus flavigaster flavigaster** Swainson

Xiphorhynchus flavigaster SWAINSON, Philos. Mag., I, 1827, p. 440 (Temiscaltepec, Mexico).

Dendrornis eburneirostris, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1891, p. 179 (Retalhuleu, Savana Grande, between the volcanoes of Agua and Fuego, Choctum); LANTZ, 1899, p. 221 (Chocan River).

Xiphorhynchus flavigaster flavigaster, RIDGWAY, *loc. cit.*, p. 244 (Los Amates, Patulul, Teleman, etc.).

Secanquim, 7 ♂, 2 ♀; Finca La Primavera, 5 ♂, 1 ♀; Finca Chamá, 6 ♂, 1 ♀; Chimoxan, 2 ♂; La Montañita, 1 ♂; Finca El Espino, 1 ♂; Finca El Cipres, 5 ♂, 4 ♀, 1(?); Hacienda California, 4 ♂, 2 ♀; San Felipe, Retalhuleu, 2 ♂, 4 ♀.

RANGE.—Chiefly Arid Tropical Zone: northern Mexico to southern Nicaragua; the race, eastern Mexico to western Nicaragua.

This large series shows remarkable individual variation in both color and size, but it is entirely without geographic significance. Dearborn noticed that two birds from the Pacific slope were apparently much smaller than others from the Caribbean slope, but ample series show that this was fortuitous.

This woodhewer shows the interesting difference between the Arid Tropical and pure Caribbean Humid Tropical faunas. The strictly rain-forest woodhewers in Guatemala are mostly rare and slightly differentiated forms, closely related to more southern forms. The present species is, however, very distinct and has no allies in Central America. It is abundant, and is the only member of the family in the dry open woods on the Pacific slope.

(352) **Xiphorhynchus erythropygius erythropygius** (Sclater)

Dendrornis erythropygia SCLATER, P. Z. S., 1856, p. 289 (Cordova, Vera Cruz, Mexico); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1891, p. 181 (El Rincon, Las Nubes, Coban, Chisec, Choctum).

Xiphorhynchus erythropygus, RIDGWAY, *loc. cit.*, p. 254.

Secanquim, 1 ♂, 2 ♀; Finca Sepacuite, 2 ♂, 4 ♀.

RANGE.—Upper Tropical Zone: Ecuador to southern Mexico; the race, Mexico to northern Nicaragua.

A rare and little-known species north of Costa Rica (as to the form *punctigula*).

(353) **Lepidocolaptes affinis affinis** (Lafresnaye)

Dendrocolaptes affinis LAFRESNAYE, Rev. Zool., 1839, p. 100 (Mexico).

Picolaptes affinis, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1891, p. 186 (Santa Maria, Cuipaché, Toliman, Volcan de Fuego, Volcan de Agua, Santa Barbara); DEARBORN, 1907, p. 108 (Tecpam).

Picolaptes affinis affinis, RIDGWAY, *loc. cit.*, p. 262 (Todos Santos, Sierra Santa Elena).

Finca Sepacuite, 1 ♀; Tecpam, 4 ♂, 1 ♀; Momostenango, 1 ♂, 1 ♀; Chichicastenango, 1 ♀; Panajachel, 1 ♀; Antigua, 1 ♂.

RANGE.—Subtropical Zone: southern Mexico to western Panama; the race, southern Mexico to northern Nicaragua.

A common cloud-forest species, rarely found below 4000 feet. The race *lignicida* Bangs and Penard, in the arid hills of Tamaulipas, is one of the few cases where a Subtropical Zone bird reaches sea-level in northern Mexico. Other cases are recorded for the Yucatan Peninsula.

(354) **Lepidocolaptes souleyetii insignis** (Nelson)

Picolaptes compressus insignis NELSON, Auk, 1897, p. 54 (Otatitlan, Vera Cruz, Mexico).

Picolaptes compressus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1891, p. 187 (Pine-ridge of Poctum, Chisec, Volcan de Agua, Volcan de Fuego, El Baul, near Santa Lucia Cosamalguapa, Retalhuleu).

Picolaptes lineaticeps insignis, RIDGWAY, *loc. cit.*, p. 267 (San José), Patulul, Mazatenango, Naranjo, etc.).

Finca Chamá, 2 ♂, 3 ♀; Puebla, 1 ♀; Finca El Espino, 3 ♂; Hacienda California, 7 ♂, 5 ♀; Finca El Cipres, 13 ♂, 9 ♀; Pantaleon, 2 ♂, 2 ♀.

RANGE.—Tropical Zone: Trinidad and Peru to southern Mexico; the race, Mexico to northern Nicaragua.

This very large series from both Atlantic and Pacific slopes shows a great deal of individual variation, but none that is geographic. As is true of other woodhewers, immature birds seem to be more heavily or darkly striped below and tend to have buffier throats. The under tail-coverts also tend to be more marked and of a looser texture. Worn adults are distinctly duller and paler both above and below, and the dusky borders to the light stripes on the underparts are less conspicuous. Such birds from both slopes are indistinguishable from the type and cotype of *parcolor* Austin from the Cayo District, British Honduras. It was pure chance that both these specimens happened to be in this plumage, which is readily distinguishable from the plumage of freshly molted adults or immature specimens.

A very common species on the Pacific slope, rare and local in the rain forest of the Caribbean slope.

(355) **Glyphorhynchus spirurus pectoralis** Sclater and Salvin

Glyphorhynchus pectoralis SCLATER AND SALVIN, P. Z. S., 1860, p. 299 (Vera Paz, Guatemala).

Glyphorhynchus cuneatus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1891, p. 175 (Choctum, Yzabal); DEARBORN, 1907, p. 107 (Los Amates).

Glyphorhynchus cuneatus pectoralis, RIDGWAY, *loc. cit.*, p. 275 (Los Amates, sources of Rio de la Pasion).

RANGE.—Tropical Zone: Brazil to southern Mexico; the race, Mexico to western Ecuador.

Like most other members of the family, this species is very uncommon in northern Central America.

(356) **Sittasomus griseicapillus sylvioides** Lafresnaye

Sittasomus sylvioides LAFRESNAYE, Rev. Mag. Zool., 1850, p. 590 (Mexico); DEARBORN, 1907, p. 108 (Los Amates, Patulul).

Sittosomus olivaceus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1891, p. 177 (Pié de la Cuesta, Choctum, Savana Grande).

Sittasomus sylvioides sylvioides, RIDGWAY, *loc. cit.*, p. 281 (Naranjo, etc.).

RANGE.—Tropical Zone: Brazil to Mexico; the race, eastern Mexico to Costa Rica.

A rain-forest species, which occurs also in the local forests of the Pacific slope.

(357) **Dendrocincla homochroa homochroa** (Sclater)

Dendromanes homochrous SCLATER, P. Z. S., 1859, p. 382 (Teotalcingo, Oaxaca, Mexico).

Dendrocincla homochroa, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1891, p. 173 (Rancho Tuilhá, Choctum, above San Diego).

Dendrocincla homochroa homochroa, RIDGWAY, *loc. cit.*, p. 294 (Savana Grande, Naranjo, etc.).

RANGE.—Tropical Zone: southern Mexico to eastern Panama; the race, Mexico, Guatemala and British Honduras.

The distribution and status of this species are worth special comment. The race *acedesta* is common from western Panama to western Nicaragua. The species is absent from eastern Costa Rica, has never been collected in eastern Nicaragua or eastern Honduras, and becomes fairly frequent in the range of true *homochroa*.

(358) **Dendrocincla anabatina anabatina** Sclater

Dendrocincla anabatina SCLATER, P. Z. S., 1859, p. 54 (Omoa, Honduras); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1891, p. 172 (Rancho Tuilhá, Choctum, Coban); DEARBORN, 1907, p. 108 (Los Amates).

Dendrocincla anabatina anabatina, RIDGWAY, *loc. cit.*, p. 289 (Samayoa).

RANGE.—Tropical Zone: southern Mexico to western Panama; the race, eastern Nicaragua northward.

This species is also lacking in eastern Costa Rica, where the genus is represented by *meruloides* (*lafresnayi*) *ridgwayi*, which is common. This last species ranges northward through eastern Nicaragua, where *anabatina* is very rare and *homochroa* is unrecorded, but is lacking in western Costa Rica and western Panama, where both the other species occur. It is an interesting case of how three species compete in the same fauna and habitat.

FAMILY **TYRANNIDÆ**.[1] FLYCATCHERS

(359) **Sayornis nigricans aquatica** Sclater and Salvin

Sayornis aquatica SCLATER AND SALVIN, Ibis, 1859, p. 119 (Dueñas, Guatemala); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1889, p. 65 (Dueñas, Quetzaltenango, Retalhuleu, Escuintla, Rio Michatoya, San Geronimo).

Sayornis nigricans aquatica, DEARBORN, 1907, p. 104 (Lake Atitlan, Tecpam); RIDGWAY, 'Birds N. and Mid. Amer.,' pt. 4, 1907, p. 600.

Panajachel, 1 ♂, 5 ♀, 1 (?); Barrillos, 1 ♀; Chichicastenango, 1 ♂, 1 ♀; San Mateo, 3 ♂; San Lucas, 1 ♂, 1 ♀.

RANGE.—Temperate, Subtropical and Tropical Zones: western United States to Bolivia; the race, Guatemala to northern Nicaragua.

This is apparently the first real series of *aquatica* to become available in America. The subspecies is obviously a transition to the Costa Rican *amnicola*, but is far nearer to the latter than to typical *nigricans*. The color of the under tail-coverts is surprisingly variable, one extreme male having them a uniform sooty black, while in another they are pure white with narrow dusky shaft-streaks. The Guatemala race is, however, a blacker bird than *nigricans*, the white abdominal area is reduced by one-third, and there is always more or less sooty in the under tail-coverts. In size the two races are alike. *Amnicola* always has wholly dusky under tail-coverts, the white abdominal area is still further restricted, and the size averages distinctly smaller.

[1] Hellmayr's arrangement followed here ('Cat Birds Americas,' pt. 5, Field Mus. Pub., No. 242).

The Black Phoebe does not fit in any particular zone. It requires mountain torrents, streams or lakes, and in Guatemala occurs from near sea-level on the Pacific slope to at least 6500 feet. It is unrecorded in the Caribbean lowlands.

(360) **Pyrocephalus rubinus blatteus** Bangs

Pyrocephalus rubinus blatteus Bangs, Proc. Biol. Soc. Wash., XXIV, 1911, p. 189 (Siboon District, British Honduras).

Pyrocephalus rubineus, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1889, p. 60 (Pine Ridge of Poctum, Santa Ana, Peten).

Range.—Tropical Zone: southern United States to Argentina and the Galapagos; the race, Yucatan to Honduras.

In default of specimens I follow Hellmayr in assuming that the birds of the Peten district belong with *blatteus* rather than *mexicanus*.

One of the most remarkable lacunæ in Neotropical birds is the absence of this species from most of Central America except for the narrow strip occupied by *blatteus*. There is plenty of country exactly suited to its requirements.

Salvin records it as common in the open pine forest and savanna country in Peten. Anthony saw a fine male at Sacapulas, which a native had just shot, but refused to part with. This could scarcely be *blatteus*, but might have been a migrant *mexicanus*.

(361) **Muscivora forficata** (Gmelin)

Muscicapa forficata Gmelin, 'Syst. Nat.,' I, 1789, p. 931 (Mexico).

Milvulus forficatus, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1890, p. 106 (Coban, San Geronimo, Dueñas, Guatemala City, Santa Isabel).

Muscivora forficata, Dearborn, 1907, p. 107 (Patulul, San José, Lake Atitlan); Ridgway, *loc. cit.*, p. 715.

Ocos, 4 ♂, 7 ♀; San José, 1 ♂, 2 ♀; Panajachel, 1 ♂; San Lucas, 1 ♂; Progreso, 1 ♀; Chimoxan, 1 (?).

Range.—Southwestern United States and Mexico, wintering south to western Panama.

A common transient and winter visitant to all open country below 5000 feet.

"A few were seen at Progreso in the early part of November. They were migrating and those seen were perched on the telegraph wire, near the railroad, where they lingered but a moment. At Panajachel two or three were noted in late October, also a record for San Lucas on November sixteenth.

"At Ocos the migration was in full swing October fifteenth. On that date a stiff gale was blowing from the southeast, against which the migrants were forced to fly. At times the flycatchers were just able to hold their own and, again, seemed to be forced backward. Often such birds, in order to find more favorable air currents, dropped to within a few feet of the ground, others veered inland and tried the shelter of the forest. The flight was still in full force at dusk. The Scissor-tails were still abundant the last of the month." (Anthony, MS.)

(362) **Muscivora tyrannus** (Linnæus)

Muscicapa tyrannus LINNÆUS, 'Syst. Nat.,' I, 1766, p. 325 (Canada and Cayenne).

Milvulus tyrannus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1890, p. 105 (Peten, Pine Ridge of Poctum, San Geronimo, Estansuelas).

Muscivora tyrannus, RIDGWAY, *loc. cit.*, p. 717 (Choctum; Coban; San Geronimo; Santa Yzabal, near San José, Dueñas).

Antigua, 1 ♂ (early May).

RANGE.—Tropical Zone: southern Mexico to Argentina.

The Fork-tailed Flycatcher is an exceedingly local bird in Central America north of western Costa Rica, and there is some evidence to believe that it may be partially migratory.

(363) **Tyrannus tyrannus** (Linnæus)

Lanius tyrannus LINNÆUS, 'Syst. Nat.,' I, 1758, p. 94 (Carolina).

Tyrannus pipiri, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1889, p. 98 (Yzabal, Retalhuleu).

Tyrannus tyrannus, RIDGWAY, *loc. cit.*, p. 691.

Finca La Primavera, 1 ♀ (April 3); Chimoxan, 1 ♂ (Sept. 20); Hacienda California, 1 ♀ (Sept. 30).

RANGE.—Eastern North America, south to Bolivia in winter, a transient only in Central America.

"At Chama they were common for a few days in small flocks of 6–10, May 15–20." (Anthony, MS.)

(364) **Tyrannus vociferans** Swainson

Tyrannus vociferans SWAINSON, Quart. Journ. Sci. Litt. and Arts Roy. Inst., XX, 1826, p. 273 (Temascaltepec, Mexico); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1889, p. 100 (Salamá, Dueñas); RIDGWAY, *loc. cit.*, p. 694.

RANGE.—Western North America, south in winter to Guatemala.

(365) **Tyrannus verticalis** Say

Tyrannus verticalis SAY, in Long's 'Exped. Rocky Mts.,' II, 1823, p. 60 (near La Junta, Colorado); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1889, p. 100 (Volcan de Agua, Dueñas); DEARBORN, 1907, p. 106 (El Rancho, Patulul); RIDGWAY, *loc. cit.*, p. 697).

Sacapulas, 1 ♂, 3 ♀; San Lucas, 1 ♂, 1 ♀; Hacienda California, 1 ♀; Progreso, 3 ♂, 2 ♀.

RANGE.—Western North America, south in winter to northern Nicaragua, where abundant.

(366) **Tyrannus melancholicus chloronotus** Berlepsch

Tyrannus chloronotus BERLEPSCH, Ornis, 1907, p. 474 (Temax, Yucatan).

Tyrannus melancholicus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1889, p. 102 (Coban, Tactic, Yzabal, San Geronimo, Dueñas, Escuintla, Retalhuleu).

Tyrannus melancholicus satrapa, DEARBORN, 1907, p. 107 (Los Amates, El Rancho, Lake Amatitlan, Patulul); RIDGWAY, *loc. cit.*, p. 700.

Virginia Plantation, near Puerto Barrios, 1 ♂ (M. C. Z.); Vera Paz trade-skins, 3 (M. C. Z.); Hacienda California, 10 ♂, 6 ♀; Ocos, 3 ♂; Finca El Cipres, 1 ♂; Barrillos, 1 ♀; San Lucas, 2 ♂; Secanquim, 1 ♂; San Antonio, 2 ♂, 1 ♀; Progreso, 2 ♂, 1 ♀; Panajachel, 3 ♂, 2 ♀; Puebla, 1 ♂, 1 ♀.

RANGE.—Tropical Zone: Texas to Brazil; the race, Yucatan to northern Colombia.

This kingbird is one of the most ubiquitous of Neotropical birds, occurring in all types of open or cleared country up to 5000 feet.

(367) **Tyrannus melancholicus occidentalis** Hartert and Goodson

Tyrannus melancholicus occidentalis HARTERT AND GOODSON, Nov. Zool., XXIV, 1917, p. 412 (San Blas, Tepic).

Ocos, 1 ♀ (Oct. 17), 1 (?) (Dec. 5).

RANGE.—Western Mexico in Tropical Zone, south in winter to Pacific coast of Guatemala.

These two specimens are clearly referable to *occidentalis* of western Mexico, a slightly characterized race, averaging slightly smaller than *chloronotus*, paler yellow below, a whiter throat, slightly paler gray head, and the chest very slightly more washed with gray. It is by no means surprising to find that this subspecies is at least partially migratory. It has not previously been reported outside of its breeding range.

(368) **Tyrannus crassirostris** subspecies

Tyrannus crassirostris, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1889, p. 103 (Escuintla).

RANGE.—Pacific coast region of Mexico from Sinaloa to Oaxaca; one record for western Guatemala, probably a winter migrant.

A winter visitant for which there is only one record, from the forest region of the Pacific coast. I am, of course, unable to say to which form this specimen belongs.

(369) **Legatus leucophaius variegatus** (Sclater)

Elainea variegata SCLATER, P. Z. S., 1856, p. 297 (Cordova, Vera Cruz, Mexico).
Legatus albicollis, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1889, p. 39 (Las Salinas, Cahabon); RIDGWAY, *loc. cit.*, p. 439.

RANGE.—Tropical Zone: southern Mexico to Argentina; the race, Mexico and northern Guatemala.

The Striped Flycatcher is a South American form, which is exceedingly rare and local in Central America north of Costa Rica.

(370) **Myiodynastes luteiventris luteiventris** Sclater

Myiodynastes luteiventris SCLATER, P. Z. S., 1859, p. 42 (Vera Paz, Guatemala); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1889, p. 48 (Peten, Savana of Santo Toribio, Cahabon, Choctum, Escuintla); DEARBORN, 1907, p. 103 (Patulul); RIDGWAY, *loc. cit.*, p. 656.

Finca Chamá, 3♂; Secanquim, 1♂; Finca Sepacuite, 6♂, 1♀; Finca La Primavera, 4♀; La Perla, 3♂, 1♀; La Carolina, 3♂, 4♀; Hacienda California, 2♀; Finca El Cipres, 14♂, 15♀, 1 (?).

RANGE.—Breeding from southern Arizona to western Panama; wintering in South America; a slight race at the northern limit of the range.

A common to abundant (Pacific slope) summer resident at lower altitudes on both sides of the mountains. Earliest arrival date March 31; none taken later than August. The paler northern form, *swarthi* Van Rossem, undoubtedly passes through Guatemala on migration.

(371) **Myiodynastes maculatus insolens** Ridgway

Myiodynastes audax insolens RIDGWAY, 'Man. N. Amer. Birds,' 1887, p. 332 (Mirador, Vera Cruz, Mexico).

Finca Chamá, 4♂, 2♀.

RANGE.—Tropical Zone: southwestern Costa Rica to Brazil; the race *insolens* in southern Mexico and northern Guatemala; the species otherwise absent in Central America.

While this species has never been recorded from Guatemala, Salvin and Godman predicted that it would be found there. In fact it is most surprising that it has escaped detection hitherto, as it occurs in Alta Vera Paz, the source of thousands of trade-skins, and I find two such skins in the collection of the Museum of Comparative Zoölogy.

As noted above, this wide-ranging and very common flycatcher has a curious hiatus in its distribution in Central America.

(372) **Megarhynchus pitangua mexicanus** (Lafresnaye)

Scaphorhynchus mexicanus LAFRESNAYE, Rev. Zool., 1861, p. 473 (Mexico).

Megarhynchus pitangua, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1889, p. 52 (Yaxcamnal, Choctum, San Geronimo, Barranco Honda, Volcan de Agua above San Diego, Savana Grande, Volcan de Fuego).

Megarhynchus pitangua mexicanus, DEARBORN, 1907, p. 103 (Los Amates, Patulul, Mazatenango, El Rancho[1]); RIDGWAY, 'Birds N. and Mid. Amer.,' pt. 4, 1907, p. 665.

Finca Chamá, 1 ♂, 1 ♀; Chipoc, 1 ♂; Chimoxan, 1 ♀; Secanquim, 1 ♂, 1 ♀; Finca La Primavera, 1 ♂; Puebla, 1 ♂; Finca Carolina, 1 ♂; Hacienda California, 1 ♂; Finca El Cipres, 7 ♂, 2 ♀, 1 (?); Pantaleon, 4 ♂; San Felipe, 1 ♂.

RANGE.—Tropical Zone: Mexico to Argentina; the race, eastern Mexico to Panama.

A common bird throughout the Tropical Zone, sometimes ranging as high as 5000 feet, but locally absent in the desert river-valleys of the interior, where it is replaced by the next form.

(373) **Megarhynchus pitangua deserticola** Griscom

Megarhynchus pitangua deserticola GRISCOM, Amer. Mus. Novit., No. 414, 1930, p. 4 (Sacapulas).

Sacapulas, 5 ♂, 3 ♀.

RANGE.—Localized in the arid interior valleys of central Guatemala.

A pale form localized in the arid Rio Negro Valley. Specimens recorded by Salvin from San Geronimo might belong here, and others collected by Dearborn at El Rancho in the Rio Motagua Valley probably do.

[1]Probably referable to *deserticola* Griscom.

(374) **Myiozetetes similis texensis** (Giraud)

Muscicapa texensis GIRAUD, 'Sixteen New Spec. Texas Birds,' Pl. 1, 1841 ("Texas"); LANTZ, 1899, p. 222 (Palin, Santo Tomas).

Myiozetetes similis, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1889, p. 41 (Choctum, Coban, Tactic, Dueñas, Escuintla, Patio Bolas, Retalhuleu, San Geronimo).

Myiozetetes similis superciliosus, DEARBORN, 1907, p. 102 (Los Amates, Gualan, Patulul, Lake Amatitlan).

Myiozetetes texensis texensis, RIDGWAY, *loc. cit.*, p. 446.

Finca Chamá, 3 ♂, 1 ♀; Finca Concepcion, 1 ♂; Chipoc, 1 (?); Chimoxan, 1 ♂, 1 ♀; Finca Sepacuite, 6 ♂, 6 ♀; Finca La Primavera, 1 ♂, 1 ♀; Puebla, 1 ♂, 1 juv.; Secanquim, 6 ♂, 2 ♀; San Antonio, 3 ♂, 1 ♀; Progreso, 1 ♀; Panajachel, 2 ♂; San Lucas, 1 ♂; Sacapulas, 4 ♂, 3 ♀; Finca Sepur, 1 ♀; Finca El Espino, 1 ♀; San José, 1 ♂; Hacienda California, 2 ♂, 2 ♀; Finca La Carolina, 5 ♂; Finca El Cipres, 6 ♂, 1 ♀, 1 (?); Ocos, 7 ♂, 3 ♀.

RANGE.—Tropical Zone: Argentina to Mexico; the race, Mexico to Central Costa Rica.

A surprisingly uniform series. The seven skins from Sacapulas are just a trifle paler than the others, but not sufficiently so to justify separation.

Ubiquitous in open places up to 6000 feet. Anthony found nests with half-grown young in late May in willows at Lake San Antonio, about ten feet from the ground.

(375) **Pitangus sulphuratus guatimalensis** (Lafresnaye)

Saurophagus guatimalensis LAFRESNAYE, Rev. Mag. Zool., 1852, p. 462 (Guatemala).

Pitangus derbianus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1889, p. 44 (San Geronimo, Dueñas, Escuintla, Retalhuleu).

Pitangus sulphuratus derbianus, DEARBORN, 1907, p. 103 (Los Amates, Lake Amatitlan, Mazatenango); RIDGWAY, *loc. cit.*, p. 672.

Puebla, 1 ♀; Progreso, 1 ♀, 1 juv.; San Antonio, 1 ♂, 1 ♀; Finca El Cipres, 5 ♂, 8 ♀; Hacienda California, 4 ♂, 6 ♀, 3 juv.; Ocos, 3 ♂, 1 ♀; Finca Carolina, 1 ♀.

RANGE.—Tropical Zone: Texas to Argentina; wanting in most of Panama and the Pacific coast of South America; the race, Guatemala to western Panama.

Peters (Bull. Mus. Comp. Zoöl., LXIX, 1929, No. 12, p. 448) has recently shown that typical *derbianus* of Texas and northern Mexico is a slightly paler and larger bird.

As noted above the Derby Flycatcher has some curious lacunæ in its range. It is common in all open country in Guatemala up to 6000 feet.

(376) **Pitangus sulphuratus pallidus** Griscom

Pitangus sulphuratus pallidus Griscom, Amer. Mus. Novit., No. 414, 1930, p. 4 (Sacapulas).

Sacapulas, 1 ♂ (the type).

Range.—Localized in the arid Rio Negro Valley, interior of Guatemala.

One of the many forms responding to the locally arid conditions of its environment.

(377) **Myiarchus crinitus** [1](Linnæus)

Turdus crinitus Linnæus, 'Syst. Nat.,' I, 1758, p. 170 (Carolina).

Myiarchus crinitus, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1889, p. 88 (Livingston, Choctum); Dearborn, 1907, p. 105 (Los Amates, Gualan); Ridgway, *loc. cit.*, p. 613.

Secanquim, 1 ♂ (March 20); Nebaj, 1 ♂ (April 29).

Range.—Eastern United States, south in winter to Colombia.

Probably a common winter visitant, as yet recorded only from the eastern side of the cordillera.

(378) **Myiarchus cinerascens cinerascens** (Lawrence)

Tyrannula cinerascens Lawrence, Ann. Lyc. Nat. Hist. N. Y., V, 1852, p. 121 (western Texas).

Myiarchus cinerascens, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1889, p. 91 (Dueñas, Barranca Hondo, Chuacus); Ridgway, *loc. cit.*, p. 626 (Nenton); Dearborn, 1907, p. 105 (El Rancho, Lake Atitlan).

San Lucas, 3 ♂, 1 ♀; Sacapulas, 10 ♂, 4 ♀.

Range.—Western United States, south in winter to Yucatan and Guatemala.

(379) **Myiarchus nuttingi** Ridgway

Myiarchus nuttingi Ridgway, Proc. U. S. Nat. Mus., V, 1882, p. 395 (La Palma de Nicoya, Costa Rica); idem, 'Birds N. and Mid. Amer.,' pt. 4, 1907, p. 630 (Nenton); Dearborn, 1907, p. 106 (El Rancho, San José).

Progreso, 10 ♂, 6 ♀; Hacienda California, 1 ♂, 9 ♀, 2 (?); Ocos, 2 ♂, 2 ♀, 1 (?).

Range.—Arid Tropical Zone: western Mexico to northwestern Costa Rica.

We have in this species a very interesting situation which no nomenclature can possibly bring out. Stated briefly, topotypical material from Costa Rica and a good series from Nicaragua shows a bird with no dusky whatever on the inner web of the outer tail-feather or a

[1]Probably the race *boreus* Bangs.

trace only on the outer third (about ten per cent of the material examined). The series from the arid interior Rio Motagua Valley at Progreso, Guatemala, agrees minutely with these Costa Rica birds and would unhesitatingly be called *nuttingi*. The fifteen birds from the Pacific slope are apparently a different subspecies. All but two have a well-marked dusky shaft-stripe, and one has this stripe so wide that it would "key down" to *magister* in Ridgway. These birds would have to be referred to *inquietus*. The two exceptions are breeding adults taken the same week at the same place. These do not have the SLIGHTEST SIGN of a dusky shaft-stripe, and on the basis of their characters would have to be called *nuttingi*. Bangs and Peters (Bull. Mus. Comp. Zoöl., LXVIII, No. 8, p. 395) have already discussed a long series from Oaxaca. I agree entirely that these birds are clearly *nuttingi*. The additional material now available, however, shows that the supposed paleness of northern birds is seasonal. A series from Sonora and Chihuahua agrees with the diagnosis of *inquietus*, but two nestlings from the same brood are illuminating, as one is obviously *inquietus*, and the other has no trace of cinnamon whatever.

It would, of course, be entirely permissible to redefine *inquietus* as a northern subspecies, in which the majority of individuals have a dusky shaft-stripe. It cannot range south to Guatemala because of the Oaxaca material. True *nuttingi*, however, cannot range north to Oaxaca, because of the Guatemala material. The variation observed at both ends of the range makes a theory of two species untenable. The presence or absence of a dusky shaft-stripe and its extent is obviously a highly mutational character in the genus *Myiarchus*, and slight differences in its development are surprisingly constant in the various species. In this particular species, *nuttingi*, however, it is NOT constant, and is either in the process of being acquired or being lost. Here and there local groups or colonies of individuals either have it or have not got it, and its presence or absence is not sufficiently uniform geographically for nomenclatural recognition. I suggest, therefore, that *inquietus* Salvin and Godman be reduced to synonymy.

(380) **Myiarchus brachyurus** Ridgway

Myiarchus brachyurus RIDGWAY, 'Man. N. Amer. Birds,' 1887, p. 334 (Ometepe, Nicaragua).

Myiarchus nuttingi brachyurus, RIDGWAY, 'Birds N. and Mid. Amer.,' pt. 4, 1907, p. 630.

Hacienda California, 1 ♂.

RANGE.—Arid Tropical Zone: Chiapas to northwestern Costa Rica.

Not previously recorded from Guatemala, but its occurrence on the Pacific slope was to be expected. Field experience with both *nuttingi* and *brachyurus* in Nicaragua emphasizes their specific distinctness.

(381) **Myiarchus tyrannulus nelsoni** Ridgway

Myiarchus magister nelsoni Ridgway, 'Birds N. and Mid. Amer.,' pt. 4, 1907, App., p. 903 (Alta Mira, Tamaulipas, Mexico).

Myiarchus magister, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1889, p. 89 (Guatemala, coll. by Skinner).

Myiarchus mexicanus, Dearborn, 1907, p. 106 (Los Amates).

Finca Chamá, 1 ♂, 1 ♀; Puebla, 1 ♀; Sacapulas, 3 ♂, 2 ♀; Progreso, 1 ♂, 1 ♀; Panajachel, 1 ♀; Ocos, 1 ♀; San José, 3 ♂.

Range.—Tropical Zone: Argentina to Colombia and the Lesser Antilles, reappearing from Honduras to southern United States; the race, Texas to Honduras, chiefly (?) in winter southward.

In spite of the paucity of records, it is reasonably certain that this species is a regular winter visitor to the whole of Guatemala. The specimens from Finca Chamá were taken May 15, and the bird from Puebla is a worn post-breeding adult. There is little doubt, therefore, that the bird breeds in eastern Guatemala. None of the specimens, even from the Pacific lowlands, show the slightest approach in size to the western form *magister*. The earliest fall date is October 14.

I follow Hellmayr in regarding *mexicanus* (or *magister*) as conspecific with *tyrannulus*. The "break" in the range in southern Central America is closely approximated by several other non-forest-haunting flycatchers of wide distribution.

(382) **Myiarchus tuberculifer lawrenceii** (Giraud)

Muscicapa lawrencei Giraud, 'Sixteen New Spec. Texas Birds,' 1841, p. 9 (Texas).
Myiarchus lawrenceii lawrenceii, Ridgway, *loc. cit.*, p. 642.

Lake Amatitlan, 1 ♀; Panajachel, 5 ♂, 7 ♀; Antigua, 1 ♂; Nebaj, 1 ♂; Huehuetenango, 1 ♂; Sacapulas, 1 ♂, 2 ♀; San Lucas, 7 ♂, 7 ♀, 3 (?); San Antonio, 1 ♂.

Range.—Tropical Zone: Bolivia to Mexico; the race, eastern and southern Mexico and the mountains of Guatemala.

Birds from the central highlands from 4800 to 6200 feet prove to be as large as specimens from eastern Mexico, and accordingly must be referred here. The wings of males average 85 mm., the extremes being 83 (very worn) to 91 mm. This form undoubtedly occurs at higher altitudes in Vera Paz, but I have no material. There is the further chance that the bird is partially migratory at the northern limit of its range.

(383) **Myiarchus tuberculifer connectens** Miller and Griscom

Myiarchus tuberculifer connectens Miller and Griscom, Amer. Mus. Novit., No. 159, 1925, p. 6 (Las Cañas, Matagalpa, Nicaragua).

Myiarchus lawrencii, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1889, p. 94 (Choctum, Yaxcamnal, Coban, Tactic, Teleman, San Geronimo, Dueñas, Volcan de Agua, Retalhuleu); Dearborn, 1907, p. 106 (Los Amates, Lake Amatitlan, Lake Atitlan, Patulul, San José).

Myiarchus lawrencei lawrencei, Ridgway, *loc. cit.*, p. 642 (Palin, sources of Rio de la Pasion, Secanquim, etc.).

Finca Concepcion, 2 (?); Finca Chamá, 2 ♂, 2 ♀; Chipoc, 1 ♂; Chimoxan, 1 ♀, 1 (?); Finca Sepacuite, 7 ♂, 3 ♀; Finca La Primavera 3 ♂, 3 ♀; Secanquim, 11 ♂, 10 ♀; Puebla, 3 ♂, 1 ♀; Finca Cipres, 10 ♂, 3 ♀, 1 (?); La Carolina, 7 ♂, 7 ♀; San Felipe, 2 ♂, 2 ♀; Pantaleon, 3 ♂, 2 ♀; Salache, 1 ♀; Hacienda California, 5 ♂, 6 ♀. Total 99.

Range.—Tropical Zone: lowlands of Guatemala south to northwestern Costa Rica.

All specimens from below 4000 feet in Guatemala clearly belong to this smaller form, the males having an average wing measurement of 80 mm. As might be expected, series from the Pacific lowlands average smaller than large series from higher altitudes (3000 feet) in Alta Vera Paz.

No attempt has been made to assort the locality references, all being given under this form.

(384) **Nuttallornis mesoleucus mesoleucus** (Lichtenstein)

Muscicapa mesoleuca Lichtenstein, 'Preis-Verz. Mex. Vög.,' 1830, p. 2 (Mexico).

Contopus borealis, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1889, p. 81 (Coban, Dueñas).

Nuttallornis borealis, Ridgway, *loc. cit.*, p. 505.

Tecpam, 1 ♀; Panajachel, 1 ♂, 1 ♀; Finca Carolina, 1 ♂, 2 ♀.

Range.—Boreal eastern North America, wintering in South America, migrating through Central America.

The Olive-sided Flycatcher is a regular migrant over the whole of Central America. The large western race is certainly tenable, but it naturally follows that individuals on migration can only be determined subspecifically, if their measurements put them clearly in one extreme or the other. Those listed above belong to the eastern form without any reasonable question. All previous records are arbitrarily cited under the typical form. Definite migration dates are May 15 and Aug. 26 to October 19. The great majority were collected in early October.

(385) **Nuttallornis mesoleucus majorinus** Bangs and Penard

Nuttallornis borealis majorinus Bangs and Penard, Proc. Biol. Soc. Wash., XXXIV, 1921, p. 90 (Pine Flats, north fork of San Gabriel River, Los Angeles Co., California).

Chimoxan, 1 ♀; Panajachel, 2 ♀; La Montañita, 1 ♀; Carolina, 1 ♀.

Range.—Boreal western North America, migrating south in winter through Central America.

These specimens are all clearly the large western form. In addition to those listed, there are three other unsexed specimens from the same localities, which are subspecifically indeterminable.

(386) **Myiochanes virens** (Linnæus)

Muscicapa virens Linnæus, 'Syst. Nat.,' I, 1766, p. 327 (Carolina).

Finca Chamá, 2 ♀, 1 (?); Chipoc, 1 ♂; Chimoxan, 1 ♀; Progreso, 1 ♂; Finca Cipres, 1 ♂; Finca Sepacuite, 1 ♀.

Range.—Eastern North America, wintering in South America, migrating through Central America.

Undoubtedly a regular transient through Guatemala, chiefly on the eastern side. The dates represented by our specimens are April 20 to May 16, August 28 to September 26. They constitute the first definite records for Guatemala, the old specimens from Vera Paz recorded by Sclater having been redetermined by Salvin as *richardsoni*.

(387) **Myiochanes richardsoni richardsoni** (Swainson)

Tyrannula richardsoni Swainson, in Richardson, 'Faun. Bor.-Amer.,' II, 1832, p. 146 (Saskatchewan, Canada).

Contopus richardsoni, Salvin and Godman 'Biol. Cent. Amer.,' II, 1889, p. 85 (Coban, Dueñas, Retalhuleu).

Myiochanes richardsonii, Dearborn, 1907, p. 105 (Lake Atitlan).

Myiochanes richardsonii richardsonii, Ridgway, *loc. cit.*, p. 521.

Panajachel, 3 ♂, 3 ♀; Finca Carolina, 2 ♀.

Range.—Western North America, wintering in South America, on migration in Central America.

Undoubtedly a regular migrant through Guatemala. Dates are April 8 to May 15, August 26 to October 5.

(388) **Myiochanes richardsoni peninsulæ** (Brewster)

Contopus richardsonii peninsulæ BREWSTER, Auk, 1891, p. 144 (Sierra de la Laguna, Lower California).

Panajachel, 1 ♂, 1 ♀; Finca Carolina, 1 ♂ (Sept. 12–Oct. 2).

RANGE.—Southern Lower California, wintering south to western Guatemala.

These three specimens are small, slightly paler, with wide wing-bars, and very long, wide bills, and undoubtedly belong to the Lower California subspecies which has not as yet been detected beyond Oaxaca.

(389) **Myiochanes richardsonii sordidulus** (Sclater)

Contopus sordidulus SCLATER, P. Z. S., 1859, p. 43 (southern Mexico and Guatemala).

Myiochanes richardsonii sordidulus, RIDGWAY, *loc. cit.*, p. 525.

Tecpam, 1 ♀; Progreso, 2 ♂; Panajachel, 3 ♂, 1 ♀; Finca El Cipres, 3 ♂, 7 ♀, 1 (?).

RANGE.—Breeding in the highlands, southern Mexico to western Panama; wintering south to Peru.

It is trite to say that determination of the races of the Western Wood Pewee is always difficult and sometimes impossible. The breeding form in Central America, *sordidulus*, averages much smaller, and tends to have a darker cap in more contrast with the back. The color character is practically non-existent, however, in worn breeding birds or immature. Certain females from North America are just as small as many Central American specimens. Consequently some of those listed above might be either form on size, but are referred here because of a darker cap. On this basis specimens are included in which the wing measures up to 84 mm. The majority were taken in July and August, and are worn breeding birds. Five specimens were shot in September (up to the 13th), but these are all so small that there is no question of their identity.

(390) **Myiochanes cinereus brachytarsus** (Sclater)

Empidonax brachytarsus SCLATER, Ibis, 1859, p. 441 (Cordoba, Vera Cruz).

Contopus brachytarsus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1889, p. 87 (Chisec, Choctum, Cahabon, Retalhuleu, Escuintla).

Myiochanes brachytarsus, RIDGWAY, *loc. cit.*, p. 527 (Gualan, etc.); DEARBORN, 1907, p. 105 (San José, Patulul, Mazatenango).

Secanquim, 3 juv.; Chimoxan, 1 ♀; Finca Chamá, 6 ♂, 14 ♀; Pantaleon, 1 ♀; San Felipe, 1 ♂; Finca El Cipres, 4 ♂, 1 ♀, 2 (?); Hacienda California, 2 ♂, 2 ♀.

RANGE.—Tropical Zone: Argentina to Mexico; the race, Mexico to Panama.

Most unfortunately the great majority of these specimens are worn breeding birds, or just acquiring the greener fall plumage. The Pacific slope specimens differ from Caribbean slope specimens in similar plumage in being markedly greener above and a deeper yellow below. The worn birds are, however, indistinguishable, and I should prefer to see good series of fresh birds before venturing to describe another subspecies in so critical a group. While I follow Hellmayr's arrangement, I am by no means convinced that it would not be better to treat *punensis* and *cinereus* as specifically distinct.

Common in the tropical lowlands throughout Central America.

(391) **Myiochanes pertinax pertinax** (Cabanis and Heine)

Contopus pertinax CABANIS AND HEINE, 'Mus. Hein.,' II, 1859, p. 72 (Jalapa, Vera Cruz).

Contopus musicus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1889, p. 82 (Volcan de Fuego, Volcan de Agua).

Myiochanes pertinax, DEARBORN, 1907, p. 105 (Lake Atitlan, Tecpam).

Myiochanes pertinax pertinax, RIDGWAY, *loc. cit.*, p. 514 (Totonicapam, Hacienda Chancol, Coban).

Finca La Primavera, 2 ♀; Chichicastenango, 4 ♂; Panajachel, 4 ♂, 3 ♀, 2 (?); Antigua, 1 ♀; San Lucas, 1 ♀; Momostenango, 1 ♂; Tecpam, 2 ♂, 2 ♀; La Montañita, 2 ♂; Quetzaltenango, 1 ♂, 1 ♀.

RANGE.—Mountains of Arizona to northern Nicaragua; the race, central and southern Mexico to Guatemala.

This large Wood Pewee, while specifically distinct, represents *fumigatus* of the mountains of South America, and *lugubris* of the highlands of Costa Rica and western Panama. The whole Wood Pewee group is a beautiful illustration of how the successful tyrants have divided the New World among them. *Virens* and *richardsonii* are the boreal, migratory group; *brachytarsus* and its allies are the tropical rain-forest group, while in the West Indies the various species have evolved into the exceedingly feeble genus *Blacius*. It will be noted that all the lowland tropical species are small and short-winged, the boreal migratory species are larger and long-winged, and the resident mountain species are large and short-winged, as perfect a correlation of structure and biology as could be wished.

The present species is fairly common in Guatemala chiefly from 4000 to 7500 feet. In my experience it has a marked preference for pine forests.

(392) **Myiochanes pertinax pallidiventris** (Chapman)

Contopus pertinax pallidiventris CHAPMAN, Auk, 1897, p. 310 (Pima County, Arizona).

Uspantan, 1 ♂.

RANGE.—Breeding in Arizona and northern Mexico; wintering southward.

I do not recall any previous winter record for this form, which is an addition to the avifauna of Guatemala.

(393) **Empidonax flaviventris** (Baird)

Tyrannula flaviventris BAIRD, Proc. Acad. Nat. Sci. Phila., I, 1843, p. 283 (Carlisle, Pennsylvania).

Empidonax flaviventris, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1889, p. 73 (Choctum, Coban, Dueñas, Retalhuleu); RIDGWAY, *loc. cit.*, p. 550 (Nenton); DEARBORN, 1907, p. 104 (Los Amates, Mazatenango, Patulul).

Finca Chamá, 1 ♂, 1 ♀; Secanquim, 5 ♂, 5 ♀; Finca La Primavera, 2 ♂; Panajachel, 1 ♀; Finca Cipres, 1 ♂, 1 ♀; Finca Carolina, 2 ♀, 1 (?); La Montañita 1 ♂; San Felipe, 1 ♂.

RANGE.—Boreal North America, in winter to Panama.

A common winter visitant to the whole of Guatemala. Extreme dates are August 15 to May 11.

(394) **Empidonax virescens** (Vieillot)

Platyrhynchos virescens VIEILLOT, 'Nouv. Dict. Hist. Nat.,' XXVII, 1818, p. 22 (Philadelphia, Pennsylvania).

Empidonax acadicus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1889, p. 70.

Empidonax virescens, RIDGWAY, *loc. cit.*, p. 552.

La Montañita, 1 ♂ (Oct. 14).

RANGE.—Eastern United States, wintering in Colombia and Ecuador.

While migrating regularly in parts of Central America, this is the first definite record for Guatemala.

(395) **Empidonax traillii traillii** (Audubon)

Muscicapa trailii AUDUBON, 'Birds Amer.,' I, 1828, Pl. XLV (Arkansas).

Empidonax trailli, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1889, p. 71 (San José[1]).

[1]The subspecies, of course, unknown.

Empidonax traillii alnorum, RIDGWAY, *loc. cit.*, p. 558.

Finca La Primavera, 1 ♂; Progreso, 1 ♂; Panajachel, 4 ♂; La Carolina, 1 ♂; Hacienda California, 1 ♂.

RANGE.—Northeastern America, wintering in South America to Argentina.

Probably a common transient throughout the country. Extreme dates are March 14 to May 10 and August 26 to November 24.

(396) **Empidonax traillii brewsteri** Oberholser

Empidonax traillii brewsteri OBERHOLSER, Ohio Journ. Sci., XVIII, 1918, p. 93 (Cloverdale, Nye Co., Nevada).

Empidonax traillii, DEARBORN, 1907, p. 104 (Los Amates, Mazatenango, San José).

Ocos, 1 ♀, 2 (?); Hacienda California, 2 ♀.

RANGE.—Western North America, wintering from Guatemala to Bolivia.

The five specimens of this race all come from the Pacific lowlands. One was taken on the surprisingly late date of June 4. Dearborn collected specimens in January.

(397) **Empidonax minimus** (Baird)

Tyrannula minima BAIRD, Proc. Acad. Nat. Sci. Phila., I, 1843, p. 284 (Carlisle, Pennsylvania).

Empidonax minimus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1889, p. 72 (Coban, Dueñas, Escuintla, Retalhuleu); RIDGWAY, *loc. cit.*, p. 563 (Nenton, Gualan); DEARBORN, 1907, p. 104 (Los Amates, El Rancho, Lake Amatitlan, Patulul, San José, Mazatenango, Lake Atitlan).

Chimoxan, 1 ♂, 1 (?); Finca Sepacuite, 1 ♂, 1 ♀; Finca La Primavera, 1 ♂, 2 ♀, 2 (?); Secanquim, 7 ♂, 2 ♀, 2 (?); Progreso, 6 ♂, 2 ♀, 1 (?); Sacapulas, 3 ♂, 1 ♀, 1 (?); Panajachel, 8 ♂, 1 ♀; Finca El Cipres, 4 ♂, 1 ♀; Finca La Carolina, 6 ♂, 2 ♀, 1 (?); Finca El Soche, 1 (?); San José, 1 ♀.

RANGE.—Eastern North America, south in winter to Panama and Peru.

An abundant winter visitant from August 13 to May 3.

(398) **Empidonax hammondii** (Xantus)

Tyrannula hammondii XANTUS, Proc. Acad. Nat. Sci. Phila., X, 1858, p. 117 (Fort Tejon, southern California).

Empidonax hammondi, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1889, p. 76 (Calderas, pine forest of Volcan de Fuego from 10,000–12,000 feet); RIDGWAY, *loc. cit.*, p. 566 (Volcan de Santa Maria); DEARBORN, 1907, p. 105 (Tecpam).

Finca La Primavera, 2 ♂; Chanquejelve, 4 ♂, 2 ♀; Nebaj, 3 ♀; La Perla, 1 ♂; Barrillos, 3 ♂; Uspantan, 1 ♂; San Mateo, 1 ♂; Huehuetenango, 3 ♂, 1 ♀, 1 (?);

San Lucas, 1 ♂, 1 ♀, 1 (?); Chichicastenango, 6 ♂, 5 ♀; Momostenango, 8 ♂, 6 ♀, 1 (?); Finca El Soche, 2 ♂; Quetzaltenango, 2 ♂, 1 ♀.

RANGE.—Western North America, wintering south to Guatemala.

An abundant winter visitant to the western and central portions of Guatemala, lingering as late as May first.

(399) **Empidonax wrightii** Baird

Empidonax wrightii BAIRD, 'Reports of Explorations and Surveys for R. R. from Miss. R. to Pac. Ocean,' IX, 1858, p. 200 (El Paso, Texas); RIDGWAY, *loc. cit.*, p. 567.

Finca Sepacuite, 1 ♀; Chanquejelve, 1 ♂, 1 ♀; Momostenango, 2 ♀; 1 (?); Finca El Soche, 1 ♀.

RANGE.—Western North America, wintering south to Guatemala.

Apparently an infrequent winter visitant, not previously recorded south of Oaxaca. Two specimens exactly resemble *E. griseus* in coloration, but do not have the long, slender bill of that form. Naturally the identification of so large a series of winter-killed *Empidonax* has been beset with difficulties. Several specimens with broken or molting primaries were indeterminable and have not been listed.

(400) **Empidonax fulvipectus pulverius** Brewster

Empidonax pulverius BREWSTER, 'Descr. Supp. New Birds from N. W. Amer. and Mexico,' 1889, p. 86 (Piños Altos, Chihuahua, Mexico).

San Mateo, 1 ♂, February 5, 1927; Momostenango, 1 ♂, December 24, 1924.

RANGE.—Pine forests of northwestern Mexico, south in winter to Guatemala.

Typical examples of this species or race, in proportions of bill, wing formula and size, in the olive and yellow winter plumage. Not previously recorded south of Jalisco. For a discussion of its systematic status, see under *fulvipectus*. In addition to the type, I have seen a good series taken between June and September, many birds in the greener fall plumage.

(401) **Empidonax fulvipectus trepidus** Nelson

Empidonax trepidus NELSON, Auk, 1901, p. 47 (Hacienda Chancol, Guatemala); DEARBORN, 1907, p. 105 (Tecpam); RIDGWAY, *loc. cit.*, p. 575.

Quetzaltenango, 5 ♂, 1 ♀; Momostenango, 1 ♂.

RANGE.—Breeding in the pine forests of north central Mexico, south in winter to Chiapas and western Guatemala.

A winter visitant of uncertain status. The specimen from Momostenango shows a marked approach to *pulverius*. See next species.

(402) **Empidonax fulvipectus fulvipectus** Lawrence

Empidonax fulvipectus Lawrence, Ann. Lyc. Nat. Hist. N. Y., X, 1871, p. 11 (City of Mexico); Ridgway, *loc. cit.*, p. 573.

Tecpam, 1 ♂, 1 ♀, July and early August.

Range.—Pine forests of southeastern Mexico, south to Guatemala.

In default of good series, these two worn breeding birds must be referred here, though they are a trifle darker below than the type and two others from eastern Mexico in similar plumage. There is no reasonable doubt that *pulverius*, *trepidus*, and *fulvipectus* are conspecific. The eastern bird is the darkest, brownest above, yellowest below. *Pulverius*, the northwestern extreme, is the grayest (breeding plumage) or palest (winter plumage), while *trepidus* is exactly intermediate in color and known breeding range. All three agree in large size, wing formula and the long narrow bill. I have already recorded an obvious intermediate between *trepidus* and *pulverius*. It would seem almost certain that *E. griseus* Brewster belongs in this group also, as proportions tend to be more important than color in this most difficult genus. Hellmayr ('Cat. Birds Americas,' pt. 5, p. 211, footnote) has suggested that *wrightii* may also belong in this group of geographic races, but its abruptly smaller size and relatively wider bill make this unlikely. Certain field experience with breeding and singing birds is absolutely necessary.

The nomenclature is interesting. There is, of course, the perfectly good possibility that *E. fulvipectus* Lawrence, 1871, may be the same as *Tyrannula affinis* Swainson, 1827, as Salvin and Godman insisted. This can be determined only by a critical re-examination of the type. In the meantime, *fulvipectus* would be the specific name, even if *griseus* is regarded as conspecific; but if *wrightii* proves to belong to this assemblage, all the forms discussed above become races of *wrightii*.

Specimens from Guerrero and Oaxaca recorded by Sclater and Salvin as *affinis* (=*fulvipectus*) should be critically redetermined. They are probably *trepidus*.

(403) **Empidonax difficilis salvini** Ridgway

Empidonax salvini Ridgway, Ibis, 1886, p. 459 (Calderas, Volcan de Fuego, Guatemala); Dickey and Van Rossem, Auk, 1928, p. 359 (crit.).

Range.—Known only from three definite specimens from the Pacific cordillera of Guatemala, but others probably in the British Museum.

Messrs. Dickey and Van Rossem were entirely correct in showing that the common green *Empidonax* of the mountains of northern Central America was quite distinct from the type of *E. salvini* Ridgway, although subsequently Ridgway confused the two, and his description in the 'Birds of North and Middle America' actually applies to *dwighti* and not *salvini*. It is practically certain that Salvin confused the two also. (See next species for synonymy.) While, therefore, it is entirely clear what *dwighti* is, it remains to be determined just what *salvini* is. Dickey and Van Rossem regarded the type of *salvini* as unique. This is not quite the case. In the Museum of Comparative Zoölogy, there is a specimen from Dueñas collected by Salvin. Originally labeled *bairdi*, it was changed to *salvini*, and it is sharply distinct from *dwighti*. It is obvious that *salvini* is at most a race of *bairdi* and a very poor one. This last bird, now properly treated as a race of *difficilis*, was scarcely represented in America at the time *salvini* was described, and is still a rare bird in all American museums except Cambridge. Here there are two specimens from Orizaba, and a large series of breeding specimens from the mountains of southern Tamaulipas. I am quite unable to separate the Dueñas bird from any of these, and am strongly inclined to believe that *difficilis bairdi* is migratory, and that the type of *salvini* and the Dueñas specimen are winter migrants of that form, which would account for the minutely greener and yellower color of the type.

This opinion is strengthened by my good fortune in rediscovering *E. salvini* the past summer, as I collected a young male in a dry wooded copse back of Panajachel on August 15, 1930. Migrating individuals of *Empidonax* were already fairly common on this date, this particular little copse had repeatedly been combed for birds, and I am almost certain that the individual I collected was a migrant. It agrees minutely with the type and the Dueñas specimen discussed above.

I think, however, that further specimens are needed before *salvini* can finally be regarded as the winter plumage of *difficilis bairdi*.

(404) **Empidonax flavescens dwighti** Dickey and Van Rossem

Empidonax flavescens dwighti Dickey and Van Rossem, Auk, 1928, p. 359 (Los Esesmiles, Chalatenango, Salvador; Coban, Volcan San Lucas, Volcan de Agua, Finca Sepur, and Tecpam, Guatemala, in range).

Empidonax salvini, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1889, p. 75 (Choctum; Calderas ?; above San Diego); Ridgway, 'Birds N. and Mid. America,' pt. 4, 1907, p. 582 (as to description, but not as to the type).

Tecpam, 1 ♀; Finca Sepur, 1 ♂, 1 ♀; Volcan San Lucas, 2 ♂, 4 ♀; Antigua, 1 ♀.

RANGE.—Subtropical Zone: mountains of Chiapas to northern Nicaragua.

It is, of course, impossible to decide to what species Salvin's specimens in the British Museum belong. They may include both. Those from Calderas are topotypes of *salvini* and probably belong there.

(405) **Empidonax albigularis albigularis** Sclater and Salvin

Empidonax albigularis, SCLATER AND SALVIN, Ibis, 1859, p. 122 (Dueñas, Guatemala); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1889, p. 70 (Dueñas only); RIDGWAY, *loc. cit.*, p. 584.

Volcan San Lucas, 1 ♂ (breeding); Pantaleon, 1 ♂.

RANGE.—Upper Tropical Zone: southern Mexico to western Panama; the race, known only from Guerrero and western Guatemala.

This rare and little-known species is one of the exceedingly critical members of the genus, and numerous authors have fallen into error in treating it, among them unfortunately myself. The following summary is offered in the hope that it may prove helpful to future workers.

Empidonax albigularis Sclater and Salvin

SPECIFIC CHARACTERS.—Wing and tail proportions normal; tail double rounded, with conspicuously lighter outer webs to outer pair of tail-feathers; bill very broad, width at base more than three-fourths the length of exposed culmen; size small (wing 60–63); outer primary averaging 5 mm. shorter than 5th, about as long as 4th; bend of wing, under wing-coverts and thighs cinnamon-buff; brownest member of the genus above; throat whitish in marked contrast with the abruptly darker chest.

RANGE.—Imperfectly known, but the only resident tropical member of the genus in Central America. All definite breeding records, however, are from 2500 to 5000 feet above sea-level. All lowland tropical records are based on specimens taken at other seasons. There is no evidence as yet of any migration, other than a possible descent to lower levels in the non-breeding season. Recorded from central Mexico to western Panama, definitely known to breed in Vera Cruz, the highlands of Guatemala, northern Nicaragua and Costa Rica.

SEASONAL VARIATION.—The only two fall specimens examined do not differ appreciably from spring specimens. Worn breeding birds appear darker above, and more uniformly colored below. Superficially they very closely resemble *E. minimus*, but are separable on their structural characters, and the buff thighs and under wing-coverts.

RACIAL VARIATION.—The Dwight Collection fortunately contains the first topotypes from western Guatemala ever to reach the United States. For many years this species was known to American ornithologists only from Vera Cruz and Puebla skins, and the description of *E. timidus* Nelson from Durango was based on a comparison with Vera Cruz birds. Years later breeding material reached The American Museum of Natural History from Nicaragua and Costa Rica. These birds were again compared with old Vera Cruz skins, and quite incorrectly described as *australis* Miller and Griscom (Amer. Mus. Novit., No. 159, 1925, p. 5), as events have proved.

Thanks to the great kindness of the Biological Survey, the unique type of *E. timidus* Nelson is before me, as well as the combined collections of the American Museum and the Museum of Comparative Zoölogy, totalling fifteen specimens. The outstanding facts brought out by this material are (1) that post-mortem change to a browner, less olive, tone is very marked in this species, (2) that the characters of *australis* Miller and Griscom are nothing but the difference between old and freshly killed specimens, (3) that specimens from western Guatemala (topotypes) are subspecifically distinct from Vera Cruz and other specimens from eastern Central America, and (4) that the type of *E. timidus* Nelson, allowing for post-mortem change, is inseparable from true *E. albigularis*.

Most fortunately, my material includes old and recent specimens from both Vera Cruz and Costa Rica. A Vera Cruz bird (1926) is quite distinct from old specimens killed between 1888–1897, but is inseparable from southern specimens recently killed. Similarly an old Costa Rican skin shot in the early nineties does not show any of the alleged characters of *australis*, but agrees perfectly with old Vera Cruz specimens. The type of *E. timidus* has undergone similar post-mortem change; so much so, that the original description, published in 1900, no longer applies. It is interesting to note, however, that it was described as generally PALER than *albigularis* (Vera Cruz specimens) and still is today. So are recently killed specimens of *albigularis* from western Guatemala paler than recently killed specimens from Vera Cruz and other parts of Central America. As the differences between *E. timidus* and *E. albigularis* from western Guatemala are exactly the same as those between old and recent specimens from Vera Cruz and Costa Rica, it is obvious that *E. timidus* is a synonym of typical *albigularis*, which is a paler, western subspecies, and that there is an eastern, more richly colored race from Vera Cruz to western Panama, which most unfortunately has to be called by the utterly inappropriate name *australis* Miller and Griscom, the characters of which are totally different from those alleged in the original description. A summary follows.

(1) *E. albigularis albigularis* Sclater and Salvin.—Western Mexico (Durango) to western Guatemala (Dueñas; Volcan San Lucas, breeding; Pantaleon). Specimens recorded by Salvin and Godman from Guerrero undoubtedly belong here. Generally paler above and below; less yellow and less contrasted below; buff of thighs and under wing-coverts paler, less cinnamon.

(2) *E. albigularis australis* Miller and Griscom.—Eastern Central America from Vera Cruz and Puebla (Huexotitla) through eastern Guatemala (Coban) and eastern Honduras (Lancetilla) to the highlands of Nicaragua and Costa Rica (breeding) and western Panama (Chiriquicito). A very old record from the Canal Zone should be redetermined for correct specific identity.

(406) **Empidonax albigularis australis** Miller and Griscom

Empidonax albigularis australis Miller and Griscom, Amer. Mus. Novit., No. 159, 1925, p. 5 (San Rafael del Norte, Nicaragua).

Empidonax albigularis, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1889, p. 70 (as to Coban only).

Range.—Southeastern Mexico and eastern Central America to western Panama.

(407) **Empidonax fulvifrons fusciceps** Nelson

Empidonax fulvifrons fusciceps Nelson, Proc. Biol. Soc. Wash., XVII, 1904, p. 152 (Comitan, Chiapas, Mexico); Dearborn, 1907, p. 104 (Lake Atitlan, Tecpam); Ridgway, *loc. cit.*, p. 592.

Empidonax fulvifrons, Salvin and Godman, 'Biol. Cent. Amer.,' p. 69, II, 1889, (Dueñas, Quetzaltenango).

Quetzaltenango, 1 ♂.

Range.—Mountains of Arizona and New Mexico south to Guatemala; the race, Chiapas and western Guatemala.

A very distinct, richly colored subspecies.

(408) **Mitrephanes phæocercus phæocercus** (Sclater)

Mitrephorus phæocercus Sclater, P. Z. S., 1859, p. 44 (Cordoba, Vera Cruz).

Mitrephanes phæocercus, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1889, p. 66 (in part, as to Coban).

Range.—Subtropical Zone: western Mexico to western Panama; the race, southeastern Mexico and northern Guatemala.

The typical race of this flycatcher occurs in the highlands of Alta Vera Paz. I have seen two old trade-skins in The American Museum of Natural History.

(409) **Mitrephanes phæocercus quercinus** Dickey and Van Rossem

Mitrephanes phæocercus quercinus Dickey and Van Rossem, Proc. Biol. Soc. Wash., XL, 1927, p. 2 (Mt. Cacaguatique, San Miguel, El Salvador).

Mitrephanes phæocercus part, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1889, p. 66 (as to Volcan de Fuego, Dueñas, ridge above Totonicapam, Quetzaltenango); Ridgway, *loc. cit.*, p. 498.

Chichicastenango, 1 ♂; Chanquejelve, 1 ♂, 1 ♀; near Guatemala City, 1 ♂, 1 ♀; Tecpam, 2 ♂, 5 ♀, 2 (?).

Range.—Western Guatemala and Salvador.

For some years I have known that the bird in the Pacific highlands of Guatemala was a very distinct dark and richly colored subspecies. It has recently been described from Salvador material by Messrs.

Dickey and Van Rossem. The latter has examined the Dwight material, and has labelled some of the specimens *quercinus*, a determination with which I am naturally in hearty accord. The race from Nicaragua described by Miller and me is a connecting link with *aurantiiventris* of Costa Rica, but I cannot agree with Dr. Hellmayr that the South American forms are conspecific. I have had the advantage of being able to compare all the described forms directly, and *berlepschi eminulus* Nelson is specifically distinct from the *phæocercus* group, in spite of the race *vividus* Griscom from Veraguas (cf. Amer. Mus. Novit., No. 280, 1927, p. 11).

A common and characteristic species of the pine and oak forests from 5000 to 8000 feet. Other races farther south are, however, characteristic of the cloud forest in the Subtropical Zone.

(410) **Xenotriccus callizonus** Dwight and Griscom

Xenotriccus callizonus Dwight and Griscom, Amer. Mus. Novit., No. 254, 1927. pp. 1 and 2 (Panajachel, Lake Atitlan, Guatemala).

Panajachel, 2 ♂.

Range.—Known only from the type locality.

By all odds the most surprising discovery made in Central America in recent years. This general region has been as thoroughly explored as any part of Central America and was the last place where one would have expected to find a new and remarkable genus. It must be a rare and vanishing relict. Mr. Anthony, most unfortunately, was unable to secure further specimens, nor was there anything special or peculiar in the type of country in which he found his two birds. (Fig. 11.)

One of the main objects of my trip to Guatemala in August, 1930, was the hope of collecting another specimen of *Xenotriccus*. Crosby and I accordingly spent nine days at Panajachel, and I did practically nothing else but search for this particular flycatcher. I must admit that it was the most discouraging quest in which I was ever engaged, and that *Xenotriccus* proved to be a very small needle in an enormous haystack.

The afternoon of our arrival Crosby went for a stroll up the mountain road to Sololá, and at an altitude of 1000 feet above the lake, the road was cut out of the volcanic tufa, leaving a cliff some twenty feet high. The jungle had been cut back, and the summit of the cliff was covered with a dense patch of bushes about three feet high. A small flycatcher appeared in one of these bushes on the edge of the cliff, and Crosby shot it in the reasonable expectation of having it fall to his feet.

By ill luck it caught in the base of the bush. It took Crosby half an hour to scale the cliff farther up the road and work back along the top to the bush containing the flycatcher. He was just about to retrieve it, when the ground gave way, and he fell heavily to the road. Fortunately uninjured but badly jarred, he picked himself up to discover that he had fallen on top of the bush and the bird, which was squashed flat, with the rear half destroyed. It was an adult *Xenotriccus*, but could not be preserved.

Eight days later I was hiding in a bamboo thicket half-way up the side of a little barranca near the village. It was almost impenetrable, and so dark that the colors of birds only ten or fifteen feet away were indistinguishable. Hearing a sweet whistled note, suggesting the call of the Yellow-bellied Flycatcher, I whistled back and noted that the bird was coming nearer and nearer. I finally made out a small flycatcher flitting restlessly about, never more than a foot from the ground, and finally secured it with a 22 cartridge loaded with dust shot. It proved to be an immature *Xenotriccus*, with the cinnamon breast-band just coming in.

(411) **Terenotriccus erythrurus fulvigularis** (Salvin and Godman)

Myiobius fulvigularis Salvin and Godman, 'Biol. Cent. Amer.,' II, 1889, p. 58 (Santa Fé, Veraguas).

Terenotriccus erythrurus fulvigularis, Dearborn, 1907, p. 104 (Los Amates); Ridgway, *loc. cit.*, p. 495.

Range.—Tropical Zone: Amazonia and Guiana to eastern Guatemala.

This widely distributed rain-forest species decreases rapidly north of Costa Rica.

(412) **Myiobius sulphureipygius sulphureipygius** (Sclater)

Tyrannula sulphureipygia Sclater, P. Z. S., 1856, p. 296 (Cordova, Vera Cruz, Mexico).

Myiobius sulphureipygius, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1889, p. 57 (Rio de la Pasion, Choctum).

Myiobius xanthopygus sulphureipygius, Ridgway, *loc. cit.*, p. 490.

Secanquim, 3 ♂, 5 ♀.

Range.—Humid Tropical Zone: southern Mexico to western Ecuador; the race, Mexico, Guatemala and British Honduras.

One of the many rain-forest species uncommon to rare north of southeastern Nicaragua.

(413) **Onychorhynchus coronatus mexicanus** (Sclater)

Muscivora mexicana SCLATER, P. Z. S., 1856, p. 295 (Cordova, Vera Cruz, Mexico); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1889, p. 53 (Rancho Chahak, Tuilha, Choctum, El Paraiso, Chisec); LANTZ, 1899, p. 222 (Santo Tomas).

Onychorhynchus mexicanus mexicanus, RIDGWAY, *loc. cit.*, p. 355 (Santo Tomas, etc.); DEARBORN, 1907, p. 103 (Patulul).

Secanquim, 3 ♂, 3 ♀.

RANGE.—Tropical Zneo: Amazonia and Guiana to southern Mexico; the race, Mexico to western Panama.

Having seen nearly one hundred specimens from Central America, and good series, including the type, of *fraterculus* Bangs from Santa Marta, I cannot agree with either Ridgway or Hellmayr in the ranges assigned to these two races. There are no satisfactory color differences, and the disadvantage of relatively small series has resulted in one trained observer diagnosing *fraterculus* as darker, while another regards it as paler! This race is a smaller extreme with a shorter bill, and is best restricted to the type locality and Panama east of the Canal Zone.

According to Salvin, not uncommon in the low heavy forest in Guatemala.

(414) **Platyrinchus cancrominus cancrominus** Sclater and Salvin

Platyrhynchus cancrominus SCLATER AND SALVIN, P. Z. S., 1860, p. 299 (Choctum, Vera Paz, Guatemala); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1888, p. 5 (Teleman, San Diego, El Paraiso).

Platytriccus cancrominus, RIDGWAY, *loc. cit.*, p. 382.

RANGE.—Tropical Zone: southern Mexico south to northern Costa Rica.

In default of specimens I cannot determine the birds from the Pacific lowlands subspecifically. They are not likely to be *dilutus* Miller and Griscom, a paler form, thus far recorded definitely only from a restricted lowland forest area in western Nicaragua in a drier climate.

This species is abundantly distinct from its numerous allies in South America.

(415) **Tolmomyias sulphurescens cinereiceps** (Sclater)

Cyclorhynchus cinereiceps SCLATER, Ibis, 1859, p. 443 (Oaxaca, Mexico).

Rhynchocyclus cinereiceps, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1888, p. 10 (Chisec, Choctum, Cahabon, San Diego, Escuintla); RIDGWAY, *loc. cit.*, p. 280 (Naranjo); DEARBORN, 1907, p. 103 (Los Amates, Mazatenango, Patulul).

Finca Chamá, 1 ♂, 1 ♀; Chimoxan, 2 ♂; Secanquim, 4 ♂, 3 ♀ 1 (?); Finca Sepacuite, 3 ♂; Puebla, 2 ♂, 2 ♀; Hacienda California, 1 ♂, 2 ♀, 1 (?); Finca Caro-

lina, 1♂, 1♀; Finca El Espino, 1 ♂; San Felipe, 1♂, 1♀; Pantaleon, 4♂, 1♀; Finca El Cipres, 11♂, 8♀, 6 (?).

RANGE.—Tropical Zone: Argentina to southern Mexico; the race, Mexico to western Panama.

A common forest bird on the Pacific as well as the Caribbean side of Central America. Mr. Anthony found it nesting in May at Finca Chamá.

(416) **Rhyncocyclus brevirostris brevirostris** (Cabanis)

Cyclorhynchus brevirostris CABANIS, Arch. Natur., XIII, 1847, p. 249 (Jalapa, Mexico).

Rhynchocyclus brevirostris, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1888, p. 8 (Choctum, La Trinidad, Volcan de Fuego).

Craspedoprion brevirostris, RIDGWAY, *loc. cit.*, p. 388.

Secanquim, 1♀; Finca El Soche, 1♂.

RANGE.—Tropical Zone: Brazil to southern Mexico; the race, Mexico to western Panama.

Recent collections from eastern Panama show that a representative of *brevirostris* of Central America and *olivaceus bardus* Bangs and Barbour occur together, indicating their specific distinctness.

The Flat-billed Flycatcher is not a common bird in Central America, but occurs in the tropical lowlands of both coasts, wherever there is heavy forest.

(417) **Todirostrum cinereum finitimum** Bangs

Todirostrum cinereum finitimum BANGS, Proc. Biol. Soc. Wash., XVII, 1904, p. 114 (San Juan Bautista, Tabasco, Mexico); RIDGWAY, *loc. cit.*, p. 364 (Naranjo, etc.); DEARBORN, 1907, p. 102 (Los Amates, San José).

Todirostrum cinereum, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1888, p. 12 (Choctum, Coban, Dueñas, Escuintla, Retalhuleu); LANTZ, 1899, p. 222 (Naranjo).

Hacienda California, 10♂, 10♀; Finca El Cipres, 3♂, 3♀, 1 (?); San José, 3♀; Pantaleon, 1♂.

RANGE.—Tropical Zone: Brazil and Peru to southern Mexico.

A common bird in Guatemala in the lowlands.

"Very common in the lowlands of the Pacific side. At Hacienda California they were equally abundant in May and October in the hedge-rows along the roads and edges of the pasture-lands. A nest, found at this station, June 5, was about twenty feet from the ground, in a very thorny tree. It had the appearance of being a mere rag of dry grass,

hanging from a twig. It was some two and a half inches in diameter, by seven in length, the entrance being a very small hole in one side, scarcely noticeable. The young were about ready to leave at this date. On June 26 a full-fledged young was taken at this station." (Anthony, MS.)

(418) **Todirostrum sylvia schistaceiceps** Sclater

Todirostrum schistaceiceps SCLATER, Ibis, 1859, p. 444 (Oaxaca, Mexico); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1888, p. 13 (Choctum); RIDGWAY, *loc. cit.*, p. 367.

Secanquim, 2 ♀, 2 (?); Finca Sepacuite, 3 ♂, 2 ♀.

RANGE.—Tropical Zone: northern Brazil to southern Mexico; the race, Central America to the Canal Zone.

This species is far less common in northern Central America than the last. In southern Central America it is rare or absent, where *T. nigriceps* occurs.

(419) **Oncostoma cinereigulare** Sclater

Oncostoma cinereigulare SCLATER, P. Z. S., 1856, p. 295 (Cordova, Vera Cruz, Mexico); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1888, p. 14 (Coban, Teleman, Choctum, Savana Grande, above San Diego, Retalhuleu); DEARBORN, 1907, p. 102 (Patulul); RIDGWAY, *loc. cit.*, p. 358.

Secanquim, 5 ♂, 1 ♀, 2(?); Finca Chamá, 2 ♂, 1 ♀; Chimoxan, 1 ♂; Hacienda California, 4 ♂, 1 ♀, 1(?); Finca El Espino, 1 ♂, 1(?).

RANGE.—Tropical Zone: southern Mexico to extreme western Panama; a closely related species or race, eastern Panama and northern Colombia.

With ample field experience of both *cinereigulare* and *olivaceum* I am inclined to keep them specifically distinct. There are no intermediates, and there is a considerable gap between the two: almost all Chiriqui and the whole of Veraguas. In most of Central America *O. cinereigulare* is much commoner on the Pacific slope. The genus is probably endemic in Central America, and the shape of the bill is unique in this enormous family.

(420) **Elainea flavogaster subpagana** Sclater and Salvin

Elainea subpagana SCLATER AND SALVIN, Ibis, 1860, p. 36 (Dueñas, Guatemala).

Elainea pagana, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1888, p. 35 (Sakluk, Dueñas).

Elainea martinica subpagana, RIDGWAY, *loc. cit.*, p. 429.

Elaenea flavogastra subpagana, DEARBORN, 1907, p. 102 (Lake Atitlan).

Secanquim, 1 ♂; Finca Chamá, 1 ♂,1 juv.; Finca Sepacuite, 1 ♂, 1 ♀, 1 juv.; Panajachel, 1 ♂; San Lucas, 1 ♂, 2 ♀; San Felipe, 1 ♂; San José, 1 ♂.

RANGE.—Tropical Zone: Argentina to southern Mexico; the race, Central America.

This noisy flycatcher prefers open country and clearings. It is ubiquitous in southern Central America, but is relatively local and uncommon northward.

"Not common at any station, but more so, perhaps, at Sepacuite, where it was found nesting in May. A nest was saddled to the upper side of a bamboo, about twenty-five feet from the ground, where it was quite inaccessible. From the ground the nest appeared to be similar to that of an *Empidonax*." (Anthony, MS.)

(421) **Elainea obscura frantzii** Lawrence

Elainea frantzii LAWRENCE, Ann. Lyc. Nat. Hist. N. Y., VIII, 1867, p. 172 (San José, Costa Rica); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1888, p. 36 (Dueñas, Volcan de Agua, Barranco Hondo, Medio Monte, San Pedro Martir); RIDGWAY, *loc. cit.*, p. 434.

RANGE.—Argentina and Brazil to Guatemala; the race, Subtropical Zone, Guatemala to western Panama.

This species is common in the cloud forest as far north as Nicaragua, but is apparently very rare or local in Guatemala. Salvin is the only man who ever obtained specimens. The imposing list of localities all boil down to the ridge between the great volcanoes, Agua and Fuego.

(422) **Elainea viridicata placens** Sclater

Elainea placens SCLATER, P. Z. S., 1859, p. 46 (Cordoba, Vera Cruz, Mexico).

Myiopagis placens, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1888, p. 27 (Coban, Cahabon, Choctum, Retalhuleu); RIDGWAY, *loc. cit.*, p. 401.

Elainea viridicata placens, DEARBORN, 1907, p. 102 (Los Amates, San José, Mazatenango).

Finca Chamá, 2 ♂, 2 ♀; Finca Carolina, 1 ♂, 1(?); Finca Cipres, 2 ♂, 1 ♀, 1(?); San José, 1 ♂.

RANGE.—Tropical Zone: Argentina to Mexico; the race, northern Central America.

Abundant throughout the lowlands of Guatemala.

(423) **Camptostoma imberbe** Sclater

Camptostoma imberbe SCLATER, P. Z. S., 1857, p. 203 (San Andres Tuxtla, Vera Cruz, Mexico); RIDGWAY, *loc. cit.*, p. 414.

Ornithion imberbe, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1888, p. 30 (Escuintla).

Progreso, 3 ♂, 1 ♀; Hacienda California, 1 ♂, 1(?).

RANGE.—Arid Tropical Fauna: Arizona and Texas through western Central America to northwestern Costa Rica.

The Beardless Flycatcher seems to have been overlooked in Guatemala, as it is common in Mexico and abundant in western Nicaragua. It is a typical member of the Arid Tropical Fauna, occupying every section of it and, as is usual, is very distinct from its South American allies, in contradistinction to representatives of rain-forest species.

(424) **Tyranniscus vilissimus vilissimus** (Sclater and Salvin)

Elainea vilissima SCLATER AND SALVIN, Ibis, 1859, p. 122 (Coban, Vera Paz, Guatemala).

Tyranniscus vilissimus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1888, p. 33 (Dueñas, Calderas, Tactic, Choctum, Coban); RIDGWAY, *loc. cit.*, p. 408.

Secanquim, 6 ♂, 4 ♀; Finca Sepacuite, 2 ♂, 3 ♀; Barrillos, 1 ♀; Finca Carolina, 3 ♀; Quetzaltenango, 2 ♀.

RANGE.—Tropical Zone: Guatemala to northern Venezuela; the race, northern Central America.

Abundant in the Caribbean lowlands, occasionally straggling up to 7000 feet, according to Salvin.

(425) **Microtriccus semiflavus** (Sclater and Salvin)

Tyrannulus semiflavus SCLATER AND SALVIN, P. Z. S., XXVIII, 1860, p. 300 (Choctum, Vera Paz, Guatemala); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1888, p. 32 (Choctum).

Microtriccus semiflavus, RIDGWAY, *loc. cit.*, p. 791.

RANGE.—Humid Tropical Zone: southern Mexico to northern Costa Rica.

A remarkable little genus, the other species, *brunneicapillus*, ranging from Costa Rica to western Ecuador. Both are rare birds in collections, particularly *semiflavus*. The genus is closely related to *Acrochordopus* of the Subtropics and *Ornithion* of the Orinoco and Amazon region, of which it might well be the northern and western representative.

(426) **Leptopogon amaurocephalus pileatus** Cabanis

Leptogon pileatus CABANIS, Journ. für Orn., 1865, p. 414 (Guatemala); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1888, p. 25 (Choctum); RIDGWAY, *loc. cit.*, p. 464 (Gualan).

Chimoxan, 1 ♂.

RANGE.—Humid Tropical Zone: Argentina to Mexico; the race, northern Central America.

An exceedingly rare and little-known bird in the whole of Central America.

(427) **Pipromorpha oleaginea assimilis** (Sclater)

Mionectes assimilis SCLATER, P. Z. S., 1859, p. 46 (Cordoba, Vera Cruz, Mexico).
Mionectes oleagineus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1888, p. 22 (Choctum, Coban, Lanquin, above San Diego, Retalhuleu).
Pipromorpha assimilis assimilis, RIDGWAY, *loc. cit.*, p. 455 (Cajabon, Naranjo); DEARBORN, 1907, p. 102 (Patulul).

Secanquim, 17 ♂, 5 ♀, 1 (?); Chipoc, 1 ♂; Finca Sepacuite, 5 ♂, 7 ♀; Barrillos, 1 ♀; Finca El Cipres, 5 ♂, 6 ♀; La Carolina, 2 ♂; Finca El Espino, 1 (?).

RANGE.—Tropical Zone: Amazonia to Mexico; the race, northern Central America.

Specimens from the Pacific lowlands average slightly paler and duller below, but they are mostly August specimens, and these slight differences are undoubtedly seasonal.

"Abundant on both sides of the Republic." (Anthony, MS.)

FAMILY **PIPRIDÆ.**[1] MANNIKINS

(428) **Pipra mentalis mentalis** Sclater

Pipra mentalis SCLATER, P. Z. S., 1856, p. 299 (Cordova, Vera Cruz, Mexico); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1890, p. 109 (Choctum, Yzabal); DEARBORN, 1907, p. 100 (Los Amates); RIDGWAY, 'Birds N. and Mid. Amer.,' pt. 4, 1907, p. 746.

Secanquim, 8 ♂ ad., 2 ♂ imm., 9 ♀; Chimoxan, 3 ♂ imm., 2 (?); Finca Chamá, 2 ♀.

RANGE.—Tropical Zone: southern Mexico to west Ecuador; the race, northern Central America.

In northern Central America this little Manakin is exclusively confined to the Caribbean lowlands, where it is common.

[1]Hellmayr's arrangement followed here '(Cat. Birds Americas,' pt. 6, Field Mus. Pub., No. 266).

(429) **Chiroxiphia linearis** (Bonaparte)

Pipra linearis BONAPARTE, P. Z. S., 1837, p. 113 ("Mexico").

Chiroxiphia linearis, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1890, p. 112 (above San Diego, La Trinidad, Medio Monte, Savana Grande, Retalhuleu).

Chiroprion linearis, RIDGWAY, *loc. cit.*, p. 740 (Naranjo, etc.); DEARBORN, 1907, p. 101 (Mazatenango, Patulul).

RANGE.—Arid Tropical Fauna: Oaxaca to southwestern Costa Rica.

I am very doubtful of the propriety of treating *linearis* as specifically distinct from *lanceolata* of western Panama southward. It is entirely a matter of opinion.

A far from uncommon bird on the Pacific slope of Guatemala, ranging up to 3500 feet. It is a curious coincidence that Mr. Anthony should have failed to find it.

(430) **Manacus candei** (Parzudaki)

Pipra candei PARZUDAKI, Rev. Zool., 1841, p. 306 (Truxillo, Honduras).

Chiromachæris candei, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1890, p. 114 (Peten, Choctum, Teleman, Yzabal).

Manacus candei, RIDGWAY, *loc. cit.*, p. 731 (Lanquin, Livingston); DEARBORN, 1907, p. 101 (Puerto Barrios).

Chipoc, 1 ♂ imm.; Secanquim, 7 ♂ ad., 2 ♂ imm., 5 ♀.

RANGE.—Caribbean rain forest from southern Mexico to eastern Costa Rica.

The genus *Manacus* is of unusual interest among tropical rain-forest birds in Central America, in that all three representatives are unquestionably distinct species, and specifically distinct from *vitellinus*, their closest South American relative.

A common bird in eastern Guatemala. Crosby and I found it common in the heavy forest east of Puerto Barrios.

(431) **Schiffornis turdinus veræ-pacis** (Sclater and Salvin)

Heteropelma veræ-pacis SCLATER AND SALVIN, P. Z. S., 1860, p. 300 (Choctum, Vera Paz, Guatemala); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1890, p. 116 (Choctum, Yzabal).

Scotothorus veræ-pacis, DEARBORN, 1907, p. 101 (Los Amates); RIDGWAY, *loc. cit.*, p. 758.

RANGE.—Tropical Zone: Amazonia to southern Mexico; the race, Mexico to western Panama.

The inclusion of this genus in the Pipridæ (and possibly some of its South American allies) spoils what would be a fairly natural and homo-

geneous family, as families go in the Order Passeres. In the first place the characters which would make it a member of the Mesomyodi are only assumed. In the second place ample field experience makes it seem incredible that *Schiffornis* has anything in common with such groups as *Pipra, Chiroxiphia, Manacus,* and *Corapipa,* all of which I know well in life, and all possessing many family characters in common. In life *Schiffornis* is thrush-like in habits and appearance, with large dreamy eyes, and the same shy, secretive ways. It is largely terrestrial, and in the breeding season has a short, but remarkably fine warbled song, with a ringing quality, suggesting two phrases of a super-vireo.

Reported as fairly common in Vera Paz by Salvin.

FAMILY **COTINGIDÆ.**[1] COTINGAS, BECARDS

(432) **Cotinga amabilis** Gould

Cotinga amabilis GOULD, P. Z. S., 1857, p. 64 (Guatemala); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1891, p. 139 (Choctum, Coban, Vera Paz); DEARBORN, 1907, p. 100 (Los Amates); RIDGWAY, 'Birds N. and Mid. Amer.,' pt. 4, 1907, p. 781.

RANGE.—Caribbean rain forest, southern Mexico to eastern Costa Rica.

According to Salvin, not uncommon in Vera Paz.

(433) **Attila spadiceus flammulatus** Lafresnaye

Attila flammulatus LAFRESNAYE, Rev. Zool., 1848, p. 47 ("Colombia"—Vera Cruz, Mexico, substituted by Bangs and Penard, 1922).

Attila citreopygius SALVIN AND GODMAN, (*nec* Bonaparte), 'Biol. Cent. Amer.,' II, 1891, p. 133 (El Zapote, Choctum, Kamkhal).

Attila citreopygia (*nec* Bonaparte) SCLATER AND SALVIN, Ibis, 1859, 120 (Guatemala); LANTZ, Trans. Kansas Acad. Sci., for 1896–1897 (1899), p. 221 (Naranjo).

Attila hypoxanthus SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1891, p. 135 (Vera Paz).

Attila citreopygus salvini, RIDGWAY, *loc. cit.,* p. 808 (Savana Grande, Escuintla ?); DEARBORN, 1907, p. 100 (Los Amates, San José, Patulul, Mazatenango).

Chimoxan, 2 ♂; Hacienda California, 1 ♂; Finca Salache, 1 ♀; La Carolina, 1 ♀ (?).

RANGE.—Tropical Zone: Brazil to Mexico; the race, southern Mexico to Honduras.

The two specimens from Chimoxan are xanthochroic individuals, representing *A. hypoxanthus* Salvin and Godman. The three specimens from the Pacific slope have practically no tinge of yellow below, and

[1]Hellmayr's arrangement followed here ('Cat. Birds Americas,' pt. 6, Field Mus. Pub., No. 266).

would appear to represent a very distinct subspecies to anyone not acquainted with the color vagaries of this bird. They show no approach whatever to either *cinnamomeus* of southwestern Mexico or *citreopygius* of Nicaragua.

"Not rare at Chimoxan but, owing to its shy disposition, very hard to secure." (Anthony, MS.)

(434) **Laniocera rufescens rufescens** (Sclater)

Lipangus rufescens SCLATER, P. Z. S., 1857, p. 276 (Coban, Guatemala).

Aulia rufescens, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1891, p. 130 (Coban).

Laniocera rufescens, RIDGWAY, *loc. cit.*, p. 764.

RANGE.—Tropical Zone: west Ecuador to Guatemala; an ill-defined race in west Ecuador.

This bird is common in eastern Panama, but is one of the rarest of Central American birds. Only three specimens have been obtained in Guatemala, all native trade-skins.

(435) **Rhytipterna holerythra holerythra** (Sclater and Salvin)

Lipangus holerythrus, SCLATER AND SALVIN, P. Z. S., 1860, p. 300 (Choctum, Vera Paz, Guatemala); DEARBORN, 1907, p. 100 (Los Amates); RIDGWAY, *loc. cit.*, p. 820.

RANGE.—Western Ecuador to Guatemala; the race, Central America and eastern Panama.

Not as rare as *Lipangus* (*olim Lathria*) at the northern limit of its range.

(436) **Lipangus unirufus unirufus** Sclater

Lipangus unirufus SCLATER, P. Z. S., 1859, p. 385 (Playa Vincente, Mexico).

Lathria unirufa, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1891, p. 129 (Coban, Choctum); RIDGWAY, *loc. cit.*, p. 823.

RANGE.—Tropical Zone: western Ecuador to Mexico; the race, Mexico to western Panama.

An uncommon to rare bird in northern Central America.

(437) **Pachyrhamphus cinnamomeus cinnamomeus** Lawrence

Pachyrhamphus cinnamomeus LAWRENCE, Ann. Lyc. Nat. Hist. N. Y., VII, 1862, p. 295 (Lion Hill, Panama); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1890, p. 126 (Coban, Choctum); RIDGWAY, *loc. cit.*, p. 840.

RANGE.—Tropical Zone: west Ecuador to southern Mexico.

This species is not common anywhere north of Panama, and decreases rapidly northward.

(438) **Pachyrhamphus polychropterus cinereiventris** Sclater

Pachyrhamphus cinereiventris, Sclater, 'Cat. Amer. Birds,' 1862, p. 242 (Santa Marta, Colombia); Salvin and Godman. 'Biol. Cent. Amer.,' II, 1890, p. 127 (Choctum, 1 specimen).

Pachyrhamphus polychropterus similis, Ridgway, *loc. cit.*, p. 832.

Chimoxan, 1 ♂ ad.

Range.—Tropical Zone: Paraguay to Guatemala; the race, Santa Marta northward.

An exceedingly rare bird in Guatemala, where it is at the extreme northern limit of its range. Having examined many hundred specimens from the whole of Central America, including the types of all the proposed forms, I heartily agree with Peters that only one good subspecies is involved.

(439) **Pachyrhamphus major australis** Miller and Griscom

Pachyrhamphus major australis Miller and Griscom, Amer. Mus. Novit., No. 159, 1925, p. 3 (San Rafael del Norte, Nicaragua).

Pachyrhamphus major, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1890, p. 128 (Choctum, Coban, Dueñas, Medio Monte, Calderas).

Pachyrhamphus major major, Ridgway, *loc. cit.*, p. 835 (Uspantan, Nebaj).

Finca La Primavera, 1 ♂, 1 ♀; San Antonio, 1 ♀; La Montañita, 1 ♂; Finca El Cipres, 2 ♂.

Range.—Tropical Mexico to northern Guatemala; the race, Guatemala southward.

Guatemalan specimens of this species are unsatisfactory intermediates, but on the whole should be referred to the southern race. I note, however, that specimens from high altitudes (6000 feet) are as large as typical *major*, and some trade-skins (presumably from the lowlands of Alta Vera Paz or Peten) show a strong approach to the pale *itzensis* Nelson of Yucatan and British Honduras.

This distinct species is not common in the southern half of its range, and is almost unrecorded between Guatemala and northern Nicaragua. It has a remarkable altitudinal range, often occurring up to 8000 feet, and in Nicaragua has never been found below 4100 feet!

Mr. Anthony writes that it seemed to be confined to the oaks and pines from 3000 to 4000 feet in the sections he visited.

(440) **Platypsaris aglaiæ sumichrasti** Nelson

Platypsaris aglaiæ sumichrasti NELSON, Auk, 1897, p. 52 (Otatitlan, Vera Cruz); RIDGWAY, *loc. cit.*, p. 853 (Coban, Choctum, Cajabon, Chuacus, Uspantan, Quiché, Escuintla); DEARBORN, 1907, p. 100 (Mazatenango, Patulul).

Platypsaris aglaiæ latirostris, RIDGWAY, *loc. cit.*, p. 855 (1 female from western ? Guatemala).

Hadrostomus aglaiæ, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1890, p. 122 (numerous localities, all parts of Guatemala except the east coast).

Secanquim, 2 ♀; San Antonio, 3 ♀; Guatemala City, 1 ♂; San Lucas, 1 ♂, 1 ♀; Panajachel, 2 ♂, 5 ♀; Finca El Espino, 1 ♂, 1 ♀, 1 (?); Finca El Cipres, 7 ♂, 5 ♀; Hacienda California, 9 ♂, 5 ♀; Pantaleon, 1 ♂, 1 ♀; San Felipe, 5 ♂, 1 ♀.

RANGE.—Southern Arizona to Costa Rica; the race, southern Mexico and Guatemala.

This splendid series proves to be surprisingly uniform, though individual variation in this species, especially in females and young males, is unusually great, making subspecific determinations difficult without good series. Males from localities in the central highlands above 5000 feet show a distinct approach to typical *aglaiæ* in having the back lighter than the pileum. It proves to be quite impossible to distinguish Pacific slope from Atlantic slope specimens. I consequently do not record *latirostris* (Bonaparte) from Guatemala. The female examined by Ridgway from an unknown locality may well have been an extreme case of individual variation, so common in this species.

(441) **Platypsaris aglaiæ hypophæus** Ridgway

Platypsaris aglaiæ hypophæus RIDGWAY, Proc. U. S. Nat. Mus., XIV, 1891, p. 467 (San Pedro Sula, Honduras).

RANGE.—Caribbean lowlands, British Honduras to eastern Costa Rica.

This dark subspecies ranges north to at least the northern half of British Honduras, and must consequently occur in the Caribbean lowlands of Guatemala. Ridgway records trade-skins of this subspecies from Guatemala, and I have seen at least four which must unquestionably be referred to *hypophæus*. I have also seen others which are obviously intermediate.

The Rose-throated Becard is an interesting endemic species of Mexico and northern Central America, and the genus, which occurs in Jamaica and southeastern Brazil, is lacking in the southern half. It is really a member of the Arid Tropical Fauna, which has spread northward and into the rain forest. It is uniformly common to abundant on the Pacific slope of Central America, but is an exceedingly rare bird in the

dense rain forest of eastern Nicaragua and Costa Rica. In southern Mexico and Central America it is confined to the Tropical Zone, but farther north and west it ascends to 8000 feet, and occurs in pine forests.

"Well distributed from the coast on the Pacific side to about 6000 feet altitude. At Hacienda California it was a common species and nesting June 25. On this date a nest was found; located about forty feet from the ground and at the end of a slender limb, well out of reach of anything but a light-weight snake. The nest was a bulky bunch of small sticks with a small opening on the side, the whole affair suggesting the nest of a verdin. Both sexes were seen to enter and leave the nest. A similar nest was found at Chamá, but, as before, out of my reach." (Anthony, MS.)

(442) **Tityra semifasciata personata** Jardine and Selby

Tityra personata Jardine and Selby, 'Illustr. Orn.,' I, 1827, Pl. xxiv (Real del Monte, Mexico).

Tityra semifasciata, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1890, p. 118 (Choctum, etc.).

Tityra semifasciata personata, Ridgway, 'Birds N. and Mid. Amer,' pt. 4, 1907, p. 872 (San Geronimo, Iguana, Barranca Hondo, Naranjo); Dearborn, 1907, p. 99 (Los Amates, El Rancho, Mazatenango, Patulul).

Finca Chamá, 2 ♂; Finca Sepacuite, 1 ♂, 2 ♀; Finca La Primavera, 2 ♂, 2 ♀; Secanquim, 5 ♂, 3 ♀; La Montañita, 1 ♀; Hacienda California, 1 ♀; La Carolina, 4 ♂, 4 ♀; Finca El Cipres, 5 ♂, 5 ♀; San Felipe, 1 ♂, 1 ♀.

Range.—Tropical Zone: southern Brazil to Mexico; the race, northern Nicaragua to eastern Mexico.

Specimens from the Pacific lowlands are minutely paler and average a trifle larger, but do not show any real approach to the distinct *griseiceps* of southwestern Mexico.

A fairly common bird in the lowlands up to about 4000 feet, found both in gallery and primeval rain-forest. Anthony found a pair at Sepacuite, entering an abandoned woodpecker hole in a dead stump.

(443) **Erator albitorques fraseri** (Kaup)

Psaris fraserii Kaup, P. Z. S., 1851, p. 47 (no locality).

Tityra albitorques, Salvin and Godman, 'Biol. Cent. Amer.,' II, 1890, p. 120 (Peten, Choctum).

Erator albitorques fraseri, Dearborn, 1907, p. 100 (Los Amates).

Range.—Tropical Zone: Peru and Ecuador to southern Mexico; the race, western Panama northward.

A rare bird throughout Central America.

FAMILY **HIRUNDINIDÆ.** SWALLOWS

(444) **Riparia riparia** (Linnæus)

Hirundo riparia LINNÆUS, 'Syst. Nat.,' I, 1758, p. 192 (Sweden).

Cotile riparia, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1883, p. 240 (Dueñas, Yzabal).

Riparia riparia, RIDGWAY, 'Birds N. and Mid. Amer.,' pt. 3, 1904, p. 73.

RANGE.—Northern hemisphere, in the New World wintering south to Brazil and Bolivia.

The Bank Swallow is a migrant only in Central America, and there are strangely few records.

(445) **Iridoprocne bicolor** (Vieillot)

Hirundo bicolor VIEILLOT, 'Ois. Amer. Sept.,' I, 1807, p. 61 (middle eastern United States).

Tachycineta bicolor, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1883, p. 235 (Vera Paz, Dueñas, Pajal Grande, San Geronimo).

Iridoprocne bicolor, DEARBORN, 1907, p. 123 (Lake Atitlan, March 3); RIDGWAY, *loc. cit.*, p. 87.

RANGE.—North America, south in winter to Guatemala.

(446) **Iridoprocne albilinea** (Lawrence)

Petrochelidon albilinea LAWRENCE, Ann. Lyc. Nat. Hist. N. Y., VIII, 1863, p. 2 (Panama).

Tachycineta albilinea, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1883, p. 235 (Peten, Yaxhá, Rio Dulce, Huamuchal, Chiapam, San José).

Iridoprocne albilinea, RIDGWAY, *loc. cit.*, p. 90.

Ocos, 2♂, 1♀; San José, 1♀.

RANGE.—Tropical Zone: Peru to Mexico.

Common in the lowland tropics of both coasts.

(447) **Tachycineta thalassina lepida** Mearns

Tachycineta lepida MEARNS, Proc. Biol. Soc. Wash., XV, 1902, p. 31 (Laguna Mts., San Diego Co., California).

Tachycineta thalassinus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1883, p. 234 (Dueñas, San Geronimo, Coban).

Tachycineta thalassina lepida, RIDGWAY, *loc. cit.*, p. 95 (Hacienda Chancol, etc.).

Zanjon, 1♂; San Mateo, 1♂; Chanquejelve, 4♂; Chichicastenango, 2♂, 3♀.

RANGE.—Western North America, south in winter to Costa Rica.

A regular winter visitant in the highlands from November to March. All our specimens were shot in January and February. None show any approach in coloration to typical *thalassina*, though several are quite large.

(448) **Hirundo erythrogaster** Boddaert

Hirundo erythrogaster Boddaert, 'Tabl. Pl. Enl.,' 1783, p. 45 (Cayenne); Salvin and Godman, 'Biol. Cent. Amer.,' I, 1883, p. 232 (Dueñas, San Geronimo, Yzabal); Ridgway, *loc. cit.*, p. 80.

Progreso, 1 ♀ (Nov. 2).

Range.—North America, wintering from Southern Mexico to Argentine.

An abundant transient, "arriving the first days in September and leaving again in April." (Salvin.)

"Not uncommon as a migrant and winter resident but at no time were they seen in large numbers. Usually associated with the Rough-wings, or in small, migrating flocks. At Ocos in early October this species was seen for several days migrating to the east, the trend of the shore-line being almost east and west at this point. The flight was almost continuous but widely scattered and not in flocks." (Anthony, MS.)

(449) **Hirundo tytleri** Jerdon

Hirundo tytleri Jerdon, 'Birds Ind.,' III, 1864, p. 870; Sharpe and Wyatt, 'Monog. Hirund.,' 1894, p. 249 (Dueñas, Guatemala); Pará, Brazil.

Range.—Eastern Asia; of alleged accidental occurrence in the New World.

Of purely accidental occurrence in the New World. Mr. Ridgway has suggested that the Guatemala specimen may be an abnormally dark individual of *erythrogaster*.

(450) **Progne chalybea chalybea** (Gmelin)

Hirundo chalybea, Gmelin, 'Syst. Nat.,' I, 1788, p. 1026 (Cayenne).

Progne chalybea, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1883, p. 225 (Peten, Cahabon, Dueñas, Escuintla, Retalhuleu, San Geronimo); Dearborn, 1907, p. 123 (El Rancho); Ridgway, *loc. cit.*, p. 40.

Hacienda California, 2 ♂, 3 ♀, 1 imm.

Range.—Tropical Zone: Paraguay to southern Texas; a race in temperate South America.

Generally distributed in the lowlands, ranging up to 5000 feet.

"Not uncommon at Hacienda California in June. At Coban, martins were abundant in the settlement and seemed to be nesting in the dome of one of the churches, in late April and early May. I was unable to secure specimens, so cannot be sure as to the species." (Anthony, MS.)

(451) **Notiochelidon pileata** (Gould)

Atticora pileata GOULD, P. Z. S., 1858, p. 355 (Guatemala); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1883, p. 230 (Coban, Quiché, Totonicapam, Quetzaltenango, Barranco de los Chocoyos, Calderas, Barsinas, Villa Lobos, Aceytuno).

Notiochelidon pileata, RIDGWAY, *loc. cit.*, p. 66 (Volcan de Santa Maria); DEARBORN, 1907, p. 123 (Tecpam).

Zanjon, 2♂, 1♀; Momostenango, 2♀; Chichicastenango, 6♂, 4♀; Nebaj, 1♂; Volcan San Lucas, 2♂; Antigua, 1♂; Panajachel, 4♂, 2♀, 2 imm.; La Montañita, 1♂.

RANGE.—A monotypic genus endemic in the mountains of Guatemala.

A common town bird, now extensively domesticated, but still nesting in caves and banks as well.

"A common resident of the highlands. Nesting on the slopes of Volcan de Agua in May and at Nebaj in April. On the twenty-sixth of that month a colony was found nesting in a cave which was not large enough to permit my entrance but seemed to contain several pairs. In late August flocks were perched on the telegraph wires near Panajachel and, so far as I could see, not mixed with any other species, though at Chichicastenango in December and January they were flocking with the Violet-green Swallow, over the high ridges above the town." (Anthony, MS.)

(452) **Petrochelidon albifrons melanogaster** (Swainson)

Hirundo melanogaster SWAINSON, Philos. Mag., I, 1827, p. 366 ("Tableland of Mexico").

Petrochelidon swainsoni, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1883, p. 227 (Dueñas, Godines).

Petrochelidon lunifrons melanogaster, RIDGWAY, *loc. cit.*, p. 51

RANGE.—Arizona and western Mexico; on migration southward and presumably wintering in southern South America.

All three forms of the Cliff Swallow pass through Central America on migration, but there are very few records, as migrating flocks do not afford the collector much opportunity to obtain specimens. Cliff Swallows of some sort were noted by Anthony at Progreso on September 8.

(453) **Stelgidopteryx ruficollis serripennis** (Aubudon)

Hirundo serripennis AUDUBON, 'Orn. Biog.,' IV, 1838, p. 593 (Charleston, South Carolina).

Stelgidopteryx serripennis, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1883, p. 237 (Dueñas, Rio Guacalate, San José, Retalhuleu, Coban, Rio Dulce, San Geronimo); DEARBORN, 1907, p. 123 (Mazatenango, Patulul, Lake Atitlan); RIDGWAY, *loc. cit.*, p. 58.

Stelgidopteryx ruficollis serripennis, GRISCOM, Proc. N. E. Zoöl. Club, XI, 1929, pp. 67–72 (monogr.).

San Lucas, 3 ♂, 1 ♀, 2 (?).

RANGE.—Eastern United States, south in winter to western Panama.

The Rough-winged Swallow is a common winter visitor to the whole of Guatemala, except the Pacific coast. Salvin's records might apply to all three races. With one exception, all Dearborn's specimens are this form. Mr. Anthony's notes apply mostly to this form, but some of his specimens prove to be *salvini*.

"Common during the winter months to about 8000 feet altitude. The first were noted at Progreso about September 8, with mixed flocks of Cliff and Barn Swallows. A considerable flight of these species appeared at this station on the above date and hundreds were seen along the telegraph wires for a day or two, when they became much less common but not rare until the following May. In the higher altitudes, *Stelgidopterx* is apt to be seen with *Tachycineta* which is equally common. Rough-winged Swallows were taken at Antigua (the slopes of Volcan de Agua) in May, at Panajachel in September, October and November, and noted as abundant at San Lucas in January." (Anthony, MS.)

(454) **Stelgidopteryx ruficollis salvini** Ridgway

Stelgidopteryx salvini RIDGWAY, *loc. cit.*, p. 62 (Dueñas, Guatemala).

Stelgidopteryx serripennis, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1883, p. 238 (San Geronimo, breeding); DEARBORN, 1907, p. 123 (Lake Atitlan, as to male with wing, 118 mm.).

Stelgidopteryx ruficollis salvini, GRISCOM, *loc. cit.*, (monogr.).

Antigua, 1 worn breeding ♂; Huehuetenango, 1 ♀; Panajachel, 3 ♂.

RANGE.—Mountains of Vera Cruz to Costa Rica.

These birds undoubtedly represent the breeding race in the highlands of western Guatemala. As I have shown elsewhere, Costa Rican specimens are inseparable, and neither are more than subspecifically distinct from *serripennis* or *ruficollis*.

(455) **Stelgidopteryx ruficollis ridgwayi** Nelson

Stelgidopteryx ridgwayi, NELSON, Proc. Biol. Soc. Wash., XIV, 1901, p. 174 (Chichen-Itza, Yucatan); RIDGWAY, *loc. cit.*, p. 62 ("adjacent districts of Guatemala").

Stelgidopteryx ruficollis ridgwayi, GRISCOM, *loc. cit.* (monogr.).

Finca Sepacuite, 4 ♂, 1 ♀, 1 juv.; Secanquim, 2 im. ♂.

RANGE.—Vera Paz and western British Honduras, in winter to adjacent lowlands of Vera Cruz and Yucatan.

The series listed above consists largely of breeding adults and young collected between May and August. It is the first definite breeding record for this very distinct subspecies. Several of the specimens were shot in a cave, showing the choice of a nesting site.

FAMILY **SYLVIIDÆ**. KINGLETS, GNATCATCHERS

(456) **Regulus satrapa clarus** Dearborn

Regulus satrapa clarus DEARBORN, p. 134 (Sierra Santa Elena, 9500 feet, Tecpam, Guatemala).

Regulus satrapa, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1879, p. 48 (cordillera near Los Encuentros, bird seen by Salvin, Feb., 1874).

Santa Ilania (10,000 feet), 4 ♂.

RANGE.—Boreal Zone: North America; the race in the high mountains of western Guatemala.

Crosby and I found kinglets quite common in the spruce and pine above Totonicapam, above 10,000 feet. It was easy to see that the bird in life was racially quite distinct from typical *satrapa*.

"Rather common in the heavy forest of cypress above Tecpam, altitude 10,000 feet. At Chichicastenango, a short distance from the above forest but at only some 7500 feet, a bird was shot, that I was sure was a kinglet, but as it was lost in the thick undergrowth, the record may be questioned." (Anthony, MS.)

(457) **Corthylio calendula calendula** (Linnæus)

Motacilla calendula LINNÆUS, 'Syst. Nat.,' I, 1766, p. 337 (Pennsylvania).

Regulus calendula, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1879, p. 49 (specimens collected in Guatemala by Skinner; seen (?) by Salvin above Totonicapam); RIDGWAY, 'Birds N. and Mid. Amer.,' pt. 3, 1904, p. 705.

RANGE.—Boreal North America, south in winter to Guatemala.

(458) **Polioptila cærulea cærulea** (Linnæus)

Motacilla cærulea Linnæus, 'Syst. Nat.,' I, 1766, p. 337 (Philadelphia, Pa.).
Polioptila cærulea, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1879, p. 51 (Retalhuleu, Escuintla, Dueñas, summit of Volcan de Agua, San Geronimo, Tactic, Coban, Lanquin, savannas of Peten); Ridgway, *loc. cit.*, p. 716.

Secanquim, 1♂, 6♀ 1 (?); Sacapulas, 1♂, 2♀; Chanquejelve, 1♀; Panajachel, 1♀; Lake Amatitlan, 1♂; Finca Carolina, 2♂, 3♀; Hacienda California, 1♂.

Range.—Eastern United States, south in winter to Guatemala.

An abundant winter visitor to the whole of Guatemala from sea-level to the summit of the Volcan de Agua (Salvin). Extreme dates are September 7 to March 3. Some of Salvin's records might apply to *mexicana*.

(459) **Polioptila cærulea mexicana** (Bonaparte)

Culicivora mexicana Bonaparte, 'Conspect. Gen. Av.,' I, 1850, p. 316 (Mexico).
Polioptila cærulea mexicana, Dearborn, 1907, p. 135 (Los Amates, San José); Ridgway, *loc. cit.*, p. 722.

Ocos, 3♀; Hacienda California, 1 (?); San José, 2♂, 1♀.

Range.—Southeastern Mexico to Guatemala in winter.

A very slightly characterized subspecies, differing only in averaging slightly smaller. No border-line specimens have been referred to *mexicana*. The few records are only from the tropical lowlands of both coasts.

(460) **Polioptila cærulea nelsoni** Ridgway

Polioptila nelsoni Ridgway, Proc. Biol. Soc. Wash., XVI, 1903, p. 109 (Oaxaca City, Oaxaca).

Chanquejelve, 2♂, 1♀ (winter).

Range.—Tropical Zone: known only from Oaxaca, Chiapas and northwestern Guatemala.

The little-known *P. nelsoni* is one of the two southern extremes of *P. cærulea*, resembling *P. cærulea cozumelæ* Griscom in being darker and grayer below. The latter, however, does not have the bluish-black forehead, is even darker below and small, like *mexicana*. As is usual with gnatcatchers, winter males of *nelsoni* have much less black on the head, or none. Whether this form is resident or a winter visitant only to Guatemala remains to be determined. The range extension southward is relatively slight.

(461) **Polioptila bilineata bilineata** (Bonaparte)

Culicivora bilineata BONAPARTE, 'Conspect. Gen. Av.,' I, 1850, p. 316 (Cartagena, Colombia).

Polioptila bilineata, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1879, p. 53 (Chisec).

Polioptila superciliaris superciliaris, RIDGWAY, 'Birds N. and Mid. Amer.,' pt. 3, 1904, p. 727.

Polioptila bilineata bilineata, GRISCOM, Amer. Mus. Novit., No. 414, 1930, pp. 4–7 (monogr.).

Secanquim, Finca Chamá, Chimoxan, 12 in all.

RANGE.—Tropical Zone: west Ecuador and Colombia to western Costa Rica and eastern Guatemala.

This little gnatcatcher is abundant as far north as eastern Nicaragua, but decreases rapidly farther north.

(462) **Polioptila bilineata albiloris** Sclater and Salvin

Polioptila albiloris SCLATER AND SALVIN, P. Z. S., 1860, p. 298 (Motagua Valley, Guatemala); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1879, p. 53 (Chuacus); DEARBORN, 1907, p. 136 (El Rancho, Gualan); RIDGWAY, *loc. cit.*, p. 725.

Polioptila bilineata albiloris, GRISCOM, *loc. cit.*, (monogr.).

Progreso, 11 ♂, 6 ♀.

RANGE.—Arid Tropical Fauna: western Mexico to northwest Costa Rica.

I am convinced that the treatment suggested in the study cited above is far nearer the truth than the tentative arrangements of Salvin and Ridgway. Any further advance in understanding this difficult species will depend upon the receipt of large series from western Mexico. It is quite remarkable that no gnatcatcher of this group has been found on the Pacific slope of Guatemala. It must surely occur there.

(463) **Ramphocænus rufiventris rufiventris** (Bonaparte)

Scolopacinus rufiventris BONAPARTE, P. Z. S., 1837, p. 119 (Guatemala).

Rhamphocænus rufiventris, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' II, 1892, p. 220 (Choctum, Chisec, Lanquin, Retalhuleu); DEARBORN, 1907, p. 109 (Los Amates).

Ramphocænus rufiventris rufiventris, RIDGWAY, 'Birds N. and Mid. Amer.,' pt. 5, 1911, p. 85.

Secanquim, 6 ♂, 2 ♀; Finca Chamá, 2 ♂; Hacienda California, 1 ♂; San José, 2 ♂, 1 ♀.

RANGE.—Tropical Zone: southern Mexico to western Ecuador.

This is really the first good modern series of topotypes to become available in this country. It shows that there is apparently no racial variation in Central America, but a surprising amount that is individual. Paler and more deeply colored birds occur throughout, and the amount of white on the outer tail-feathers is surprisingly inconstant.

A fairly common bird in the lowlands of both coasts. In life this little bird has habits which at times are wren-like and at others like *Polioptila*, as it skips about in the bushes with its long tail cocked up. The song is a soft, delicate trilled whistle, all on the same key.

Family **Troglodytidæ**. Wrens

(464) **Heleodytes capistratus nigricaudatus** Nelson

Heleodytes capistratus nigricaudatus Nelson, Auk, 1897, p. 70 (San Benito, Chiapas); Ridgway, 'Birds N. and Mid. Amer.,' pt. 3, 1904, p. 506.

Campylorhynchus capistratus, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1880, p. 64 (as to Savana Grande, Escuintla, Naranjo, Retalhuleu).

Heleodytes capistratus, Dearborn, 1907, p. 132 (Lake Amatitlan, Patulul, San José).

Ocos, 3 ♂, 3 ♀; Finca El Cipres, 6 ♂, 2 ♀; Finca El Espino, 1 ♂, 1 ♀; Hacienda California, 4 ♂, 7 ♀, 1 (?); Pantaleon, 4 ♂, 2 ♀; Lake Amatitlan, 1 ♀.

Range.—Arid Tropical Fauna: southern Mexico to northwestern Costa Rica; the race, Chiapas and Pacific slope of Guatemala.

Guatemala is in the zone of intermediacy between true *capistratus* of Nicaragua and northwestern Costa Rica and *nigricaudatus* of Chiapas. The abundant material available shows that the great majority of the specimens are *nigricaudatus* in the darker chestnut of the upperparts and the unbarred central rectrices. There is considerable variation in the latter character, however, which exists to a certain extent in the type series. Several adult specimens also vary toward *rufinucha* in having a little concealed barring on the back or spotted under tail-coverts. In this respect the specimen from Lake Amatitlan is as extreme as any in a series of *xerophilus* from Progreso, and is consequently a genuine intergrade. An immature male from Finca El Cipres is melanistic. The black of the pileum continues over the mantle, the back is heavily flammulated with black, and the tail is mostly black, only the outer feathers being appreciably barred with white.

(465) **Heleodytes capistratus xerophilus** Griscom

Heleodytes capistratus xerophilus Griscom, Amer. Mus. Novit., No. 414, 1930, p. 7 (Progreso, Guatemala).

Campylorhynchus capistratus, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1880, p. 64 (as to Motagua Valley localities).

Heleodytes capistratus, Dearborn, 1907, p. 132 (as to El Rancho).

Progreso, 14♂, 13♀, 3 (?).

Range.—Endemic in the arid belt of the Rio Motagua Valley, interior of Guatemala.

An interesting connecting link between *capistratus* and *rufinucha* of Vera Cruz.

(466) **Heleodytes zonatus zonatus** (Lesson)

Picolaptes zonatus Lesson, 'Cent. Zool.,' 1831, p. 210 ("California").

Campylorhynchus zonatus, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1880, p. 68 (near Dueñas, Volcan de Fuego, Tactic, Coban, Choctum, Alotepeque).

Heleodytes zonatus, Ridgway, *loc. cit.*, p. 510; Dearborn, 1907, p. 133 (Lake Amatitlan, Lake Atitlan, Tecpam).

Guatemala City, 1♀; Antigua 1♂, 1 juv.; Lake Amatitlan, 1♂, 1♀; San Antonio, 1♂, 1♀; Quetzaltenango, 1♀; San Lucas, 1♂, 2♀; Chichicastenango, 3♂, 2♀; La Perla, 1♂; La Montañita, 2♂; Tecpam, 4♂, 4♀; Panajachel, 8♂, 7♀, 2 (?).

Range.—Irregularly Tropical to Temperate Zones: southern Mexico to western Ecuador, with a very local and interrupted distribution; the race, Mexico to northern Nicaragua.

"Abundant in many parts of the pine zone, above 3500 feet. Not uncommon at Antigua and San Antonio. Abundant at Panajachel and San Lucas. At La Montañita a flock of a dozen or more was seen in the tops of the tall pines, at an altitude of 4000 feet. A few were noted at Chichicastenango, at over 7000 feet. At La Primavera a pair was building a nest in a pine, but both birds were lost by falling over a cliff. This would seem to be the limit of distribution to the northeast, none being seen about Coban or at Chamá." (Anthony, MS.)

(467) **Heleodytes zonatus restrictus** Nelson

Heleodytes zonatus restrictus Nelson, Auk, 1901, p. 49 (Frontera, Tabasco); Ridgway, *loc. cit.*, p. 513 (eastern Guatemala).

Range.—Known only from Vera Cruz, Oaxaca, Tabasco, and adjacent portions of Guatemala, in the Tropical Zone.

The Dwight Collection unfortunately contains no specimens of this distinct form, which is a Tropical Zone representative in the lowlands of Vera Cruz south to Peten in Guatemala. I have seen several old Coban trade-skins, however, obviously referable to this subspecies.

(468) **Thryophilus pleurostictus pleurostictus** (Sclater and Salvin)

Thryothorus pleurostictus SCLATER AND SALVIN, Ibis, 1860, p. 30 (Guatemala ex Skinner; no locality, but "Vera Paz" guessed as the source of origin; I designate Gualan).

Thryophilus pleurostictus, DEARBORN, 1907, p. 134, (Gualan); RIDGWAY, *loc. cit.*, p. 629.

Hacienda California, 1 ♂, 2 ♀; Ocos, 6 ♂, 2 ♀, 1(?).

RANGE.—Arid Tropical Fauna: Guerrero to northwestern Costa Rica; the race, south to western and central Guatemala.

This very distinct species is a common and characteristic member of the Arid Tropical Fauna of the Pacific coast of Central America from southwestern Mexico to northwestern Costa Rica. Salvin was perfectly correct in guessing that it occurred on the Pacific coast of Guatemala (cf. 'Biol. Cent. Amer.,' I, 1880, p. 87), and it is a curious accident that it should have been overlooked there until now. Dearborn's record from Gualan shows that this species, like many others, reappears in the arid section of the Rio Motagua Valley, and the Skinner specimen undoubtedly came from this region, rather than the Pacific slope. It is probable that there are two races involved, in which case the Pacific coast bird will be the one to be described. In default of material from the interior, I can only report that Pacific coast specimens agree minutely with a large series from Oaxaca, and show no approach whatever to *lateralis* Dickey and Van Rossem from southeastern Salvador.

"At Ocos the species seemed to be rather common, inhabiting the scattered brush and grasslands near the beach." (Anthony, MS.)

(469) **Thryophilus rufalbus rufalbus** (Lafresnaye)

Thriothorus rufalbus, LAFRESNAYE, Rev. Zool., 1847, p. 337 ("Mexico").

Thryophilus rufalbus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1880, p. 82, (Volcan de Fuego, Dueñas, Savana Grande, San Diego, Escuintla, Retalhuleu, Coban); DEARBORN, 1907, p. 134 (Mazatenango); RIDGWAY, *loc. cit.*, p. 632.

San Antonio, 1 ♀; Finca El Cipres, 4 ♂, 2 ♀.

RANGE.—Tropical Zone: Guatemala to northern Colombia and Trinidad; the race, Guatemala to northern Nicaragua.

This particular wren is a species of southern origin, Guatemala being at the extreme northern limit of its ranges. Lafresnaye's type is obviously identical with Guatemalan specimens, which differ from the more southern *castanonotus* in being whiter below and less heavily barred tail and secondaries. Nicaraguan specimens are intermediate, but nearer *castanonotus*. In Guatemala, as in most of Central America, it is found on both sides of the Pacific cordillera, but is lacking in desert regions, or heavy rain forest. The record from Coban is probably erroneous.

(470) **Thryophilus modestus pullus** Ridgway

Thryophilus modestus pullus Ridgway, Proc. Biol. Soc. Wash., XVI, 1903, p. 167 (Huehuetan, Chiapas).

Thryophilus modestus, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1880, p. 84 (Volcan de Fuego, Dueñas, Savana Grande, Escuintla, Retalhuleu, Coban); Dearborn, 1907, p. 134 (Gualan, Lakes Atitlan and Amatitlan, Patulul, San José).

Ocos, 1 ♂; Finca El Espino, 1 ♂, 1(?); Hacienda California, 22 ♂, 7 ♀; San José, 1 ♂, 1 ♀; Pantaleon, 2 ♂; Finca El Cipres, 5 ♂, 5 ♀, 1(?); Hacienda California, 3 ♂, 1(?); Palin, 2 ♂; Panajachel, 2 ♀; Barrillos, 1 ♂; San Lucas, 1 ♂, 2 ♀; Finca La Primavera, 9 ♂, 4 ♀; Finca Sepur, 1 ♀; Finca Concepcion, 1 ♂; Finca Sepacuite, 5 ♂, 2 ♀, 2(?).

Range.—Arid Tropical Fauna: Chiapas to Canal Zone; the race, Chiapas to northern Nicaragua.

This very large series shows that *pullus* is a barely tenable form, averaging a little darker above and the tail less heavily barred. Specimens from the Pacific coast average about 2 mm. shorter winged than large Costa Rican series. Highland birds in Guatemala, however, are minutely larger than coastal birds, and consequently similar in size to typical *modestus*. The subspecies *pullus* also ranges south in the interior to the highlands of north central Nicaragua, whence I have seen a series of twelve specimens.

"Abundant and widespread. Often found in grassy pastures, in situations similar to the habitat of the Maryland Yellowthroat." (Anthony, MS.)

(471) **Thryothorus albinucha albinucha** Cabot

Thryothorus albinucha Cabot, Proc. Bost. Soc. Nat. Hist., II, 1847, p. 258 (Yalahao, Yucatan); Salvin and Godman, 'Biol. Cent. Amer.,' I, 1880, p. 95 (Sakluk, near Peten).

Thryothorus petenicus Salvin, P. Z. S., 1863, p. 187 (Sakluk, Peten).

Range.—Arid Tropical Fauna: Yucatan and Peten.

The specimen from Sakluk remains unique. Baird ('Rev. Amer. Birds,' 1864, p. 149) long ago pointed out certain minor differences between this specimen and the type of *albinucha*, but a series is still lacking to confirm their constancy.

(472) **Thryothorus albinucha subfulvus** Miller and Griscom

Thryothorus albinucha subfulvus MILLER AND GRISCOM, Amer. Mus. Novit., No. 159, 1925, p. 8 (Calabasas, near Metapa, Nicaragua).

Sacapulas, 2 ♂, 1 ♀.

RANGE.—Known only from the arid interior of Guatemala and Nicaragua.

On comparing these specimens with the unique type, no essential differences in either size or coloration could be found, though adequate series might, of course, show some racial variation. The discovery of this species in an isolated arid valley in the interior of Guatemala is, however, of great geographic interest, and indicates that we are dealing with a relict form. Undoubtedly, the range of *subfulvus* will prove to be less disconnected than now appears, but the origin of the species dates back to a time when heavy rain forest on the Caribbean slope did not exist.

There is a further interesting possibility. Field experience with both races of *albinucha* and all but one of the races of the North American *ludovicianus* shows the close relationship of these birds. It is purely arbitrary to say that *ludovicianus berlandieri* and *albinucha subfulvus* are specifically distinct.

(473) **Pheugopedius maculipectus umbrinus** (Ridgway)

Thryothorus maculipectus umbrinus RIDGWAY, 'Man. N. Amer. Birds,' 1887, p. 552 (Guatemala; I designate Vera Paz).

Thryothorus maculipectus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1880, p. 92 (Choctum, Cahabon, to San Luis).

Pheugopedius maculipectus umbrinus, DEARBORN, 1907, p. 133 (Los Amates; Yzabal); RIDGWAY, 'Birds N. and Mid. Amer.,' pt. 3, 1904, p. 535 (part); GRISCOM, Proc. N. E. Zoöl. Club, XII, 1930, p. 6 (crit.; distr.).

Chimoxan, 2 ♀; Chipoc, 1 juv.; Finca Chamá, 11 ♂, 4 ♀, 1(?); Secanquim, 8 ♂, 1 ♀; Finca Sepacuite, 9 ♂, 3 ♀.

RANGE.—Tropical Zone: Tamaulipas and Yucatan to eastern Honduras; the race, eastern Guatemala and British Honduras.

(474) **Pheugopedius maculipectus varians** Griscom

Pheugopedius maculipectus varians, Griscom, Proc. N. E. Zoöl. Club, XII, 1930, p. 7 (San José, Guatemala).

Thryothorus maculipectus, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1880, p. 92 (Savana Grande).

Pheugopedius maculipectus umbrinus, part, Dearborn, 1907, p. 133 (Patulul, San José).

Finca El Soche, 1 juv.; Finca Salache, 1 ♂, 1 ♀; Finca El Cipres, 6 ♂; Hacienda California, 2 ♂; San José, 4 ♂.

Range.—Pacific lowlands of Guatemala.

An isolated representative of *umbrinus*, much paler and more dully colored.

(475) **Troglodytes musculus intermedius** Cabanis

Troglodytes intermedius, Cabanis, Journ. für Orn., 1860, p. 407 (San José, Costa Rica); Salvin and Godman, 'Biol. Cent. Amer.,' I, 1880, p. 100 (Dueñas, Panajachel, Quetzaltenango, Coban, etc., and in all villages throughout the country).

Troglodytes musculus hypædon, Ridgway, *loc. cit.*, p. 578; Dearborn, 1907, p. 133 (Los Amates, Lake Amatitlan, Tecpam).

Troglodytes musculus intermedius, Chapman and Griscom, Bull. A. M. N. H., 1924, p. 286 (monog.).

Finca Sepacuite, 9 ♂, 1 ♀; Finca Chamá, 4 ♂, 1(?); Finca Sepur, 1 ♂; Finca La Primavera, 3 ♂, 1 ♀; Nebaj, 3 ♂; Momostenango 2 ♂, 2 ♀; La Perla, 5 ♂, 2 ♀; Tecpam, 1 ♀; San Lucas, 3 ♂, 1 ♀; Antigua, 1 ♂, 1 ♀; San Antonio, 1 ♂; Puebla, 1 ♂; Quetzaltenango, 3 ♂; Lake Amatitlan, 3 ♂; Panajachel, 6 ♂; La Carolina, 9 ♂, 1 ♀; Finca El Cipres, 2 ♂, 1(?); Finca El Soche, 1 ♂; Hacienda California, 1 ♀.

Range.—Patagonia to southern Mexico; the race, Guatemala to Costa Rica.

The relationships of this race have been fully discussed by Dr. Chapman and myself in the paper referred to above.

Common throughout the country, even ascending to the summits of the volcanoes, according to Salvin.

(476) **Troglodytes rufociliatus rufociliatus** Sharpe

Troglodytes rufociliatus Sharpe, 'Cat. Birds Brit. Mus.,' V, 1881, p. 262 (Volcan de Fuego, Guatemala); Ridgway, *loc. cit.*, p. 588 (Volcan de Santa Maria).

Troglodytes brunneicollis, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1880, p. 103 (Volcan de Fuego).

Santa Ilania, 1 ♀; Volcan San Lucas, 1 ♂, 1 ♀ imm.; Tecpam, 3 ♂, 1 ♀, 1(?); Quetzaltenango, 3 ♂, 1 ♀.

Range.—Endemic in the high mountains of western Guatemala; a race in Salvador.

A very distinct species of the Temperate Zone on the high volcanoes of western Guatemala. It is found chiefly above 9000 feet. Its closest relative is *T. monticola* Bangs of Santa Marta; but it belongs to a group of mountain species, of which *brunneicollis* of Mexico, *ochraceus* of Costa Rica and *solstitialis* of the Andes are representatives.

Crosby and I found several at 10,500 feet in the mountains south of Totonicapam. The birds were always seen in clumps of epiphytes in the crotches of large oaks, a habit which is characteristic of *T. ochraceus*.

(477) **Cistothorus (polyglottus?) elegans** Sclater and Salvin

Cistothorus elegans, Sclater and Salvin, Ibis, 1859, p. 8 (Lake Dueñas, Guatemala).

Cistothorus polyglottus, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1880, p. 106 (summit of Volcan de Agua at 11,000 ft.).

San Antonio, 1 ♂.

Range.—The group, locally in savannas and grassy swamps, Magellan to Canada; the race, known from a few localities from southern Mexico to northern Nicaragua, both in the Tropical and Boreal Zones.

Lack of material makes it impossible to determine specific limits in Short-billed Marsh Wrens, but it would appear most misleading to regard them as all one. The map on p. 108, Chapman's 'Birds of Ecuador,' gives an excellent idea of the distribution of the genus.

(478) **Nannorchilus leucogaster musicus** (Nelson)

Hemiura leucogastra musica Nelson, Proc. Biol. Soc. Wash., XVI, 1903, p. 159 (Teapa, Tabasco and adjacent parts of Guatemala).

Nannorchilus leucogaster musicus, Ridgway, *loc. cit.*, p. 620.

Range.—The genus, endemic in Tropical Mexico; the race, known only from the two specimens cited above.

The Guatemala skin in the U. S. National Museum is an unsexed trade-skin of unknown locality.

(479) **Henicorhina leucosticta tropæa** Bangs and Peters

Henicorhina leucosticta tropæa Bangs and Peters, Bull. Mus. Comp. Zoöl., LXVII, No. 15, 1927, p. 480 (La Vizagua, Costa Rica).

Henicorhina leucosticta, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1880, p. 79 (Choctum, Cahabon and San Luis, Barranco Hondo, Savana Grande).

Henicorhina prostheleuca, Dearborn, 1907, p. 133 (Los Amates, Patulul); Ridgway, *loc. cit.*, p. 610.

Finca Concepcion, 1 (?); Finca Chamá, 3♂, 1♀; Finca La Primavera, 2♂, 2♀; Secanquim, 1♂; Finca Sepacuite, 6♂.

RANGE.—Tropical Zone: Peru and Guiana to southern Mexico; the race, Guatemala to western Panama (Caribbean slope).

Field experience with all three forms of *prostheleuca* in Central America and also with *leucosticta darienensis* of eastern Panama does not endorse the specific distinctness of Canal Zone and Darien specimens on the slight color differences existing, which are largely destroyed by individual variation.

A common rain-forest species with a remarkable song and mouse-like habits. Mr. Anthony writes that several specimens were caught in small mammal traps.

(480) **Henicorhina leucophrys castanea** Ridgway

Henicorhina leucophrys castanea RIDGWAY, Proc. Biol. Soc. Wash., XVI, 1903, p. 168 (eastern ? Guatemala).

Finca Sepacuite, 6♂, 1♀.

RANGE.—Subtropical Zone: Bolivia to Mexico; the race, Vera Paz only.

This series shows that *castanea* comes from the highlands of Vera Paz, the usual source of the old Coban trade-skins, on which the race was founded. It is surprising how this species varies locally in northern Central America, one of the few cases where the Vera Paz form is distinctly different both from the Vera Cruz and western Guatemala forms. It is much darker than either, but small, like the Vera Cruz race.

"All of the specimens in the collection were taken in a thick rain-forest, near Sepacuite, where it associated with the last species, seeking food along the fallen logs and among the damp leaves in the semi-darkness of the undisturbed jungle." (Anthony, MS.)

(481) **Henicorhina leucophrys capitalis** Nelson

Henicorhina leucophrys capitalis NELSON, Auk, 1897, p. 74 (Pinabete, Chiapas, Mexico); RIDGWAY, 'Birds N. and Mid. Amer.,' pt. 3, 1904, p. 615 (Volcan de Fuego, Volcan de Agua, Totonicapam).

Henicorhina leucophrys, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1880, p. 80 (Volcan de Agua, Volcan de Fuego, Totonicapam).

San Lucas, 3♂ (6500 ft.).

RANGE.—Subtropical Zone: mountains of western Guatemala.

A well-marked form, paler than *castanea*, in general color resembling *mexicana*, but distinctly larger, with a grayer pileum.

(482) **Salpinctes obsoletus neglectus** Nelson

Salpinctes obsoletus neglectus Nelson, Auk, 1897, p. 70 (Hacienda Chancol, western Guatemala); Ridgway, *loc. cit.*, p. 651.

Salpinctes obsoletus, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1880, p. 71 (Quetzaltenango, Salamá, Rabinal, Quiché, Jutiapa, bibl.).

Salpinctes maculatus, Ridgway, Proc. Biol. Soc. Wash., XVI, 1903, p. 169 (Toyabaj (=Joyabaj), Quiché, Guatemala).

Salpinctes guttatus guttatus, Dickey and Van Rossem, Proc. Biol. Soc. Wash., XL, 1927, pp. 25–28 (Joyabaj, Quiché, crit.).

Chichicastenango, 3♂, 1♀; Sacapulas, 3♂, 1♀; Quetzaltenango, 1♂; Panajachel, 1♂; Huehuetenango, 2♀; San Lucas, 24♂, 20♀, 8 imm.

Range.—Arid Subtropical and Temperate Zones: southwestern United States to the summits of high volcanoes in Central America; the race, western Guatemala.

The present magnificent series makes a further advance possible in understanding the complicated relationships of these puzzling Central American Rock Wrens. Messrs. Dickey and Van Rossem in an able critique (*loc. cit.*) have recently shown that the volcano wrens of this group boiled down to two representative forms instead of three distinct species, a suspicion which I had entertained for some years. With only two specimens from Guatemala of *S. maculatus*, however, all they could do was to show that they were inseparable from *S. guttatus* of Salvador, although fully aware that "a representative series of *maculatus* might well disclose mass variation in the series of the '*obsoletus*' group." This now proves to be the case.

If we start with typical *obsoletus* and work southward, the Mexican specimens, which I have examined in New York and Boston, fail to disclose any characters for *notius* Ridgway. So excessively variable are these birds in both size and color, that large series are needed to determine any character. While I have seen no additional young specimens, there would seem to be nothing in the alleged difference in size.

Turning now to the fifty-two specimens from San Lucas, Guatemala, both sexes and immature are fully represented. The series was taken at 5500 to 9500 feet at all seasons of the year, so that fresh and worn specimens are equally abundant. The amount of individual variation is almost incredible, and the extremes appear specifically distinct. The wing variation in males is 67–75 mm. Eliminating certain extremes of color variation for the moment, all the specimens from Guatemala agree with each other and differ from typical *obsoletus* in being a darker, grayer brown above, more streaked and dotted above, and averaging more speckled below. These characters are precisely the ones claimed by

Nelson in describing *neglectus* from western Guatemala, and are abundantly confirmed.

Another point of even greater importance can be made by examining the dark extremes of individual variation. Two adult specimens are obviously *S. maculatus* Ridgway, and two immature specimens belong here also. Five other adults are intermediate. It will be apparent, therefore, that the Guatemalan Rock Wren is a variable intermediate with excellent average characters. One extreme (two specimens) is scarcely separable from *obsoletus*. The other extreme (*S. maculatus* Ridgway) is inseparable from one extreme of *S. guttatus* of Salvin and Godman. The great majority of individuals are variously intermediate, but mostly nearer *obsoletus*. The group nomenclature suggested is as follows, omitting the well-known insular forms:

I.—Upperparts hair brown, faintly streaked with darker, and sometimes minutely speckled with whitish; underparts mainly unspotted (North America to southern Mexico) ..... *S. obsoletus obsoletus.*

II.—Upperparts darker, grayer brown, conspicuously streaked, sometimes heavily blotched, with darker, and speckled with white; underparts almost always more or less spotted (western Guatemala) ..... *S. obsoletus neglectus.*

III.—Upperparts always heavily blotched; underparts heavily spotted to heavily barred.

(*a*).—Immature darker above and more coarsely variegated dorsally (volcanoes of Salvador) ..... *S. obsoletus guttatus.*

(*b*).—Immature paler and less variegated (volcanoes of western Nicaragua and northwest Costa Rica) ..... *S. obsoletus fasciatus.*

Mr. Anthony's field notes and studies also made him suspect the unsatisfactory nature of the former classification. "At Volcan San Lucas, Rock Wrens were quite common at any season, the broken rocky sides of the volcano offering ideal home sites and retreats that seemed to be fully appreciated. A series, representing different seasons, show many variations hardly in keeping with present classification. Often times birds that might be classed as either *notius* or *guttatus* were shot from the same rock, Both were taken at Chichicastenango, within sight of Joyabaj, the home of *maculatus*. *Salpinctes* were met with also at Quiché and Huehuetenango, as well as along the trail to the top of the Cuchumetan Mts. not far from Nenton, where *neglectus* is found, according to Nelson. There would seem to be at least a semi-migration of the Rock Wrens in these parts of Guatemala. Though they are found on the rocky sides of the volcanoes about Lake Atitlan, at all seasons, they are more common after the first of November. At Chichicastenango, I saw none until the spring migration began, in the middle of February, when a few appeared. This station offers but little in way of suitable nesting

sites, which may account in part for the lack of Rock Wrens during the winter and nesting season. In this town and also Quiché, as well as other settlements within the habitat of the genus, several times I saw birds running about the roofs of the houses and under the tiles, where I have no doubt they nested." (Anthony, MS.)

(483) **Microcerulus philomela philomela** (Salvin)

Cyphorhinus philomela, SALVIN, P. Z. S., 1861, p. 202 (Choctum, Guatemala).
Microcerulus philomela, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1880, p. 76 (Choctum, Lanquin, forests between Cahabon and San Luis); RIDGWAY, 'Birds N. and Mid. Amer.,' pt. 3, 1904, p. 667.

RANGE.—Humid Tropical Zone: Guatemala to Venezuela and Ecuador; the race, Guatemala to Costa Rica.

The form *luscinia* Salvin of southwestern Costa Rica to the Canal Zone is at most a representative of *philomela*. Dr. Chapman has already ('Birds Ecuador,' p. 575) commented on eastern Panama specimens, which connect the Central American birds with *squamulatus* and *tæniatus*. The species has a marvellous song in the breeding season, but is almost impossible to find at other times of the year. Part of its reputation for great rarity is due to its small size and protective coloration.

FAMILY **CINCLIDÆ**. DIPPERS

(484) **Cinclus mexicanus anthonyi** Griscom

Cinclus mexicanus anthonyi GRISCOM, Amer. Mus. Novit., No. 438, 1930, p. 7 (San Mateo, 8250 ft., 45 miles east of Nenton, western Guatemala).
Cinclus mexicanus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1879, p. 44 (ridge above Totonicapam).

San Mateo, 3 ♂, 3 ♀; Barrillos, 1 ♂; Tecpam, 1 ♀.

RANGE.—Western North American to northern Nicaragua; the race, mountains of western Guatemala southward.

On September 5, 1862, Salvin came across a pair of Dippers in a mountain torrent above Totonicapam at about 10,000 feet. One was shot, but lost in the stream. This has been the only evidence of the occurrence of a Dipper in Guatemala, until the present series. Its distinctness was to be expected.

"A single specimen taken at Tecpam, July 20, at an altitude of 8500 feet. The natives told me the bird was not uncommon, but no others were seen. At San Mateo I found the species rather common

along the watercourse below the town, and again, along the same stream, at Barrillos. At this last place the natives told me of a species of 'duck' that I might find there, and I was expecting possibly a grebe. My surprise was amusing when I discovered that the Dipper was posing as a duck." (Anthony, MS.)

Family **Mimidæ**. Mockingbirds and Thrashers

(485) **Mimus gilvus lawrencei** Ridgway

Mimus gilvus lawrencei Ridgway, Proc. U. S. Nat. Mus., V, 1882, p. 10 (Tehuantepec City, Oaxaca).

Mimus gilvus guatemalensis Ridgway, Smiths. Misc. Coll., XLVII, 1904, p. 113 (Capetillo, Guatemala); Ridgway, 'Birds N. and Mid. Amer.,' pt. 4, 1907, p. 239 (Nebaj); Dearborn, 1907, p. 132 (Lake Atitlan).

Mimus gilvus, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1879, p. 36 (Salamá, San Geronimo, plains of Zacapa, upper Motagua Valley, Dueñas, Jutiapa).

Sacapulas, 1 ♂, 4 ♀; Progreso, 1 ♂, 1 ♀; Huehuetenango, 1 ♂; San Lucas, 5 ♂, 5 ♀; Panajachel, 17 ♂, 8 ♀, 1(?); Lake Amatitlan, 3 ♂; Antigua, 1 ♀, 1(?); 2 juv.; Ocos, 1 ♂, 2 ♀; Hacienda California, 1 ♀.

Range.—Northern South America, Lesser Antilles, and southern Mexico, Yucatan, and Guatemala; the race, Oaxaca to western Guatemala.

The type locality for *guatemalensis* Ridgway being Capetillo on the Pacific slope, it follows that specimens from Ocos and Hacienda California are essentially topotypical. In the first place, there is obviously no geographic variation in the series before me, but there is a great deal of variation due to age, and less which is purely individual. Juveniles of this species are a much browner gray above, and are, of course, spotted below. What are apparently first-year birds are common. These are a slightly duller or browner gray above, with the wings and tail less black, and more buff tinge below. In addition, freshly molted adults tend to have blacker wings and tails, a "cleaner" gray appearance above, and whiter underparts. These browner birds have the characters ascribed to *lawrencei* and the grayer birds those ascribed to *guatemalensis*. Two specimens before me from Chivelá, Oaxaca, essentially topotypes of *lawrencei*, are quite indistinguishable from the grayer Guatemala specimens. One bird from Huehuetenango is so much browner above than the Oaxaca specimens that, if the localities were unknown, it would be "keyed down" by anyone to *lawrencei*, while the Oaxaca birds would be referred to *guatemalensis*. Great differences in wing and tail-length and their relative proportions are largely matters of individual variation.

It does not follow that longer winged birds also have longer tails, and I suspect that younger birds tend to have shorter tails.

In the Yucatan Peninsula and the coast of British Honduras, a very distinct subspecies occurs commonly. It is a radically smaller bird, clearer gray, with blacker wings and reduced light edgings to the greater converts. The nomenclature is, however, still uncertain. The name *gracilis* (Cabanis) is based on a Honduras specimen, and the species was definitely recorded from the plains of Comayagua in 1860. This record was overlooked by Ridgway, who questioned "Honduras," and suggested British Honduras. It is highly unlikely that Honduras and Yucatan birds should prove to be alike and different from Guatemala specimens. It is much more likely that *lawrencei*, as well as *guatemalensis*, should prove identical with *gracilis*, and that the Yucatan bird requires a name. This is one more case, therefore, where the lack of material and exploration in Honduras prevents the final revision of a Central American bird.

This mockingbird has a remarkable distribution. The two races in Central America occupy the Arid Tropical Zone and are relicts which came perhaps originally from the east, as the bird is found on St. Andrews, Old Providence, and Cozumel Islands.

"Rather common in certain parts of the uplands, in semi-open reaches. On the sides of Volcan de Agua, below the rain forest, at 7000 feet and down to the level of the town, at 5500 feet, mockingbirds were not rare. Quite common at Lake Atitlan, at Panajachel and San Lucas in July and August. Also not rare at Progreso, where it was seen on the tops of the high cactus hedges, very much as one might find the more northern species in Arizona or Sonora. A few were seen at Huehuetenango in December." (Anthony, MS.)

(486) **Dumetella carolinensis** (Linnæus)

Muscicapa carolinensis Linnæus, 'Syst. Nat.,' I, 1766, p. 328 (Virginia).

Galeoscoptes carolinensis, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1879, p. 26 (Coban, Choctum, Rio de la Pasion, Cahabon, Barranco Hondo); Dearborn, 1907, p. 132 (Los Amates); Ridgway, *loc. cit.*, p. 218.

Secanquim, 6♂, 1♀; Finca La Primavera, 3♂, 2♀; Barillos, 1♂; Chanquejelve, 1♂, 1♀; Nebaj, 1♂, 1♀.

A common winter visitor to eastern Guatemala, but unrecorded from the Pacific slope, and apparently much scarcer in southern than in northern Guatemala. Recorded from October 22 to April 19.

(487) **Melanotis hypoleucus** Hartlaub

Melanotis hypoleucus HARTLAUB, Rev. Zool., 1852, p. 460, (Guatemala); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1879, p. 29 (Dueñas, Godines, San Geronimo, Coban); RIDGWAY, *loc. cit.*, p. 213 (Zunil); DEARBORN, 1907, p. 132 (near Tecpam).

Nebaj, 13♂, 11♀; Tecpam, 1♂; San Lucas, 6♂, 4♀; Panajachel, 2♂, 4♀; Antigua, 3♂, 2♀.

RANGE.—Endemic in the highlands of western Guatemala from 3000 to 7000 ft.

This strongly marked genus consists of three species, the one here considered, *cærulescens* of Mexico, and *longirostris* of the Tres Marias. There is as yet no clue as to why *hypoleucus* should not range southward into Salvador and Honduras.

The bird is common in the open country. Salvin has given a splendid account of its habits and life history.

[(*Rhodinocichla rosea* (Lesson)

There is a specimen of this bird in the Derby Museum at Liverpool labelled "Guatimala," purchased from Leadbeater in 1844. The presence of this species in Guatemala has never been confirmed by subsequent extensive exploration, and the locality is undoubtedly erroneous.]

FAMILY **TURDIDÆ**. THRUSHES, BLUEBIRDS, SOLITAIRES

(488) **Myadestes unicolor veraepacis** Griscom

Myadestes unicolor veraepacis GRISCOM, Amer. Mus. Novit., No. 438, 1930, p. 6 (Finca Sepacuite, 50 miles east of Coban, Alta Vera Paz, Guatemala).

Myiadestes unicolor, SCLATER, P. Z. S., 1856, p. 229 (Cordova, Vera Cruz).

Myiadectes unicolor, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1879, p. 42 (Coban, Choctum, and forests northward to Peten).

Myadestes unicolor, RIDGWAY, 'Birds N. and Mid. Amer.,' pt. 4, 1907, p. 170.

Finca Sepacuite, 1♂.

RANGE.—Lower levels of Subtropical Zone: mountains of Vera Cruz to northern Nicaragua; the race, Vera Paz, Guatemala.

Salvin has written graphically of the line of demarcation between the two solitaires in Guatemala. "A traveller journeying to Coban hears the song of the last outlier of *M. obscurus*, just after passing the village of Santa Cruz; before he reaches Coban the notes of *M. unicolor* alone strike his ear." In spite of the few specimens in America, it is a common bird in Vera Paz from about 1000 to 4500 feet.

(489) **Myadestes obscurus oberholseri,** Dickey and Van Rossem

Myadestes obscurus oberholseri Dickey and Van Rossem, Proc. Biol. Soc. Wash., XXXVIII, 1925, p. 133 (Volcan de San Rafael, Salvador).

Myiadectes obscurus, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1879, p. 40 (Volcan de Fuego, Cerro de Zunil, Quetzaltenango, San Geronimo, Tactic).

Myadestes obscurus obscurus, Ridgway, *loc. cit.*, p. 168 (San Marco, Nebaj, etc.).

a.—San Lucas, 1 ♂, 2 ♀; Antigua, 1 ♂; Volcan Zunil, 1 ♂; Quetzaltenango, 4 ♂, 1 ♀.

b.—Approaching *occidentalis* in color. Momostenango, 2 ♂, 3 ♀; San Mateo, 2 ♂; Chichicastenango, 3 ♂, 1 ♀; Barrillos, 2 ♂.

Range.—Upper levels of Subtropical Zone and Arid Temperate Zone: northwestern Mexico, south along the Pacific cordillera of Central America to Salvador; the race, western Guatemala and Salvador.

With the good series now available, *Myadestes obscurus* proves to be a very variable bird, and these variations are difficult to treat nomenclaturally. There are, roughly speaking, three main types of color variation. Typical *obscurus* from Vera Cruz is the darkest, with the most russet-brown back and wings, sharply contrasted with the gray pileum; large series from Chihuahua and Sonora are extremely pale, with an olive back faintly contrasted with the pileum, constituting an excellent race, *cinereus* Nelson; variously intermediate birds for which the earliest name is *occidentalis* Stejneger, based on specimens from Jalisco. From Chiapas and Guatemala southward there is a sharp break to smaller size, which must also be reckoned with. Arranged in tabular form, we get the following results:

Locality	Coloration	Wing of Males	Race
Southern Tamaulipas	medium	103	*occidentalis*
Nuevo Leon	between medium and dark	104	nearer *occidentalis*
Vera Cruz	dark	104	*obscurus*
N. W. Mexico	very pale	104	*cinereus*
Tres Marias Isl.	pale	101	*occidentalis* (=*insularis*)
Jalisco	pale to medium	104	*occidentalis*
Mexico	medium to dark	104	*occidentalis* or *obscurus*
Hidalgo	nearest dark	104	*obscurus*
Guerrero and Michoacan	nearest medium	103	*occidentalis*
N. W. Guatemala	medium	98.5	nearer *oberholseri*
S. W. Guatemala	between medium and dark	98	*oberholseri*
Salvador	reported as dark	98	*oberholseri*

It will be seen, therefore, that *obscurus* is a large and dark extreme from southeastern Mexico, *cinereus* is a pale extreme from northwestern

Mexico, and *oberholseri* is a small and darkish southern extreme from Salvador. The greater part of Mexico is occupied by intermediate birds, *occidentalis*, which tend to become darker eastward and southward and paler northwestward. Birds from northwestern Guatemala and Chiapas approach *occidentalis* in coloration, but are obviously *oberholseri* in smaller size. I see no special advantage in naming or recognizing minor intermediate variations, although in current practice it would be entirely legitimate to recognize *insularis*, chiefly on its isolation, although its characters are only about fifty per cent so definite as the other named forms.

A common bird in the main cordillera of Guatemala chiefly from 5000 to 7000 feet.

"The 'Guarda Barranca' of Guatemala is one of the most noted song birds of Central America, and the one most often seen in cages, where it would seem to lose but little of its desire to voice its happy song. Along the deep, dark ravines of the highlands, where semi-darkness reigns at midday, the sweet, ringing notes of this bird are a thing to be remembered. Nor are the beautiful surroundings altogether entitled to the effect, though it must be admitted that such setting does not detract from the charm. The song of the 'Guardian of the Ravine' would be the same under any conditions." (Anthony, MS.)

(490) **Turdus infuscatus** (Lafresnaye)

Merula infuscata, LAFRESNAYE, Rev. Zool., 1844, p. 41 (Mexico).

Turdus infuscatus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1879, p. 24, (Coban, ridge above San Geronimo, Quetzaltenango).

San Lucas, 1 ♂ ad.

RANGE.—Subtropical and Temperate Zones: Vera Cruz and Guatemala.

This specimen is a little smaller than the minimum given by Ridgway for typical Vera Cruz specimens, but a small series, at least, is needed to confirm it. The bird of western Guatemala should certainly prove separable. Salvin's specimens were all from Coban, the localities in the Pacific cordillera being based on sight records only.

This is the northern representative of the black or blackish robins so widely distributed in the mountains of South America. The group is represented in Costa Rica by *T. nigrescens*.

(491) **Turdus grayi grayi** Bonaparte

Turdus grayi Bonaparte, P. Z. S., 1837, p. 118 (Guatemala; Alta Vera Paz by subsequent designation); Salvin and Godman, 'Biol. Cent. Amer.,' I, 1879, p. 18 (Dueñas, San Geronimo, Tactic, Coban only).

Planesticus grayi and *grayi tamaulipensis*, Dearborn, 1907, p. 137 (as to Los Amates, El Rancho, Lake Amatitlan, Lake Atitlan); Ridgway, *loc. cit.*, p. 117.

Finca Sepacuite, 5♂, 2♀; Finca Concepcion, 1♂; Finca Chamá, 1♂; Secanquim, 4♂, 1♀; Finca La Primavera, 2♂, 1♀; Sacapulas, 1♂, 1♀; La Perla, 1♂; San Lucas, 1♂, 1♀; Antigua, 4♂, 1♀; Puebla, 1♂; Panajachel, 4♂, 2♀; San Antonio, 1♂, Progreso 1♂, 1♀.

Range.—Tropical Zone: eastern Mexico to western Panama; the race, Vera Cruz to Honduras east of the Pacific cordillera.

A very common robin at lower altitudes ranging up to 5000 feet. It is not a forest species, but prefers clearings, orchards, plantations, and the trees along rivers and streams. Mr. Anthony makes the interesting observation that most of the individuals of this species disappear between September and February.

(492) **Turdus grayi umbrinus** Griscom

Turdus grayi umbrinus Griscom, Amer. Mus. Novit., No. 438, 1930, p. 3 (Finca El Cipres, near Mazatenango, Pacific slope of Guatemala).

Turdus grayi (part), Salvin and Godman, 'Biol. Cent. Amer.,' I, 1879, p. 18 (Escuintla, Retalhuleu).

Planesticus grayi (part), Dearborn, 1907, p. 136 (Mazatenango, San José).

Finca El Cipres, 9♂, 7♀; Finca El Espino, 1♂; Hacienda California, 3♂, 1♀; La Carolina, 1♂, 2♀; San Felipe, 1♀; Pantaleon, 3♂; San José, 2♀.

Range.—Known only from Pacific lowlands of Guatemala.

So far as can be judged from the satisfactory series listed above, this local race seems to be well marked, and is the brownest extreme of this species.

(493) **Turdus assimilis leucauchen** Sclater

Turdus leucauchen, Sclater, P. Z. S., 1858, p. 447 (Guatemala).

Turdus tristis, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1879, p. 15 (as to Coban, Choctum, Cahabon to San Luis).

Planestictus tristis leucauchen, Dearborn, 1907, p. 137 (Los Amates); Ridgway, *loc. cit.*, p. 111.

La Perla, 6♂, 2♀; Finca Sepur, 1♂, 1♀; Finca Sepacuite, 18♂, 8♀.

Range.—Chiefly Subtropical Zone: Mexico to western Panama; the race, eastern Guatemala.

This fine series proves what I had previously suspected (cf. Amer. Mus. Novit., No. 184, 1925, p. 11), that the home of *leucauchen* is the highlands of Vera Paz, and that females and younger males are easily separable from males in being more olive, less slaty. The older collections in the East are loaded with ancient "Coban trade-skins" of this form, which have become discolored with age, the males being more olive, less slaty than freshly killed specimens.

"Abundant in most of the coffee belt of northeastern Guatemala from an altitude of about 1500 to 5000 feet. In March it was a common bird at La Perla, which is as far to the west as I recall meeting with the species. At Coban and to the east in Vera Paz it was everywhere abundant until October, when the most of them departed for a period of about three months." (Anthony, MS.)

(494) **Turdus assimilis rubecundus** (Dearborn)

Planesticus tristis rubecundus Dearborn, 1907, p. 137 (Patulul, Sololá, Guatemala).

Turdus tristis, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1879, p. 16 (as to rich olive-brown specimens from western parts = Dueñas).

San Lucas, 1 imm. ♂ (?).

Range.—Known only from the localities in western Guatemala recorded above. and northern Salvador.

Birds undoubtedly of this form or specimens strongly approaching it were common in Salvin's day at Dueñas, but recent collectors have found the species rare and local in western Guatemala. The single specimen obtained by Anthony is just as richly ferruginous brown as the type.

(495) **Turdus plebejus** subspecies

Turdus plebeius, Salvin and Godman, 'Biol. Cent. Amer.,' Introduction to Aves volumes, Nov., 1904, p. xiii (Guatemala).

Range.—Subtropical or Temperate Zone in the mountains of Central America: *p. plebejus*, a well-known bird in Costa Rica and western Panama; *p. rafaelensis* (Miller and Griscom) in northern Nicaragua; *p. differens* (Nelson) in Chiapas.

The thrushes were the first group of birds reported upon in the 'Biologia' (1879) and obviously numerous specimens were received from Guatemala subsequently. After Salvin's death in 1897, Godman abandoned the plans for a supplement, but marked additional species and records with a dagger (†) in the distributional lists by countries in the

"Introduction." In this way we know the definite presence of this species in Guatemala. A glance at its distribution shows that this was to have been expected, and we can infer also that the Guatemala race should be very close to *differens*, if not identical.

I have collected this species both in Panama and Nicaragua, and I am convinced that I saw a small flock in the mountains south of Totonicapam in August, 1930.

(496) **Turdus rufitorques** Hartlaub

Turdus rufitorques, HARTLAUB, Rev. Zool., 1844, p. 214 (Guatemala); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1879, p. 22 (Dueñas, Calderas, Volcan de Fuego, Godines, Quetzaltenango, above Totonicapam, Chilasco, Tactic).

Planesticus rufitorques, RIDGWAY, *loc. cit.*, p. 97 (Volcan de Santa Maria, Jacaltenango, Hacienda Chancol); DEARBORN, 1907, p. 138 (Tecpam).

Huehuetenango, 1 ♀; Chichicastenango, 3 ♂, 2 ♀; Barrillos, 4 ♂, 1 ♀; Nebaj, 1 ♂, 1 ♀; Zanzon, 1 ♂; Tecpam, 5 ♂, 4 ♀, 1(?); San Mateo, 2 ♂, 3 ♀; San Lucas, 3 ♂, 2 ♀; Guatemala City, 1 ♂; San Antonio, 1 ♂; Quetzaltenango, 4 ♂, 1 ♀; Panajachel, 9 ♂, 5 ♀; Momostenango, 14 ♂, 6 ♀.

RANGE.—Subtropical and Temperate Zones: Pacific cordillera of Chiapas and Guatemala.

The most interesting thing about this great series is the highly complex plumage changes and variations of this little-known species, most of which have never been described.

1.—The juvenal male is dark grayish brown above, heavily margined with rusty buff on the pileum and nape, and with a distinctly sagittate pattern on the interscapulum; wing-coverts and tertials irregularly tipped with buff; beneath buffy white, the chest, sides, and flanks strongly tinged with rusty buff, heavily spotted with blackish except on throat and belly. What are apparently older specimens have a more or less cinnamon-rufous on chest and sides, and the flanks are buffy grayish (3 specimens).

2.—The juvenal female is similar, but a little paler and duller, the buff wash below devoid of any rusty tinge. This plumage is worn some time, as one specimen is very worn and frowsy (2 specimens).

3.—The immature male is dark slaty olive above, with a dull cinnamon-rufous collar. In some specimens the feathers of the pileum are broadly margined with pale rusty, and the feathers of the back have lighter olive edgings. Some have a few buffy tips to the wing-coverts and tertials. The chin is always white, the throat is whitish or pale rusty, streaked with blackish; the breast varies from cinnamon-buff to cinnamon-rufous, sometimes sharply demarcated from the dull slaty-olive underparts, sometimes extending down to the vent, or tinging the abdomen. In those birds in which the abdomen is chiefly grayish olive, there may be a lighter edging to the feathers, giving a margined or flammulated effect. In all cases the under tail-coverts have broad shaft-streaks of whitish. The axillars are rusty, later mixed and finally uniform blackish. The upper mandible is dusky and the lower mandible tipped with

dusky. One July specimen is very worn and frowsy, and generally duller in color in consequence; it is molting, but shows no signs of adult plumage (7 specimens).

4.—The immature female is very similar, passing through the same variations, but all colors are a shade or two duller and paler. The bastard primary averages narrower and shorter than in young males. A July and early September specimens are very worn (9+specimens).

5.—Adult females are often not certainly separable. The most highly plumaged birds are generally darker and a little brighter, about as in young males. There are never any buff margins on the wing-coverts, the axillars are always blackish, and the bill is more yellow, less dusky (11 specimens).

6.—Every stage exists between young males and fully adult males, which are jet-black with bright cinnamon-rufous collar and breast, a white chin, and upper throat streaked black and rufous and yellow bills. It is apparent, however, that the black of the upperparts is acquired before losing the olive-gray of the underparts, the white shaft-streaks to the under tail-coverts and the buff margins to the wing-coverts. Such intermediate specimens were collected in January, March, September, October, and December. Just as in young males, certain specimens have much more rufous below, this color invading the abdomen. What appear to be winter adults have brownish edgings to the feathers of the pileum, and dully slaty abdomens variously margined obscurely with paler. Such specimens may, however, be a final stage of immaturity. I am inclined to believe that it takes at least three years to acquire the solid black and rufous plumage, and at least two years to acquire the most highly colored female plumage (41 specimens).

A freak male is dark blackish brown throughout, with a blackish throat and a faint suggestion only of the pectoral and muchal collar. A freak female is even darker blackish brown throughout with an even fainter suggestion of the collar. It is the only female with a solid yellow bill, and looks supiciously like a melanistic androgynomorph.

A very distinct endemic species. It is abundant from 7000 to 11,000 feet, but is frequently found down to 5000 feet.

(497) **Turdus migratorius** subspecies

Turdus migratorius, SCLATER AND SALVIN, Ibis, 1860, p. 396 (Coban, Guatemala).
Planesticus migratorius, RIDGWAY, *loc. cit.*, p. 102.

The only specimen ever taken in Guatemala (January, 1860) may be *propinquus* as an accidental winter visitant, as Ridgway suggests. On the other hand, it might belong to the breeding race *phillipsi* Bangs of Vera Cruz.

(498) **Hylocichla mustelina** (Gmelin)

Turdus mustelinus GMELIN, 'Syst. Nat.,' I, 1788, p. 817 (New York); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1879, p. 9 (Choctum, Coban, Tactic, Godines).

RANGE.—Eastern North America, south in winter to Panama.

A common winter visitant to the lowlands of eastern Guatemala, only once recorded in the highland area.

(499) **Hylocichla minima aliciæ** (Baird)

Turdus aliciæ Baird, 'Reports of Explorations and Surveys for R. R. from Miss. R. to Pac. Ocean,' IX, 1858, p. 217 (West Northfield, Illinois); Salvin and Godman, 'Biol. Cent. Amer.,' Introduction to Aves volumes, Nov., 1904, p. xxii (Guatemala; specimen received after completion of the text on the thrushes).

Range.—Boreal eastern North America, wintering in northern South America; migrating along the outer islands of the east coast of Central America, very rare or casual on the mainland (4 records only).

(500) **Hylocichla ustulata ustulata** (Nuttall)

Turdus ustulatus Nuttall, 'Man. Orn. U. S. and Canada,' Land Birds, 1840, p. 830 (Columbia River); Salvin and Godman, 'Biol. Cent. Amer.,' I, 1879, p. 12 (Coban, Dueñas, Costa Grande).

Hylocichla ustulata, Dearborn, 1907, p. 136 (Los Amates, Patulul, Mazatenango).

Finca La Primavera, 1 ♂; Nebaj, 1 ♀; Panajachel, 1 ♂; San Lucas, 5 ♂, 2 ♀.

Range.—Western North America, wintering in Central America.

There is an interesting difference in the distribution of the two races of this thrush in Central America. The western form winters regularly, but is much less common on the Atlantic than the Pacific slope. Old records of this form in days when these thrushes were badly confused should be disregarded, unless specimens are carefully redetermined. The intensive collecting of the last twenty years has failed to produce a single record of *ustulata* anywhere in the New World south of Costa Rica. This fact was correctly pointed out by Salvin in 1879, and ignored by everyone since.

Extreme dates for this form in Guatemala are October 8 to April 23.

(501) **Hylocichla ustulata swainsonii** (Cabanis)

Turdus swainsonii Cabanis, in Tschudi's 'Faun. Peru.,' Aves, 1844–46, p. 188 (New Jersey); Salvin and Godman, 'Biol. Cent. Amer.,' I, 1879, p. 11 (Coban).

La Perla, 1 ♂; Secanquim, 1 ♀ (April 9); Finca Sepacuite, 1 ♂ (May 9); Chimoxan, 1 ♂ (Oct. 2); Finca La Primavera, 1 ♂.

Range.—Eastern North America, wintering in South America principally east of the Andes.

The Olive-backed Thrush winters over much of South America east of the Andes, and is a common late spring and fall transient in Central America, unrecorded from the Pacific slope north of Costa Rica. In spring it reaches Panama about March 20, and the height of the migration is about April 15 to 20. In northern Central America it arrives

the first week in April, lingering into May. Its supposed wintering in Central America is based on assumption, and there is not a single critically determined specimen on record in this country, collected in January or February. October and November are the main months of the fall migration. November 15 is the latest date for western Panama, and there is one December record for Costa Rica.

(502) **Hylocichla guttata auduboni** (Baird)

Turdus auduboni BAIRD, 'Rev. Amer. Birds,' I, 1864, p. 16 (Fort Bridger, Wyoming); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1879, p. 14 (Pine forest of Volcan de Fuego, 10,000–12,000 ft.).

Hylocichla guttata auduboni, RIDGWAY, *loc. cit.*, p. 46 (Hacienda Chancol); DEARBORN, 1907, p. 136 (Tecpam).

Chichicastenango, 1 ♂, 2 ♀; Momostenango, 2 ♂.

RANGE.—Rocky Mountains, south in winter to Guatemala.

The subspecies of the Hermit Thrush in winter plumage are notoriously difficult of determination, but there would seem to be no reasonable doubt about four of those listed above. Two females measure 99 mm. and two males 104 and 106 mm. A male from Momostenango measures 100 mm. and might be *polionota*, but is not as slaty above as the few specimens available.

Salvin and Godman (*loc. cit.*, p. 13) record *pallasi* from Coban. Their careful critique of this specimen makes it certain that it is neither *auduboni* or *nana*, but it almost certainly is not *pallasi*, which has never been found south of Corpus Christi, Texas.

(503) **Hylocichla guttata polionota** Grinnell

Hylocichla guttata polionota GRINNELL, Condor, 1918, p. 89 (White Mts., Inyo Co., California).

Chichicastenango, 1 ♀ (December 16, 1924).

RANGE.—Breeding in the vicinity of the type locality, south in winter to Guatemala.

This specimen measures 93 mm. and is markedly more slaty, less brown above than *auduboni* and agrees quite well with the few specimens of *polionota* available, when some allowance for winter plumage is made.

Mr. Anthony writes that Hermit Thrushes were not uncommon in the forest above Chichicastenango and Momostenango from December to March.

(504) **Catharus dryas dryas** (Gould)

Malacocichla dryas, Gould, P. Z. S., 1854, p. 285 (Guatemala).

Catharus dryas, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1879, p. 7 (Teleman, Volcan de Agua above San Diego, over a dozen specimens in 1873); Ridgway, *loc. cit.*, p. 21.

San Lucas, 1 ♀.

Range.—Subtropical Zone: Guatemala, reappearing in (western Colombia?) and western Ecuador; the race *maculatus*, eastern Colombia to Bolivia.

One of the most remarkable cases of discontinuous distribution in Central American birds.

(505) **Catharus melpomene bangsi** Dickey and Van Rossem

Catharus melpomene bangsi Dickey and Van Rossem, Proc. Biol. Soc. Wash., XXXVIII, 1925, p. 135 (Volcan de San Salvador, Salvador).

Catharus melpomene, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1879, p. 2 (Dueñas, Coban); Ridgway, *loc. cit.*, p. 29.

Finca Concepcion, 1 ♂; Finca La Primavera, 1 ♀; Nebaj, 1 ♀; Panajachel, 1 ♂ imm.

Range.—Subtropical Zone: central Mexico to Costa Rica; the race, Guatemala and Salvador.

These three adult specimens are very slightly darker above than typical *melpomene*, and distinctly darker and more slaty below, with less white ventrally. They are also a little larger. Thus they correspond exactly with the description of *bangsi*, a form autoptically unknown to me, but well characterized. Certainly, good series from both Salvador and Guatemala would have to be available before they could be separated. Unfortunately post-mortem color change is marked in this species, and old specimens are quite worthless for subspecific characters.

Crosby and I found this *Catharus* not uncommon about Panajachel in August, 1930, and collected a small series of birds which were about to breed. Throughout its range, this species prefers dry thickets and avoids the rain forest. It is excessively shy and secretive.

(506) **Catharus frantzii alticola** Salvin and Godman

Catharus alticola Salvin and Godman, 'Biol. Cent. Amer.,' I, 1879, p. 3 (forests of the Volcan de Fuego, 6000–10,000 ft., Guatemala).

Catharus frantzii alticola, Dearborn, 1907, p. 138 (Sierra Santa Elena, above Tecpam); Ridgway, *loc. cit.*, p. 29.

San Mateo, 1 ♂; Santa Ilania, 1 ♂; Antigua, 1 ♂; Volcan San Lucas, 3 ♂, 2 ♀; Quetzaltenango, 3 ♂, 2 ♀.

RANGE.—Cloud forest of upper Subtropical and Temperate Zones: southwestern Mexico to western Panama; the race, Chiapas and western Guatemala.

While a bird of the Humid Temperate Zone in Guatemala, it is typically subtropical in southern Central America.

(507) **Catharus mexicanus cantator** Griscom

Catharus mexicanus cantator GRISCOM, Amer. Mus. Novit., No. 438, 1930, p. 4 (Finca Sepacuite, 50 miles east of Coban, Vera Paz, Guatemala).

Catharus mexicanus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1879, p. 6, (Coban, Teleman).

Finca Sepacuite, 3 ♂, 1 ♀; Barrillos, 1 ♀.

RANGE.—Subtropical Zone: eastern Mexico to western Panama; numerous local races; the present one, highlands of Guatemala.

Formerly regarded as almost as rare a bird as *dryas*, large series now exist in American museums from many parts of its range. It is a remarkably variable species, and good modern material is needed to determine racial variation. As usual in this genus, post-mortem color change is rapid and pronounced, and one should beware of old specimens.

This species lives in the dense, dripping cloud-forest often with *frantzii*, and has a superb Hermit Thrush-like song. There is no finer dawn chorus than this species and *Myadestes*.

(508) **Sialia sialis guatemalæ** Ridgway

Sialia sialis guatemalæ RIDGWAY, Proc. U. S. Nat. Mus., V, 1882, p. 13 (Guatemala); idem, 'Birds N. and Mid. America,' pt. 4, 1907, p. 147 (Hacienda Chancol, Capetillo, Zacatapequez, Volcan de Santa Maria, etc.); DEARBORN, 1907, p. 138 (generally distributed above 5000 ft., Tecpam).

Sialia sialis, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1879, p. 46 (Quetzaltenango, above Totonicapam, Godines, Dueñas, San Geronimo, Tactic, Coban).

Finca La Primavera, 1 ♂, 1 ♀; Chichicastenango, 1 ♂, 1 ♀; Huehuetenango, 1 ♂; Barrillos, 4 ♀; Panajachel, 6 ♂, 3 ♀, 2 juv.; Nebaj, 2 ♂, 2 ♀; La Montañita, 1 ♀; San Antonio, 1 juv.; Antigua, 1 ♂; Tecpam, 2 ♂, 2 ♀, 2 juv.; Chanquejelve, 1 ♂, 3 ♀; San Lucas, 8 ♂, 4 ♀, 1 juv.; Quetzaltenango, 2 ♂.

RANGE.—Eastern United States to northern Nicaragua; the race, eastern Mexico and Guatemala.

The steady increase of material in the last thirty years has gradually been modifying Ridgway's treatment of this bluebird ('Birds N. and Mid. Amer.,' pt. 4, 1907, pp. 142–148). Ample breeding material from northwestern and southeastern Mexico shows that two well-marked races are involved, and the following brief synopsis is appended. I omit

the recognizable *grata* Bangs of southern Florida, with which we are not concerned here.

1. Typical *sialis*.—Slightly smaller, wing of ♂ averaging 100; adult male purplish blue; underparts sharply contrasted cinnamon rufous and white; ♀ bluish gray above, washed with light grayish brown.

2. *sialis fulva* Brewster.—Larger, wing averaging 104; ♂ more azure above, pale cinnamon rufous below, the white area reduced and not sharply contrasted; ♀ much paler above. Southern Arizona and northwestern Mexico (Chihuahua and Sonora at least), south in winter to Vera Cruz. Large series examined.

3. *sialis guatemalæ* Ridgway.—Larger, wing averaging 105.5; ♂ variable above, the majority tending to be purplish blue; underparts intermediate, the cinnamon rufous almost as dark as in *sialis*, but as extensive as in *fulva*, not sharply contrasted with the white; ♀ distinctly darker even than *sialis*, with a darker brown wash. Breeding in the highlands of eastern and southeastern Mexico (southern Tamaulipas, 4000–6000 feet, southern San Luis Potosi, environs of Mexico City, Vera Cruz) and the whole of the highland region of Guatemala. Over eighty specimens examined.

4. *sialis episcopus* Oberholser.—Coloration exactly as in the last race; a rare and local resident in the lowlands of northern Tamaulipas and extreme southeastern Texas from 2100 feet to sea-level; specimens from 2100 feet wing up to 102, from Brownsville region, 98–99. The color characters of these birds make it absolutely impossible to refer them to typical *sialis*, which is a rare and irregular winter visitant to the Brownsville region.

5. *sialis meridionalis* Dickey and Van Rossem.—Much smaller than *guatemalæ*, wing averaging 99; coloration of both sexes averaging very slightly darker. Highlands in the interior of Salvador and northern Nicaragua.

The only really novel point in this summary is the fact that *fulva* does NOT occur throughout Mexico, and that breeding birds from eastern and southeastern Mexico are indistinguishable from Guatemala specimens. As a matter of fact, Oberholser was the first person to call attention to the color characters of specimens from this region, as compared with true *fulva*, and it seems a pity that the name *episcopus* can stand in nomenclature only on the slightly smaller size of lowland birds. Similarly *meridionalis* is amply separable from *guatemalæ*, but it could scarcely be told even in series from *episcopus*. We have here, then, one of the many cases where logical and observable variations can be duly recorded, but no permissible device can render the taxonomy anything but inconvenient one way or another.

The nomenclature involved is remarkably complex, and is worth reporting in some detail. For many years a common name in the literature for the "Mexican" bluebird was *azurea*. This name goes back to Baird or Swainson. I am greatly indebted for information and counsel to Drs. Richmond and Friedmann of the U. S. National Museum. The

full reference in Swainson's 'Synopsis of Birds Discovered in Mexico' (Philos. Mag., (N.S.) I, No. 5, May, 1827, p. 369) is as follows:

> Sialia azurea? Sylvia Sialis? Wilson I. pl. 3. f. 3, Common on the Table-land at Real del Monte and other places.
>
> I have some doubts whether this is not a distinct species; my specimen is of a young bird.

Leaving the interpretation of this remarkable combination aside for the moment, the next step was taken by Baird, in his 'Review of American Birds,' 1864. He had three bluebirds collected by Sartorius in Vera Cruz, and called them *azurea*. If *azurea* Swainson is regarded as a *nomen nudum*, Baird validated the name *azurea* by a proper description and diagnosis. The U. S. National Museum most courteously forwarded me these specimens, one of them bearing a type label. I unhesitatingly identify them as the breeding form of southeastern Mexico. It follows, therefore, that if *azurea* Swainson is a *nomen nudum*, *azurea* Baird becomes the name of the highland form from eastern Mexico to Guatemala, and *guatemalæ* Ridgway becomes a synonym of it.

We may now return to the original citation of Swainson and discuss its interpretation. It seems to me that there are two which are logically possible and plausible.

a.—It may be a *nomen nudum*. Swainson's whole paper dealt with new birds discovered in Mexico, or supposed to be new, and his own comment under this species showed that he suspected its distinctness. It can be argued, therefore, that "Sialia azurea?" meant "new species?" and that "Sylvia sialis?" meant that if the Mexican Bluebird was not distinct, it was Wilson's *Sylvia sialis*. Swainson thought the bird was new, and his SECOND CHOICE was Wilson's species. On this line of reasoning, a further interesting question arises. Would a reference to a definite specimen from a definite locality (many hundred miles south of the winter range of *Sylvia sialis* Wilson) take precedence over a plate reference to a species to which that specimen was doubtfully referred? One weakness in this whole argument, however, is that this case is not clearly a *nomen nudum* under the formal definitions of the 'Code.'

b.—Following Dr. Richmond's MS., the A. O. U. Committee has ruled (Auk, 1908, p. 388) that *Sialis azurea* Swainson, 1827, was a substitute name for *Sylvia sialis* Wilson and therefore *azurea* is not available for any bluebird under any circumstances. Dr. Richmond further points out that it makes no difference whether Swainson had an actual specimen or not; "he did not describe it, but merely asked himself an editorial sort of question as to whether the bird was not really the same

as *Sylvia sialis* Wilson." We are thus led to the anomalous position of regarding *azurea* as a probable synonym of *sialis*, in spite of the fact that we know perfectly well that Swainson's specimen could not possibly have been *sialis*, and that Swainson did not think so himself. Here again, objections can be urged. It can be argued that the "?" after *Sialia azurea* makes it illogical to regard it as a substitute name. As Swainson described the genus *Sialia* on the same page, he might have been proposing a new specific name, when transferring the species *sialis* Wilson from the genus *Sylvia*. Here again the "?" and his lines of comment make this unlikely and unreasonable.

To sum up, Swainson did not clearly express his intentions and his point of view. The technical rules of the 'Code' do not absolutely cover the case. While, therefore, there are two lines of reasoning out an interpretation, both are open to criticism, and lack finality. It is probably much better to follow the Committee's decision, rather than to disturb the nomenclature to no purpose, although a technicality open to criticism is involved.

A common bird throughout the Altos of Guatemala from 5000 feet to tree-line.

Family **Vireonidæ**. Vireos

(509) **Vireo virescens**[1] Vieillot

Vireo virescens Vieillot, 'Ois. Amer. Sept.,' I, 1807, p. 84 (Pennsylvania, by subsequent designation).

Vireo olivaceus, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1881, p. 188 (Coban, Dueñas).

Vireosylva olivacea, Ridgway, 'Birds N. and Mid. Amer.,' pt. 3, 1904, p. 147.

Panajachel, 1 ♂ (Aug. 26, 1926).

Range.—Eastern North America, wintering in South America to Brazil and Bolivia, on migration in Central America.

(510) **Vireo flavoviridis flavoviridis** (Cassin)

Vireosylvia flavoviridis Cassin, Proc. Acad. Nat. Sci. Phila., V, 1851, p. 152 (Panama); Dearborn, 1907, p. 124 (Mazatenango).

Vireo flavoviridis, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1881, p. 190 (Retalhuleu, Chisec).

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[1]The name *olivaceus* (Linnæus) restored in the 'A. O. U. Check List.'

Finca Chamá, 6 ♂, 3 ♀; Finca Sepacuite, 2 ♂; Progreso, 1 ♀; Panajachel, 1 ♂; La Perla, 2 ♂; Hacienda California, 1 ♂, 1 ♀, 2(?); La Carolina, 3 ♂, 6 ♀; Finca El Cipres, 18 ♂, 20 ♀.

RANGE.—Tropical Zone: Mexico and Central America, wintering from Panama to Amazonia.

An abundant summer resident over the lowlands, rarely ascending as high as 5000 feet. Arrives from the south the first week in April, earliest record late March (Dearborn), but not generally common or singing until April 15. I have seen none taken later than October 1.

Mr. Anthony's field notes state that this species was taken at San Lucas, October 27, and at Huehuetenango, December 28, but there must have been some error in identification, as his collection contains no such specimens. I do not believe that this vireo could possibly occur at the latter locality at any season of the year.

(511) **Vireo philadelphicus** (Cassin)

Vireosylvia philadelphicus CASSIN, Proc. Acad. Nat. Sci. Phila., V, 1851, p. 153 (near Philadelphia, Pennsylvania); RIDGWAY, *loc. cit.*, p. 151.

Vireo philadelphicus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1881, p. 191 (Coban, Tactic, Retalhuleu, above San Diego).

Secanquim, 1(?); La Montañita, 1 ♂ (Oct. 18).

RANGE.—Boreal eastern North America, wintering in Central America south to western Panama.

(512) **Vireo gilvus gilvus** (Vieillot)

Muscicapa gilva VIEILLOT, 'Ois. Amer. Sept.,' I, 1807, p. 65 (New York).

Huehuetenango, 1 ♂, 2 ♀; La Montañita, 1 ♂, 1(?); San Lucas, 1 ♂, 1 ♀; Panajachel, 2 ♂, 5 ♀, 1(?); Sacapulas, 1 ♂, 1 ♀; Progreso, 1 ♂; Finca Carolina, 1 ♀.

RANGE.—Eastern North America; only the above winter records.

It is fortunate that the great majority of the specimens listed above are so large in size that there can be no reasonable doubt of their subspecific determination. Three sexed birds, however, and two unsexed birds might be either race, as regards wing length, but are referred here on the basis of not having smaller bills or obviously duller coloration.

The Warbling Vireo in winter plumage is appreciably greener above and more extensively washed with greenish yellow below. The most obvious difference is the contrast between the gray pileum and the greener back. It is apparently quite common and generally distributed in Guatemala in winter, arriving principally in October, the earliest date

being September 28, 1926. Mr. Anthony's collection gives us no information as to its departure in spring, but there are mid-winter specimens.

(513) **Vireo gilvus swainsonii** Baird

Vireo swainsonii Baird 'Reports of Explorations and Surveys for R. R. from Miss. R. to Pac. Ocean,' IX, 1858, p. 336 (Petaluma, Sonoma Co., California).

Vireosylva gilvus swainsoni, Dearborn, 1907, p. 124 (El Rancho, Patulul).

Progreso, 1 ♂ (Nov. 2).

Range.—Western North America, south to Guatemala in winter.

This specimen is the only one clearly belonging to the western race in both size and color characters. It will presumably be found to occur generally in the western half of the country at least, judging by Dearborn's account. His latest date was April 2.

(514) **Vireo flavifrons** Vieillot

Vireo flavifrons Vieillot, 'Ois. Amer. Sept.,' I, 1807, p. 85 (United States); Salvin and Godman, 'Biol. Cent. Amer.,' I, 1881, p. 195 (Coban, Choctum, Lanquin, San Geronimo, Dueñas, Volcan de Fuego, San José).

Lanivireo flavifrons, Ridgway, *loc. cit.*, p. 163; Dearborn, 1907, p. 124 (Gualan, El Rancho).

Vireo propinquus, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1881, p. 197 (Coban, Guatemala, =*flavifrons*×*solitarius*); Ridgway, *loc. cit.*, p. 166.

Secanquim, 1 ♂; San Lucas, 1 ♂; San José, 1 ♂; Hacienda California, 1 ♂; Finca Carolina, 6 ♂, 2 ♀.

Range.—Eastern United States, south in winter to Colombia.

A common transient and winter visitant, chiefly in the lowlands. It has been recorded as early as Sept. 10 (Salvin).

(515) **Vireo solitarius solitarius** (Wilson)

Muscicapa solitaria Wilson, 'Amer. Orn.,' II, 1810, p. 143 (near Philadelphia).

Vireo solitarius, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1881, p. 196 (Coban, Cahabon, Volcan de Fuego, Volcan de Agua).

Lanivireo solitarius, Dearborn, 1907, p. 124 (Lake Atitlan, Tecpam); Ridgway, *loc. cit.*, p. 167.

Finca La Primavera, 1 ♀; Sacapulas, 2 ♂, 2 ♀, 1(?); Barrillos, 3 ♂; Nebaj, 1 ♀; San Mateo, 1 ♂; La Perla, 1 ♀; Momostenango, 2 ♂; Chichicastenango, 2 ♂, 4 ♀, 1(?); Huehuetenango, 1 ♂, 1 ♀; Uspantan, 1 ♂; Chanquejelve, 1 ♂; La Montañita, 1 ♂, 2 ♀; San Lucas, 1 ♂, 2 ♀, 1(?); Panajachel, 1 ♂, 1 ♀; Finca El Soche, 1 ♂.

Range.—Eastern North America, south in winter to northern Nicaragua.

An abundant winter visitant, chiefly in the highlands, and very rarely recorded below 2000 feet. The seasonal occurrence is from October 15 to April 27, an exceptionally late date. Several of the specimens are very large, and one from San Lucas has considerable gray on the back as well. The latter, particularly, could be referred to *alticola* Brewster, but I hesitate to do so, as the available evidence shows that this subspecies winters solely in the lowlands south and east of the Alleghenies.

(516) **Vireo solitarius cassini** Xantus

Vireo cassinii Xantus, Proc. Acad. Nat. Sci. Phila., 1858, p. 117 (Fort Tejon, California).

Finca La Primavera, 1 (March 29, 1925).

Range.—Pacific coast of North America, south in winter to Oaxaca and Guatemala.

The only record as yet for Guatemala.

(517) **Vireo noveboracensis noveboracensis** (Gmelin)

Muscicapa noveboracensis, Gmelin, 'Syst. Nat.,' I, 1788, p. 947.

Vireo noveboracensis, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1881, p. 200 (Coban).

Range.—Eastern United States, south in winter to eastern Guatemala (once) and eastern Honduras (once).

Apparently a very rare winter visitant to eastern Guatemala, for there is only one record. Probably more numerous in Peten, as it is abundant in the lowland forests of Quintana Roo.

(518) **Vireo bellii bellii** Audubon

Vireo bellii Audubon, 'Birds Amer.,' VII, 1844, p. 333 (Fort Union, Dakota); Dearborn, 1907, p. 125 (Gualan, San José, Patulul); Ridgway, *loc. cit.*, p. 204.

Sacapulas, 1 ♀; Ocos, 3 ♀; Hacienda California, 3 ♂, 3 ♀; San José, 1 ♂.

Range.—Prairie districts of United States, south in winter to northern Nicaragua.

Probably a fairly common winter visitant to the lowlands of the western half of Guatemala, in spite of the paucity of records. The extreme dates are October 6 to March 25. The species has never been recorded from higher altitudes.

(519) **Vireo ochraceus ochraceus** Salvin

Vireo ochraceus SALVIN, P. Z. S., 1863, p. 188 (San José de Guatemala); DEARBORN, 1907, p. 124 (San José); RIDGWAY, *loc. cit.*, p. 193.

San José, 6 ♂, 3 ♀; Ocos, 1(?).

RANGE.—Tropical Zone, Mazatlan, Mexico to western Guatemala.

As is now well known, young birds of this species are quite different in appearance from adults, being grayer, less green above, and whiter, less yellow below. This caused the abandonment of the supposed species, *V. semiflavus* Salvin, from Peten, the difference being due to age. Nevertheless, when series of adults from the Pacific slope are compared with series from the Caribbean coast, very obvious differences exist, and there are two easily recognizable forms, as follows:

(1). *Vireo ochraceus ochraceus*, SALVIN.—Olive green of upperparts with a distinct tint of BROWN, lost in worn adults and in young; yellow of underparts in adults slightly duller, more ochraceous. Locally in mangrove swamps from Mazatlan to San José, Guatemala.

(2). *Vireo ochraceus semiflavus* Salvin.—Decidedly smaller; olive green of upperparts with a distinct tint of gray, greatly intensified in worn adults and in young; yellow of underparts in adults slightly brighter, more gamboge. Caribbean lowlands from Yucatan to Nicaragua, chiefly but not exclusively coastal.

(520) **Vireo ochraceus semiflavus** Salvin

Vireo semiflavus SALVIN, P. Z. S., 1863, p. 188 (Sakluk, near Peten, Guatemala).
Vireo ochraceus, DEARBORN, 1907, p. 124 (Puerto Barrios).

RANGE.—Tropical Zone: Yucatan to eastern Nicaragua.

(521) **Vireo huttoni vulcani** Griscom

Vireo huttoni vulcani GRISCOM, Amer. Mus. Novit., No. 438, 1930, p. 3 (Quetzaltenango, 8500 ft., Guatemala).

Vireo huttoni, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1882, p. 203 (Volcan de Fuego); RIDGWAY, *loc. cit.*, p. 195.

Momostenango, 1 ♂, 1 ♀; Chichicastenango, 1 ♂; Tecpam, 3 ♂, 2 ♀; Zanjon, 1 ♂, 1(?); Quetzaltenango, 6 ♂, 3 ♀.

RANGE.—Western United States to Guatemala: the race, in western Guatemala in the Temperate Zone.

A very distinct form of boreal origin. Mr. Anthony considered it rare.

(522) **Hylophilus decurtatus decurtatus** Bonaparte

Sylvicola decurtata BONAPARTE, P. Z. S., 1837, p. 118 (Guatemala).

Hylophilus decurtatus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1882, p. 206 (Choctum).

Pachysylvia decurtata, RIDGWAY, *loc. cit.*, p. 216.

Secanquim, 3♂, 1♀, 1 (?); Chimoxan, 1♂, 1 (?); Finca Chamá, 1♂; Puebla, 1♂.

RANGE.—Humid Tropical Zone: Mexico to Canal Zone; the race, eastern Mexico to eastern Costa Rica.

Having examined nearly 200 specimens of this species from every part of its range, and with field experience of all three subspecies, I cannot agree with Todd that no racial variation is recognizable (cf. Proc. Biol. Soc. Wash., XLII, 1909, pp. 204–205). *Pusilla* Lawrence is a well-marked small southern extreme of the Caribbean slope from Talamanca southward. Specimens from southwestern Costa Rica and Chiriqui (Pacific slope) are more or less intermediate. Birds from northwestern Costa Rica are typical *decurtata*, one of the numerous cases where a Caribbean forest bird crosses the continent at the Nicaraguan "break." Isolated in the local gallery forests of Salvador, and the volcanoes of western Nicaragua, is a slightly paler form, *pallida* Dickey and Van Rossem.

A common bird in the rain forest of eastern Guatemala.

(523) **Hylophilus ochraceiceps ochraceiceps** Sclater

Hylophilus ochraceiceps, SCLATER, P. Z. S., 1859, p. 375 (Playa Vicente, Oaxaca); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1882, p. 208 (Choctum, Chisec).

Pachysylvia ochraceiceps ochraceiceps, RIDGWAY, *loc. cit.*, p. 218.

RANGE.—Humid Tropical Zone: southern Mexico to northwestern Ecuador and Amazonia; the race, Central America to western Panama.

This species is quite uncommon throughout its Central American range.

FAMILY **VIREOLANIIDÆ.** SHRIKE-VIREOS[1]

(524) **Smaragdolanius pulchellus pulchellus** (Sclater and Salvin)

Vireolanius pulchellus SCLATER AND SALVIN, Ibis, 1859, p. 12 (Guatemala); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1882, p. 210 (Choctum, Rasché, Savana Grande, above San Diego); DEARBORN, 1907, p. 125 (Patulul); RIDGWAY, *loc. cit.*, p. 223.

Secanquim, 1♀.

RANGE.—Humid Tropical Zone: southern Mexico to the Canal Zone: the race, in Mexico and Guatemala.

The gorgeous Emerald Shrike-vireo has a reputation for rarity, which is partly due to its habits. It lives in the tops of the enormous

[1]Cf. Pycraft, P. Z. S., 1907, pp. 352–379. I am indebted for this reference to Dr. Alexander Wetmore, who maintains this family, in my judgment quite properly.

forest trees, and is seldom visible from the ground. When the very distinct song is learned, however, it proves to be a common bird, if the collector visits its haunts in the breeding season.

For the characters of the genus *Smaragdolanius*, see Griscom (Amer. Mus. Novit., No. 438, 1930, p. 3).

(525) **Vireolanius melitophrys** Du Bus

Vireolanius melitophrys Du Bus, 'Esquiss. Orn.,' Pl. xxvi (Mexico); Salvin and Godman, 'Biol. Cent. Amer.,' I, 1883, p. 209 (Volcan de Fuego); Dearborn, 1907, p. 125 (Lake Atitlan); Ridgway, *loc. cit.*, p. 225 (crit.).

San Lucas, 1 ♂; Tecpam, 1 ♀; Panajachel, 1 ♀.

Range.—Temperate Zone, endemic in the mountains of southern Mexico and western Guatemala.

This bird is exceedingly rare in collections, but there is good reason to believe that there are at least two subspecies. It occurs chiefly in oak forests from 6000 to 7000 feet altitude. Those shot by Mr. Anthony were quite silent and found in thick undergrowth.

Family **Cyclarhidæ**. Pepper-Shrikes[1]

(526) **Cyclarhis flaviventris flaviventris** Lafresnaye

Cyclaris flaviventris Lafresnaye, Rev. Zool., 1842, p. 133 ("Santa Cruz," = Vera Cruz ?, Mexico).

Cyclorhis flaviventris, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1883, p. 212 (as to Tactic, Coban, Choctum); Ridgway, *loc. cit.*, p. 228.

Secanquim, 1 ♂; Finca Sepacuite, 1 ♂; Finca Chamá, 1 ♂; Finca La Primavera, 5 ♂, 1 ♀.

Range.—Tropical Zone: southern Mexico and eastern Guatemala.

This series agrees quite well with the type of *flaviventris* and a good series from Mexico, but four of the specimens have a trace of white on the belly, thus showing a slight tendency toward the southern races.

(527) **Cyclarhis flaviventris nicaraguæ** Miller and Griscom

Cyclarhis flaviventris nicaraguæ Miller and Griscom, Amer. Mus. Novit., No. 183, 1925, p. 6 (Matagalpa, Nicaragua).

Cyclorhis flaviventris, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1883, p. 212 (as to Volcan de Fuego, above San Diego).

Cyclarhis flaviventris, Dearborn, 1907, p. 125, Mazatenango, Patulul, Lake Atitlan.

[1]Cf. Pycraft P. Z. S., 1907, pp. 352-379. I am indebted for this reference to Dr. Wetmore, who maintains this family, in my judgment quite properly.

Chanquejelve, 1 ♂; San Antonio, 2 ♂; San Lucas, 1 ♂, 1 ♀; Panajachel, 3 ♂, 2 ♀; Nebaj, 1 ♀, 4 imm.; Guatemala City, 1 ♀; Pantaleon, 3 ♂.

RANGE.—Western Guatemala, Salvador and Nicaragua, presumably also western Honduras.

These birds are a very unsatisfactory lot, and their identification is either a matter of opinion, or the accident of small series. Roughly speaking, they are all intergrades between *flaviventris* and *nicaraguæ*. Some are much nearer *flaviventris*, others are almost typical *nicaraguæ*, but both extremes occur in a series taken the same week at the same place. In such a case a definite subspecies name is really more misleading than helpful.

Mr. Anthony writes that *Cyclarhis* is of rather general distribution in Guatemala between 1200 and 6000 feet. I am well acquainted with all the Central American races in life. The bird prefers to live in dense thickets, but ascends trees to feed and to sing, and it is most exceptional to find a male singing from another site.

FAMILY **BOMBYCILLIDÆ.** WAXWINGS

(528) **Bombycilla cedrorum** Vieillot

Bombycilla cedrorum VIEILLOT, 'Ois. Amer. Sept.,' I, 1807, p. 88 (eastern North America?).

Ampelis cedrorum, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1883, p. 216, (above Mixco, Sacatepeques, Dueñas, Savana Grande, Escuintla, San Geronimo, Tactic, Coban, Cahabon, Choctum, Dolores near Peten).

Finca Chamá, 1 ♂ (May 5); Antigua, 1 ♂ (May 15); San Lucas, 2 ♂; Sacapulas, 1 ♂; Finca Sepur, 6 ♂, 1 ♀, 2 (?).

RANGE.—North America, south in winter to Costa Rica.

An abundant winter visitant, chiefly at higher altitudes, remaining quite late.

FAMILY **PTILOGONATIDÆ.** SILKY FLYCATCHERS

(529) **Ptilogonys cinereus molybdophanes** Ridgway

Ptilogonys cinereus molybdophanes RIDGWAY, 'Man. N. Amer. Birds,' 1887, p. 464 (Guatemala); DEARBORN, 1907, p. 123 (Lake Atitlan, Tecpam); RIDGWAY, 'Birds N. and Mid. Amer.,' pt. 3, 1904, p. 117.

Ptilogonys cinereus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1883, p. 218 (Dueñas, Volcan de Fuego, Volcan de Agua, Sumpango, Barranco Hondo, above Totonicapam).

San Mateo, 1 ♂, 4 ♀; Guatemala City, 2 ♂, 1 ♀; San Lucas, 16 ♂, 14 ♀.

RANGE.—The family and genus, endemic in the Subtropical and Temperate Zones, mountains of central and southern Mexico to western Panama; the species, Mexico and Guatemala; the race, western Guatemala.

"Somewhat restricted in its range, but common in suitable locations. They were seen in flocks of a hundred or more near the city of Guatemala in late November. At San Lucas the species was abundant, feeding on the blossoms of the silk-bark oak (*Grevillea robusta*) in late October. In February a number were noted at San Mateo." (Anthony, MS.)

FAMILY **PARIDÆ.** TITMICE

(530) **Psaltriparus melanotis melanotis** (Hartlaub)

Parus melanotis HARTLAUB, Rev. Zool., 1844, p. 216 (Guatemala).

Psaltriparus melanotis, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1881, p. 58 (Sololá, Godines, Volcan de Fuego, San Lucas); DEARBORN, 1907, p. 134 (Lake Atitlan to Tecpam).

Psaltriparus melanotis melanotis, RIDGWAY, 'Birds N. and Mid. Amer.,' pt. 3, 1904, p. 427 (Hacienda Chancol, etc.).

Huehuetenango, 3♂, 1♀; Momostenango, 4♂, 4♀; Chichicastenango, 3♂, 2♀; San Mateo, 3♂, 2♀; Zanjon, 3♂, 1♀; Tecpam, 8♂, 1♀; Panajachel, 1♂; San Lucas, 8♂, 1♀; Quetzaltenango, 2♂, 6♀.

RANGE.—Southwestern United States to Guatemala; the race, southern Mexico to Guatemala in the Temperate Zone.

The Paridæ are a family of Old World origin, which has developed a small group of endemic genera in the Sonoran Subregion. The genus *Psaltriparus* is quite closely related to *Acanthiparus* of India.

Common in the more open and drier parts of the Altos above 5000 feet, particularly in brush-land and scrub-oak. Flocks containing twenty or more individuals are common.

FAMILY **CERTHIIDÆ.** CREEPERS

(531) **Certhia familiaris alticola** Miller

Certhia familiaris alticola MILLER, Auk, 1895, p. 186 (to replace *C. mexicana* Gloger preoccupied); DEARBORN, 1907, p. 134 (Tecpam); RIDGWAY, 'Birds N. and Mid. Amer.,' pt. 3, 1904, p. 471 (Hacienda Chancol, Puebla Vieja).

Certhia mexicana, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1880, p. 62 (Volcan de Fuego, Totonicapam, ridge above San Geronimo to Chilasco).

Santa Ilania, 1♂; San Mateo, 1♀.

RANGE.—Northern hemisphere, south in the New World to northern Nicaragua; the race, eastern Mexico and western Guatemala.

With only two specimens available, I cannot separate Guatemala creepers from *alticola* of Vera Cruz.

The Brown Creeper is one of the many species of boreal origin in Central America, which follows the pine forests southward. It is consequently found at much lower altitudes in Nicaragua than in Vera Cruz. In Guatemala it has never been collected below 9000 feet.

Family **Compsothlypidæ**. Wood Warblers

(532) **Mniotilta varia** (Linnæus)

Motacilla varia Linnæus, 'Syst. Nat.,' I, 1766, p. 333 (Santo Domingo).

Miniotilta varia, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1880, p. 110 (Retalhuleu, Patio Bolas, Escuintla, Dueñas, Volcan de Agua, Volcan de Fuego, San Geronimo, Tactic, Coban, Choctum); Dearborn, 1907, p. 127 (Patulul, Mazatenango, Gualan); Ridgway, 'Birds N. and Mid. Amer.,' pt. 2, 1902, p. 432.

Chimoxan, 1 ♂; Chipoc, 1 ♂; La Montañita, 1 ♂; Chanquejelve, 1 ♂; San Lucas, 2 ♀; Panajachel, 1 ♂; Finca El Cipres, 1 ♂; San José, 1 ♂.

Range.—Eastern North America, south in winter to Colombia. A common winter visitant, arriving as early as August 3.

(533) **Helmitheros vermivorus** (Gmelin)

Motacilla vermivora Gmelin, 'Syst. Nat.,' I, 1788, p. 951 (Pennsylvania).

Helminthotherus vermivorus, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1880, p. 113 (Dueñas, Tactic, Coban, Khamkal, Choctum).

Helmintheros vermivorus, Dearborn, 1907, p. 127 (Patulul, April 2); Ridgway, *loc. cit.*, p. 439.

Helmitherus vermivorus, Lantz, 1899, p. 223 (Naranjo).

Secanquim, 1 ♀.

Range.—Eastern United States, south in winter to western Panama.

An uncommon winter visitant, recorded chiefly in the Caribbean rain forest.

(534) **Vermivora chrysoptera** (Linnæus)

Motacilla chrysoptera Linnæus, 'Syst. Nat.,' I, 1766, p. 333 (near Philadelphia, Pa.).

Helminthophaga chrysoptera, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1880, p. 114 (Coban, Choctum).

Helminthophila of Ridgway, *loc. cit.*, p. 448.

Range.—Eastern United States, south in winter to Colombia.

(535) **Vermivora pinus** (Linnæus)

Certhia pinus, Linnæus, 'Syst. Nat.,' I, 1766, p. 187 (Philadelphia, Pa.).
Helminthophaga pinus, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1880, p. 115 (Retalhuleu, Coban, Choctum, Teleman).
Helminthophila pinus, Dearborn, 1907, p. 127 (Gualan); Ridgway, *loc. cit.*, p. 455.

Secanquim, 1 ♂ (Jan. 26); Hacienda California, 1 ♂ (Sept. 22).

Range.—Eastern United States, south in winter to Colombia.

(536) **Vermivora ruficapilla ruficapilla** (Wilson)

Sylvia ruficapilla Wilson, 'Amer. Orn.,' III, 1811, p. 120 (near Nashville, Tenn.).
Helminthophaga ruficapilla, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1880, p. 116 (specimens sent in 1848 and 1851 by Don José Constancia from Guatemala to Strickland, now in Cambridge).
Helminthophila rubricapilla rubricapilla, Ridgway, *loc. cit.*, p. 468.

Sacapulas, 1 ♀; San Lucas, 2 ♀.

Range.—Eastern North America, south in winter to Guatemala.

(537) **Vermivora ruficapilla ridgwayi** Van Rossem

Vermivora ruficapilla ridgwayi Van Rossem, Proc. Biol. Soc. Wash., XLII, 1929, p. 179 (new name to replace *gutturalis* preoccupied).
Helminthophila rubricapilla gutturalis, Ridgway, *loc. cit.*, p. 470.

Finca La Primavera, 1 ♂; Momostenango, 1 ♂; Barrillos, 5 ♂, 2 ♀; San Lucas, 6 ♂.

Range.—Western United States, south in winter to Guatemala.

Apparently a fairly common winter visitant, although new to Guatemala. The series collected unfortunately gives no idea of arrival or departure dates.

(538) **Vermivora celata lutescens** (Ridgway)

Helminthophaga celata var. *lutescens*, Ridgway, Amer. Journ. Sci. and Arts, IV, 1872, p. 457 (Kadiak, Alaska).
Helminthophila celata, Salvin and Godman, 'Biol. Cent. Amer.,' I. 1880, p. 117 (Chimuy, Vera Paz).
Helminthophila celata lutescens, Dearborn, 1907, p. 127 (Tecpam).

Range.—Northern Pacific coast district, south in winter to Guatemala (two records).

(539) **Vermivora peregrina** (Wilson)

Sylvia peregrina Wilson, 'Amer. Orn.,' IV, 1811, p. 83 (Cumberland River, Tennessee).

Helminthophaga peregrina, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1880, p. 117 (Dueñas, Coban, Lanquin).

Helminthophila peregrina, Dearborn, 1907, p. 127 (Patulul, Mazatenango); Ridgway, 'Birds N. and Mid. Amer.,' pt. 2, 1902, p. 460.

Finca Chamá, 1 ♀; Secanquim, 1 ♀; Finca La Primavera, 2 ♂, 3 ♀; Barrillos, 5 ♂, 2 ♀; Momostenango, 1 ♀; La Perla, 1 ♂, 2 ♀; Sacapulas, 1 (?); Panajachel, 2 ♂, 1 ♀, 1 (?); San Lucas, 6 ♂, 3 ♀, 1 (?); Finca El Soche, 1 ♀; Ocos, 1(?); Finca Carolina, 6 ♂, 3 ♀.

Range.—Boreal eastern North America, south in winter to Colombia.

An abundant winter visitant throughout from September 25 to April 20.

"A common winter resident, more abundant above 2000 feet but not rare at sea-level. One of the several species that was always to be found feeding on the yellow flowers of the silk-bark oak. In such trees they were abundant at Barrillos, March 18." (Anthony, MS.)

(540) **Vermivora superciliosa superciliosa** (Hartlaub)

Conirostrum superciliosum, Hartlaub, Rev. Zool., 1844, p. 215 (Guatemala).

Parula superciliosa, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1880, p. 122 (Quetzaltenango, Volcan de Fuego, above Chuacus, Santa Barbara).

Oreothlypis superciliosa, Dearborn, 1907, p. 127 (Tecpam); Ridgway, *loc. cit.*, p. 477.

Chichicastenango, 1 ♂, 2 ♀; Momostenango, 2 ♂, 1 ♀; San Mateo, 1 ♂; La Montañita, 1 ♂; San Lucas, 1 ♂; Tecpam, 4 ♂, 1 ♀, 2(?); Quetzaltenango, 6 ♂.

Range.—Subtropical to Temperate zones: Mexico to northern Nicaragua; the race, Guatemala and southern Mexico.

For a recent review of this species see Miller and Griscom (Amer. Mus. Novit., No. 183, 1925, pp. 7–8).

This pretty little warbler is found chiefly in oak and pine forests. It is rare below 7000 feet, and was common above Totonicapam at 10,500 feet in August, 1930.

(541) **Compsothlypis americana ramalinæ**[1] Ridgway

Compsothlypis americana ramalinæ Ridgway, *loc. cit.*, p. 486, range on p. 783 (no type or type locality designated); Dearborn, 1907, p. 127 (Gualan, San José).

[1]This race not reognized in the 'A. O. U. Check List.'

Parula americana, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1880, p. 119 (Coban).

RANGE.—Mississippi Valley, south in winter to eastern Guatemala and eastern Nicaragua (once).

(542) **Compsothlypis pitiayumi inornata** (Baird)

Parula inornata BAIRD, 'Rev. Amer. Birds,' I, 1864, p. 169 (Choctum, Guatemala); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1880, p. 120 (Choctum).

Compsothlypis pitiayumi inornata, RIDGWAY, *loc. cit.*, p. 488.

RANGE.—Tropical or Subtropical Zone: Texas to Argentina; the race, Chiapas and Vera Paz.

Students should refer to Dr. Chapman's paper on this genus (Auk, 1925, p. 200). I heartily agree that the group originated in Mexico and Central America and spread south. The Guatemala race seems to be exceedingly rare. Salvin is the only man who ever found it in Guatemala.

(543) **Peucedramus olivaceus aurantiacus** Ridgway

Peucedramus olivaceus aurantiacus RIDGWAY, Proc. U. S. Nat. Mus., No. 1074, 1896, p. 441 (Chilasco, Vera Paz, Guatemala).

Peucedromus olivaceus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1881, p. 143 (Volcan de Fuego, Volcan de Agua, Chilasco).

Chichicastenango, 3♂, 1♀; Momostenango, 3♂, 1♀; San Mateo, 1♂; Tecpam, 1♂.

RANGE.—Southwestern United States to northern Nicaragua; the race, Temperate Zone pine forests of Guatemala.

For a review of this species see Miller and Griscom (Amer. Mus. Novit., No. 183, 1925, pp. 8–11). The fresh specimens listed above abundantly confirm the distinctness of the race *aurantiacus*. It does not appear to be a common bird in Guatemala, and has been found only in the higher parts of the Altos.

(544) **Dendroica æstiva æstiva** (Gmelin)

Motacilla æstiva GMELIN, 'Syst. Nat.,' I, 1789 p. 996 (Canada).

Dendroeca æstiva, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1880, p. 124 (Dueñas, Retalhuleu, San Geronimo, Tactic, Coban, Cahabon).

Dendroica æstiva, DEARBORN, 1907, p. 128 (Los Amates, Lake Amatitlan, Patulul, Mazatenango, San José).

Probably typical *æstiva*.—Secanquim, 1♂; Chipoc, 1♂, 1(?); Chimoxan, 1♀, 1(?); Progreso, 1♂; Sacapulas, 1♂; La Perla, 1♂; Finca Carolina, 1♂; Hacienda California, 1♂; Ocos, 2♂, 6♀.

Either *æstiva* or *brewsteri*.—Finca Cipres, 1♂; Ocos, 1♂; Panajachel, 1♂(?).

RANGE.—North America, south in winter to Guiana, Brazil, and Peru; the various races do not appear to have definite winter ranges.

It is an almost hopeless proposition to identify females and immature forms of the various races of Yellow Warblers in winter plumage, as extremes and intermediate specimens must always be reckoned with as possibilities. With adult males, however, something can usually be done, and much time and care has been devoted to their critical determination.

The Yellow Warbler is an abundant winter visitor to the whole of Central America. I have examined hundreds of specimens, and am convinced that every single race occurs or can be expected in every part of this region. The season in Guatemala is from August 9 to May 6.

(545) **Dendroica æstiva sonorana** Brewster

Dendroica æstiva sonorana BREWSTER, Auk, 1888, p. 137 (Oposura, Sonora Mexico); DEARBORN, 1097, p. 128 (El Rancho, San José); RIDGWAY, 'Birds N. and Mid. Amer.,' pt. 2, 1902, p. 512.

Ocos, 1 ♀?; San José, 1 ♀.

RANGE.—Breeds in southwestern United States and northwestern Mexico; winters at least as far south as western Panama.

(546) **Dendroica æstiva rubiginosa** (Pallas)

Motacilla rubiginosa PALLAS, Zoogr. Rosso. Asiatica, I, 1826, p. 496 (Sitka Alaska).

Sacapulas, 1 ♀; Finca Carolina, 1 ♀; Finca Cipres, 1 ♀; Progreso, 1 ♂ imm. (perhaps *brewsteri*).

RANGE.—Pacific slope of Canada, in winter at least to western Panama.

(547) **Dendroica æstiva brewsteri** Grinnell

Dendroica æstiva brewsteri GRINNELL, Condor, 1903, p. 72 (Palo Alto, California).

Finca Sepacuite, 1 ♂; Sacapulas, 1 ♂; Finca Carolina, 1 ♀.

RANGE.—Pacific slope of United States; I have seen winter specimens from Guatemala and northern Nicaragua.

(548) **Dendroica æstiva amnicola** Batchelder

Dendroica æstiva amnicola BATCHELDER, Proc. N. E. Zoöl. Club, VI, 1918, p. 82 (Curslet, Newfoundland).

Finca Chamá, 1 ♂ ad. (May 4).

RANGE.—Breeds in Newfoundland; this is the only extra-limital record.

(549) **Dendroica æstiva ineditus** Phillips

Dendroica æstiva ineditus Phillips, Auk, 1911, p. 85 (Matamoros, Tamaulipas, Mexico).

Ocos, 1 ♂ ad. (October 22).

Range.—Described from migrant specimens in Tamaulipas, probably breeding in adjacent mountains to the west.

(550) **Dendroica erithachorides xanthotera** Todd

Dendroica bryanti xanthotera Todd, Proc. Biol. Soc. Wash., XXXVII, 1924, p. 123 (Puntarenas, Costa Rica).

Dendroica bryanti castaneiceps, Dearborn, 1907, p. 128 (San José); Lantz, 1899, p. 223 (San José); Ridgway, *loc. cit.*, p. 530.

Ocos, 4 ♂, 3 ♀.

This series clearly belongs to Todd's form, recently described from northwestern Costa Rica, and not to *castaneiceps*, which may prove to be confined to Lower California and the adjacent Mexican mainland.

Typical *bryanti* will almost surely be found on the coast of eastern Guatemala. It has a continuous range from Mexico to western Panama.

(551) **Dendroica cærulescens** (Gmelin)

Motacilla cærulescens Gmelin, 'Syst. Nat.,' I, 1788, p. 960 (San Domingo).
Dendroeca canadensis, Salvin, Ibis, 1866, p. 205 (Coban).

Range.—Eastern North America, wintering in the West Indies; the record cited above is the only one for Central America.

(552) **Dendroica coronata coronata** (Linnæus)

Motacilla coronata Linnæus, 'Syst. Nat.,' 12th Ed., I, 1766, p. 33 (near Philadelphia, Pa.).

Dendroeca coronata, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1880, p. 127 (Escuintla, Dueñas, San Geronimo, Coban, Cahabon); Dearborn, 1907, p. 128 (Puerto Barrios, Los Amates, Tecpam).

Finca La Primavera, 1 ♀ (April 8); Sacapulas, 2 ♂; San Lucas, 5 ♂, 6 ♀; Nebaj, 1 ♀ (April 27).

Range.—Eastern North America, south in winter to the Canal Zone and Colombia.

A common winter visitant throughout.

(553) **Dendroica coronata hooveri** Macgregor

Dendroica coronata hooveri Macgregor, Condor, 1899, p. 32 (Palo Alto, Calif.).

San Lucas, 3 ♂.

Range.—Western North America, south in winter to Guatemala.

These three specimens are notably larger than the balance of the series from Guatemala, and probably represent the western form.

(554) **Dendroica auduboni auduboni** (Townsend)

Sylvia auduboni Townsend, Journ. Acad. Nat. Sci. Phila., VII, 1837, p. 191 (Columbia River).

San Lucas, 1 ♂ imm.

Range.—Pacific North America, south in winter to Guatemala.

This specimen is sufficiently small to be referred here. See beyond for further discussion.

(555) **Dendroica auduboni memorabilis** Oberholser

Dendroica auduboni memorabilis Oberholser, Ohio Journ. Sci., XXI, No. 7, May, 1921, p. 243 (Ward, Boulder Co., Colorado; specimen seen from "Guatemala").
Dendroica auduboni, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1880, p. 128 (ridge above Totonicapam; San Geronimo).

San Lucas, 3 ♂; Momostenango, 2 ♂ ad., 3 ♀; Chichicastenango, 2 ♂ ad., 5 ♀. (earliest November 16).

Range.—Western North America, south in winter to Guatemala.

The large Rocky Mountain race of Audubon's Warbler is unquestionably highly migratory, reaching California, southeastern Texas, southern Tamaulipas and Guatemala, thus occurring in the non-breeding seasons in the breeding areas of all the other races. This makes the identification of winter individuals very difficult, and sometimes impossible in the case of immature specimens which are of medium size. While Oberholser examined very large series, it is unfortunate that his measurements were based on a relatively small percentage of his material. The examination of nearly 200 specimens available at the moment brings out some interesting minor details. Thus the wing measurements of adult male *auduboni* and *memorabilis* overlap, and females of *memorabilis* reach a maximum of 81 mm. A good series of adult males from Cochise Co., Arizona, average as small as *auduboni*.

Probably a much commoner winter visitant to Guatemala than previously supposed.

(556) **Dendroica auduboni nigrifrons** Brewster

Dendroica nigrifrons BREWSTER, Auk, 1889, p. 94 (Pinos Altos, Chihuahua).

Momostenango, 2 ♂ ad.; Chichicastenango, 2 ♂ ad.

RANGE.—Mountains of southern Arizona to Durango.

These four birds are easily separable from the other Audubon's Warblers in being larger, more heavily black below, more heavily streaked with black above, and almost or entirely devoid of the brownish tinge to the upperparts, so characteristic of the winter plumage of *auduboni* and *memorabilis*. It will be seen that these birds correspond exactly to the description of the winter plumage of *nigrifrons* given by Ridgway.

Now complications arise in that Arizona birds referred to *nigrifrons* are by no means typical of that race, the type series of which is before me. The so-called winter plumage of *nigrifrons* is really based on the Arizona bird or winter migrants coming from that general area. I have no time, nor is this the occasion to undertake a critical study of so difficult a taxonomic problem, but I hazard the guess that the breeding birds of southern Arizona (at least Huachuca Mts.) constitute an undescribed form, that its winter plumage (adult males) is the one now ascribed to *nigrifrons*, that the difference in this plumage as compared with *auduboni* and *memorabilis* is an additional subspecific character of this unnamed form, and that the unique adult male of *goldmani* is the winter plumage of the true *nigrifrons* as here restricted.

(557) **Dendroica auduboni goldmani** Nelson

Dendroica goldmani NELSON, Auk, 1897, p. 66, (Hacienda Chancol, Guatemala).
Dendroica auduboni goldmani, RIDGWAY, *loc. cit.*, p. 556.

As stated above, I regard this bird as the winter plumage of the real *nigrifrons* Brewster. The unique specimen was taken in January, and there is not a shadow of evidence for believing that this bird was anything but a migrant from considerably farther north. Mr. Anthony's notes below refer, of course, to the species only.

"A common form in the upper pine belt. When crossing over the higher parts of the Cuchumatan Mts., in northern Huehuetenango, I saw small flocks of what I considered *nigrifrons* at an altitude of from 10,000 to 12,000 feet. They were not uncommon at both Momostenango and Chichicastenango, in open pine forest, in January and December." (Anthony, MS.)

(558) **Dendroica magnolia** (Wilson)

Sylvia magnolia WILSON, 'Amer. Orn.,' III, 1811, p. 63 (eastern United States).

Dendroeca maculosa, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1881, p. 129 (Retalhuleu, Dueñas, Coban, Choctum).

Dendroica maculosa, DEARBORN, 1907, p. 128 (Los Amates, Lake Amatitlan, Patulul, Mazatenango); RIDGWAY, *loc. cit.*, p. 532.

Finca Sepacuite, 1 ♀; Finca La Primavera, 2 ♀; Secanquim, 5 ♂, 10 ♀, 1(?); Sacapulas, 1 ♀; San Lucas, 1 ♂; Panajachel, 1 ♂, 1 ♂; Ocos, 2 ♀; Finca Carolina, 1(?); Hacienda California, 2 ♂.

An abundant winter visitant, almost entirely in the Tropical Zone, and much commoner on the Caribbean than on the Pacific slope. Males taken at Secanquim between March 8 and April 6 are molting, but none have acquired full spring plumage. The extreme dates are October 12 to April 15.

(559) **Dendroica cerulea** (Wilson)

Sylvia cerulea WILSON, 'Amer. Orn.,' II, 1810, p. 141 (Pennsylvania).

Dendræca cærulea BAIRD, 'Rev. Amer. Birds,' I, 1864, p. 19 (Guatemala, specimen in Lawrence Coll.).

Dendroica rara, RIDGWAY, *loc. cit.*, p. 570.

RANGE.—Eastern North America, wintering east of the Andes to Bolivia; casual in Central America between Yucatan and eastern Costa Rica.

(560) **Dendroica pensylvanica** (Linnæus)

Motacilla pensylvanica LINNÆUS, 'Syst. Nat.,' I, 1766, p. 333 (near Philadelphia, Pa.).

Dendræca pennsylvanica, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1881, p. 132 (Dueñas, Coban, Choctum, and Teleman).

Chimoxan, 1 ♂, 1 ♀ (Sept. 27 and Oct. 1).

RANGE.—Eastern North America, south in winter to Panama.

An uncommon transient, its actual wintering in northern Central America requiring confirmation.

(561) **Dendroica castanea** (Wilson)

Sylvia castanea WILSON, 'Amer. Orn.,' II, 1810, p. 97 (Pennsylvania).

Dendroeca castanea, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1881, p. 133 (Guatemala, specimen collected by Skinner).

RANGE.—Eastern North America, in winter eastern Panama to Colombia.

An exceedingly rare, perhaps only a casual migrant in Central America, north of the Canal Zone.

(562) **Dendroica fusca** (Müller)

Motacilla fusca MÜLLER, 'Natursyst.,' Suppl., 1776, p. 175 ("Guyane").
Dendroeca blackburniæ, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1881, p. 134 (Dueñas, Coban, Choctum).

Chimoxan, 1 ♀ (Oct. 1); Panajachel, 1 ♂, 1 ♀ (Oct. 4 and 5); Finca Sepacuite, 1 ♀ (May 10, in breeding plumage).

RANGE.—Eastern North America; in winter as far south as Peru.

Probably a regular transient, its wintering in northern Central America requiring confirmation.

(563) **Dendroica dominica albilora** Ridgway

Dendroica dominica var. *albilora* RIDGWAY, Amer. Nat., VII, 1873, p. 606 (Belize, Brit. Honduras).
Dendroeca dominica, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1881, p. 135 (Choctum, Dueñas, Totonicapam).

La Montañita, 1 ♀.

RANGE.—Central United States, in winter to Nicaragua.

A common winter visitant, arriving as early as August 7. (San Lucas, Griscom, 2 seen, 1 collected.)

(564) **Dendroica graciæ decora** Ridgway

Dendroica graciæ var. *decora* RIDGWAY, Amer. Nat., VII, 1873, p. 608 (Belize, Brit. Honduras); idem, 'Birds N. and Mid. Amer.,' pt. 2, 1902, p. 586 (Joyabaj).
Dendrœca decora, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1881, p. 136, ("Guatemala," old specimens).

La Montañita, 2 ♂, 1 ♀.

RANGE.—Southwestern United States to northern Nicaragua; the race, Oaxaca and Chiapas southward.

These two specimens agree in color characters with *decora* (a lowland form in British Honduras and Oaxaca), but are a little larger, as might be expected of a highland bird. This warbler is probably much commoner in the high pine forest in western Guatemala than the few records would indicate. I found it common in northern Nicaragua, after looking for it specially and learning the song. The race *decora* is in all probability a composite.

(565) **Dendroica virens virens** Gmelin

Motacilla virens GMELIN, 'Syst. Nat.,' I, 1789, p. 985 (Philadelphia, Pa.).

Dendroeca virens, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1881, p. 138 (Dueñas, San Geronimo, Tactic, Coban).

Dendroica virens, DEARBORN, 1907, p. 129 (El Rancho, Lake Amatitlan, Lake Atitlan); RIDGWAY, *loc. cit.*, p. 562.

Secanquim, 1 ♂, 2 ♀; Finca Sepur, 2 ♀; Finca La Primavera, 3 ♂, 1 ♀; Finca Sepacuite, 1 ♂, 1 ♀; Sacapulas, 3 ♂, 3 ♀; Barrillos, 2 ♀; Nebaj, 1 ♀; Huehuetenango, 1 ♀; La Montañita, 1 ♂, 2(?); Panajachel, 1 ♀; Guatemala City, 1 ♂; Finca Carolina, 1 ♂; Finca El Soche, 2 ♂.

RANGE.—Eastern North America, south in winter to Panama.

Abundant winter visitant from October 15 to May 4. Some males have the full breeding plumage as early as March 31. It is most exceptional to find this warbler anywhere in Central America below 2500 feet.

(566) **Dendroica chrysoparia** Sclater and Salvin

Dendroeca chrysoparia SCLATER AND SALVIN, P. Z. S., 1860, p. 298 (mountains of Vera Paz, Guatemala); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1881, p. 140 (Tactic).

RANGE.—Breeds in central Texas, south in winter to northern Nicaragua.

(567) **Dendroica occidentalis** (J. K. Townsend)

Sylvia occidentalis TOWNSEND, Journ. Acad. Nat. Sci. Phila., VII, 1837, p. 190 (near Fort Vancouver, Washington).

Dendroeca occidentalis, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1881, p. 139 (Volcan de Fuego, San Geronimo, Alotepeque).

Chichicastenango, 6 ♂, 5 ♀; Momostenango, 2 ♀; San Mateo, 1 ♀; La Montañita, 1 ♂, 1 ♀ (Oct. 22); Chanquejelve, 1 ♂, 1 ♀.

RANGE.—Western North America, south in winter to northern Nicaragua.

Common winter visitant in the pine forests of the Altos.

(568) **Dendroica townsendi** (J. K. Townsend)

Sylvia townsendi TOWNSEND, Journ. Acad. Nat. Sci. Phila., VII, 1837, p. 191 (near Fort Vancouver, Washington).

Dendroeca townsendi, SALVIN AND GODMAN, p. 141 (Dueñas, Volcan de Fuego, Coban).

Dendroica townsendi, RIDGWAY, *loc. cit.*, p. 559; DEARBORN, 1907, p. 128 (Tecpam).

Chichicastenango, 4♂, 4♀; Momostenango, 5♂, 5♀; Chanquejelve, 1♂, 2♀; Huehuetenango, 2♂; Barrillos, 2♂, 1♀; San Mateo, 1♂, 2♀; San Lucas, 5♂, 5♀; La Montañita, 6♂, 1♀; Panajachel, 5♂, 9♀.

RANGE.—Western North America, south in winter to northern Nicaragua.

"Abundant winter visitant in the mountain pine forests from September 7 to May 1 at Guatemala City." (Anthony, MS.)

(569) **Seiurus aurocapillus** (Linnæus)

Motacilla aurocapilla LINNÆUS, 'Syst. Nat.,' I, 1766, p. 334 (near Philadelphia, Pa.).

Siurus auricapillus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1881, p. 144 (Escuintla, Savana Grande, Dueñas, Tactic, Coban, Choctum).

Seiurus aurocapillus, DEARBORN, 1907, p. 129 (Mazatenango); RIDGWAY, *loc. cit.*, p. 635.

Finca La Primavera, 1♀; Barrillos, 1(?); Nebaj, 1♂; San Lucas, 2♂; Finca Carolina, 1♂, 1(?).

A common winter visitant from October 7 to April 26.

(570) **Seiurus motacilla** (Vieillot)

Turdus motacilla VIEILLOT, 'Ois. Amer. Sept.,' II, 1807, p. 9 (Kentucky).

Siurus motacilla, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1881, p. 147 (Retalhuleu, Alotenango, Volcan de Fuego, Coban, Choctum).

Guatemala City, 1♂.

A common winter visitor, recorded from late August to April.

(571) **Seiurus noveboracensis noveboracensis** (Gmelin)

Motacilla noveboracensis GMELIN, 'Syst. Nat.,' I, 1789, p. 958 (Louisiana and New York).

Siurus noveboracensis, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1881, p. 146 (Coban, San Geronimo, Dueñas, Patio Bolas, Retalhuleu).

Secanquim, 1♂; Finca Sepacuite, 1? (May 22).

RANGE.—Northern North America, south in winter to Ecuador; this race predominating in the West Indies, *notabilis* in Central America.

The exact status of the Water-thrush in Guatemala is unknown, but in all Central America it is much less common than the western race. The species is abundant from August to late May.

(572) **Seiurus noveboracensis notabilis** Ridgway

Seiurus nævius notabilis Ridgway, Proc. U. S. Nat. Mus., III, 1880, p. 12 (Wyoming).

Seiurus noveboracensis notabilis, Dearborn, 1907, p. 129 (Los Amates, Lake Amatitlan, both intermediate); Ridgway, 'Birds N. and Mid. Amer.,' pt. 2, 1902, p. 645.

Chimoxan, 2 ♂; Hacienda California, 1 ♂.

One of these specimens is clearly the common intermediate bird, in size nearer the typical form, but in color approaching *notabilis*. I have always considered the color characters as being a little more definite.

(573) **Oporornis formosus** (Wilson)

Sylvia formosa Wilson, 'Amer. Orn.,' III, 1811, p. 85 (Kentucky).

Oporornis formosa, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1881, p. 148 (Dueñas, Calderas, Coban, Choctum); Dearborn, 1907, p, 129 (Los Amates); Ridgway, *loc. cit.*, p. 662.

Chimoxan, 1? (Sept. 13) ; San Felipe, 1 ♂.

Range.—Eastern United States, south in winter to Colombia.

(574) **Oporornis philadelphia** (Wilson)

Sylvia philadelphia, Wilson, 'Amer. Orn.,' II, 1810, p. 101 (Philadelphia, Pa.).

Panajachel, 1 ♀ (Sept. 20); La Carolina, 1 ♀ (May 15).

Range.—Eastern North America, winters south to Ecuador.

Probably a rare migrant, but previously unrecorded in Central America north of Nicaragua.

(575) **Oporornis tolmiei** (Townsend)

Sylvia tolmiei, Townsend, 'Narr. Journ. Rocky Mts.,' 1839, p. 343 (Columbia River, near Fort Vancouver, Washington).

Geothlypis macgillivrayi, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1881, p. 155 (Dueñas, Coban).

Oporornis tolmiei, Dearborn, 1907, p. 129 (Lakes Amatitlan and Atitlan, Patulul); Ridgway, *loc. cit.*, p. 631.

Finca La Primavera, 3 ♂, 3 ♀; Sacapulas, 1 ♂, 1 ♀; Nebaj, 2 ♂, 1 ♀; Momostenango, 1 ♀; Panajachel, 1 ♂, 2 ♀ (?); San Lucas, 2 ♂; Finca Carolina, 1 ♀; Hacienda California, 1 ♀, 2(?).

Range.—Western North America, south in winter to Colombia.

An abundant winter visitant from September 23 to April 26.

(576) **Geothlypis trichas brachidactyla** (Swainson)

Trichas brachydactylus SWAINSON, 'Anim. in Menag.,' 1838, p. 295 ("northern Provinces of United States").

Geothlypis trichas, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1881, p. 150 (Chiapam, Retalhuleu, Escuintla, Dueñas, San Geronimo, Coban, Choctum).

Geothlypis trichas brachydactyla, DEARBORN, 1907, p. 129 (Los Amates, Lakes Amatitlan and Atitlan, Mazatenango, San José); RIDGWAY, *loc. cit.*, p. 664.

Secanquim, 1 ♂; Finca La Primavera, 2 ♂; Sacapulas, 1 ♀; Finca Sepur, 1 ♂; Hacienda California, 1 ♂, 1 ♀; La Carolina, 1 ♀.

RANGE.—Eastern United States, south in winter to Costa Rica.

A common winter visitant from at least November 8 to the exceptionally late date of May 19. Probably the great majority of older records for the species apply to this race.

(577) **Geothlypis trichas occidentalis** Brewster

Geothlypis trichas occidentalis BREWSTER, Bull. Nutt. Orn. Club, VIII, 1883, p. 159 (Truckee River, Nevada).

Ocos, 1 ♀ imm. (Oct. 17); Panajachel, 1 ♂ imm.

RANGE.—Western North America, south in winter to western Guatemala.

Apparently this subspecies in measurements and slightly paler, duller coloration above. Not previously reported south of western Mexico.

(578) **Chamæthlypis poliocephala palpebralis** (Ridgway)

Geothlypis palpebralis RIDGWAY, 'Man. N. Amer. Birds,' 1887, p. 526 (Mirador, Vera Cruz, Mexico).

Quiriguá, 1 ♂ ad. (Coll. Mus. Comp. Zoöl.).

RANGE.—Tropical lowlands, eastern Mexico to Yucatan, British Honduras and eastern Guatemala.

Previously unrecorded from Guatemala. I have, however, seen specimens from various parts of British Honduras, and it is apparent that this richly colored form has a continuous range from Vera Cruz to eastern Guatemala on the Caribbean side of the continent.

(579) **Chamæthlypis poliocephala caninucha** (Ridgway)

Geothlypis poliocephala var. *caninucha* RIDGWAY, Amer. Journ. Sci., IV, 1872, p. 459 (Retalhuleu, Guatemala).

Geothlypis caninucha, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1881, p. 153 (Retalhuleu, Patio Bolas, Dueñas, San Geronimo).

Chamæthlypis caninucha, DEARBORN, 1907, p. 130 (Patulul, Mazatenango); RIDGWAY, 'Birds N. and Mid. Amer.,' pt. 2, 1902, p. 689.

Panajachel, 1 (?); Lake Amatitlan, 1 ♀; San Felipe, 1 ♂; San José, 1 ♂; Pantaleon, 7 ♂, 1 ♀; Carolina, 1 ♂, 2 ♀; Hacienda California, 9 ♂, 4 ♀; Finca El Cipres, 15 ♂, 4 ♀, 4 imm.

About ten per cent of this large series has at least a trace of white or yellowish on eyelids, making it impossible to maintain *caninucha* as specifically distinct. While abundant on the Pacific slope, this warbler is rare and local on the eastern side of the mountains. Just how to allocate these specimens is uncertain. The specimen from Lake Amatitlan is clearly *poliocephala palpebralis* as to its eyelid character, and the one from Panajachel is *caninucha* with equal certainty.

(580) **Icteria virens virens** (Linnæus)

Turdus virens, LINNÆUS, 'Syst. Nat.,' I, 1758, p. 171 (Carolina).

Icteria viridis, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1881, p. 158 (Retalhuleu, Volcan de Fuego, Savana Grande, Polochic Valley, Coban, Choctum).

Icteria virens, DEARBORN, 1907, p. 130 (Los Amates, Lake Amatitlan, San José, Mazatenango, Patulul, Lake Atitlan).

Chimoxan, 1(?); Finca La Primavera, 1(?); Secanquim, 2 ♀; Chanquejelve, 1 ♀ (approaching *longicauda*); Panajachel, 1 ♂; Ocos, 1 ♂, 1 ♀; Hacienda California, 3 ♀, 1(?).

RANGE.—Eastern United States, south in winter to Costa Rica.

A relatively uncommon winter visitant from September 24 to April 7, but doubtless arriving much earlier and remaining a little later.

(581) **Granatellus sallæi sallæi** (Bonaparte)

Setophaga sallæi BONAPARTE, Compt. Rend., XLIII, 1856, p. 957 (Cordova, Vera Cruz).

Granatellus sallæi, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1881, p. 161 (Cahabon, Tactic).

RANGE.—Tropical Zone: known only from Vera Cruz, Oaxaca, and Vera Paz, Guatemala; a race in Yucatan; exceedingly rare.

This genus is an interesting relict. There is another species in southwestern Mexico, *venustus*, one of the rarest of birds, and *francescæ* on the Tres Marias. The genus reappears in Amazonia, where *pelzelni* is widely distributed, with at least two races. It is so close to other genera of the family that are purely Sonoran, that it probably originated in the general region, where the northern group of species are now found.

(582) **Wilsonia citrina** (Boddaert)

Muscicapa citrina Boddaert, 'Tabl. Pl. Enl.,' 1783, p. 41 (Louisiana).
Myiodioctes mitratus, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1881, p. 167 (Retalhuleu, Dueñas, Coban, Choctum).
Wilsonia mitrata, Dearborn, 1907, p. 130 (Los Amates, Patulul); Ridgway, *loc. cit.*, p. 705.

Hacienda California, 1 ♂ (Sept. 22); Ocos, 1 ♀.

Range.—Eastern United States, south in winter to Panama.

A common winter visitant, chiefly in the lowlands.

(583) **Wilsonia canadensis** (Linnæus)

Muscicapa canadensis Linnæus, 'Syst. Nat.,' I, 1766, p. 327 (Canada).
Myiodioctes canadensis, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1881, p. 166 (Retalhuleu, Alotenango, Dueñas, Coban).

Chimoxan, 1 ♂; Progreso, 1 ♂; Zunil, 1 ♂; Panajachel, 2 ♂, 2 ♀; Hacienda California, 1 ♀.

Range.—Eastern North America, wintering chiefly in South America to Peru.

A common transient throughout Central America, with scarcely any definite mid-winter records.

(584) **Wilsonia pusilla pusilla** (Wilson)

Muscicapa pusilla Wilson, 'Amer. Orn.,' III, 1811, p. 103 (southern States).
Myiodioctes pusillus, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1881, p. 168 (Dueñas, San Geronimo, Coban).
Wilsonia pusilla, Dearborn, 1907, p. 130 (Los Amates, Tecpam).

Chichicastenango, 1 ♀; Chanquejelve, 1 ♀; La Montañita, 1 ♂; San Lucas, 2 ♂, 1 ♀.

Range.—Boreal North America, the three races wintering together in Central America to the Canal Zone.

I have now examined large series of Wilson's warblers from various parts of Central America. While the positive identification of individuals is always difficult and often nearly impossible, there is no doubt that the great majority of wintering birds are *pileolata*, and this form extends farthest south. Typical *pusilla* is fairly frequent in Guatemala, and the most southern point from which I have seen an authentic specimen is northern Nicaragua. I have seen very few definite specimens of *chryseola*, but this is probably due to the fact that its characters are largely obscured in winter plumage.

The references above refer to all three possible forms.

(585) **Wilsonia pusilla pileolata** (Pallas)

Motacilla pileolata Pallas, Zoogr. Rosso. Asiat., I, 1826, p. 497 (Kadiak, Alaska).

Secanquim, 1♂, 2♀; Finca La Primavera, 2♂, 1♀; Finca Chamá, 1♂; Finca Sepur, 1♂; Chimoxan, 1♂; Sacapulas, 1♂; Chichicastenango, 1♂, 4♀; Momostenango, 3♂, 3♀; Barrillos, 1♂, 5♀; San Mateo, 2♂; La Montañita, 1♂; Nebaj, 2♂, 2♀; Guatemala City, 1♂; San Lucas, 8♂, 1♀; Panajachel, 1♂, 1♀; Finca Carolina, 2♂; San Felipe, 1♂.

Abundant throughout from September 11 to April 26.

(586) **Wilsonia pusilla chryseola** Ridgway

Wilsonia pusilla chryseola Ridgway, *loc. cit.*, 1902, p. 714 (Red Bluff, California).

Secanquim, 1♂; Chichicastenango, 1♂; Panajachel, 2♂.

(587) **Cardellina rubrifrons bella** Griscom

Cardellina rubrifrons bella Griscom, Amer. Mus. Novit., No. 438, 1930, p. 2 (Chichicastenango, Guatemala).

Cardellina rubrifrons, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1881, p. 163 (Volcan de Fuego and Totonicapam); Ridgway, *loc. cit.*, p. 720.

Chichicastenango, 2♂, 1♀.

Range.—Arizona to Guatemala; the race, in western Guatemala.

A monotypic genus of the temperate pine forests of the Sonoran Region.

(588) **Setophaga ruticilla** (Linnæus)

Motacilla ruticilla Linnæus, 'Syst. Nat.,' I, 1758, p. 186 (Virginia).

Setophaga ruticilla, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1881, p. 178 (Retalhuleu, Totonicapam, Dueñas, San Geronimo, Coban, Choctum); Dearborn, 1907, p. 130 (Gualan).

Secanquim, 1♀; Finca Chamá, 3♂, 2♀; Chimoxan, 1♀; Progreso, 1♂; Panajachel, 1♂; Hacienda California, 1♂.

A common winter visitant from September 16 to May 6. Arrived at Puerto Barrios, August 21, 1930 (Griscom).

(589) **Setophaga picta guatemalæ** Sharpe

Setophaga picta subspecies *guatemalæ*, Sharpe, 'Cat. Birds Brit. Mus.,' X, 1885, p. 417 (Guatemala).

Setophaga picta, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1881, p. 180 (Volcan de Fuego, ridge near Chol, San Geronimo, Santa Barbara, Chilasco, Tactic).

Setophaga picta guatemalæ, DEARBORN, 1907, p. 130 (Tecpam); RIDGWAY, *loc. cit.*, p. 729 (Hacienda Chancol, Joyabaj, etc.).

Chichicastenango, 1♂, 1♀; Momostenango, 2♂, 4♀; Chanquejelve, 1♂; Uspantan, 1♂; Huehuetenango, 1♂; Tecpam, 1♀; Panajachel, 1♂; La Montañita, 2♂, 1♀; Quetzaltenango, 1♂, 1♀.

RANGE.—Temperate Zone, pine and oak forests: southwestern United States to northern Nicaragua; the race, Guatemala southward.

A fairly common bird throughout the Altos, its habits exactly similar to the better known species.

(590) **Myioborus miniatus flammeus** (Kaup)

Setophaga flammea KAUP, P. Z. S., 1851, p. 50 (Guatemala; I designate Alta Vera Paz).

Setophaga miniata, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1881, p. 181, part (as to Chilasco and Choctum, Coban only).

Myioborus miniatus flammeus, part, RIDGWAY, *loc. cit.*, p. 733.

Finca Sepacuite, 11♂, 3♀; Finca Sepur, 1♂; La Montañita, 1♀, 1(?); Barrillos, 2♂, 1♀; La Perla, 1♂, 2♀.

RANGE.—Highlands of Mexico to Salvador; the race, in Alta Vera Paz.

This good series, when compared with recent specimens of true *miniatus* from southeastern Mexico, obviously represents a well-marked subspecies, the characters of which are as follows: underparts flame-scarlet rather than vermilion; outer tail feathers with less white terminally; tail averaging much shorter, in males 55–62 as compared with 62–69 in typical *miniatus;* wing length, however, the same in both races.

The nomenclature is involved. Kaup's original description was only one line and a half long, and it might be stretched to include the much more orange bird of the Pacific cordillera. However, a Coban trade-skin was the most likely basis for his specimen and, as he called it his bird "*flammea*" rather than "*aurantiaca*," I fix the name on the Vera Paz form.

(591) **Myioborus miniatus intermedius** Hartlaub

Setophaga intermedia HARTLAUB, Rev. et Mag. Zool., 1852, p. 5 (Guatemala; I designate Panajachel, western Guatemala).

Setophaga miniata, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1881, p. 181 (as to Dueñas, Carrizal and Quetzeltenango).

Myioborus miniatus flammeus, DEARBORN, 1907, p. 131 (Tecpam); RIDGWAY, *loc. cit.*, p. 733 (Volcan de Fuego, Volcan de Agua).

Volcan San Lucas, 7 ♂, 2 ♀, 1(?); Chichicastenango, 3 ♂; Antigua, 1 ♀; Quetzaltenango, 2 ♂; Panajachel, 3 ♀, 6(?); Tecpam, 1 ♂, 2(?).

RANGE—Pacific cordillera of Guatemala.

This strikingly distinct subspecies is far more easily separable from *flammeus* than the latter is from *miniatus*. Its underparts are orange-red, about the color of a tangerine orange. The tail has the same length as typical *miniatus*, but the white tips to the outer feathers average shorter, as in *flammeus*. The nomenclature is again perplexing. Hartlaub compared his bird with *vulnerata* Wagler (a synonym of *miniata* Swainson) and *verticalis* of South America. His chief point of difference as regards *vulnerata* was imaginary, due to a defect in Wagler's description. However, he distinctly called the underparts of his specimen "miniato aurantiaco," a color term which applies exactly to the bird of western Guatemala. I prefer consequently to revive his name for the present, rather than propose still another one for this unfortunate species.

There are two other points of interest about *intermedius*. One is that the line of demarcation between it and *flammeus* seems to be approximately the same as that separating the two species of *Myadestes;* and the other is the unstable nature of the color of the underparts, there being a great deal of variation in the shade of orange, even in males from the place at the same season. It is now quite apparent that the red *miniatus* passes gradually into the yellow *aurantiacus* of Costa Rica. Messrs. Dickey and Van Rossem have already described a connecting link from Salvador. The genus is as yet unknown in Nicaragua, but will undoubtedly be found there, when the northern highlands are properly explored.

A very common bird at lower altitudes in the Altos, ranging up to the lowest levels of the Painted Redstart, so that the two birds are occasionally found in the same wood. In habits it is an exact counterpart of the redstarts.

(592) **Euthlypis lachrymosa schistacea** Dickey and Van Rossem

Euthlypis lachrymosa schistacea DICKEY AND VAN ROSSEM, Condor, XXVIII, 1926, p. 270 (Pine Peaks, Volcan Conchagua, Salvador; Barranca Hondo, Guatemala, in range).

Setophaga lachrymosa, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1881, p. 184 (Alotenango, Savana Grande).

Euthlypis lachrymosa lachrymosa, RIDGWAY, *loc. cit.*, p. 737 (Volcan de Agua, Volcan de Fuego, Barranca Hondo, etc.).

RANGE.—Tropical Zone: southern Mexico to Nicaragua; the race, western Chiapas, Guatemala and Salvador.

Apparently a rare and local bird in Guatemala, strictly confined to the Pacific slope of the cordillera. Mr. Anthony did not succeed in securing specimens. I, therefore, follow Dickey and Van Rossem in referring the one Guatemala specimen in this country to their Salvador race, *schistacea*.

While I have never seen a topotypical series of *schistacea*, ten specimens from western Nicaragua do not appear separable from a good series of typical *lachrymosa*.

The genus is monotypic and endemic in the range given above.

(593) **Basileuterus culicivorus culicivorus** (Lichtenstein)

Sylvia culicivora LICHTENSTEIN, 'Preis-Verz. Mex. Vög.,' 1830, p. 2 (Mexico, Jalapa, Vera Cruz, designated by Todd).

Basileuterus culicivorus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1881, p. 171 (Volcan de Fuego, Volcan de Agua, Coban, Khamkal, Choctum, road from Cahabon to San Luis); DEARBORN, 1907, p. 131 (Patulul).

Finca Sepacuite, 7 ♂, 4 ♀; Secanquim, 6 ♂; Finca El Soche, 1 ♂; Finca El Espino, 1 ♂.

RANGE.—Subtropical Zone: northeastern Mexico to western Panama; the race, southern Mexico to northern Costa Rica.

The single specimen from the Pacific slope does not appear to differ from the series from Vera Paz.

This warbler is found in heavy forest from about 1500 to 4500 feet, and is generally common. Mr. Anthony is correct in thinking that his specimen, taken at nearly sea-level at Finca El Espino, must have been a wanderer.

(594) **Basileuterus belli belli** (Giraud)

Muscicapa belli GIRAUD, 'Sixteen New Spec. Texas Birds,' 1841, Pl. IV, fig. 2 and text ("Texas;" Mount Orizaba, Vera Cruz, designated by Todd).

Basileuterus belli (part), SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1881, p. 174 (Coban).

One Coban trade-skin (Mus. Comp. Zoöl.).

RANGE.—Subtropical Zone: southern Mexico and Guatemala; the race, southern Mexico to Vera Paz, Guatemala.

The single trade-skin examined from Vera Paz is much nearer *belli* than *scitulus*, so that Coban records are allocated under the typical form provisionally.

(595) **Basileuterus belli scitulus** Nelson

Basileuterus belli scitulus NELSON, Auk, 1900, p. 268 (Todos Santos, Guatemala); RIDGWAY, *loc. cit.*, p. 744 (Volcan de Agua, Dueñas, Uspantan, etc.).

Basileuterus belli (part), SALVIN AND GODMAN, 'Biol. Cent. Amer..' I, 1881 p. 174 (Volcan de Fuego).

Nebaj, 1 ♂; Tecpam, 4 ♂, 2 ♀; San Lucas, 3 ♂, 1 ♀, 1(?).

RANGE.—Chiapas and Pacific cordillera of Guatemala.

It is not surprising that Mr. Anthony confused this and the next three species, in the field. All the specimens listed above were taken in the Temperate Zone, from 7500 to 10,000 ft.

(596) **Basileuterus delattrii delattrii** Bonaparte

Basileuterus delattrii BONAPARTE, Compt. Rend., XXXVIII, 1854, p. 383 (Nicaragua); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1881, p. 176 (as to Volcan de Agua); SHARPE, 'Cat. Birds Brit. Mus.,' X, 1885, p. 396 (as to Calderas, La Trinidad and Volcan de Fuego).

Basileuterus rufifrons delattrii, DEARBORN, 1907, p. 131, Patulul (Lake Amatitlan).

Basileuterus delattrii delattrii, TODD, Proc. U. S. Nat. Mus., LXXIV, 1929, p. 87 (monogr.).

San Lucas, 1 ♀.

RANGE.—Tropical Zone: western Guatemala to northern Colombia; the race, western Guatemala to Costa Rica.

One of the prettiest pieces of systematic work with Central American birds that has been done in a long time was Todd's recent demonstration of the specific (perhaps even generic) distinctness of *B. delattrii* and *B. rufifrons*. The synonymy is badly confused, and is given in some detail by Todd, so that Guatemalan references are cited as from his paper, quoted above.

(597) **Idiotes salvini** (Cherrie)

Basileuterus salvini CHERRIE, Proc. U. S. Nat. Mus., XIV, 1891, p. 342 (Coban Vera Paz, Guatemala).

Basileuterus rufifrons (part), SHARPE, 'Cat. Birds Brit. Mus.,' X, 1885, p. 397 (Coban, Cahabon).

Basileuterus delattrii (part) SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1881, p. 176 (Coban and Cahabon).

Idiotes rufifrons salvini, TODD, Proc. U. S. Nat. Mus., LXXIV, 1929, p. 89 (monogr.).

Finca Sepacuite, 3 ♂, 2 ♀, 1 juv.; Secanquim, 3 ♂, 2 ♀; Chimoxan, 1 ♂; Finca Concepcion, 1 ♀; Nebaj, 1 ♂.

RANGE.—Chiefly Subtropical Zone: Vera Cruz to Vera Paz, northern Guatemala.

It is a pity that Mr. Todd was not able to see the entire Dwight Collection of this group, as otherwise the one respect in which I differ from his treatment would probably have been eliminated. To summarize the facts briefly, it has long been known that there were two types of coloration in Guatemala: (1) "*Basileuterus*" *rufifrons* subspecies, with yellow throat and whitish abdomen, and (2) "*B.*" *salvini* Cherrie, with underparts entirely yellow. This latter bird was redescribed as *flavigaster* Nelson, and has been misidentified as *B. delattrii*. Mr. Todd was forced to treat them as representative subspecies, though he commented on apparent anomalies in their distribution and was unable to assign them definite ranges.

The Dwight Collection shows very clearly that both occur together not only in Vera Paz, but also in the western cordillera, where incidentally *B. belli* and *B. delattrii* also occur. I have seen no specimen, however, and know of no record of the *rufifrons* type from the lowlands of eastern Guatemala or British Honduras. Under these circumstances, it is obvious that we are dealing with two species or two color phases, the latter a phenomenon quite unknown otherwise in this group of warblers.

I am not strongly impressed with the genus *Idiotes*, though Mr. Todd's facts are beyond dispute. In one respect, at least, *salvini* is intermediate between *Basileuterus delattrii* and "*Idiotes*" *rufifrons*, in that the tail is about the same length as the wing, instead of obviously shorter or obviously longer. Even if *Idiotes* were regarded as a subgenus, however, it would not in the least impair Mr. Todd's major thesis, the facts making it quite impossible to regard these very closely related birds as representative forms.

A juvenal is olive-brown above, with two buffy-brown wing-bars, and ochraceous buff below, lighter on the belly. There are traces of a light superciliary line, and the lores are dusky. There is a small patch of chestnut feathers on one side of the pileum.

(598) **Idiotes rufifrons rufifrons** (Swainson)

Setophaga rufifrons Swainson, 'Anim. in Menag.,' 1838, p. 294 ("Mexico"; Real Ariba, Vera Cruz designated by Todd).

Basileuterus rufifrons (part) Salvin and Godman, 'Biol. Cent. Amer.,' I, 1881, p. 91 (as to specimen from Dueñas).

Basileuterus rufifrons dugesi, Dearborn, 1907, p. 131 (Lake Atitlan).

Idiotes rufifrons rufifrons, Todd, Proc. U. S. Nat. Mus., LXXIV, 1929, p. 91 (monogr.).

Finca La Primavera, 7 ♂, 3 ♀; Chanquejelve, 2 ♂; Panajachel, 1 ♂, 2 ♀.

RANGE.—Northwestern and northeastern Mexico to north central Guatemala; the race, Puebla and Vera Cruz southward.

Mr. Todd is again entirely correct in identifying this bird as *rufifrons*, not *dugesi*, and in regarding it as resident and not a winter visitant. It differs from topotypical *rufifrons* only in the greater development of black in the loral regions and around the eyes, the black tending to encircle the eye on the lower as well as the upper half. The validity of such a character, however, depends upon perfectly even make-up of the skins, and I prefer to see it confirmed. In my material, Guatemala specimens are not greener above than Vera Cruz birds.

This warbler is fond of brush-land and thickets in cleared country. It was very common around Panajachel and ranged up to 7000 feet.

(599) **Ergaticus versicolor** (Salvin)

Cardellina versicolor, SALVIN, P. Z. S., 163, p. 188 (Volcan de Fuego).

Ergaticus versicolor, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1881, p. 165 (Volcan de Fuego, Sololá, Totonicapam, Chilasco); RIDGWAY, *loc. cit.*, p. 761 (Todos Santos, Hacienda Chancol, Uspantan); DEARBORN, 1907, p. 131 (cypress region above 9000 ft.).

Chichicastenango, 2♂, 4♀, 1(?); San Mateo, 2♂; Santa Ilania, 2♂, 2♀; Zanjon, 2♂, 4♀; Tecpam, 4♂, 4♀, 4(?), 2 juv.; Quetzaltenango, 6♂, 1♀.

RANGE.—Temperate Zone of western Guatemala.

This remarkable genus has another species, *ruber*, in the mountains of Vera Cruz. North American students are not accustomed to pink warblers. Between 9000 to 10,500 feet above Totonicapam, Crosby and I found these pretty little birds in flocks in the pines and cypress, where it was easily the commonest species. Anthony, however, found it as low as 7000 feet in the northern Altos.

FAMILY **MOTACILLIDÆ**. PIPITS, WAGTAILS

(600) **Anthus spinoletta rubescens** (Tunstall)

Alauda rubescens TUNSTALL, 'Orn. Brit.,' 1771, p. 2 (Pennsylvania).

Anthus ludovicianus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1880, p. 108 (Dueñas).

RANGE.—Arctic North America, south in winter to Guatemala.

FAMILY **FRINGILLIDÆ**. FINCHES, SPARROWS

(601) **Hesperiphona abeillii pallida** Nelson

Hesperiphona abeillii pallida NELSON, Proc. Biol. Soc. Wash., XLI, 1928, pp. 155–156 (Coban, Vera Paz, Guatemala).

Coccothraustes abeillaei, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1886, p. 426 (Volcan de Fuego, Chilasco, Coban).

RANGE.—Mountains of southern Mexico and Guatemala; the race, in Guatemala.

It is to be regretted that Mr. Anthony did not succeed in obtaining specimens of this rare bird. It has been recorded from the oak forests both in Vera Paz and the Pacific cordillera at an average altitude of 6000 feet. It is quite possible that two different races will be involved, when adequate series of specimens are obtained.

(602) **Pheucticus chrypopeplus aurantiacus** Salvin and Godman

Pheuticus aurantiacus SALVIN AND GODMAN, Ibis, 1891, p. 272 (Volcan de Santa Maria, Guatemala); RIDGWAY, 'Birds N. and Mid Amer.,' pt. 1, 1901, p. 623 (Villanueva); DEARBORN, 1907, p. 120 (El Rancho).

Progreso, 1 ♂ ad., 2 ♂ imm., 2 juv.

RANGE.—Known only from a few localities in Guatemala.

This little-known grosbeak is very rare in collections, and is still shrouded in some uncertainty. All modern specimens have come from the arid section of the Rio Motagua Valley, and no others from the original type-locality. It is consequently possible that two different races are involved.

The bird is very closely related to *chrysopeplus* of tropical western Mexico, which is not specifically distinct from *chrysogaster* of Ecuador and Peru. Both are obvious relicts of the same original South American stock. The case is an unusual one, in that a very different species *tibialis* is found in southern Central America, with no near South American allies.

"Found only at Progreso, where it nested, broods of young being seen with the parents in early July. This strikingly handsome grosbeak was by no means uncommon in July, but when I visited Progreso in September very few were seen. This species is often kept as a cage bird by the natives, who claim that its song is unusually fine. I cannot say that I have heard the song, either as a wild bird or caged." (Anthony, MS.)

(603) **Hedymeles ludovicianus** (Linnæus)

Loxia ludoviciana LINNÆUS, 'Syst. Nat.,' I, 1766, p. 306 (Louisiana).

Hedymeles ludovicianus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1884, p. 337 (Vera Paz, Retalhuleu, Dueñas, Volcan de Fuego, San Geronimo, Tactic, Coban, Choctum).

Zamelodia ludoviciana, DEARBORN, 1907, p. 120 (Los Amates, Lake Atitlan, San José, Mazatenango, Patulul).

Secanquim, 1 ♂; Finca La Primavera, 1 ♀; Sacapulas, 2 ♂, 1 ♀; Progreso, 2 ♂; San Lucas, 5 ♂, 2 ♀; Finca El Soche, 1 ♀; Finca Carolina, 1 ♂, 2 ♀.

RANGE.—Eastern North America, south in winter to Colombia.

A not common winter visitant from the middle of October to April 2. "Abundant at Sacapulas in March." (Anthony, MS.)

(604) **Guiraca cærulea cærulea** (Linnæus)

Loxia cærulea LINNÆUS, 'Syst. Nat.,' I, 1758, p. 175 (Carolina).

Guiraca cærulea,[1] SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1885, p. 345 (Chol, Cuyotenango, Salamá, Choctum, Yzabal).

Guiraca cærulea lazula,[1] DEARBORN, 1907, p. 119 (El Rancho, Los Amates, Patulul, Lake Amatitlan, Lake Atitlan); RIDGWAY, *loc. cit.*, p. 610.

Finca Chamá, 1 ♂ (approaching *eurhyncha*, collected April 27); San Lucas, 1 ♂ imm.; Sacapulas, 3 ♂, 1 ♀; Pantaleon, 1 ♂, 1 ♀; San José, 1 ♂.

RANGE.—Eastern United States, south in winter at least to Guatemala.

Probably a common winter visitant, generally distributed from mid-October to late April. In addition to the specimens listed here, I have seen Coban trade-skins belonging to the typical form.

(605) **Guiraca cærulea interfusa** Dwight and Griscom

Guiraca cærulea interfusa DWIGHT AND GRISCOM, Amer. Mus. Novit., No. 257, 1927, p. 4 (Fort Lowell, Arizona).

Sacapulas, 1 ♂, 1 ♀.

RANGE.—Southwestern United States and adjacent Mexico, south to Guatemala in winter.

Clearly belonging to this slightly larger and paler form, the winter range of which is extended slightly southward.

Very abundant at Sacapulas in March (Anthony).

(606) **Guiraca cærulea eurhyncha** (Coues)

Goniaphea cærulea var. *eurhyncha* COUES, Amer. Nat., VIII, 1874, p. 563 (Mexico).

San Lucas, 1 ♀; San José, 1 ♂.

RANGE.—Resident in southern Mexico and Guatemala.

While there is no definite breeding record for Guatemala, nor have I seen a breeding specimen myself, there is not the slightest reasonable doubt that the Blue Grosbeak is resident. These two specimens have

[1]Older records cannot, of course, be allocated subspecifically.

such large bills, that they are unquestionably *eurhyncha*, and represent the breeding form, which is known from Chiapas. The bill of the male listed exceeds the maximum of any Mexican specimen previously examined by me, and in coloration represents the darkest extreme of the *cærulea-eurhyncha* type.

(607) **Cyanocompsa cyanoides concreta** (Du Bus)

Cyanoloxia concreta Du Bus, Bull. Acad. Roy. Brux., XXII, 1855, p. 150 (Mexico).

Guiraca concreta, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1885, p. 346 (Yzabal, Choctum).

Cyanocompsa concreta concreta, Ridgway, *loc. cit.*, p. 596.

Finca Chamá, 1 ♂, 1 ♀; Secanquim, 2 ♂, 3 ♀; Finca Sepacuite, 2 ♂.

Range.—Tropical Zone: Bolivia to Mexico; the race, northern Central America.

This series exhibits interesting individual variation in the males, some being appreciably bluer, less black, than others. All clearly belong to the Mexican rather than the Costa Rican form.

A rain-forest species in Central America, which is far less common northward.

(608) **Cyanocompsa parellina dearborni** Miller and Griscom

Cyanocompsa parellina dearborni Miller and Griscom, Amer. Mus. Novit., No. 184, 1925, p. 1 (San Rafael del Norte, Nicaragua).

Cyanocompsa parellina, Dearborn, 1907, p. 119 (Los Amates; Patulul; crit.).

Range.—Tropical Zone: southern Mexico to northern Nicaragua; the race, Guatemala southward.

While I have never seen a specimen of this species from Guatemala, Dearborn's comments show conclusively that this form is involved. South of Mexico this species would appear to be exceedingly rare and local.

(609) **Oryzoborus funereus funereus** Sclater

Oryzoborus funereus, Sclater, P. Z. S., 1859, p. 378 (Suchapam, Oaxaca); Salvin and Godman, 'Biol. Cent. Amer.,' I, 1885, p. 349 (Choctum).

Finca Chamá, 5 ♂, 1 ♀; Secanquim, 2 ♀, 2 juv.

Range.—Tropical Zone: Mexico to Colombia; a doubtful race in west Ecuador.

A very uncommon species north of Panama, affecting clearings and river-banks in heavy forest.

(610) **Sporophila corvina** (Sclater)

Spermophila corvina SCLATER, P. Z. S., 1859, p. 379 (Playa Vicente, Oaxaca); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1885, p. 356 (Yzabal, Choctum).

Sporophila corvina, LANTZ, 1899, p. 223 (Chocan River); RIDGWAY, *loc. cit.*, p. 571.

Finca Chamá, 21 ♂, 9 ♀; Chimoxan, 1 ♂, 1 ♀; Chipoc, 2 ♂, 3 ♀.

RANGE.—Tropical rain forest, southern Mexico to western Panama.

A common bird in the clearings of the forests of the Caribbean lowlands.

"At Chipoc a nest was found on September first. The bird was flushed from the set of two eggs, as it was about to deposit a third, it would seem. The nest was some eight feet from the ground, in a coffee tree, a rather closely built but quite simple structure, so thin that it seemed incomplete. In the same grove of trees and at the same time were seen several of our northern migrants, *Icterus spurius* and *Setophaga ruticilla*. An interesting overlapping of the nesting of the southern species with the migration from the United States." (Anthony, MS.)

(611) **Sporophila morelleti morelleti** (Bonaparte)

Spermophila morelleti BONAPARTE, 'Consp. Gen. Ave.,' I, 1850, p. 497 (Guatemala; Alta Vera Paz by subsequent designation).

Spermophila moreleti, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1885, p. 353, part (Peten; Totonicapam; Dueñas).

Spermophila aurita SHARPE, *nec* Bonaparte, 'Cat. Birds Brit. Mus.,' XII, 1888, p. 133 (Dueñas, Totonicapam, etc.).

Sporophila morelleti DEARBORN, 1907, p. 118 (Los Amates); RIDGWAY, *loc. cit.*, p. 575.

Chipoc, 1 ♂, 1 ♀; Finca La Primavera, 1 ♂; Finca Sepacuite, 7 ♂, 5 ♀; Finca Chamá, 3 ♂, 3 ♀; Barrillos, 1 ♂, 1 ♀; Panajachel, 1 ♂; 7 ♀; Antigua, 3 ♂; San Antonio, 2 ♂; La Perla, 2 ♂; Puebla, 3 ♂, 3 ♀; San Lucas, 1 ♂, 2 ♀.

RANGE.—Tropical Zone: southern Texas to Costa Rica; a race, in northeastern Mexico and Texas.

Several of the males from western highland localities (Panajachel and San Antonio) are intermediates toward the next form, having some black on chin and throat and less white in the wing. Probably Sharpe's record of *S. aurita* from Dueñas is based on a similar bird.

This is the commonest seed-eater of northern Central America.

(612) **Sporophila morelleti mutanda** Griscom

Sporophila morelleti mutanda GRISCOM, Amer. Mus. Nov., No. 438, 1930, p. 7 (Hacienda California, near Ocos, Pacific slope, Guatemala).

Spermophila moreleti, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1885, p. 353, part (Retalhuleu).

Spermophila aurita SHARPE, *nec* Bonaparte, 'Cat. Birds Brit. Mus.,' XII, 1888, p. 133 (Retalhuleu).

Sporophila morelleti, DEARBORN, 1907, p. 118 (as to Mazatenango and Patulul).

Hacienda California, 8♂, 10♀; Ocos, 2♂, 1♀; Carolina, 2♂, 1♀; Finca El Cipres, 9♂, 4♀.

RANGE.—Known only from the Pacific slope of Guatemala.

Four specimens (Hacienda California, 1♂; San José, 3♂) are aberrant birds which I do not care to name definitely. They have a broad white collar across the hind neck, and the underparts are pale ochraceous-tinged, suggesting a slight approach to *albitorques* and *torqueola* of southwestern Mexico.

The remarkable parallelism between the males of this form and *S. aurita* is fully discussed in the original description.

(613) **Sporophila minuta parva** (Lawrence)

Spermophila parva LAWRENCE, Ann. N. Y. Acad. Sci., II, 1883, p. 382 (Tehuantepec, Oaxaca).

Spermophila richardsoni SALVIN AND GODMAN, Ibis, 1891, p. 611 (Tonala, Chiapas and Retalhuleu, Guatemala).

Sporophila minuta parva, RIDGWAY, *loc. cit.*, p. 568 (Retalhuleu).

Hacienda California, 21♂, 14♀; Carolina, 5♂, 2♀.

RANGE.—Tropical Zone: northern South America to Mexico; the race, Arid Tropical Fauna, Oaxaca to Nicaragua.

A pretty little species, which is now known to be far commoner than the scanty published records would indicate.

(614) **Tiaris olivacea pusilla** Swainson

Tiaris pusilla SWAINSON, Philos. Mag., (N.S.) I, 1827, p. 438 (Real del Monte, Hidalgo, Mexico).

Phonipara pusilla, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1885, p. 360 (Sakluk near Peten).

Euetheia olivacea pusilla, RIDGWAY, *loc. cit.*, p. 534 (Peten district).

Finca Concepcion, 1♂; Secanquim, 1♂, 2♀; Finca Sepacuite, 11♂, 4♀.

RANGE.—West Indian and Caribbean regions; the race, Tropical Zone, locally from southern Mexico to Colombia.

The genus *Euetheia* has a most remarkable distribution, in the way that the several species replace each other in various islands of the West Indies. The present one goes right across the Caribbean Sea, is abundant on Cozumel Island (*intermedia*), and seems to have attained a foothold on the opposite mainland, as it is fairly common in eastern Mexico and Yucatan. It is not surprising to find it rare and local from Guatemala to Nicaragua, but it is difficult to understand how it again becomes abundant from Costa Rica southward.

"First met with at Sepacuite, where it was quite abundant in the pasture-lands, in company with the foregoing *Sporophila*. It was also met with, sparingly, at Finca Concepcion and Chipoc. On May 5 a nest and set of four fresh eggs were found at Sepacuite. The nest was well hidden in a small cavity, in a low ditch-bank, composed of fine grasses and lined with the same. The parent was quite shy, flushing from the nest at my approach and instantly seeking shelter in thick undergrowth a few yards distant." (Anthony, MS.)

(615) **Volatinia jacarini atronitens** Todd

Volatinia jacarini atronitens Todd, Proc. Biol. Soc. Wash., XXIII, 1920, p. 72 (Campeche, Mexico).

Volatinia splendens, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1885, p. 358 (Dueñas, Escuintla, Retalhuleu, Salamá, Choctum).

Volatinia jacarina splendens, Dearborn, 1907, p. 118 (Los Amates, Gualan, Mazatenango, San José); Ridgway, *loc. cit.*, p. 526.

Finca Chamá, 11 ♂, 1 ♀; Finca Concepcion, 1 ♂; Chimoxan, 1 ♂; Secanquim, 5 ♂, 3 ♀; Finca Sepacuite, 13 ♂, 6 ♀; Finca La Primavera, 1 ♂; Puebla, 2 ♂; Panajachel, 1 ♂, 1 ♀; San Lucas, 6 ♂; Finca El Cipres, 7 ♂, 8 ♀; Hacienda California, 11 ♂, 4 ♀; Carolina, 1 ♂, 1 ♀; San José, 3 ♂, 1 ♀.

Range.—Tropical Zone: Argentina to Mexico; the race, Guiana and Orinoco to Mexico.

A wearisomely abundant seed-eater in the tropical lowlands of the whole of Central America, ranging up to about 5000 feet.

"An abundant species in all grasslands below 3500 feet, nearly always in company with *Sporophila*, feeding on the grass-seeds, hanging from the slender tips of weeds and grasses in a manner similar to the goldfinches of more northern climes. At Hacienda California I witnessed a mating song that differed from anything noted in the past. The bird, a male, was perched on a slender twig near the ground, and at intervals of about a second hopped about a foot in the air, uttering a low 'cheep' as it reached the apex, again repeating the note at the instant it touched

the perch. This was continued for several minutes, while I stood at a distance of only a few yards. At no time did there seem to be the slightest variation in the height of its leap or the spot from which it started. At San Lucas, an albino was seen, that seemed to be entirely white except for one feather in the center of the tail." (Anthony, MS.)

(616) **Caryothraustes poliogaster poliogaster** (Du Bus)

Pitylus poliogaster Du Bus, Bull. Acad. Roy. Belg., XIV, 1847, p. 105 (Guatemala); Salvin and Godman, 'Biol. Cent. Amer.,' I, 1884, p. 333 (Choctum, Yaxcamnal, Kamkhal); Lantz, 1899, p. 223 (Santo Tomas).

Caryothraustes poliogaster poliogaster, Ridgway, *loc. cit.*, p. 655.

Secanquim, 15 ♂, 9 ♀, 2(?); Finca Sepacuite, 1 ♂, 1 ♀; Chimoxan, 1 ♂.

Range.—Tropical Zone: Panama to southern Mexico; the race, from Honduras northward.

A common species in the Caribbean rain forest.

(617) **Saltator atriceps atriceps** (Lesson)

Tanagra (Saltator) atriceps Lesson, 'Cent. Zool.,' 1830, p. 208 (Mexico).

Saltator atriceps, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1884, p. 326 (Coban, Yzabal, Choctum, Escuintla, Savana Grande, Zapote, Mirandilla, Santa Lucia Cosamalguapa, San Agustin, Retalhuleu); Dearborn, 1907, p. 120 (Gualan, Mazatenango, Patulul, Lake Amatitlan).

Finca Chamá, 1 ♀; Finca Sepacuite, 7 ♂, 2 ♀; Secanquim, 5 ♂, 2 ♀; Hacienda California, 3 ♂, 3 ♀; Finca El Cipres, 13 ♂, 1 ♀, 1(?); San Felipe, 4 ♂, 2 ♀.

Range.—Tropical Zone: southern Mexico to Canal Zone; the race, Mexico to Costa Rica.

Common in the lowlands. It is a noisy bird of the thickets, with many harsh jay-like notes.

(618) **Saltator magnus magnoides** Lafresnaye

Saltator magnoides Lafresnaye, Rev. Zool., 1844, p. 41 (Mexico, error; southeastern Guatemala designated by Peters); Salvin and Godman, 'Biol. Cent. Amer.,' I, 1884, p. 327 (Coban, Chisec, Choctum).

Saltator magnoides medianus Ridgway, *loc. cit.*, p. 664 (Guatemalan references in range); Dearborn, 1907, p. 120 (Los Amates).

Finca Chamá, 8 ♂, 5 ♀; Chipoc, 2 ♀; Chimoxan, 1 ♂; Finca Concepcion, 1 ♂; Secanquim, 3 ♂, 3 ♀; Finca Sepacuite, 3 ♂, 2 ♀; La Perla, 1 ♂, 1 ♀; Barrillos, 1 ♂.

Range.—Tropical Zone: Brazil to Mexico; the race, Guatemala to Costa Rica.

While this species is known only from eastern Guatemala, not occurring on the Pacific slope, this region is an intermediate one as regards subspecific characters. The excellent series before me is on the whole much nearer the race *magnoides*, but occasional specimens in most of the localities cited have a good deal of black on the pileum, and strongly approach the Mexican race *gigantodes* Cabanis.

A common bird in forest clearings.

(619) **Saltator grandis grandis** (Lichtenstein)

Tanagra grandis LICHTENSTEIN, 'Preis-Verz. Mex. Vög.,' 1931, p. 2 (Mexico).

Finca Chamá, 1 ♀; Finca La Primavera, 1 ♂.

RANGE.—Tropical Zone: southern Mexico to Costa Rica; a race in Yucatan, and another in Pacific Guatemala.

While these are apparently the only specimens of this form ever taken in Guatemala, it will undoubtedly prove to be common in Peten and should be expected in the lowlands near Puerto Barrios.

(620) **Saltator grandis hesperis** Griscom

Saltator grandis hesperis GRISCOM, Amer. Mus. Novit., No. 438, 1930, p. 8 (San José, Guatemala).

Saltator grandis, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1884, p. 328 (Escuintla, Retalhuleu, Savana Grande, Dueñas); DEARBORN, 1907, p. 120 (Lake Amatitlan, San José, Patulul); LANTZ, 1899, p. 223 (Naranjo); RIDGWAY, *loc. cit.*, p. 666.

San Lucas, 3 ♂; Panajachel, 1 imm.; Lake Amatitlan, 1 ♂, 1 ♀; Antigua, 1 ♂; San Felipe, 1 ♂; Hacienda California, 9 ♂, 10 ♀; Finca El Cipres, 1 ♂, 1 ♀; Finca El Espino, 1 ♂; Ocos, 1 ♀; San José, 1 ♂, 1 ♀.

RANGE.—Localized in the Pacific lowlands from Guatemala to Nicaragua.

This saltator has a somewhat anomalous distribution. It is a common bird in the rain forest of eastern Costa Rica and Nicaragua, but rare on the Pacific slope. It is consequently unexpected to find it very rare in eastern Guatemala, but abundant on the Pacific slope.

(621) **Spinus atriceps** (Salvin)

Chrysomitris atriceps SALVIN, P. Z. S., 1863, p. 190 (Quetzaltenango, Guatemala, alt. 8000 feet); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1886, p. 429 (Quetzaltenango).

Spinus atriceps, RIDGWAY, *loc. cit.*, p. 100 (Hacienda Chancol).

Tecpam, 4 ♂ ad., 2 ♂ imm., 3 ♀ ad., 1 ♀ imm.

RANGE.—Endemic in the mountains of western Guatemala.

Adult females closely resemble males, but are somewhat duller colored throughout. The black crown is not so sharply demarcated behind, and the olive green of the back is obscured with a sooty wash, with faint indications of mesial streaks.

This very distinct siskin is a rare bird in collections, and Salvin obtained only two specimens in all his years in the country. It is probably a relict, perhaps most nearly related to *S. spinescens* of Colombia.

"While the genus *Spinus* was often met with at higher elevations, all of those taken, with the exception of ten, are easily referable to the following species. On August 10 a flock of about fifty siskins was met with at Tecpam at 8700 feet, in the open pasture-land, near oak and alder growth to which they retreated when disturbed. Ten specimens were secured, all of which were well fed on what seemed to be the seed of a *Salvia*." (Anthony, MS.)

(622) **Spinus notatus notatus** (Du Bus)

Carduelis notatus Du Bus, Bull. Acad. Roy. Belg., XIV, 1847, p. 106 (Mexico).

Chrysomitris notata, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1886, p. 429 (Volcan de Fuego, Volcan de Agua, hills near Antigua, Santa Barbara, Coban).

Finca Sepacuite, 1 ♀; Secanquim, 2 ♂, 1 ♀; Nebaj, 1 ♂; Chichicastenango, 1 ♀; Momostenango, 3 ♂, 4 ♀; La Perla, 3 ♂, 1 ♀; Panajachel, 1 ♀; San Lucas, 4 ♂, 1 ♀.

Range.—Pine and oak forests of the mountains, southern Mexico to northern Nicaragua; a race, in southwestern Mexico.

One of the many birds in Guatemala, which follows pine forests practically to sea-level. In northern Nicaragua, for instance, it occurs exclusively in the Tropical Zone.

"A species much more common than the last and far more widely distributed, being met with from an altitude of 800 feet below Secanquim, where it was feeding on the seeds of weeds along the river, to the tops of the pines a thousand feet higher along the adjacent ridges, where its habits were similar to those of our siskin of the north. It was seen and taken at Momostenango in January, and at Chichicastenango in February and March. In June I found them common at 9000 feet on the slopes of Volcan San Lucas, where its feeding habits were similar to those of our goldfinches, clinging to the tips of dry weeds, while the seeds were garnered. There were flocks of two hundred or more *Spinus* seen several times at Zanjon in January, but they were so restless that no specimens were taken. They were, with little doubt, this species, though there might have been some of the last species with them." (Anthony, MS.)

(623) **Spinus (Astragalinus) tristis** subspecies?

Panajachel, 1 imm., (sex ?), September 17, 1926.

It is most unfortunate that this very surprising discovery of Mr. Anthony's is represented by one immature specimen only. The date, the plumage, and the fact that any form of this species only reaches extreme northern Mexico as a rare and irregular winter visitant makes it almost certain that this specimen must have been raised nearby. It is aberrant in several respects. The size is minute (wing, 63.5 mm.); the general color above is darker even than *salicamans*, but more olive, less brown; the wing bars are ochraceous buff; the underparts are yellower, less brown, than the corresponding stage of any other race, becoming quite bright on the belly and under tail-coverts; there is a concealed patch of white at the base of the primaries, and no white whatever in the tail.

(624) **Spinus (Astragalinus) psaltria mexicanus** (Swainson)

Carduelis mexicana Swainson, Philos. Mag., (N.S.) I, 1827, p. 435 (Real del Monte, Hidalgo, Mexico).

Chrysomitris mexicana, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1886, p. 431 (as to San Geronimo, Coban).

Sacapulas, 3 ♂, 1 ♀; Finca La Primavera, 1 ♀.

Range.—Western United States, south in the mountains to Peru; the race, Mexico and northern Guatemala.

These specimens are not only much larger than typical *croceus*, but are larger than a good series from the Pacific cordillera. They are also distinctly paler yellow below, and have more white in the tail and wings. In other words, they are very much nearer *mexicanus* from southern Mexico than they are to typical *croceus* of Panama. All the older records from Guatemala are from Alta Vera Paz or Coban trade-skins, and probably apply in large part to *mexicanus*.

(625) **Spinus psaltria croceus** Jouy

Spinus psaltria croceus Jouy, Proc. U. S. Nat. Mus., XVI, 1894, p. 780 (Panama).

Chrysomitris mexicana, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1886, p. 431 (as to Dueñas).

Astragalinus psaltria croceus, Ridgway, *loc. cit.*, p. 118 (crit.); Dearborn, 1907, p. 115 (Mazatenango).

San Lucas, 14 ♂, 7 ♀; Panajachel, 3 ♂, 2 ♀; Lake Amatitlan, 2 ♂; Pantaleon, 2 ♂.

Range.—Pacific cordillera of Chiapas and Guatemala south to the Canal Zone.

This large series is intermediate between *croceus* of Panama and *mexicanus*. In color they are *croceus*, but the males average 64 mm. in wing length rather than about 61 mm. There would seem to be no point in describing formally another slight intermediate race.

This goldfinch apparently violates the usual rules of zonal distribution, as it turns up anywhere from the Temperate to the Humid Tropical Zones. It is a common bird in Guatemala.

"Of rather general distribution, where open hillsides and weed-fields furnished fertile feeding grounds. In June it was common in the coffee plantations near San Lucas, feeding on the blossoms of the silk-bark oak, *Grevillea robusta*. April 15 a few were seen at La Primavera, but they were not so abundant on the east side of the Republic as in the mountains of the west." (Anthony, MS.)

(626) **Sicalis chrysops** Sclater

Sycalis chrysops Sclater, P. Z. S., 1861, p. 376 (Mexico); Salvin and Godman, 'Biol. Cent. Amer.,' I, 1886, p. 432 (Dueñas, Guatemala).

Sicalis chrysops, Ridgway, *loc. cit.*, p. 523 (crit.).

Range.—Known only from Orizaba, Chiapas, and Dueñas, Guatemala.

An exceedingly rare bird, an obvious relict of an otherwise purely South American group. It is very slightly different from certain races of *S. luteiventris*, and has no real specific characters.

(627) **Loxia curvirostra stricklandi** Ridgway

Loxia curvirostra stricklandi Ridgway, Proc. U. S. Nat. Mus., VIII, 1885, p. 354 (new name for *mexicana*, preoccupied).

Loxia mexicana, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1886, p. 424 (Chuacus, Guatemala).

Range.—Boreal Zones of both hemispheres, south in the New World to the mountains of northern Nicaragua.

Series will be needed before crossbills south of Mexico can be assigned to a definite subspecies. There are two specimens in the National Museum, from Joyabaj, Quiché, which are not satisfactorily separable from *stricklandi*. Three specimens from northern Nicaragua are considerably smaller than *stricklandi*, of Mexico, as might be expected. This, however, makes it impossible to separate them from *bendirei* of the Rocky Mountains. I might add that the crossbill definitely breeds in Nicaragua.

(628) **Spiza americana** (Gmelin)

Emberiza americana GMELIN, 'Syst. Nat.,' I, 1788, p. 872 (New York).

Spiza americana, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1886, p. 416 (above San Diego, Retalhuleu, Huamuchal); DEARBORN, 1907, p. 115 (Lake Atitlan); RIDGWAY, 'Birds N. and Mid. Amer.,' I, 1901, p. 171.

Finca Chamá, 1 ♂; Panajachel, 1 ♂; Ocos, 1 ♂; Hacienda California, 1 ♂.

RANGE.—Eastern United States, south in winter to Colombia.

A common winter visitor and abundant transient, recorded from August 26 to May 4.

(629) **Poœcetes gramineus confinis** Baird

Poocætes gramineus var. *confinis* BAIRD, 'Reports of Explorations and Surveys for R. R. from Miss. R. to Pac. Ocean,' IX, 1858, p. 448 (western United States).

Poœcetes gramineus, SALVIN AND GODMAN, Introd. to Aves vols., 1904, p. xix (Guatemala, specimen received since section on finches was published).

RANGE.—Western North America, south in winter to Guatemala.

(630) **Chondestes grammacus strigatus** Swainson

Chondestes strigatus SWAINSON, Philos. Mag., (N.S.) I, 1827, p. 435 (Mexico); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1886, p. 375 (Barranco Hondo).

Sacapulas, 1 ♀ (Feb. 26).

RANGE.—Western United States, south in winter to Guatemala.

This is the second record for the Western Lark Sparrow in Guatemala, the first having been collected by Salvin at Barranco Hondo, on October 22, 1873.

(631) **Passerculus sandwichensis alaudinus** Bonaparte

Passerculus alaudinus BONAPARTE, Compt. Rend., XXXVII, 1853, p. 918 (California).

Passerculus sandwichensis alaudinus, RIDGWAY, *loc. cit.*, p. 195 (Hacienda Chancol, Guatemala).

RANGE.—Western North America, south in winter to Guatemala.

(632) **Ammodramus savannarum australis** (Maynard)

Ammodramus australis MAYNARD, Amer. Exch. and Mart, III, 1887, p. 33 (Nassau, New Providence, Bahamas).

Chichicastenango, 1 ♂; Nebaj, 1 ♂ (April 21).

RANGE.—Eastern United States, south in winter to Cuba, Cozumel Island and Guatemala.

This subspecies has been recorded from Yucatan, but not previously from Guatemala.

(633) **Ammodramus savannarum bimaculatus** (Swainson)

Ammodramus bimaculatus SWAINSON, Philos. Mag., (N.S.) I, 1827, p. 435 (Temascaltepec, Mexico).

Coturniculus passerinus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1886, p. 384 (Coban, Sakluk, near Peten).

Coturniculus savannarum bimaculatus, RIDGWAY, *loc. cit.*, p. 209; DEARBORN, 1907, p. 116 (Patulul).

Sacapulas, 1 ♂, 3 ♀; Momostenango, 1 ♀; Chanquejelve, 1(?); Ocos, 1(?).

RANGE.—Western United States, south to Costa Rica in winter.

Owing to the impossibility of allocating the few older records for the Grasshopper Sparrow subspecifically, the status of the present form as a winter visitant is not definitely known. The four specimens from Sacapulas listed above are unquestionably *bimaculatus*, the others are intermediate between it and *australis*. The extreme dates represented are October 28 and March 8.

N. B.—Undoubtedly one or more forms of this species will be found breeding in Guatemala. The Central American *obscurus* breeds locally from Vera Cruz and Chiapas to Costa Rica, and certainly occurs in Guatemala. It is possible that the very dark *cracens* of British Honduras might be found in the adjacent lowlands of Peten. Salvin mentions that his birds from Peten were the darkest of his series.

Anthony reports this sparrow as not uncommon in the highlands, where open grass- or brush-lands afforded cover to its liking. His field notes, however, afford no evidence that he found breeding birds.

(634) **Aimophila ruficauda connectens** Griscom

Aimophila ruficauda connectens GRISCOM, Amer. Mus. Novit., No. 438, 1930, p. 9 (Progreso, Guatemala).

Haemophila ruficauda, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1886, p. 396 (Chol, Chuacus, Motagua Valley to Gualan).

Aimophila ruficauda lawrencii, DEARBORN, 1907, p. 116 (El Rancho).

Progreso, 19 ♂, 8 ♀, 6 imm.; Gualan, 1 ♂ (M. C. Z.).

RANGE.—Arid Tropical Fauna, Oaxaca to Costa Rica; the race, in Guatemala.

This very distinct intermediate form is isolated in the arid Rio Motagua Valley from Progreso to Gualan.

"This sparrow was taken only at Progreso, where it was quite common at all times, haunting the cactus fences and brushy thickets along the edges of the fields. It is quite possible that it is equally com-

mon in other parts of the valley of the Motagua, as far as Zacapa. Specimens taken October 28 and November 5 indicate that the nesting period was at least near at hand, the testes of the males being a quarter of an inch in diameter." (Anthony, MS.)

(635) **Aimophila rufescens rufescens** (Swainson)

Pipilo rufescens SWAINSON, Philos. Mag., (N.S.) I, 1827, p. 434 (Temascaltepec, Mexico).

Hæmophila rufescens, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1886, p. 394 (perhaps San Geronimo).

Typical *rufescens*.—Secanquim, 1 ♀; Finca Concepcion, 3 ♂; Finca La Primavera, 15 ♂, 4 ♀.

Intermediates between *rufescens* and *gigas*.—Sacapulas, 1 ♂, 1 ♀; La Perla, 2 ♂, 1 ♀.

RANGE.—Chiefly Arid Temperate Zone: southern Mexico to northwest Costa Rica; the race, southern Mexico through north central Guatemala to northern Nicaragua.

In comparing series of this species, the most careful allowance must be made for wear and seasonal differences. The winter plumage of this sparrow is always more creamy, less gray, beneath than the breeding plumage. Worn birds are likely to be paler above: the dark shaft-stripes of the back wear off, leaving an apparently unstriped effect, and the light central crown-stripe sometimes disappears, leaving a bird with a solid chestnut pileum. When due allowance for these factors is made, no reliable racial variation can be found between Vera Paz skins and typical birds from Vera Cruz and Oaxaca. Farther west in Oaxaca, however, specimens are a little paler and show a slight approach to *pallida* Nelson and Palmer. A very different form is found in the Pacific cordillera, and I list above quite a series of intermediate birds from intermediate localities.

(636) **Aimophila rufescens discolor** Ridgway

Aimophila rufescens discolor RIDGWAY, Proc. U. S. Nat. Mus., X, 1888, p. 587 (Segovia River, Honduras).

Hæmophila rufescens part, SALVIN ANI GODMAN, 'Biol. Cent. Amer.,' I, 1886, p. 394 (Poctun in Peten).

RANGE.—Tropical Zone: pine woods and savannas from Peten to eastern Nicaragua.

The subspecies *discolor* Ridgway is a dwarf form, living in the pine forests of the tropical lowlands of eastern Central America from Peten

and British Honduras to southern Honduras. Size differences are less marked southward, whence the type came. Salvin's comment about his Peten specimen and its very small size (wing 2.55 inches) shows that it belongs to *discolor*, which on geographical grounds is to be expected.

(637) **Aimophila rufescens gigas** Griscom

Aimophila rufescens gigas Griscom, Amer. Mus. Novit., No. 438, 1930, p. 9 (Nebaj, Quiché, Guatemala).

Haemophila rufescens, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1886, p. 394 (as to Dueñas, Quetzaltenango, Carrizal).

Aimophila rufescens, Dearborn, 1907, p. 116 (Lake Atitlan, Tecpam).

Momostenango, 4♂, 1♀; Chichicastenango, 5♂, 1♀; Nebaj, 2♂; Antigua, 4♂, 1♀; La Montañita, 1♂; San Lucas, 11♂, 1♀; Panajachel, 4♂, 3♀, 9 imm.; Lake Amatitlan, 3♂.

Range.—Pacific cordillera of Guatemala.

This gray giant form is apparently abundant in the highlands of western Guatemala. While it is not at all surprising that it should be different from the typical form in Vera Paz, it is surprising that the bird in Salvador is not separable from typical *rufescens*, although the mountain ranges in western Guatemala continue southward unbroken into Salvador. It is apparent therefore that this species must have reached the mountains of Salvador from the east rather than the north.

"On June 7 a nest and set of four eggs were found on the slopes of Volcan de Agua, at an altitude of about 6500 feet. The nest was a well-woven structure of grass, lined with finer fibers of the same and well hidden on the ground in a thick bunch of coarse grass, in an old cornfield. The bird, when flushed, flew to a thick growth of high grass, at some distance down the slope, and was lost." (Anthony, MS.)

(638) **Aimophila botterii petenica** (Salvin)

Ammodromus petenicus Salvin, P. Z. S., 1863, p. 189 (plains of Peten).

Aimophila botterii petenica, Ridgway, 'Birds N. and Mid. Amer.,' I, 1901, pp. 260–261, crit.; Miller and Griscom, Amer. Mus. Novit., No. 184, 1925, p. 3 (crit.).

Range.—Texas and Arizona to western Nicaragua; the race known from the type only.

This bird, still known from only one female, cannot be treated satisfactorily. Its relationships with *sartorii* remain to be determined, and that form requires more satisfactory description. The majority of the specimens of *sartorii* in existence are very worn birds, which consequently

appear darker above, and grayer, less buffy below, though these are the color characters alleged to differentiate it from typical *botterii*. Both birds breed in Chiapas and Vera Cruz. It may be that they are specifically distinct, or might prove to be identical.

(639) **Aimophila botterii** subspecies

Aimophila botterii subspecies, MILLER AND GRISCOM, Amer. Mus. Novit., No. 184, 1925, p. 3 (Antigua, Guatemala; crit.).

Antigua, 1 ♂.

Without more material, I cannot add to the comments published on this specimen some years ago. In a group such as this, where we are badly handicapped for lack of material, it would serve no purpose to describe another form on one specimen. I believe, however, that the present bird will prove separable in the future.

(640) **Junco alticola** Salvin

Junco alticola SALVIN, P. Z. S., 1863, p. 189 (pine forests of Volcan de Fuego, Guatemala, 8000 feet); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1886, p. 374 (Volcan de Agua, Quetzaltenango, Totonicapam, etc.); RIDGWAY, *loc. cit.*, p. 303 (Volcan de Santa Maria, Hacienda Chancol, Todos Santos, Calel); DEARBORN, 1907, p. 116 (Sierra Santa Elena).

Chichicastenango, 1 ♂; Momostenango, 2 ♂, 1 ♀; Zanzon, 1 ♂; Santa Ilania, 2 ♂, 1 ♀, 2 imm.; San Mateo, 5 ♂; Quetzaltenango, 4 ♂, 4 ♀; Tecpam, 4 ♂, 3 ♀, 4 imm.

RANGE.—Boreal Zone: high mountains of western Guatemala.

While sometimes found common at 8000 feet or even lower, the junco is especially characteristic of the highest altitudes. Above Totonicapam, for instance, Crosby and I did not see it below 9000 feet, but it was the most abundant land-bird above 10,000 feet. Mr. Anthony supplies the interesting information that he found small flocks in January, at 11,000 feet in the Sierra Chuchumetan, north of Huehuetenango.

(641) **Spizella socialis mexicana** Nelson

Spizella socialis mexicana NELSON, Auk, 1899, p. 30 (San Cristobal, Chiapas); RIDGWAY, *loc. cit.*, p. 313 (Sacahajá, Dept. of Quiché, May 22).

Uspantan, 1 ♂; Momostenango, 1 ♂.

RANGE.—North America, south in pine forests to Nicaragua; the race, southern Mexico and northwestern Guatemala.

One of these specimens, taken on February 24, has a wing of 76 mm. and is apparently typical of this race and must be referred here provisionally. It is curious that there seems to be no resident Chipping Sparrow in the pine forests of most of western Guatemala. The species reappears in Salvador (*cicada* Dickey and Van Rossem) and is common in northern Nicaragua, where the race remains to be determined. In no case can these birds be referred to *pinetorum*, a small and even darker form of the lowland pine forests in eastern Central America from Peten to northeastern Nicaragua.

(642) **Spizella socialis pinetorum** Salvin

Spizella pinetorum Salvin, P. Z. S., 1863, p. 189 (pine ridges of Poctum, Peten); Salvin and Godman, 'Biol. Cent. Amer.,' I, 1886, p. 378 (Vera Paz).

Range.—Tropical pine forests, Peten and British Honduras to northeastern Nicaragua.

(643) **Spizella pallida** (Swainson)

Emberiza pallida Swainson, 'Fauna Bor.-Amer.,' II, 1831, p. 251 (Carlton house, Saskatchewan River, Manitoba).

Sacapulas, 1 ♀ (March 9).

Range.—Great Plains, south in winter to Guatemala.

Not previously recorded south of Oaxaca.

(644) **Zonotrichia capensis septentrionalis** Griscom

Zonotrichia capensis septentrionalis Griscom, Amer. Mus. Novit., No. 438, 1930, p. 12 (Chichicastenango, Guatemala).

Zonotrichia pileata, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1886, p. 371 (Guatemala City, Antigua, Dueñas, Quetzaltenango, whole Altos of Guatemala, Coban).

Brachyspiza capensis peruviana, Dearborn, 1907, p. 117 (Guatemala City, Lake Atitlan, Tecpam); Ridgway, *loc. cit.*, p. 347.

Finca La Primavera, 1 ♂, 1 ♀; Finca Sepacuite, 3 ♂; Barrillos, 5 ♂, 1 ♀; La Perla, 1 ♂; Chichicastenango, 11 ♂, 7 ♀, 2 imm.; Momostenango, 6 ♂, 5 ♀; Nebaj, 5 ♂, 3 ♀; San Mateo, 5 ♂, 1(?); Tecpam, 5 ♂, 1 juv.; Panajachel, 3 ♂, 2 ♀; Antigua, 1 ♀, 1(?); Uspantan, 2 ♂; Zanzon, 1 ♀; Quetzaltenango, 1 ♂; San Lucas, 4 ♂, 4 ♀.

Range.—Most of South America, Haiti, and Subtropical Zone of Central America north to Chiapas; the race, Chiapas and Guatemala.

Apparently a common bird in the highlands throughout Guatemala. I am unable to distinguish Vera Paz from Pacific cordillera specimens. It ranges from about 3000 to 11,000 feet, and nests in the heart of Guatemala City.

(645) **Melospiza lincolnii lincolnii** (Audubon)

Fringilla lincolnii AUDUBON, 'Orn. Biog.,' II, 1834, p. 539 (Labrador).

Melospiza lincolni, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1886, p. 387 (Coban, Dueñas); DEARBORN, 1907, p. 117 (Lake Atitlan).

Finca La Primavera, 2 ♀; Chanquejelve, 1 ♂, 1(?).

RANGE.—Boreal eastern North America, south in winter to Guatemala.

A not uncommon winter visitant, which has been taken as late as April 8. Mr. Anthony reports that he found it chiefly in the pine woods above 3000 feet.

(646) **Melospiza lincolnii striata**[1] Brewster

Melospiza lincolni striata BREWSTER, Auk, 1889, p. 89 (Comox, British Columbia).

Barrillos, 3 ♂; Chichicastenango, 1 ♂, 1 ♀; San Lucas, 1 ♂(?).

RANGE.—Pacific coast region of boreal western North America, south in winter to western Guatemala.

Fortunately Dr. Dwight went over the Lincoln's Sparrows in this collection very carefully and determined every bird himself. I concur in his identifications and agree with him that this form is recognizable.

(647) **Passerina ciris ciris** (Linnæus)

Emberiza ciris LINNÆUS, 'Syst. Nat.,' I, 1758, p. 179 (Carolina).

Cyanospiza ciris, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1886, p. 365 (Peten, Dueñas, Volcan de Agua, Escuintla, Santa Lucia Cosamalguapa, Huamuchal, San Geronimo, Coban, Teleman); RIDGWAY, *loc. cit.*, p. 586.

Passerina ciris, DEARBORN, 1907, p. 119 (Gualan, Los Amates, El Rancho, Mazatenango, Patulul, Lake Amatitlan).

Finca La Primavera, 1 ♂ imm. (April 9); Quirigua, 1 ♂ (M. C. Z.).

RANGE.—Southeastern United States, south in winter to western Panama.

A common winter visitant in eastern Guatemala. A specimen (imm.) from San Lucas is intermediate, nearer the typical form in

[1]The proper name is *gracilis* (Kittlitz).

size, but approaching *pallidior* in color. This race winters primarily in eastern Mexico and Central America. I have seen no specimens from the Pacific coast north of Costa Rica, but certain specimens collected by Underwood at Bolson are unquestionably the typical form.

The references include both races.

(648) **Passerina ciris pallidior** Mearns

Passerina ciris pallidior Mearns, Proc. Biol. Soc. Wash., 1911, p. 271 (western Texas).

Sacapulas, 6♂; Panajachel, 1♂; Ocos, 2♂; Hacienda California, 6♂, 1♀; San José, 1♂.

Range.—Western Texas, south in winter to Costa Rica.

A common winter visitant to the western half of Guatemala from October 27 to April 4. Specimens of this race are readily recognizable by their larger size and the paler duller coloration below, particularly of females and immature. I have seen other specimens from Bolson, Costa Rica, and Ceiba, eastern Honduras.

(649) **Passerina cyanea** (Linnæus)

Tanagra cyanea Linnæus, 'Syst. Nat.,' I, 1766, p. 315 (Vera Cruz).

Cyanospiza cyanea, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1886, p. 364 (Dueñas, Escuintla, Retalhuleu, San Geronimo, Coban); Ridgway, *loc. cit.*, p. 582.

Passerina cyanea, Dearborn, 1907, p. 118 (Los Amates, El Rancho, Patulul, Mazatenango, Lake Amatitlan).

Secanquim, 14♂, 2♀; Finca La Primavera, 5♂, 3♀; Sacapulas, 1♀; Progreso, 1♀; Barrillos, 5♂, 1♀; Chanquejelve, 2♂; La Perla, 1♂; Chichicastenango, 1♂; Huehuetenango, 1♂; Momostenango, 1♂; Panajachel, 1♀; San Lucas, 3♂, 2♀; Finca El Soche, 3♂; Hacienda California, 2♂, 1♀; Finca Carolina, 1♂, 1♀.

Range.—Eastern United States, south in winter to western Panama.

An abundant winter visitant from October 18 to April 11; much less common at higher altitudes in the plateau country.

Mr. Anthony writes that Indigo Buntings were especially noticeable at Sacapulas in January and February, where they shared with *P. ciris* the honor of being the most abundant species, hundreds being flushed from the fields of dry weeds along the Rio Negro. In common with most, if not all, of the migrants from the United States these birds become excessively fat, just before they depart for the North.

(650) **Passerina versicolor purpurascens** Griscom

Passerina versicolor purpurascens GRISCOM, Amer. Mus. Novit., No. 438, 1930, p. 12 (Progreso, Guatemala).

Cyanospiza versicolor, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1886, p. 361 ("Guatemala").

Passerina versicolor, DEARBORN, 1907, p. 119 (El Rancho).

Progreso, 2 ♂ ad., 1 ♂ imm.

RANGE.—Arid Tropical Zone: United States border and Mexico; the race, in Guatemala.

Until Mr. Anthony's discovery that a form of the Varied Bunting bred in the arid Motagua Valley, there was only one definite record for Guatemala. However, Skinner sent Gould a specimen, and another obtained by Van Patten is said to be in the National Museum at Washington.

(651) **Pipilo maculatus repetens** Griscom

Pipilo maculatus repetens GRISCOM, Amer. Mus. Novit., No. 438, 1930, p. 12 (Zanzon, western Guatemala).

Pipilo maculatus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1886, p. 408 (Sololá, Quetzaltenango, Chimaltenango).

Hortulanus maculatus, DEARBORN, 1907, p. 117 (Lake Atitlan, above Tecpam).

Barrillos, 1 ♂; Nebaj, 4 ♂, 4 ♀; Momostenango, 3 ♂, 3 ♀; Chichicastenango, 1 ♂, 1 ♀; Zanzon, 3 ♂, 1 ♀; San Mateo, 2 ♂; Tecpam, 2 ♂, 1 ♀, 2 juv.; Panajachel, 1 ♂; Volcan San Lucas, 3 ♂, 1 juv.; Quetzaltenango, 5 ♂, 1 ♀.

RANGE.—British Columbia to Guatemala; the race, in Guatemala.

This very distinct form, as compared with typical *maculatus*, shows an interesting reversion to the darker coloration of the more northern races *montanus* and *megalonyx*, and also approaches them in the more extensive white streaking and spotting of back and wings. The genus is obviously highly mutational in southern Mexico, though material from southwestern Mexico is sadly lacking. Even with the few specimens available it is easily apparent that *torquatus*, *nigrescens*, *macronyx*, and *maculatus* are very closely related. The remarkable amount of individual variation in each series comes very near connecting them all, though at least two of these so-called species occur together anywhere in the area. The situation is further complicated by *Buarremon brunneinuchus*, which is *Pipilo torquatus* with a longer and slenderer bill, and the only member of the group which has penetrated or survived farther south. We have here a pretty problem for the geneticist, and an excellent illustration of how an artificial taxonomy obscures interesting relationships. Chapman

has already treated exhaustively the variation in another group of the genus *Buarremon*. Among the birds of the New World, these finches furnish an outstanding case of striking variations which cannot be correlated with differences in their environment.

A common bird in the highlands from 6000 to 10,500 feet. At higher altitudes it often consorts in mixed flocks with juncos.

(652) **Melozone biarcuatum** (Prévost)

Pyrgita biarcuatum Prévost, 'Voy. "Vénus," ' Ois., 1846, Pl. vi (Guatemala).

Pyrgisoma biarcuatum, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1886, p. 401 (Dueñas, Escuintla, Coban, Retalhuleu).

Melozone biarcuatum, Dearborn, 1907, p. 117 (Fiscal, Lakes Amatitlan and Atitlan, Patulul, Mazatenango); Ridgway, *loc. cit.*, p. 443.

Finca Sepur, 1 ♀; Finca Concepcion, 1 ♀; Finca Sepacuite, 10 ♂, 9 ♀; San Lucas, 7 ♂, 2 ♀, 1(?), 2 juv.; Antigua, 4 ♂, 1 ♀; Panajachel, 6 ♂, 3 ♀, 1(?), 4 juv.; Lake Amatitlan, 3 ♂, 3 ♀; La Carolina, 2 ♂, 2 ♀, 1 juv.; Finca El Cipres, 7 ♂, 9 ♀, 11 juv.

Range.—Endemic in Guatemala.

This great series shows some interesting minor variations in size. Specimens from El Cipres (2300 feet), on the Pacific slope, are the smallest, while birds from San Lucas and Panajachel are much larger. The results are arranged in tabular form below. Only the wing-length of adult males is included.

Pacific Slope
El Cipres (2300 feet) 68–73.5

Highlands
San Lucas (5500 feet) 76–80
Panajachel (5500 feet) 74–76.5
Amatitlan (4000 feet) 73–78.5
Antigua (4500 feet) 69–72
Vera Paz (3500 feet) 70.5–77

It will be apparent, therefore, that the larger size of the western highland birds is not uniformly consistent. The birds from Antigua are small for no apparent reason. Furthermore, Vera Paz specimens, far to the northeast, are intermediate in size. I see no advantage, therefore, in proposing two races. I can detect no essential color variation in seasonally comparable material. Worn breeding birds are grayer and paler above, and paler below on the sides, flanks and vent.

Juvenals are dingy brown above, with dusky central stripes and margins. The underparts are dirty yellowish white, heavily flammulated

with dusky. The bill is yellow. In later stages the margins above and the flammulations below gradually disappear. The chestnut pileum and the odd markings on the sides of the head are the last adult characters to develop, and as they do so, the bill changes to black.

This genus with five species is endemic in the Arid Tropical Fauna of western Central America.

The present species is a common bird, particularly in the highlands, where it prefers thickets on the edges of open land.

(653) **Melozone occipitalis** (Salvin)

Pyrgisoma occipitale SALVIN, Ibis, 1878, p. 446 (Volcan de Fuego, Guatemala); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1886, p. 404 (Volcan de Fuego above San Diego, Savana Grande).

Melozone occipitalis, RIDGWAY, *loc. cit.*, p. 445.

Chanquejelve, 1 ♂; San Lucas, 1 ♂, 2 ♀; 1 juv.; Palin, Amatitlan, 1 ♂.

RANGE.—Endemic in western Guatemala.

This species is very close to *M. leucotis* of Costa Rica and northern Nicaragua, and may prove to be only subspecifically distinct. When the mountains of Honduras are properly explored, an intermediate form may turn up. Mr. Anthony's specimens show that it is not as local as Salvin thought.

At San Lucas Anthony noticed that this species appeared to prefer heavier undergrowth near the forest.

(654) **Arremonops striaticeps chloronotus** (Salvin)

Embernagra chloronota SALVIN, P. Z. S., 1861, p. 202 (Choctum, Vera Paz, Guatemala); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1886, p. 413 (Chisec, Choctum).

Arremonops chloronotus, DEARBORN, 1907, p. 117 (Los Amates); RIDGWAY, *loc. cit.*, p. 452.

Secanquim, 2 ♂, 1(?); Chimoxan, 1 ♂; Finca Chamá, 11 ♂, 5 ♀.

RANGE.—Humid Tropical Zone: southern Mexico to Pacific slope of Ecuador; the race, southern Mexico to northern Honduras.

Austin (1929, Bull. Mus. Comp. Zoöl., LXIX, p. 390) has demonstrated the intergradation of *striaticeps* and *chloronotus*, suspected by Todd.

"A common species at Chamá, and a few seen at Secanquim. At the first station they were nesting the last of April and early May and were several times seen in the coffee plantation, carrying nesting material." (Anthony, MS.)

(655) **Arremon aurantiirostris saturatus** Cherrie

Arremon aurantiirostris saturatus Cherrie, Proc. U. S. Nat. Mus., XIV, 1891, p. 345 (Choctum, Vera Paz, Guatemala).

Arremon aurantiirostris, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1884, p. 324 (Coban, Choctum, Chisec); Dearborn, 1907, p. 117 (Los Amates); Ridgway, *loc. cit.*, p. 456, footnote.

Chimoxan, 1 ♀; Finca Sepacuite, 1 ♂; Secanquim, 2 ♂, 1 ♀.

Range.—Humid Tropical Zone: Peru to southern Mexico; the race, Mexico and Guatemala.

As Ridgway suggested in a footnote, this northern form is easily separable from typical *aurantiirostris* and *rufidorsalis* Cassin of Costa Rica, a race recently discussed by Peters. It is much larger, the wing of males reaching 86.5 mm. As an average, the coloration tends to be a little darker below, and the breast-band averages wider. It should be noted that younger males and females of all races have greener flanks, and narrower breast-bands and yellower, less orange bills in life.

Common in the rain forest according to Salvin.

(656) **Atlapetes gutturalis griseipectus** Dwight and Griscom

Atlapetes gutturalis griseipectus Dwight and Griscom, Amer. Mus. Novit., No. 16, 1921, p. 3 (Quezaltenango, Guatemala).

Buarremon gutturalis, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1884, p. 320 (Coban, Volcan de Agua, Volcan de Fuego, Totonicapam).

Atlapetes gutturalis, Dearborn, 1907, p. 118 (Tecpam); Ridgway, *loc. cit.*, p. 461.

Chichicastenango, 1 ♂, 2 ♀; Nebaj, 2 ♂; Tecpam, 1 ♂, 2 ♀; Santa Ilania, 1 ♂ imm.; San Lucas, 2 ♂, 1 ♀, 1 (?), 1 juv.; Antigua, 1 ♂; Panajachel, 1 ♀; Quetzaltenango, 5 ♂, 2 ♀.

Range.—Subtropical and Arid Temperate Zones: Colombia to Guatemala; the race, western Guatemala.

The receipt of additional specimens from Mr. Anthony fully confirms the distinctness of this form. I have seen no specimens from Vera Paz.

"Not uncommon in suitable locations, above 5500 feet. They were common at 9000 feet on Volcan San Lucas, where immature specimens were taken June 6. A few were seen in the brush above Chichicastenango in December, and they were quite common at 9500 feet above Tecpam. Usually met with in the old, half cleared fields, near thicker cover at the edge of the forest." (Anthony, MS.)

(657) **Buarremon brunneinuchus** (Lafresnaye)

Embernagra brunneinucha LAFRESNAYE, Rev. Zool., 1839, p. 97 (Mexico).
Buarremon brunneinucha, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1884, p. 320 (Volcan de Fuego); DEARBORN, 1907, p. 118 (Tecpam).

Volcan San Lucas, 6 ♂, 5 ♀, 1 juv.; Tecpam, 3 ♂, 1 ♀, 1 juv.

RANGE.—Subtropical and Humid Temperate Zones: southern Peru to Mexico.

One of the most surprisingly constant birds of this Zone, in spite of its interrupted distribution in Central America. It is fairly common in western Guatemala, chiefly from 8000 to 10,000 feet. While a characteristic Subtropical Zone species in most of its range, it is common in Guatemala only in the Temperate Zone.

"This species was first met with above Tecpam, at 8500 feet, and later at 10,000 feet, where it was far more common. At 9500 feet on the Volcano San Lucas, it was quite common along the edges of the Indian corn-fields, where fallen trees, brush, etc., furnished fairly good cover. In this character of cover they were in company with the last species and *Pipilo maculatus*, and when disturbed all retreated to better shelter in the adjacent ravines. On July 29 an immature bird was taken, near Tecpam, at 8500 feet; it evidently had been raised in the near vicinity, as it was still with the adults." (Anthony, MS.)

FAMILY **CŒREBIDÆ**. HONEY-CREEPERS

(658) **Cœreba mexicana mexicana** (Sclater)

Certhiola mexicana SCLATER, P. Z. S., 1856, p. 286 (south Mexico); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1883, p. 251 (Choctum).
Cœreba mexicana, RIDGWAY, 'Birds N. and Mid. Amer.,' pt. 2, p. 409.

Finca Chamá, 4 ♂, 7 ♀; Chimoxan, 1 ♀; Finca Sepacuite, 1 ♀.

RANGE.—Tropical Zone: western Peru to southern Mexico; the race, Mexico to Colombia.

A common Honey-Creeper in the rain forests of Central America.

"At Chamá they were nesting in May. A nest was found on the twelfth of that month, some twenty-five feet from the ground in a slender, thorny tree. A round ball of green moss, about eight inches in diameter, with a small opening on one side, below the center. It was not possible to reach the nest without wrecking the contents, so I am unable to say whether it contained eggs or young. Several times, at about this same date, birds were seen carrying nesting material." (Anthony, MS.)

(659) **Diglossa baritula montana** Dearborn

Diglossa montana Dearborn, 1907, p. 125 (Sierra Santa Elena, 9500 feet, near Tecpam, Guatemala).

Diglossa baritula, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1883, p. 242 (Quetzaltenango, Calderas, Volcan de Agua, Santa Barbara, Coban); Ridgway, *loc. cit.*, p. 380.

Santa Ilania, 1 ♀; San Lucas, 3 ♂ ad., 3 ♂ imm., 3 ♀ ad., 2 ♀ imm.; Tecpam, 2 ♂ ad., 1 ♂ imm., 1 ♀ ad.

Range.—Temperate Zone: mountains of southern Mexico and Guatemala; the race, Guatemala.

Guatemalan specimens differ from Mexican in that adult males are less blackish on the head and usually have the entire throat slate gray. Females average more of a pale cinnamon tinge below. While males are very distinct, I cannot regard the differences as specific.

One of the relatively few Subtropical and Temperate Zone genera of the Andes, which is represented north of Costa Rica. According to Salvin the bird is not uncommon in Guatemala.

(660) **Cyanerpes cyaneus cyaneus** (Linnæus)

Certhia cyanea Linnæus, 'Syst. Nat.,' I, 1766, p. 186.

Cœreba cyanea, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1883, p. 248 (Dueñas, Medio Monte, Escuintla, Retalhuleu, Coban, Lanquin, Choctum).

Cyanerpes cyaneus, Dearborn, 1907, p. 126 (Patulul, Mazatenango); Ridgway, *loc. cit.*, p. 386.

Finca Chamá, 8 ♂, 3 ♀; Chimoxan, 2 ♀; Chipoc, 1 ♀; Secanquim, 1 ♂, 3 ♀; Finca La Primavera, 1 ♀; Sacapulas, 1 ♀; La Perla, 1 ♀; Finca Selache, 1 ♀; Finca Cipres, 7 ♂, 9 ♀; Hacienda California, 1 ♂; Finca Carolina, 21 ♂, 14 ♀; San Felipe, 4 ♂.

Range.—Tropical Zone: Brazil to Mexico; a race, western Colombia and Ecuador.

Abundant in tropical lowlands throughout its great range.

(661) **Cyanerpes lucidus lucidus** (Sclater and Salvin)

Cœreba lucida Sclater and Salvin, Ibis, 1859, p. 14 (Guatemala); Salvin and Godman, 'Biol. Cent. Amer.,' I, 1883, p. 249 (Choctum).

Range.—Humid Tropical Zone: Guatemala to eastern Panama; the race, northern Central America.

This species is a close representative of *C. cæruleus* of South America, and is a rare bird in the northern half of its range.

(662) **Chlorophanes spiza guatemalensis** Sclater

Chlorophanes guatemalensis Sclater, P. Z. S., 1861, p. 129 (Guatemala).
Chlorophanes spiza, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1883, p. 247 (Choctum, Kampamak, Yaxcamnal).
Chlorophanes spiza guatimalensis, Ridgway, *loc. cit.*, p. 383.

Finca Chamá, 4 ♂, 1 ♀; Secanquim, 2 ♂; Finca Sepacuite, 1 ♀.

Range.—Tropical Zone: Bolivia and Guiana to Guatemala; the race, Costa Rica northward.

This species is much less common in Central America north of Costa Rica than southward.

Family **Thraupidæ**. Tanagers

(663) **Chlorophonia occipitalis** (Du Bus)

Euphonia occipitalis Du Bus, 'Esquiss. Orn.,' 1847, Pl. xiv, (Mexico).
Chlorophonia occipitalis, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1883, p. 253 (Coban, Choctum); Ridgway, 'Birds N. and Mid. Amer.,' pt. 2, 1902, p. 6.

Finca Sepacuite, 1 ♂; Volcan Zunil, 1 ♀; San Lucas, 1 ♂.

Range.—Subtropical Zone: southern Mexico to northern Nicaragua.

As there is no satisfactory Mexican material in this country, and as I have only one adult male in good plumage from Guatemala, it is impossible to make comparisons. Nicaraguan specimens apparently do not differ from Guatemalan.

Met with in some numbers in the virgin forest around Coban (4300 feet), according to Salvin.

(664) **Tanagra elegantissima** (Bonaparte)

Pirpa elegantissima Bonaparte, P. Z. S., 1837, p. 112 (Mexico).
Euphonia elegantissima, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1883, p. 256 (Cuyotenango, Antigua, Calderas, Santa Barbara, Coban, Choctum); Ridgway, *loc. cit.*, p. 12.

Finca Concepcion, 3 ♂; Finca El Soche, 1 ♂; Volcan San Lucas, 2 ♂; Tecpam, 1 ♂, 1 ♀; Quetzaltenango, 1 ♂.

Range.—Subtropical Zone: southern Mexico to western Panama.

Having examined very large series from Mexico to Veraguas, I am quite unable to recognize a southern race *vincens* Hartert (cf. Bull. Brit. Orn. Club, XXXIII, p. 77) from Costa Rica southward. The color of the forehead is a matter of individual variation in both series, and less than 10 per cent of the individuals are definitely larger or smaller.

This species is the Central American representative of the blue-capped group of the genus, which occurs throughout the Andes and reappears in the West Indies. It is a common bird almost throughout its range, and sometimes descends to 1500 feet. Mr. Anthony found it as high as 10,000 feet in the rain forest on the Volcan San Lucas.

"This species has, in common with the other species of the genus, the habit of feeding extensively on the seeds of mistletoe, which are voided complete, surrounded by a soft, glue-like envelope, which insures their sticking to the twigs and branches with which they may come in contact, thus planting the parasite." (Anthony, MS.)

(665) **Tanagra affinis** Lesson

Tanagra affinis Lesson, Rev. Zool., 1842, p. 175 (Realejo, Nicaragua).

Euphonia affinis, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1883, p. 258 (Dueñas, Calderas, Savana Grande, Retalhuleu); Dearborn, 1907, p. 121 (Gualan, Patulul, Mazatenango, San José); Ridgway, *loc. cit.*, p. 21.

Finca El Cipres, 13 ♂, 11 ♀; Hacienda California, 7 ♂, 6 ♀, 1 juv.; Carolina, 2 ♂, 2 ♀; San Felipe, 1 ♀.

Range.—Chiefly Arid Tropical Fauna, southern Mexico to Costa Rica, chiefly on the Pacific slope; also outer third of Yucatan Peninsula, and Rio Motagua Valley, Guatemala.

A common bird in the arid scrub of many parts of Central America. It performs considerable seasonal and vertical migrations.

(666) **Tanagra olivacea humilis** (Cabanis)

Phonasca humilis Cabanis, Journ. für Orn., 1860, p. 334 (Costa Rica).

Euphonia minuta, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1883, p. 259 (Coban).

Euphonia minuta humilis, Ridgway, *loc. cit.*, p. 23.

Range.—Tropical Zone: Amazonia to Guatemala; the race, west Ecuador to Guatemala.

Like many other tropical rain-forest birds, the Central American representative of this species is only racially differentiated. It is exceedingly rare north of Costa Rica.

(667) **Tanagra lauta lauta** Bangs and Penard

Tanagra lauta lauta Bangs and Penard, Bull. Mus. Comp. Zoöl., XLIII, No. 2, 1919, p. 35 (new name for *E. hirundinacea* Bonaparte).

Euphonia hirundinacea, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1883, p. 261 (Poctum, Choctum, Coban, Cahabon); Dearborn, 1907, p. 121 (Mazatenango); Ridgway, *loc. cit.*, p. 25.

Finca Chamá, 6 ♂, 6 ♀; Finca Cipres, 2 ♂ imm., 5 ♀; San Felipe, 6 ♂, 2 ♀.

RANGE.—Tropical Zone: southern Mexico to eastern Costa Rica; a race, in northwestern Costa Rica.

Adult males from the Pacific lowlands differ from Caribbean slope specimens in having a little less white in the two outer tail-feathers on each side, particularly the inner. Even if this difference proved constant in larger series, it would be too trifling in my opinion to recognize formally by name.

Having examined large series of this species from its entire range on both sides of Central America, I am impressed with the unusual amount of color variation it shows, just as is the case with the closely related *crassirostris* farther south.

The name *Euphonia gnatho* Cabanis, founded on a large and deep-billed bird from "Costa Rica," has recently been resurrected by Messrs. Todd and Carriker as a Costa Rica subspecies of *hirundinacea*, stated to differ from northern birds in addition in being bluer or greener, less violaceous. This disposition of the case I can endorse only in part. A series from eastern Costa Rica and specimens from Mexico show that adult males vary from violet to green above in the same series from the same place. The difference in size between eastern Costa Rican and Mexican specimens seems too trifling to recognize in nomenclature, and ours do not differ at all. But when we examine specimens from Miravalles, Nicoya and Guanacaste we find a bird with a notably deep and large bill. It is significant in this connection that Salvin and Godman maintained *gnatho* as a distinct species on the basis of a specimen from Nicoya, and the specimens which Mr. Todd discussed (in Carriker, 'Birds of Costa Rica,' p. 868) all came from Miravalles and Bebedero. I would restrict *Euphonia hirundinacea gnatho* (Cabanis), or *Tanagra lauta proba* Bangs and Penard, as it must now be known, to the Guanacaste region of northwestern Costa Rica and southwestern Nicaragua. Typical *hirundinacea* or *lauta* unquestionably occurs in eastern Costa Rica.

	Depth of Bill at Base Males
Three from eastern Costa Rica	4.8–5.2
Six from Nicaragua	5.0–5.2
One from Guatemala	5.1
Three from Mexico	4.9–5.0
Two from Volcan Mombacho (*proba*)	5.8–6.0
One from Miravalles (*proba*)	6.6

This species is the northernmost of the thick-billed group with yellow throats. From western Costa Rica southward *T. crassirostris* takes its place, and the latter passes into *T. laniirostris* of Amazonia.

(666) **Tanagra gouldi gouldi** (Sclater)

Euphonia gouldi Sclater, P. Z. S., 1857, p. 66 (Guatemala); Salvin and Godman, 'Biol. Cent. Amer.,' I, 1883, p. 263 (Choctum, Coban, Kamkhal); Dearborn, 1907, p. 121 (Los Amates); Lantz, 1899, p. 223 (Santo Tomas).

Finca Chamá, 1 ♂; Chimoxan, 4 ♂, 1 ♀; Secanquim, 1 ♂; Finca Sepacuite, 1 ♂, 1 ♀.

Range.—Tropical Zone: southern Mexico to Costa Rica; a race in western Panama.

A very distinct species, exclusively confined to the rain forest of the Caribbean slope.

(669) **Tangara larvata larvata** (Du Bus)

Calliste larvata Du Bus, 'Esquiss. Orn.,' 1845, Pl. ix (Tabasco, s. e. Mexico); Salvin and Godman, 'Biol. Cent. Amer.,' I, 1883, p. 274 (Yzabal, Choctum, Chisec).
Calospiza larvata larvata, Ridgway, *loc. cit.*, p. 47.

Finca Chamá, 5 ♂, 3 ♀; Chimoxan, 2 ♂, 2 ♀; Secanquim, 3 ♂, 4 ♀.

Range.—Tropical Zone: western Ecuador to southern Mexico; the race, northern Central America.

The only member of this enormous genus, with a continuous distribution north of Costa Rica. It is far less common north of Nicaragua than farther south.

(670) **Tangara lavinia cara** (Bangs)

Calospiza lavinia cara Bangs, Proc. Biol. Soc. Wash., XVIII, 1905, p. 155 (Ceiba, Honduras).
Calliste lavinia, Lantz, 1899, p. 223 (Santo Tomas).

Range.—Tropical and Subtropical Zones: western Colombia to eastern Guatemala; the race, northeastern Costa Rica northward.

The slight range-extension northward in the record cited above has apparently been overlooked. In default of specimens, the subspecies is purely provisional.

(671) **Tangara cabanisi** (Sclater)

Calliste cabanisi SCLATER, Ibis, 1868, p. 71 (Costa Cuca, west Guatemala; new name for *C. sclateri* Cabanis, *nec* Lafresnaye); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1883, p. 271 (Costa Cuca).

Calospiza cabanisi, RIDGWAY, *loc. cit.*, p. 42.

RANGE.—Known only from the unique type collected by Dr. Bernoulli.

Both Sclater and Salvin have carefully investigated the history of this specimen, and there does not seem to be the slightest question of the authenticity of the locality. It is remarkable, however, that the species should never have been rediscovered, and it is equally remarkable that its closest relative, *heinei* (=*atricapilla* Lafresnaye of Sclater and Salvin's critique) belongs to a small group of the genus, which is otherwise unrepresented in Central America.

(672) **Thraupis cana diaconus** (Lesson)

Tanagra diaconus LESSON, Rev. Zool., 1842, p. 175 (Realejo, Nicaragua).

Tanagra cana, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1883, p. 277 (Peten, Yzabal, Cahabon, Lanquin, Choctum, Yaxcamnal, Dueñas, Escuintla, Santa Lucia Cosamalguapa, Retalhuleu); DEARBORN, 1907, p. 121 (Los Amates, Mazatenango, San José); LANTZ, 1899, p. 223 (Palin).

Chimoxan, 1 ♂; Fina Chamá, 5 ♂, 6 ♀; Chipoc, 1 ♂; Puebla, 2 ♀; San Antonio, 1 ♀; Panajachel, 1 ♀; San Lucas, 2 ♂, 1 ♀; Hacienda California, 3 ♂; Finca El Cipres, 2 ♂; Pantaleon, 2 ♀.

RANGE.—Tropical Zone: Peru and Venezuela to southern Mexico; the race, western Panama northward.

A minority of the specimens from the Pacific slope are very slightly paler above on the head and mantle than the series from Finca Chamá. This difference might be due, however, to more fully adult plumage. In any case the Pacific slope birds are extremes of the characters of *diaconus*, and are quite distinct from true *cana*. The race is an unsatisfactory one, in that most of Central America is occupied by variously intermediate birds, and it is a perfectly arbitrary matter where to draw the line between them. We must also consider in this connection *dilucida* Bangs from the Pearl Islands. If this minute race be recognized, it cannot be restricted to the Pearl Islands but must be used for the intermediate birds in southern Central America. The treatment here suggested is to recognize two races only. But *diaconus* could include all birds from Costa Rica to the Canal Zone, or its range could be extended north along the Caribbean slope to Vera Cruz. Any one with several

hundred or more specimens available could shuffle them around in the ways suggested. It should always be remembered that true *cana* from eastern Panama southward is merely another intermediate, *diaconus* being one extreme and *quæsita* Bangs and Noble of Peru the other.

The Blue Tanager is wearisomely abundant in the tropical lowlands of nearly the whole of Central America.

(673) **Thraupis abbas** (Lichtenstein)

Tanagra abbas LICHTENSTEIN, 'Preis-Verz. Mex. Vög.,' 1831, p. 2 (Mexico); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1883, p. 278 (Peten, Chisec, Choctum, Coban, Cahabon, Tactic, Dueñas, Retalhuleu, and Patio Bolas); DEARBORN, 1907, p. 121 (Los Amates, Patulul, Mazatenango, Atitlan); RIDGWAY, *loc. cit.*, p. 60.

Finca Chamá, 5♂, 2♀; Chipoc, 1♂, 1♀; Chimoxan, 1♂, 2♀; Secanquim, 5♂, 4♀, 1 (?); Finca Sepacuite, 3♂, 5♀; Barillos, 4♂, 4♀; La Perla, 4♂, 2♀; San Antonio, 2♀; Panajachel, 2♂, 1♀, 1(?); San Lucas, 8♂, 4♀; Finca El Soche, 1♀; Finca Carolina, 6♂, 3♀; Hacienda California, 6♂, 2♀; Finca El Cipres, 12♂, 8♀; San Felipe, 4♂; Pantaleon, 1♂, 1♀.

RANGE.—Southern Mexico to northern Nicaragua.

This very distinct species replaces *T. palmarum* of Amazonia and southern Central America. It is an open-country bird, and in most of Central America it is commoner above 1500 feet than below it. It does not occur in Guatemala above 6000 feet.

(674) **Ramphocelus passerinii passerinii** Bonaparte

Ramphocelus passerinii BONAPARTE, 'Antologia,' 1831, No. 130, p. 3 (Mexico); DEARBORN, 1907, p. 122 (Los Amates); RIDGWAY, *loc. cit.*, p. 109.

Rhamphocælus passerinii, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1883, p. 281 (Choctum, Yzabal, Cahabon, Tucuru); LANTZ, 1899, p. 223 (Santo Tomas).

Finca Chamá, 18♂, 7♀; Secanquim, 2♂, 1♀; Puebla, 1♂, 3♀.

RANGE.—Caribbean rain forest, southern Mexico to western Panama; a race, in southwestern Costa Rica.

A series from Almirante, Panama, the extreme southern limit of the species, does not appear to differ materially from these fresh Guatemala specimens.

An abundant bird throughout its range.

[*Ramphocelus uropygialis* Bonaparte

Ramphocelus uropygialis BONAPARTE, Rev. Zool., 1851, p. 178 (said to be from Guatemala); SALVIN AND GODMAN, Biol. Cent. Amer., I, 1883, p. 284, Pl. XVIII, fig. 2; discussion and bibliography.

I see no point in including this mythical species in a formal list of Guatemala birds. There is no definite evidence that it came from Guatemala, and Bonaparte was notoriously inaccurate in his localities for Central American birds. These tanagers are particularly conspicuous and common, and no birds are less likely to be overlooked.]

(675) **Phlogothraupis sanguinolenta sanguinolenta** (Lesson)

Tanagra sanguinolentus Lesson, 'Cent. Zool.,' 1830, p. 107 (Mexico).

Phlogothraupis sanguinolenta, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1883, p. 285 (Peten, Coban, Achil near Coban, Choctum, Cahabon, Yzabal); Ridgway, *loc. cit.*, p. 120.

Finca Chamá, 5 ♂; Finca Sepacuite, 6 ♂, 4 ♀; Secanquim, 12 ♂, 5 ♀.

Range.—Caribbean rain forest, southern Mexico to western Panama; the race *aprica* Bangs, Costa Rica southward.

One of the very few endemic genera in the Caribbean forests of Central America. Common.

(676) **Piranga erythromelas** Vieillot

Pyranga erythromelas Vieillot, 'Nouv. Dict. d'Hist. Nat.,' XXVIII, 1819, p. 293 (eastern North America).

Pyranga rubra, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1883, p. 286 (Vera Paz trade-skin, a young male).

Range.—Eastern United States, wintering south to Bolivia; very rarely recorded on migration in eastern Central America.

(673) **Piranga ludoviciana** (Wilson)

Tanagra ludoviciana Wilson, 'Amer. Orn.,' III, 1811, p. 27 ("Louisiana").

Pyranga ludoviciana, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1883, p. 297 (Coban, Dueñas, Alotenango).

Piranga ludoviciana, Dearborn, 1907, p. 121 (Patulul, Mazatenango, Lake Atitlan); Ridgway, *loc. cit.*, p. 91.

La Perla, 1 ♂; Chichicastenango, 1 ♂; Momostenango, 2 ♂, 1 ♀; Panajachel, 1 ♂, 1 ♀; San Lucas, 9 ♂, 10 ♀; Finca Carolina, 1 ♂.

Range.—Western United States, south in winter to Guatemala.

The Western Tanager is a fairly common winter visitant to the western highlands and the Pacific slope. It is rarely taken below 3000 feet. It occurs from October first to March.

(678) **Piranga rubra rubra** (Linnæus)

Fringilla rubra Linnæus, 'Syst. Nat.,' I, 1758, p. 181 (Carolina).

Pyranga æstiva, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1889, p. 289 (Rio Dulce, Yzabal, Quiriguá, Iguana, Dueñas, Savana Grande, Volcan de Agua, Retalhuleu, San Geronimo, Tactic, Coban, Choctum).

Piranga rubra, DEARBORN, 1907, p. 121 (Los Amates, Gualan, Patulul, Lake Atitlan); RIDGWAY, *loc. cit.*, p. 79.

Secanquim, 3♂, 2♀; Chimoxan, 2♂; Finca Chamá, 1♂; Sacapulas, 1♂; Nebaj, 1♂; La Perla, 1♂; San Lucas, 4♂, 2♀; Panajachel, 1♂; Finca Carolina, 4♂, 1♀.

RANGE.—Eastern United States, south in winter to Peru and Guiana.

A common winter visitant throughout, below 6000 feet, from September 28 to April 27.

(679) **Piranga flava albifacies** Zimmer

Piranga flava albifacies ZIMMER, Field Mus. Nat. Hist., Publ. 269, 1929, p. 205 (San José del Sacaré, Chalatenango, Salvador).

La Montañita, 2♂, 5♀; Chichicastenango, 1♂; Huehuetenango, 1♂ (not typical).

RANGE.—The species, Arizona to Brazil; the race, mountain-pine and oak forests, northern Nicaragua, Salvador, and western Guatemala.

Zimmer's recent excellent monograph of this species (*loc. cit.*) has been of invaluable assistance in identifying the material in the Dwight Collection. The only hiatus in Zimmer's Central American material was Guatemala, and this deficiency Mr. Anthony has remedied. I have long known of the large race in the western highlands of Central America, recently described as *albifacies*. So far as I can see, the Guatemala specimens listed above are indistinguishable from a long series collected in the mountains of northern Nicaragua. While this tanager has been completely overlooked in western Guatemala, its extension northward from the highlands of Salvador was to have been expected.

(680) **Piranga flava dextra** Bangs

Piranga hepatica dextra BANGS, Proc. Biol. Soc. Wash., XX, 1907, p. 30 (Jalapa, Vera Cruz).

Pyranga hepatica SALVIN AND GODMAN (*nec* Swainson), 'Biol. Cent. Amer.,' I, 1883, p. 291 (Guatemala; two old records with no locality).

Piranga flava dextra, ZIMMER, *loc. cit.*, pp. 210–213 (crit., regards old records of *hepatica* as probably belonging here).

Chichicastenango, 1♂ ad.; Momostenango, 1♂ ad.; Chanquejelve, 1♀ ad.

RANGE.—Eastern half of Mexican Plateau, south in winter to northwestern Guatemala.

These three specimens from northwestern Guatemala are unquestionably *dextra*. They all have the pronounced gray edgings on the back of that form and could be separated at a glance, by a tyro, as different from *albifacies*. They were all taken in mid-winter and, as one of them at least comes from the same place whence I have seen *albifacies*, I conclude that this northern form is partially migratory and on rare occasions reaches northern Guatemala in winter.

(681) **Piranga flava figlina** Salvin and Godman

Pyranga figlina Salvin and Godman, 'Biol. Cent. Amer.,' I, 1883, p. 293 (Manatee River, British Honduras; Poctum, Guatemala).

Piranga flava figlina, Zimmer, *loc. cit.*, pp. 207–210 (crit., discussion of Guatemalan specimens).

Piranga testacea figlina, Ridgway, *loc. cit.*, p. 87.

Secanquim, 4 ♂, 1 ♀.

Range.—Tropical pine-lands, Peten to northeastern Nicaragua.

These small dark birds agree best with topotypes from British Honduras, and I quite agree with Zimmer that the minor differences observable are not worth recognizing in nomenclature. As a problem in distribution, this tanager is an exact parallel with *Aimophila rufescens*. Both species in the northern half of Central America prefer pine forests, and both are represented in the lowland pine forests of the Caribbean slope by a relatively small dark form.

(682) **Piranga leucoptera leucoptera** Trudeau

Pyranga leucoptera Trudeau, Journ. Acad. Nat. Sci. Phila., VIII, 1839, p. 190 (Mexico).

Pyranga erythromelaena, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1883, p. 295 (Chisec, Rasché, Santa Lucia Cosamalguapa, Escuintla, Retalhuleu, above San Diego, Volcan de Atitlan).

Piranga leucoptera, Dearborn, 1907, p. 122 (Patulul, Mazatenango); Ridgway, *loc. cit.*, p. 99.

Finca Chamá, 1 ♂; Chimoxan, 1 ♂; Finca Sepacuite, 2 ♂; Finca Carolina, 1 ♂, 1 ♀; Finca Cipres, 5 ♂, 2 ♀; San Felipe, 5 ♂.

Range.—Upper Tropical and lower Subtropical Zones: Peru and Guiana to Mexico; the race, northern Central America.

I have seen but very few Mexican specimens, but the majority of these and the Vera Paz specimens differ from Pacific-slope Guatemala and Nicaragua series in averaging very slightly larger and in having the black band on the forehead a little wider. These differences, however,

are very slight and apply to 50 per cent of the more southern material at most. Thus, Nicaraguan specimens are distinctly small, but tend to have more black on the forehead than Pacific-Guatemala specimens.

(683) **Piranga bidentata sanguinolenta** Lafresnaye

Pyranga sanguinolenta Lafresnaye, Rev. Zool., 1839, p. 97 (Mexico).
Pyranga bidentata, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1883, p. 296 (Volcan de Fuego, Barranco Hondo, San Geronimo).
Piranga bidentata sanguinolenta, Ridgway, *loc. cit.*, p. 96.

Finca La Primavera, 1 ♂; La Perla, 7 ♂, 1 ♀; Barrillos, 3 ♂; Finca El Soche, 1 ♂; San Lucas, 2 ♂, 2 ♀.

Range.—Subtropical and Arid Temperate Zones: eastern and southwestern Mexico to western Panama; the typical form in southwestern Mexico.

A fairly common species in the pine and oak forests from 5000 to 9000 feet.

(684) **Habia rubica rubicoides** (Lafresnaye)

Saltator rubicoides Lafresnaye, Rev. Zool., VII, 1844, p. 41 (Mexico).
Habia rubica rubicoides, Griscom, Occas. Papers Boston Soc. Nat. Hist., V, 1930, pp. 289–292 (monogr.).
Phœnicothraupis rubica rubicoides, Ridgway, *loc. cit.*, p. 144.

Finca Sepacuite, 2 ♂.

Range.—Tropical Zone: Paraguay to Mexico; the race, hot lowlands of Vera Cruz south to northern Guatemala.

These two males are an excellent illustration of the scientific absurdity of definitely naming intermediates. They are not alike and show tendencies toward three different subspecies. In color, one of them is nearer *nelsoni* of Yucatan than typical *rubicoides*. The other specimen is much nearer *rubicoides* in color, but approaches *confinis* in size. I have little doubt but that specimens in extreme northern and northeastern Peten will be much nearer *rubicoides* and *nelsoni* respectively.

(685) **Habia rubica confinis** (Bangs)

Phœnicothraupis rubica confinis Bangs, Proc. Biol. Soc. Wash., XVIII, 1905, p. 156 (Yaruca, Honduras).
Habia rubica confinis, Griscom, *loc. cit.*, 1930, p. 290 (monogr.).

Secanquim, 12 ♂, 4 ♀.

Range.—Tropical lowlands, eastern Guatemala and eastern Honduras.

This excellent series agrees perfectly with the type collection from Yaruca, Honduras, and the geographical probabilities accord with these facts. Numerous old trade-skins examined also belong here, and our old conception of *rubicoides* as the race in Guatemala must be abandoned. It is practically certain that all the older locality records from eastern Guatemala belong here.

In the review cited above I have given my reasons for not using the name *ignicapilla* Finsch (ex Lichtenstein).

(686) **Habia rubica salvadorensis** Dickey and Van Rossem

Habia rubica salvadorensis Dickey and Van Rossem, Proc. Biol. Soc. Wash., XL, 1927, p. 4 (Cacaguatique, El Salvador); Griscom, *loc. cit.*, 1930, p. 291 (monogr).

Phœnicothraupis rubicoides (part) Salvin and Godman, 'Biol. Cent. Amer.,' I, 1883, p. 300 (Alotenango, Savana Grande, Escuintla, Costa Grande, Retalhuleu).

Phœnicothraupis rubica rubricoides (*sic*) Dearborn, 1907, p. 122 (Patulul).

Finca El Cipres, 2 ♀.

Range.—Tropical lowlands, Salvador and western Guatemala.

These two specimens are intermediate between *affinis* and *confinis*, and agree with specimens kindly forwarded by Dickey and Van Rossem from Salvador. Unfortunately, I have no adult males from Guatemala. The female of *salvadorensis* has yet to be compared with the female of *affinis* Nelson from Oaxaca.

The species has a remarkably discontinuous distribution. It is lacking on the Caribbean slope from eastern Nicaragua to South America. It is also lacking in western Nicaragua and western Ecuador. I am quite unable to advance a theory to account for these facts.

(687) **Habia salvini salvini** (Berlepsch)

Phœnicothraupis salvini Berlepsch, Ibis, 1883, p. 487 (Guatemala; I designate Alta Vera Paz); Salvin and Godman, 'Biol. Cent. Amer.,' I, 1883, p. 303 (Chisec); Ridgway, *loc. cit.*, pp. 148–152 (as to the species, but not the races).

Secanquim, 8 ♂, 6 ♀; Puebla, 1 ♀; Chimoxan, 1 ♂.

Range.—Tropical Zone: Vera Paz to northern Nicaragua; the race, Vera Cruz, Oaxaca, Chiapas and north central Guatemala.

This series is topotypical *salvini*. Mexican specimens from Vera Cruz (excluding the low coastal district) are not separable. Old trade-skins belong here mostly.

The species *salvini* is a representative form of *fuscicauda* of southern Central America, and it is most questionable whether they should be kept specifically distinct.

(688) **Habia salvini littoralis** (Nelson)

Phœnicothraupis littoralis Nelson, Auk, 1891, p. 48 (Frontera, Tabasco).
Phœnicothraupis salvini littoralis Dearborn, 1907, p. 123 (Los Amates).

Range.—Coastal plain from Tamaulipas to eastern Guatemala.

As only one pair of specimens exists from the hot lowlands of eastern Guatemala, a final determination is impossible and must await an adequate series. While it is to be expected that the bird in the Peten lowlands southward would not be the same as true *salvini*, its relationships to *roœnsis* Griscom and *discolor* Ridgway remain to be determined.

(689) **Habia salvini wetmorei** Dickey and Van Rossem

Habia salvini wetmorei Dickey and Van Rossem, Proc. Biol. Soc. Wash., XL, 1927, p. 5 (Puerto del Triunfo, Usulutan, El Salvador).
Phœnicothraupis salvini, Dearborn, 1907, p. 122 (Mazatenango).

San José, 2 ♂, 1 ♀; Finca El Espino, 1 ♂, 1 ♀.

Range.—Tropical lowland forests of Salvador and western Guatemala.

The San José specimens have already been examined and determined by Mr. Van Rossem. This subspecies has perfectly recognizable characters, and ranges along the Pacific slope of Guatemala and El Salvador. Perhaps the most interesting thing about these two excessively variable species of the genus is that both are absent from the Pacific slope of Nicaragua.

Mr. Anthony writes that both species of ant-tanagers were much commoner on the Caribbean than the Pacific slope.

(690) **Lanio aurantius** Lafresnaye

Lanio aurantius Lafresnaye, Rev. Zool., 1846, p. 204 ("Colombia"); Salvin and Godman, 'Biol. Cent. Amer.,' I, 1883, p. 304 (Choctum, Kamkhal, Kampamak); Dearborn, 1907, p. 122 (Los Amates); Ridgway, *loc. cit.*, p. 123.

Secanquim, 2 ♀.

Range.—Chiefly upper Tropical Zone: Caribbean rain forest, southern Mexico to Honduras.

While Mr. Anthony secured only two specimens of this Shrike-tanager, it is in reality abundant in the rain forests of eastern Guatemala, and American museums are full of old trade-skins of this species, collected by native hunters.

(691) **Eucometis spodocephala spodocephala** (Bonaparte)

Chlorospingus spodocephalus BONAPARTE, Compt. Rend., XXXIX, 1854, p. 922 (Nicaragua).

Eucometis spodocephala, SCLATER AND SALVIN, Ibis, 1860, p. 274 (Guatemala, ex Constancia); DEARBORN, 1907, p. 122 (Los Amates); SCLATER, 'Cat. Birds Brit. Mus.,' IX, 1886, p. 219 (Coban); LANTZ, 1899, p. 223 (Santo Tomas).

RANGE.—Tropical Zone: western Nicaragua to western Chiriqui (common); reappearing in eastern Honduras (1 record), British Honduras (1 record), and eastern Guatemala (2 records); the race *pallida* common in the Yucatan Peninsula.

This genus is common on the Pacific coast of Central America north to Nicaragua. It is exceedingly rare and local in the forested areas of eastern Central America, and there are a mere handful of records from eastern Nicaragua to Guatemala. On the outer half of the Yucatan Peninsula in drier and more open scrub country, the subspecies *pallida* Berlepsch is locally quite common. It is by no means certain, of course, that the old Guatemala records cited above belong here.

(692) **Eucometis spodocephala pallida** Berlepsch

Eucometis spodocephala pallida BERLEPSCH, Auk, 1888, pp. 451, 452 (Yucatan); RIDGWAY, 'Birds N. and Mid. Amer.,' pt. 2, 1902, p. 141 and footnote (Guatemala).

RANGE.—Yucatan Peninsula and perhaps eastern Guatemala.

In the citation above, Ridgway discusses an old Guatemala trade-skin which is much nearer *pallida* than *spodocephala*. It is highly probable that specimens from Peten near the Yucatan boundary will prove to be much nearer *pallida*.

(693) **Chlorospingus olivaceus olivaceus** Bonaparte[1]

Poospiza olivacea BONAPARTE, 'Consp. Av.,' I, 1850, p. 473 ("Brazil"; = error; I designate Alta Vera Paz, Guatemala).

Chlorospingus olivaceus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1884, p. 315 (Coban, Kamkhal, San Geronimo); RIDGWAY, *loc. cit.*, p. 159.

Finca Sepacuite, 9 ♂, 6 ♀, 2 juv.; Finca Sepur, 2 ♂, 3 ♀.

RANGE.—Subtropical Zone: Tumbalá, Chiapas to western Panama; numerous local races, the typical form, Chiapas (?) and Vera Paz, Guatemala.

The wings of the males vary from 68–72 mm. The two juveniles have the head and cap strongly suffused with greenish. The underparts are chiefly very pale lemon-yellow, strongly washed on chest, flanks, and sides with greenish yellow, and everywhere flecked with dusky.

[1]Now called *C. ophthalmicus dwighti* Underdown, Auk, 1931, p. 612.

(694) **Chlorospingus olivaceus postocularis** Cabanis

Chlorospingus postocularis CABANIS, Journ. für Orn., 1866, p. 163 (Guatemala; I designate Volcan de Fuego); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1884, p. 314 (Volcan de Fuego and Volcan de Agua, 3000 to 8000 feet); RIDGWAY, *loc. cit.*, p. 160.

Barrillos, 1 ♀; Nebaj, 2 ♂; San Mateo, 1 ♂, 1 ♀; Santa Ilania, 1 ♀; Volcan de Agua, 1 ♀; San Lucas, 2 ♂, 1 ♀.

RANGE.—Subtropical Zone: Pacific cordillera, Chiapas and western Guatemala.

The wing of males varies from 71-77.5 mm., so this form averages decidedly larger than *olivaceus*. Specimens from Barrillos and Nebaj are distinctly intermediate. While the head is darker slate, there are still distinct traces of darker, lateral stripes. It is consequently impossible to keep these birds specifically distinct.

Four specimens of *C. schistaceiceps* of Salvador kindly forwarded by Messrs. Dickey and Van Rossem differ from *postocularis* in averaging smaller again, in having the cap paler gray, but absolutely uniform, and distinctly brighter yellow-green pectoral band, sides, flanks and under tail-coverts. In preparing their original diagnosis Dickey and Van Rossem borrowed most of the Dwight Collection material listed above, which was erroneously determined as *olivaceus*. They were perhaps misled as to the relationships of *olivaceus* and *postocularis*. Certainly it seems clear to me that *schistaceiceps* is a well-marked representative form, and not a distinct species.

The only *Chlorospingus* known from Honduras is the type of *C. honduratius* Berlepsch, from the Volcan de Puca. I have never seen this type, but a long series from the mountains of northern Nicaragua agrees so minutely with the description of the type, that these birds must be referred provisionally to *honduratius*. This form is a perfect connecting link between *schistaceiceps*[1] and *novicius regionalis* Bangs of Costa Rica. It is, if anything, even brighter yellowish green below than *schistaceiceps*, the cap is distinctly grayer than *novicius regionalis*, but decidedly brown as compared with *schistaceiceps*. I conclude that all these birds are subspecies of *olivaceus*. Finally, it is entirely possible that *C. atriceps* Nelson from Pacific Chiapas will proye to be a tenable form. When Ridgway treated it as a synonym of *postocularis*, he had never seen an authentic Guatemalan specimen. The type specimens should be compared with the series now available.

[1]This form has yet to be compared with *honduratius*.

FAMILY **ICTERIDÆ.** CACIQUES, ORIOLES, COWBIRDS, GRACKLES, ETC.

(695) **Zarhynchus wagleri mexicanus** Ridgway

Zarhynchus wagleri mexicanus RIDGWAY, Proc. Wash. Acad. Sci., III, 1901, p. 151 (Motzorongo, Vera Cruz, Mexico); DEARBORN, 1907, p. 112 (Los Amates).

Eucorystes wagleri, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1886, p. 436 (Cahabon, Lanquin, Choctum); LANTZ, 1899, p. 222 (Chocan River).

Finca Sepur, 1 ♂; Finca Sepacuite, 3 ♂, 4 ♀; Secanquim, 5 ♂, 5 ♀; Finca Concepcion, 1 ♂.

RANGE.—Tropical Zone: west Ecuador to Mexico; the race, Mexico to Guatemala.

This excellent series is certainly referable to *mexicanus*, the two best characters of which are the less arched frontal shield and the duller darker chestnut of head and rump. Guatemala specimens approach typical *wagleri*, however, in having the black of the abdomen glossier and less restricted. I am not impressed with the size differences claimed between the two races.

(696) **Gymnostinops montezuma** (Lesson)

Cacicus montezuma LESSON, 'Cent. Zool.,' 1830, p. 33 (Mexico).

Gymnostinops montezuma, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1886, p. 438 (Iguana, Choctum, Chisec, Quiriguá, Yzabal, between Cahabon and San Luis, Tucuru, Tamahu); DEARBORN, 1907, p. 112 (Los Amates, Gualan); LANTZ, 1899, p. 223 (Santo Tomas); RIDGWAY, 'Birds N. and Mid. Amer.,' pt. 2, 1902, p. 180.

Puebla, 2 ♂, 1 ♀.

RANGE.—Tropical Zone: southern Mexico to Panama.

(697) **Amblycercus holosericeus holosericeus** (Lichtenstein)

Sturnus holosericeus LICHTENSTEIN, 'Preis-Verz. Mex. Vög.,' 1831, p. 1 (Mexico).

Amblycercus holosericeus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1886, p. 446 (Peten, Yzabal, Choctum, Dueñas, Retalhuleu); DEARBORN, 1907, p. 112 (Los Amates, Lake Amatitlan, Lake Atitlan, Patulul, San José); RIDGWAY, *loc. cit.*, p. 194.

Finca Chamá, 1 ♂, 1 ♀; Finca Concepcion, 1 ♀; Secanquim, 4 ♂, 6 ♀; Finca Sepacuite, 1 ♂, 1 ♀; Finca La Primavera, 1 ♀; Puebla, 2 ♂; San Lucas, 2 ♂, 1 ♀; Panajachel, 1 ♂; Finca El Soche, 1 ♀; Finca El Cipres, 2 ♂; Hacienda California, 5 ♂, 3 ♀; San José, 1 ♂; Pantaleon, 1 ♀.

RANGE.—Tropical Zone: Bolivia to Mexico; the race, whole of Central America.

A common bird of thick undergrowth, ranging as high as 5500 feet.

(698) **Psomocolax oryzivorus impacifus** Peters

Psomocolax oryzivorus impacifus PETERS, Proc. Biol. Soc. Wash., XLII, 1929, p. 123 (Pasa Nueva, Vera Cruz, Mexico).

Cassidix oryzivora, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1886, p. 445 (Choctum).

Cassidix oryzivora mexicana, RIDGWAY, *loc. cit.*, p. 199.

RANGE.—Tropical Zone: Paraguay to southern Mexico; the race, Central America.

With the material which has accumulated in eastern museums in recent years, I agree with Todd and Chapman that *violea* Bangs is scarcely tenable. The parasitic Rice Grackle is an exceedingly rare bird north of Panama, and is restricted to the rain forests of the Caribbean slope.

(699) **Tangavius æneus involucratus** Lesson

Tangavius involucratus LESSON, Rev. Zool., 1839, p. 41 (Mexico); DEARBORN, 1907, p. 113 (El Rancho, Lake Atitlan, Tecpam).

Molothrus æneus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1887, p. 452 (Dueñas, Retalhuleu, Huamuchal, San Geronimo, Choctum).

Callothrus robustus, RIDGWAY, *loc. cit.*, p. 201.

Finca Chamá, 1 ♀; Chimoxan, 1 ♂; Sacapulas, 2 ♂; Finca Sepacuite, 3 ♂, 1 ♀; Secanquim, 7 ♂; Puebla, 2 ♂; Progreso, 3 ♂, 1 ♀; Barrillos, 2 ♂; Nebaj, 2 ♂, San Antonio, 1 ♀; Panajachel, 2 ♂, 8 ♀; Finca El Cipres, 1 ♂, 4 ♀; Hacienda California, 3 ♂, Ocos, 1 ♂ imm., 2 ♀.

RANGE.—Chiefly Arid Tropical Fauna: Mexican border to western Panama; two races in western Mexico.

A very uniform series except for the Pacific slope males. These show a decided approach to *assimilis* Nelson in having slightly shorter and deeper bills, and in having the rump more or less strongly tinged with violet as well as bronzy. In large size and in texture of plumage, however, they are just like *involucratus*.

The genus *Tangavius* is one of the endemic specialties in the avifauna of the drier parts of tropical Mexico and Central America. In Guatemala and Mexico it has invaded clearings in the eastern lowlands, but from Nicaragua southward it is strictly confined to the Pacific slope. It is not common south of northwestern Costa Rica, and in Veraguas is rare and local. In the arid coast district of northern Colombia, an outlying representative (*T. armenti*) occurs, which is one of the rarest birds of the New World.

(700) **Agelaius phœniceus richmondi** Nelson

Agelaius phœniceus richmondi NELSON, Auk, 1897, p. 58 (Tlalcotalpam, Vera Cruz).

Agelæus phœniceus SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1887, p. 454 (Peten; Coban?).

RANGE.—North America, south locally to Costa Rica; the race, Caribbean slope, Vera Cruz to southeastern Nicaragua.

Specimens from Quintana Roo and British Honduras do not differ from topotypes of this small, dark race, so I have no hesitation in referring Peten records to *richmondi*. The Red-winged Blackbird reappears on the Caribbean slope of Central America in southeastern Nicaragua, where Miller and I collected four specimens in 1917. The males differ from *richmondi* only in having shorter tails and more slender feet. The single female did not appear to differ in color appreciably. These birds must therefore be referred to *richmondi*, until a good series shows some definite characters.

Anthony saw a single male at Panzos on the Rio Polochic.

(701) **Agelaius phœniceus grinnelli** Howell

Agelaius phœniceus grinnelli HOWELL, Auk, 1917, p. 196 (San Sebastian, Salvador).

Agelæus phœniceus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1887, p. 454 (Dueñas).

Antigua, 1 ♂; San Antonio, 3 ♂, 1 ♀.

RANGE.—Little known; local colonies from western Guatemala to northwestern Costa Rica provisionally referred to this form.

We now know that small colonies of Red-wings occur locally throughout western Central America south to northwestern Costa Rica, but good series of females are necessary from each colony before their final determination can be made. All these western birds, however, agree in being much larger than the east coast *richmondi*. The Guatemala adult males measure wing, 120, 123, 130, a Salvador male measures 122.5, two west Nicaragua males 122 and 122.5, and Costa Rica specimens are similar. It is apparent, therefore, that Guatemala birds are best referred to *grinnelli* for the present, and their relationships to *nayaritensis* remain to be determined. This can be left to Messrs. Dickey and Van Rossem, who have the most material at their command.

(702) **Sturnella magna mexicana** Sclater

Sturnella mexicana Sclater, Ibis, 1861, p. 179 (Jalapa, Vera Cruz).

Sturnella magna, Sclater, 'Cat. Birds, Brit. Mus.,' XI, 1886, p. 358 (pine ridges of Poctum; Peten, Guatemala); Salvin and Godman, 'Biol. Cent. Amer.,' I, 1887, p. 457.

Sturnella magna inexpectata, Ridgway, *loc. cit.*, p. 364 (eastern Guatemala).

Range.—Eastern North America to northern South America; the race, tropical lowlands Caribbean slope, Vera Cruz to eastern Nicaragua.

Topotypes collected by De Oca at Jalapa agree with Sclater's brief diagnosis in being "much inferior" in dimensions to northern specimens and also a little darker. These small birds range southward in the savannas of the Caribbean slope of Central America to northeastern Nicaragua, where Townsend secured the specimens upon which Ridgway based his *inexpectata*. This subspecies was apparently based on the assumption that larger and darker birds from the highlands represented *mexicana*, and that Nelson's *alticola* from Chiapas was a synonym of that form. My own view is that Nelson was right and Ridgway wrong. As the following table shows, Jalapa males are much nearer the smaller form in size, as well as color.

	Wing Measurements of Males
2 Jalapa	105.0–108.5
10 Vera Cruz lowlands	99.6–103.6(102.6)
5 Chiapas lowlands	101.6
2 eastern Nicaragua	96.5
6 highlands eastern Mexico	115.6
Type of *alticola*	113.0
3 highlands west and central Mexico	114.6–115.2
3 highlands western Guatemala	112.0–114.0
4 highlands north central Nicaragua	108.2–113
9 highlands northern Costa Rica	107.5–114

In Guatemala this form has been found only in the savannas of Peten.

(703) **Sturnella magna alticola** Nelson

Sturnella magna alticola Nelson, Auk, 1900, p. 266 (Ocuilapa, Chiapas).

Sturnella hippocrepis, Sclater and Salvin, Ibis, 1859, p. 19; idem, 1860, p. 34 (Dueñas).

Sturnella magna (part), Salvin and Godman, 'Biol. Cent. Amer.,' I, 1887, p. 457.

Tecpam, 2 ♂; San Antonio, 1 ♂.

Range.—Southern portion of Mexican Plateau, south in the highlands of Central America to western Chiriqui, chiefly from 2000 to 8000 feet.

To complete our survey of the Central American meadowlarks, I might add here that birds collected by Benson and me in the tropical savannas of Veraguas are far too small for *alticola* and are best referred provisionally to *paralios* Bangs of Santa Marta.

In addition to the specimens listed above, Mr. Anthony saw two near San Andres in Quiché, and flushed two others near Sacapulas. The meadowlark is consequently a very local bird in western Guatemala.

(704) **Icterus galbula** (Linnæus)

Coracias galbula Linnæus, 'Syst. Nat.,' I, 1758, p. 108 ("America").

Icterus baltimore, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1887, p. 461 (Coban, Choctum, Cahabon, Volcan de Fuego, Escuintla, San Pedro Martyr).

Icterus galbula, Dearborn, 1907, p. 115 (Mazatenango, Patulul); Ridgway, *loc. cit.*, p. 310.

Secanquim, 1 ♂; Finca La Primavera, 1 ♂; Barrillos, 3 ♂; Chichicastenango, 1 ♂; Momostenango, 1 ♂; Progreso, 1 ♂; Sacapulas, 2 ♂; Panajachel, 2 ♂, 1 ♀; San Lucas, 7 ♂; Finca El Soche, 1 ♂, 1 ♀; Finca Carolina, 6 ♂, 1 ♀; Hacienda California, 1 ♂.

Range.—Eastern United States, south in winter to Colombia.

An abundant transient and uncommon winter visitant, less common on the Pacific slope. Earliest fall arrival September 17. Most abundant in October and the last half of March.

(705) **Icterus bullockii** (Swainson)

Xanthomus bullockii Swainson, Philos. Mag., I, 1827, p. 436 (tableland of Mexico).

Chichicastenango, 1 ♂; Finca Carolina, 2 ♀ (October 20).

Range.—Western United States, south in winter to western Guatemala.

A rare or uncommon winter visitant to western Guatemala, not previously recorded south of central Mexico.

(706) **Icterus spurius** (Linnæus)

Oriolus spurius Linnæus, 'Syst. Nat.,' I, 1766, p. 162 (Carolina).

Icterus spurius, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1887, p. 464 (Coban, Cahabon, Choctum, Dueñas, Retalhuleu, Escuintla and throughout the Costa Grande in January and February); Dearborn, 1907, p. 113 (El Rancho, Los Amates, Gualan, Lake Amatitlan, San José, Mazatenango, Patulul); Ridgway, *loc. cit.*, p. 275.

Finca La Primavera, 1 ♂; Chipoc, 1 ♀; Secanquim, 1 ♂, 1 ♀; Progreso, 3 ♂, 1 ♀; Sacapulas, 5 ♂, 4 ♀; Ocos, 2 ♂; Hacienda California, 3 ♂.

Range.—Eastern United States, south in winter to Colombia.

An abundant winter visitant throughout the lowlands of Guatemala, rarely higher than 4000 feet. Salvin records it as fairly common by early August, and obtained molting specimens in July. He consequently suspected that it might breed in the highlands, but this has never been confirmed, and is most improbable. We now know that the Orchard Oriole often leaves its breeding grounds and starts southward by the middle of June.

(707) **Icterus maculi-alatus** Cassin

Icterus maculi-alatus CASSIN, Proc. Acad. Nat. Sci. Phila., III, 1847, p. 332 ("Vera Cruz"); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1887, p. 467 (Volcan de Fuego, above San Diego, San Pedro Martyr, Escuintla, Aguna); RIDGWAY, *loc. cit.*, p. 265.

Chanquejelve, 1 ♂ ad., 1 ♂ imm.; San Lucas, 1 ♂ imm., 1 ♀; San Antonio, 1 ♀.

RANGE.—Endemic in western Guatemala, rare and local.

This is one of the most interesting of Guatemalan birds. It is difficult enough to account for the number of species of orioles in one place in northern Central America, but the Bar-winged Oriole in the Pacific highlands of Guatemala is notable on three counts: (1) it is rare and local, with a distribution that does not coincide with any faunal, topographic, or climatic boundaries; (2) it is obviously more closely related to *Icterus wagleri* and *I. prosthemelas* than any other species of the genus; and (3) these latter species replace each other in totally different faunal and climatic areas, but *Icterus maculi-alatus* occurs chiefly in localities where *I. wagleri* is positively known to be very common. At all the places where Anthony obtained this species, for instance, he also secured large series of *wagleri*.

Another point of interest about this species is that the assumption that the sexes were alike is erroneous. The adult female is olive-green above, yellower on pileum and rump, duskier on the wing-coverts and interscapulum, where the feathers are dusky centrally; primaries blackish; tail olive-green; forehead, lores, sides of head including narrow line over eyes, auriculars, chin, throat and chest black, the last with an evenly rounded oval outline posteriorly; rest of underparts including sides of breast saffron yellow, becoming yellowish green on flanks, thighs, and vent; wing-coverts with broad whitish edgings, forming an indistinct wing-bar, lost in worn plumage. Young males and young females differ in having the black areas replaced by yellowish (forehead and auriculars) or veiled and edged with yellowish.

It will thus be seen that *maculi-alatus* is as closely related to *parisorum* as it is to *wagleri*. From all these facts only one general conclusion can be drawn. At some time in the past northern Central America was surely a center of differentiation for this genus, and many of the present-day "fixed species" must have arisen as genetic mutations in some ancestral stock. The species with which we are here concerned, as they evolved, struggled for niches and habitats, able to compete with other sections of the genus, but not with each other. One, *wagleri*, became a successful highland type in the tropics from northern Mexico to Nicaragua; another, *prosthemelas*, occupied the Caribbean rain forest; *parisorum* pushed north into the Temperate Zone and became migratory; *maculi-alatus* failed, and survives as a relict species in a fragment of the range of a successful rival. This case has a close parallel in *Icterus auratus* and *Icterus cucullatus igneus* of Yucatan.

(708) **Icterus prosthemelas** (Strickland)

Xanthornus prosthemelas Strickland, Jardine's 'Contrib. Orn.,' 1850, p. 120 (Guatemala).

Icterus prosthemelas, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1887, p. 467 (Coban, Choctum); Dearborn, 1907. p. 113 (Los Amates); Ridgway, *loc. cit.*, p. 269.

Secanquim, 2 ♂, 1 ♀; Finca Sepacuite, 1 ♂; Finca Chamá, 2 ♂, 2 ♀; Chimoxan. 1 ♂; Puebla, 1 ♀.

Range.—Caribbean lowland rain forest, from southern Mexico to western Panama (Almirante).

(709) **Icterus wagleri wagleri** Sclater

Icterus wagleri Sclater, P. Z. S., 1857, p. 7 (Mexico); Salvin and Godman, 'Biol. Cent. Amer.,' I, 1887, p. 466 (Dueñas, Calderas, San Geronimo); Dearborn, 1907, p. 113 (Lakes Amatitlan and Atitlan, Tecpam).

Finca La Primavera, 1 ♂, 3 ♀, 1 (?); Sacapulas, 5 ♂, 6 ♀; Nebaj, 2 ♂, 3 ♀; Chichicastenango, 1 ♂, 2 ♀; Huehuetenango, 1 ♀; Chanquejelve, 1 ♀ (?); San Antonio, 1 ♂, 2 ♀; Panajachel, 1 ♂, 1 ♀; San Lucas, 11 ♂, 6 ♀; Lake Amatitlan, 2 ♂.

Range.—Northern Mexico to northern Nicaragua, chiefly Subtropical Zone southward; a race, in northwestern Mexico.

Study of a very large series of modern carefully sexed specimens of Wagler's Oriole shows two interesting things. Fall and winter specimens are distinctly more richly colored below than spring and summer specimens. Females average distinctly less richly colored below than

males, and are also 8–10 mm. shorter in the wing. In other words, fresh fall females are different from comparable males, but are approximately the same as summer males. When proper allowance for these various slight differences is made, the northwestern subspecies *castaneopectus* Brewster from Sonora and Chihuahua is a well-marked large form, more richly colored below than southern specimens and more suffused with chestnut. Comparative measurements of the wing are given below. It will be seen that specimens from Tepic, Jalisco, and Colima are intermediate, being as large as any, but colored like southern specimens. Birds from San Luis Potosi and Coahuila belong distinctly to the typical form. Wagler's original specimen probably came from Vera Cruz, and such specimens may prove to be larger in size and consequently intermediate. There is no need for three races, however, and Guatemala specimens are best referred to the typical form, leaving the northwestern extreme, with both color and size-characters, as distinct. In this way nomenclature is not disturbed.

A very common species in the highlands from 3000 to 6000 feet, preferring the borders of second-growth woods and scrub. Mr. Anthony confused this species and the last, in the field.

19 ♂ Sonora and Chihuahua	105.0–111.5
3 ♂ Western Mexico	107.5–111.5
2 ♂ San Luis Potosi	103.0–106
20 ♂ Guatemala	101.0–107.5
8 ♀ Sonora and Chihuahua	99.0–102(100)
4 ♀ Western Mexico	98.0–100.5
1 ♀ San Luis Potosi	97.0
20 ♀ Guatemala	92.0–100(95.5)

(710) **Icterus mesomelas mesomelas** (Wagler)

Psarocolius mesomelas Wagler, Isis, 1829, p. 755 (Mexico).

Icterus mesomelas, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1887, p. 470 (Coban, Choctum); Dearborn, 1907, p. 117 (Los Amates); Ridgway, *loc. cit.*, p. 305.

Secanquim, 1 ♂, 2 ♀; Finca Concepcion, 1 ♀.

Range.—Humid Tropical Zone: southern Mexico to northern Peru; the race, northern Central America.

(711) **Icterus chrysater chrysater** (Lesson)

Xanthornus chrysater Lesson, 'Oeuvr. compl. Buffon,' VII, 1847, p. 332 (Mexico); Bonaparte, 'Consp. Av.,' I, 1850, p. 434 (Mexico).

Icterus giraudi, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1887, p. 469 (Volcan de Fuego, Dueñas, San Antonio, Motagua Valley, Tactic, Coban); Dearborn, 1907, p. 114 (Lake Atitlan, Tecpam); Ridgway, *loc. cit.*, p. 293.

Icterus gualanensis UNDERWOOD, Bull. Brit. Orn. Club, No. 55, 1898, p. 59 (Gualan, Guatemala).

Finca La Primavera, 3♂, 6♀; Finca Sepacuite, 1♀; Finca El Soche, 2♂, 1♀; Finca Concepcion, 10♂, 3♀, 3 juv.; Barrillos, 1♂, 6♀; Nebaj, 1♀; La Montañita, 3♂, 2♀; Chichicastenango, 3♂; Momostenango, 2♂, 1♀; Zanzon, 1♀; Tecpam, 1♂, 1♀.

RANGE.—Tropical to Subtropical Zones: southern Mexico to Nicaragua; other races, Veraguas to Colombia and Venezuela.

Having had the opportunity in recent years to examine very large series of this familiar species, best known as *Icterus giraudi* Cassin, it has become increasingly obvious that Central American specimens north of the curious "break" in the distribution between northern Nicaragua and Veraguas constitute a well-marked subspecies, quite distinct from Colombia and Panama specimens. Northern specimens are much larger, and adult females, instead of being almost identical in color with males, differ in having the pileum and mantle suffused with brownish, not pure cadmium yellow.

When it comes to the name that this northern race should bear, numerous complications arise. In the first place, *Icterus gualanensis* Underwood must be disposed of. The description shows that he had one or more specimens of a large *Icterus giraudii*, in which the black of the forehead invaded the occiput. By a curious chance the cotypes have been for years unrecognized in the collection of the Museum of Comparative Zoölogy. These two specimens, supplemented by a few trade-skins and forty modern specimens from Yucatan, British Honduras, and the Caribbean lowlands of eastern Guatemala, reveal a marked tendency in the birds of this area to an increased amount of black on the face and head. The forehead is often more broadly black, the occiput is more or less streaked with black, the bases of the feathers being black instead of yellow. On the side of the head the black extends backward ALWAYS as a BROAD line over the eye and sometimes includes half of the auricular region. In all of these points there is a great deal of individual variation, and only a minute proportion of the individuals examined have ALL of these characters. In the highlands of western Guatemala only a minute proportion of individuals show a slight tendency toward any of these characters. While, therefore, it would be possible for a "splitter" to consider that there were two subspecies of this oriole in northern Central America, I personally do not favor the recognition of so slight a tendency in nomenclature, and prefer to treat this question as a series of minor variations within one form. It will be apparent, however, that, other

things being equal, the name *Icterus giraudii gualanensis* Underwood must be used for the subspecies of northern Central America.

By a curious coincidence the name *Icterus chrysater* Lesson has been persistently ignored by ornithologists, although Salvin years ago wrote that he believed *chrysater* and *giraudii* to be the same bird. That he did not use it was probably due to the uniform practice of the British at that period of ignoring names, unless they had examined the type or authentic specimens, or unless the author was a personal friend in whom they had confidence. Bonaparte's redescription of *chrysater* Lesson in 1850 removes any possible doubt as to what species was concerned. Lesson's name was published in 1847. Cassin's description of *giraudii* was read at the December, 1847, meeting of the Philadelphia Academy, but was not published until well along in 1848. Lesson's name consequently has priority over Cassin's, and the species should be known as *chrysater*. In any event the name *chrysater* has many years priority over *gualanensis* Underwood, and would date from Bonaparte, even if *chrysater* Lesson could be construed as a *nomen nudum*. The races of this oriole are:

1.—*Icterus chrysater chrysater* Lesson, 1847. From extreme southeastern Mexico to the highlands of northern Nicaragua. Adult female browner, less yellow on pileum and mantle; much larger. Wing, ♂, 100–111 mm.; depth of bill at gonys averaging 8 mm.

2.—*Icterus chrysater giraudii* Cassin, 1848. Panama (Veraguas eastward) and Colombia. Adult female similar to adult male; much smaller. Wing, ♂, 91–101 mm.; depth of bill at gonys averaging 7.5 mm.

3.—*Icterus chrysater melanopterus* Hartlaub, 1849. Mountains of northern Venezuela. Slightly larger than *giraudii*, with a much stouter, heavier bill. Wing, ♂, 98–103; depth of bill averaging 9.5 mm.

A common upland species above 3000 feet, preferring the pine and oak woods.

(712) **Icterus gularis gularis** (Wagler)

Psarocolius gularis Wagler, Isis, 1829, p. 754 (Tehuantepec, Oaxaca).

Icterus gularis gularis, Griscom, Amer. Mus. Novit., No. 438, 1930, p. 14 (monogr.).

Gualan, 3 ♂, 1 ♀ (M. C. Z.).

Range.—Arid Tropical Fauna: southern Mexico to Nicaragua; the race, southwestern Mexico.

In the paper cited I discussed the remarkable and interesting variations of this oriole, and commented on the birds listed above. Geographically these birds are intermediate between the large *xerophilus* of the upper Motagua Valley and the small orange *yucatanensis* of the

lowlands to the northeast. They are also exactly intermediate in color and size characters, and are consequently not separable from typical *gularis* of southwestern Mexico.

(713) **Icterus gularis troglodytes** Griscom

Icterus gularis troglodytes Griscom, Amer. Mus. Novit., No. 438, 1930, p. 13 (San Felipe, Retalhuleu, Pacific slope, Guatemala).

Icterus gularis (part), Salvin and Godman, 'Biol. Cent. Amer.,' I, 1887, p. 475 (Retalhuleu, Savana Grande, San Pedro Martyr, Zacapa); Dearborn, 1907, p. 114 (as to Mazatenango); Ridgway, *loc. cit.*, p. 284.

Ocos, 2 ♀; Finca El Cipres, 5 ♂, 5 ♀; Hacienda California, 3 ♂; 7 ♀; Pantaleon, 2 ♂; San Felipe, 2 ♂, 2 ♀; San José, 1 ♂; Antigua, 1 ♂; San Lucas, 1 ♂.

Range.—Pacific lowlands of Guatemala.

Specimens of this oriole from the Pacific lowlands of Guatemala are one-third smaller than typical *gularis*, and consequently are no larger than certain races of *I. sclateri*. In fact many of the specimens were erroneously determined as *sclateri*.

(714) **Icterus gularis gigas** Griscom

Icterus gularis gigas Griscom, Amer. Mus. Novit., No. 438, 1930, p. 13 (Sacapulas, Rio Negro Valley, Guatemala).

Icterus gularis (part), Salvin and Godman, 'Biol. Cent. Amer.,' I, 1887, p. 475 (San Geronimo specimens perhaps belong here).

Sacapulas, 8 ♂, 10 ♀.

Range.—Isolated in the arid section of the Rio Negro Valley, Guatemala.

A giant, yellow form.

(715) **Icterus gularis xerophilus** Griscom

Icterus gularis xerophilus Griscom, Amer. Mus. Novit., No. 438, 1930, p. 14 (Progreso, Guatemala).

Icterus gularis (part), Dearborn, 1907, p. 114 (El Rancho).

Progreso, 16 ♂, 5 ♀.

Range.—Isolated in the arid portion of the Rio Motagua Valley, Guatemala.

A giant, rich orange form.

(716) **Icterus sclateri formosus** Lawrence

Icterus formosus LAWRENCE, Ann. Lyc. Nat. Hist., N. Y., X, 1872, p. 184 (Juchitan, Oaxaca).

Icterus sclateri formosus, GRISCOM, Amer. Mus. Novit., No. 438, 1930, pp. 15–18 (monog.).

Chanquejelve, 1 ♀.

RANGE.—Arid Tropical Fauna: Oaxaca to northwestern Costa Rica; the race, Oaxaca, Chiapas, and northwestern Guatemala.

(717) **Icterus sclateri maximus** Griscom

Icterus sclateri maximus GRISCOM, Amer. Mus. Novit., No. 438, 1930, pp. 15–18 (Sacapulas, Rio Negro Valley, Guatemala; monog.).

Sacapulas, 14 ♂, 3 ♀.

RANGE.—Isolated in the arid Rio Negro Valley, Guatemala.

A very large, black-backed, relatively yellow race, apparently localized in the arid portion of the Rio Negro Valley. Its racial characters are exactly the same as those of the local representative of *Icterus gularis*.

(718) **Icterus sclateri alticola** Miller and Griscom

Icterus sclateri alticola MILLER AND GRISCOM, Amer. Mus. Novit., No. 184, 1925 p. 4 (Progreso, Guatemala); GRISCOM, *op. cit.*, No. 438, 1930, pp. 16–18 (monog.).

?*Icterus mentalis* (*nec* Lesson), SCLATER AND SALVIN, Ibis, 1860, p. 275 (San Geronimo); OWEN, Ibis, 1861, p. 62 (descr. eggs, San Geronimo).

Icterus sclateri, SCLATER, 'Cat. Birds, Brit. Mus.,' XI, 1886, p. 385 (descr. based on specimens from San Geronimo, apparently belonging to this form); DEARBORN, 1907, p. 114 (El Rancho).

Progreso, 11 ♂, 11 ♀.

RANGE.—Arid section of Rio Motagua Valley, Guatemala.

As already pointed out in my review cited above, this large, orange, black-backed subspecies is not a highland form, and is localized in the arid portions of central Guatemala, chiefly at the western end of the Rio Motagua Valley. Its name could scarcely be more inappropriate. Here again there is perfect parallelism between this species and the local race of *Icterus gularis*.

(719) **Icterus sclateri** subspecies

Icterus sclateri subspecies, GRISCOM, Amer. Mus. Novit., No. 438, 1930, p. 18 (crit.).

Gualan, 1 ♀; trade-skins, 3.

I have already pointed out with *Icterus gularis* that the specimens from the eastern end of the Rio Motagua Valley were very small and were connecting links between *xerophilus*, *gularis*, and *tamaulipensis*. *Icterus sclateri* shows exactly the same tendencies, but, as the species is lacking elsewhere in eastern Central America, we are probably dealing with another local race which will have to be described when an adequate series of good specimens is available.

(720) **Icterus pectoralis pectoralis** (Wagler)

Psarocolius pectoralis WAGLER, Isis, 1829, p. 755 (Mexico).

Icterus pectoralis, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1887, p. 474 (as to San Geronimo); RIDGWAY, *loc. cit.*, p. 283.

Icterus pectoralis pectoralis, RIDGWAY, *loc. cit.*, p. 283; GRISCOM, Amer. Mus. Novit., No. 438, 1930, p. 18 (crit.; range).

Finca Chamá, 1♂; Sacapulas, 1♂; Lake Amatitlan, 1♂; San Lucas, 2♂; Gualan, 1♂, 1♀; Finca Carolina, 3♂ (intermediate).

RANGE.—Arid Tropical Fauna: Oaxaca to northwestern Costa Rica; the race, in the interior from Oaxaca to northern Nicaragua.

True *pectoralis* proves to be the large form of Mexico, which ranges south in the central highlands to northern Nicaragua, but has never been collected above 5000 feet.

(721) **Icterus pectoralis anthonyi** Griscom

Icterus pectoralis anthonyi GRISCOM, Amer. Mus. Novit., No. 438, 1930, p. 18 (Finca El Cipres, near Ocos, Pacific coast of Guatemala).

Icterus pectoralis (part) SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1887, p. 474 (Retalhuleu, Escuintla, Savana Grande); DEARBORN, 1907, p. 114 (Patulul); LANTZ, 1899, p. 222 (Palin); RIDGWAY, *loc. cit.*, p. 284.

Ocos, 2♂; Finca El Espino, 1♀; Finca El Cipres, 8♂, 6♀; Hacienda California, 9♂, 11♀; San Felipe, 1♂; Pantaleon, 4♂, 6♀.

RANGE.—Pacific lowlands of Guatemala.

A much smaller bird than true *pectoralis*, but with its rich coloration. It will be noted, therefore, that its characters exactly parallel those of the Pacific slope representative of *I. gularis*.

There is a final point in the systematics of this oriole to be brought out. I am not aware that a good description of the immature bird has been published. Suffice it to say, here, that the spotting of the breast completely disappears, and the general coloration exactly resembles that of *I. gularis*, and *I. sclateri*. There is only one reliable difference that I know of: *pectoralis* always has broader edgings of white on the tertials

and secondaries than *sclateri* in all plumages, provided that comparable plumages are used. Worn immature *sclateri* sometimes completely lose all sign of these light edgings. Nearly all the young specimens of *pectoralis anthonyi* listed above were erroneously determined as *sclateri*. When these are added to the specimens of *gularis troglodytes*, also erroneously determined as *sclateri*, we obtain quite a respectable series of a species, which does not occur on the Pacific slope of Guatemala!

We can now sum up the facts in the distribution of these three very closely related species. The most widely distributed and the most dominant is *I. gularis*, the only one to penetrate the humid tropics. *Icterus sclateri* prefers the more arid parts of the Arid Tropical Zone. *Icterus pectoralis* is the least plastic of the three, and is the least common in the most arid sections of the Fauna. The variations of all three species are exactly alike, wherever they occur together, provided they do vary.

(722) **Euphagus cyanocephalus** (Wagler)

Psarocolius cyanocephalus WAGLER, Isis, 1829, p. 758 (Mexico).

Scolecophagus cyanocephalus, RIDGWAY, p. 250 (Hacienda Chancol, Guatemala); SALVIN AND GODMAN, Introd. to Aves vols. of Biologia, 1904, p. xxi (Guatemala).

RANGE.—Western North America, south in winter to northwestern Guatemala (two records).

The southernmost recorded point in the winter range of Brewer's Blackbird is the record cited above, a locality very near the Chiapas border.

(723) **Dives dives** (Lichtenstein)

Icterus dives LICHTENSTEIN, 'Preis-Verz. Mex. Vög.,' 1830, p.1 (Mexico).

Dives sumichrasti, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1887, p. 481 (Achil, Choctum, Coban, Tactic).

Dives dives, RIDGWAY, *loc. cit.*, p. 254.

Finca Chamá, 1 ♂; Finca Concepcion, 1 ♀, 1 juv.; Finca El Soche, 1 ♂, 2 ♀; Finca Sepacuite, 3 ♂, 6 ♀, 1(?); Secanquim, 3 ♂, 5 ♀; Finca La Primavera, 4 ♂, 4 ♀; Barrillos, 5 ♂, 3 ♀; Puebla, 1 ♂, 1 ♀.

RANGE.—Southeastern Mexico and Yucatan through central Guatemala to north central Nicaragua.

This genus reappears in western Ecuador and Peru, suggesting the distribution of *Melopelia*. Its closest relative is *Ptiloxena* of Cuba, which indicates the relative antiquity of the group.

"Common along the eastern side of the Republic, as far as Barrillos, at 5200 feet, and Nebaj, at 6700 feet. They are strictly a bird of the

fields and open brush-land and usually to be seen near the corn-fields. Their habits do not cause them to be popular with the Indians. I was told that in times of unusual damage to crops, the natives capture one of this species, a mouse, also considered to be an enemy, and a grasshopper. All are taken to one of their many places of worship, where certain rites are performed, after which the captives are told of the dire consequences in case the damage is not stopped at once. The prisoners are then taken to the fields, told to spread the news, and released." (Anthony, MS.)

(724) **Megaquiscalus major macrourus** (Swainson)[1]

Quiscalus macrourus SWAINSON, 'Anim. in Menag.,' 1838, p. 299 (Real del Monte, Hidalgo, Mexico); SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1887, p. 482 (everywhere about houses and villages, San José, Escuintla, Dueñas, Guatemala City, San Geronimo, Choctum, etc.).

Megaquiscalus major macrourus, DEARBORN, 1907, p. 113 (in every village).

Nebaj, 2♂, 1♀; San Lucas, 1♂; Antigua, 1♂, 1♀; Panajachel, 1♂, 4♀; Finca Carolina, 7♂, 2♀; Hacienda California, 3♀; Finca El Cipres, 3♂, 3♀.

RANGE.—Southern United States to Colombia; the race, Texas to Costa Rica.

The specimens listed above from inland localities differ from the Pacific coast lowlands series in that the males are less extensively violet both above and below, passing more rapidly into bluish green. A few males from the highlands of northern Nicaragua are similar. Females appear darker below, a richer wood-brown, less grayish brown, and a greener, less violet sheen above. The birds from the Pacific coast lowlands, and a series from eastern Honduras agree perfectly with Mexican and Texas specimens. The very few birds examined from Yucatan are slightly smaller, with shorter tails, and the females perhaps average a trifle paler. I am convinced that the Great-tailed Grackle in Central America requires careful revision, but the material at my command is far too scant to warrant my doing so. Most collectors have neglected to secure material of such a tiresome, impudent and abundant town bird.

"At Lake Atitlan, several times I saw these grackles catching small fish and taking them to the nests, where I have no doubt they were served to the nestlings. The method of capture was usually by a quick snap as the bird passed over the water near enough to secure the fish without getting much wet, if any. However, several times I saw them plunge like a tern or kingfisher, but not more than three or four inches below the surface of the water." (Anthony, MS.)

[1]Now called *Cassidix mexicanus mexicanus* (Gmelin).

Family Corvidæ. Crows, Jays

(725) **Corvus corax sinuatus** Wagler

Corvus sinuatus Wagler, Isis, 1829, p. 748 (Mexico).

Corvus corax, Salvin and Godman, 'Biol. Cent. Amer.,' I, 1887, p. 487 (Estansuelas, Dueñas, Chimaltenango, above Calderas (8300 feet), Volcan de Fuego (12,000 feet), Volcan de Atitlan, Quetzaltenango, San Geronimo.

Corvus corax sinuatus, Ridgway, 'Birds N. and Mid. Amer.,' pt. 3, 1904, p. 262.

Range.—Northern hemisphere, in the New World, south to northern Nicaragua.

In default of specimens I follow Meinertzhagen's recent review of the genus (Novit. Zool., XXXIII, 1926, pp. 102–104). He produces excellent evidence to show that the smaller ravens of the Old and New Worlds are indistinguishable in large series. This treatment is very conservative, and is unsatisfactory in the extent to which it ignores minor variations in one hemisphere or the other, but I am inclined to agree that it is the only course at present.

"Rather common in the higher parts of the Chuchumatan Mountains of northern Huehuetenango. Several were seen near Todos Santos and in the forest between there and the top of the divide to the south. At Chanquejelve several were seen, also at San Mateo and Barrillos. One or two noted at Sacapulas. At Progreso a pair was seen scouting for food along a cactus hedge. As this station is only about 2000 feet altitude and the raven is strictly a bird of the mountains, it would seem to be out of its range. However, the Sierra de la Minas is only a short ten miles from Progreso and at 4500 feet in this range I found a flock of twenty or more." (Anthony, MS.)

(726) **Calocitta formosa pompata** Bangs

Calocitta formosa pompata Bangs, Proc. N. E. Zoöl. Club, 1914, IV, p. 101 (Bolson, northwest Costa Rica).

Calocitta formosa (part), Salvin and Godman, 'Biol. Cent. Amer.,' I, 1887, p. 508 (Rio Motagua below Chol, Chuacus, Zacapa).

Calocitta formosa azurea (*nec* Nelson), Dearborn, 1907, pp. 109–111 (El Rancho, Gualan; crit.; intermediates from San José); Ridgway, *loc. cit.*, p. 296.

Progreso, 1 ♂, 1 ♀; Pantaleon, 3 ♂, 4 ♀ (intermediates between *pompata* and *azurea*).

Range.—Arid Tropical Zone: Costa Rica to northwestern Mexico; the race, Costa Rica and Nicaragua north in the interior to Oaxaca.

This Magpie-jay is a beautiful illustration of a bird with a perfect correlation between its racial variations and the climate and character of its habitat. It is primarily a species of the Arid Tropical Zone, pre-

ferring scrub country or even a more xerophytic type of vegetation. Never ranging above 3000 feet, its extension inland from the Pacific coast is bounded exactly by the topography. In southwestern Mexico the typical form is a smaller, grayer bird with a black occiput and malar region. In Costa Rica and Nicaragua we have a small, gray bird with no black on the occiput or malar region (=*pompata*). This form penetrates well inland in north central Nicaragua, but as we go northward the bird is divided into two groups or colonies by the Pacific cordillera. In the arid interior valleys of Honduras and Guatemala the small, gray type remains unchanged, and even in the arid interior of Oaxaca at Chivelá, a good series is inseparable from the type series from Costa Rica. These birds were inadvertently recorded by Bangs and Peters as typical *formosa*. On the Pacific coast, however, the story is somewhat different. In southern Chiapas and the northern half of Guatemala we get a local area of much heavier rainfall and denser vegetation. The Magpie-jay in this region is a larger, bluer and darker bird, *azurea* Nelson. In the southern half of the Pacific coast of Guatemala specimens from Pantaleon and San José are perfect intermediates from a climatically transitional area.

It remains to note that the genus *Calocitta* is endemic in the Arid Tropical Fauna, a distinct species, *colliei*, occupying the northern part of arid tropical western Mexico.

(727) **Calocitta formosa azurea** Nelson

Calocitta formosa azurea Nelson, Auk, 1897, p. 55 (Huehuetan, Chiapas, Mexico); Dearborn, 1907, pp. 109–111 (Mazatenango, Patulul; crit.).

Calocitta formosa (part), Salvin and Godman, 'Biol. Cent. Amer.,' I, 1887, p. 508 (Savana Grande, Retalhuleu, Escuintla).

Finca El Cipres, 6♂, 5♀, 1?; Hacienda California, 4♂, 1♀, 1(?); Finca Carolina, 3♂, 2♀.

Range.—Chiapas and Pacific coast of Guatemala.

The Crested Magpie-jay is abundant where found, is tame and impudent, and a pest to the hunter, as it warns other birds of danger. It croaks, screeches, mews, growls, and whistles, and one wearies of its perpetual outcry and curiosity. Mr. Anthony writes feelingly in the same vein, and reports seeing some at Nenton, presumably *pompata*.

(728) **Cyanocitta stelleri ridgwayi** Miller and Griscom

Cyanocitta stelleri ridgwayi Miller and Griscom, Amer. Mus. Novit., No. 184, 1925, p. 7 (Volcan de Fuego, Guatemala).

Cyanocitta coronota (*nec* Swainson), Salvin and Godman, 'Biol. Cent. Amer.,'

I, 1887, p. 491 (Volcan de Fuego, Barranco de los Chocoyos, Totonicapam, San Raymundo, Santa Barbara, Chilasco).

Cyanocitta stelleri coronata, DEARBORN, 1907, p. 111 (Tecpam, Chimaltenango); RIDGWAY, *loc. cit.*, p. 362.

Momostenango, 13♂, 9♀; Chichicastenango, 5♂, 6♀; Huehuetenango, 7♂, 3♀; Nebaj, 6♂, 1♀; Uspantan, 1♂, 1♀; Zanzon, 1♂; Quetzaltenango, 4♂; Tecpam, 4♂, 7♀; San Mateo, 3♂, 1♀.

RANGE.—British Columbia to northern Nicaragua; the race, in western Guatemala.

When Miller and I described this subspecies, we had only five specimens from Guatemala. The present series of seventy-four specimens fully confirms its distinctness. Representative races are now known from Salvador and northern Nicaragua, but as usual Honduras is a blank which still needs to be filled in. Large series are also badly needed from nearly every part of southern Mexico.

Steller's Jay is of boreal origin in Central America, and has spread south to the limit of pine forests. It rarely occurs below 7000 feet in Guatemala, but descends to 3500 feet in northern Nicaragua. It is common throughout.

(729) **Aphelocoma unicolor cœlestis** Ridgway

Aphelocoma unicolor coelestis RIDGWAY, *loc. cit.*, p. 345 (San Cristobal, Chiapas).

Aphelocoma unicolor, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1887, p. 495 (Totonicapam, Quiché, Chilasco).

Momostenango, 1♂, 1♀; Santa Ilania, 2♂, 1 juv.; Tecpam, 3♂, 1♀, 2 juv.

RANGE.—Southern Mexico and western Guatemala; the race, Chiapas and western Guatemala.

Immature birds have the lower mandible largely yellow. This beautiful jay lives in the high pine forests from 7000 to 10,000 feet, and is rare and local. Mr. Anthony found it common only in the cypress forest above Tecpam at 10,000 feet.

(730) **Xanthoura luxuosa vivida** Ridgway

Xanthoura luxuosa vivida RIDGWAY, Auk, 1900, p. 28 (Pluma, Oaxaca); idem, 'Birds N. and Mid. Amer.,' pt. 3, 1904, p. 309 (Nenton, Guatemala); DEARBORN, 1907, p. 111 (Patulul).

Xanthura luxuosa, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1887, p. 502 (Retalhuleu, Savana Grande, Zapote, Rio Chiguate, Patio Bolas).

Hacienda California, 3♂, 2♀.

RANGE.—Chiefly Arid Tropical Zone: Texas to northern Honduras; the race, Oaxaca to the Pacific coast of Guatemala.

This little series is remarkably variable. While there is no question but that all five birds are *vivida* rather than any other subspecies, two specimens are almost as green below as true *luxuosa*, and two others are brighter apple-green above than any other specimens of the species.

The Green Jay is common on the Pacific slope (Salvin).

(731) **Xanthoura luxuosa guatimalensis** Bonaparte

Xanthoura guatimalensis BONAPARTE, 'Consp. Av.,' I, 1850, p. 380 (Guatemala).

Xanthura luxuosa, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1887, p. 502 (Cahabon, Yzabal, Choctum).

Finca Chamá, 1 ♂, 3 ♀; Secanquim, 23 ♂, 8 ♀, 1(?).

RANGE.—Yucatan and Campeche through central Guatemala to northern Honduras.

The Green Jay is a remarkably variable bird, and further material is badly needed from Honduras, southwestern Mexico and western Guatemala. In eastern Guatemala all specimens are distinctly yellower below than any from Mexico, but there is often a more or less pronounced tinge of green on the breast. The specimens from Finca Chamá north of the highlands are all greenish tinged and show a distinct approach to *vivida*. Those from Secanquim are clearly *guatimalensis*, coming from south and east of the highlands of Vera Paz, and about one-third only of the series is tinged with green. Specimens from Yucatan (Mérida and Chichen-Itza) Quintana Roo, and British Honduras are never tinged with green, and the yellow is a slightly duller, paler shade. A better series would probably show them to be separable. Two adults from the arid extreme tip of the Peninsula (Rio Lagartos) are quite different, very glaucous above, and whitish yellow beneath. They are worn, however, and I prefer to see more material.

(732) **Cissilopha yucatanica** Bu Bois

Cyanocitta yucatanica DUBOIS, Bull. Acad. Roy. Belg., XL, 1875, p. 13 (Yucatan).

Cyanolyca yucatanica, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1887, p. 498 (near Lake Yaxhá, Peten).

Cissilopha yucatanica, RIDGWAY, *loc. cit.*, p. 315.

RANGE.—Yucatan Peninsula and adjacent parts of Peten and British Honduras.

(733) **Cissilopha melanocyanea melanocyanea** (Hartlaub)

Garrulus (*Cyanocorax*) *melanocyaneus* HARTLAUB, Rev. Zool., 1844, p. 215 (Guatemala).

Cyanolyca melanocyanea, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1887, p. 498 (Coban, Tactic, San Geronimo, Dueñas, Quetzaltenango, Volcan de Fuego up to 8000 feet).

Cissilopha melanocyanea, DEARBORN, 1907, p. 111 (Fiscal, Lakes Amatitlan and Atitlan, Tecpam); RIDGWAY, *loc. cit.*, p. 317.

Finca Concepcion, 4♂, 1 juv.; Finca El Soche, 5♂; Finca Sepacuite, 6♂, 5♀; 1 juv.; Finca La Primavera, 4♂, 1♀; Progreso, 1♂, 1(?); Secanquim, 1♂, 1♀; Nebaj, 12♂, 5♀; Sacapulas, 2♂; La Montañita, 1♀; San Lucas, 3♂, 7♀, 2 juv.; Panajachel, 4♂, 4♀, 4 juv.; Antigua, 4♂, 4♀; 1 juv.; Lake Amatitlan, 5♂, 1♀.

RANGE.—Pine forests in the mountains of Guatemala to northern Nicaragua; a race, in northern Nicaragua.

I can detect no constant differences in this great series between Vera Paz specimens and those from western Guatemala.

Abundant in the more arid and lower altitudes of the Altos from Progreso (Anthony) to the lower limit of *Cyanocitta*.

(734) **Cyanolyca mitrata** Ridgway

Cyanolyca mitrata RIDGWAY, Auk, 1899, p. 255 (new name to replace *ornata* preoccupied); idem, 'Birds N. and Mid. Amer.,' pt. 3, 1904, p. 322.

Cyanolyca ornata, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1887, p. 499 (Cahabon, Coban).

Barrillos, 3♂, 1♀.

RANGE.—Endemic in the mountains of Vera Cruz to north central Guatemala.

A very closely related species, *cucullata* Ridgway, represents this jay in the mountains of Costa Rica and western Panama.

It is interesting to note that the western limits of this species correspond with that of other Vera Paz specialties.

(735) **Cyanolyca pumilo pumilo** Strickland

Cyanocorax pumilo STRICKLAND, in Jardine's 'Contrib. Orn.,' 1849, p. 122 (Guatemala).

Cyanolyca pumilo, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1887, p. 500 (Calderas, Sierra de las Nubes, San Pedro Carcha); RIDGWAY, *loc. cit.*, p. 321.

Nebaj, 1♂, 1♀; Barrillos, 1♂; San Mateo, 1♂, 2♀; Tecpam, 2♂, 2♀; Santa Ilania, 1♂.

RANGE.—Chiapas, western Guatemala, and a race in Salvador.

A very local and uncommon bird in Guatemala, chiefly in oak forests at 7000 to 8000 feet. The old record from San Pedro Carcha is undoubtedly erroneous.

(736) **Psilorhinus mexicanus cyanogenys** Sharpe

Psilorhinus cyanogenys SHARPE, 'Cat. Birds Brit. Mus.,' III, 1877, p. 140 (Pearl Bay Lagoon, east Nicaragua).

Psilorhinus mexicanus, SALVIN AND GODMAN, 'Biol. Cent. Amer.,' I, 1887, p. 506 (Yzabal, Quiriguá, Iguana, Teleman, Choctum).

Psilorhinus mexicanus cyanogenys DEARBORN, 1907, p. 111 (Los Amates); RIDGWAY, *loc. cit.*, p. 301.

Finca Chamá, 1 ♂, 1 ♀; Secanquim, 3 ♂, 2 ♀; Puebla, 2 ♂, 1 ♀.

RANGE.—Humid Tropical Zone: Vera Cruz to western Panama; the race, Guatemala to Costa Rica.

The series from Alta Vera Paz is much nearer typical *mexicanus*, in size, but all have the wider tail-tips characteristic of the southern form. It seems much better to leave *cyanogenys* as an intermediate form, inevitably somewhat variable in characters, rather than describe a fifth subspecies with poorer characters than any of the other four.

An abundant jay in the Caribbean rain forest. Like all jays it has an extensive vocabulary, but one note is exactly like the scream of the Red-shouldered Hawk.

BIBLIOGRAPHY

A List of the More Important Papers Dealing with the Birds of Guatemala

The bibliography is largely restricted to the citation of papers on the bird-life of Guatemala as such. Purely systematic papers, or others containing incidental descriptions of new species, will be found under the species in the systematic list. A list of references to standard books or papers dealing with the topography, physiography, climate and geology of the country is also appended.

General Reference Works

1887. Salvin, O., and Godman, F. D.—'Biologia Centrali Americana.' Lepidoptera-Rhopalocera. Introd., pp. I–XXX.

Valuable comparative data on the distribution of butterflies. Brief sketch of the topography of Guatemala. Résumé of the author's explorations and the territory covered by their assistants and professional collectors.

1894. Sapper, Carl.—'Grundzüge der physikalischen Geographie von Guatemala.' Petermann's Mitteil., Erganzungsheft, No. 113. With 4 maps.

1899. Sapper, C.—'Über Gebirgsbau und Boden des nordlichen Mittelamerika.' Idem, No. 127.

1915. Salvin, O., and Godman, F. D.—'Biologia Centrali Americana.' Introductory volume to the entire work, 150 pp., 8 maps.

An indispensable reference volume, with chapters on topography, sources of material, itinerary of various collectors, summary of contents of the sixty-three volumes, and chapters on the origin of the fauna and flora of Central America by eminent specialists, brought up to date. The Aves, curiously enough, were not included. The maps supply the only existing clues in many cases to the whereabouts of the innumerable collecting stations.

1926. 'Naturalist's Guide to the Americas.'—Edited by Victor E. Shelford, *et. al.* Williams and Wilkins Co., Baltimore.

"Guatemala." By Wilson Popenoe, pp. 596–600.

Excellent account of the topography and physiography, dividing the country into six general regions. This account is far superior to that in the 'Biologia.'

Ornithological

1837. Bonaparte, C. L. J. L.—'Birds Collected by Colonel Velasquez de Leon During a Fortnight's Scientific Tour in Guatemala.' P. Z. S., 1837, pp. 114–119.

Lists 39 species, describing several as new.

It is quite apparent that most of these must have been purchased from the Indians, as the majority come from the eastern part of the cordillera and the rain forests of Vera Paz. The Colonel landed on the Pacific coast.

1840*a*. LESSON, R. P.—'Oiseaux-mouches rares ou nouveaux, communiqué par MM. Longuemare et Parzudaki.' Rev. Zool., 1840, pp. 71–74.

Description of *Campylopterus rufus*. The other species mentioned or described came from various parts of the New World. There is no locality given for *C. rufus*, but it must have come from Guatemala. Perhaps Dr. Berlioz can some day give us the history of the type.

1840*b*. LAFRESNAYE, F. DE.—'Quelques nouvelles espèces d'oiseaux.' Rev. Zool., 1840, p. 130.

Describes *Prionites* [=*Aspatha*] *gularis*, based on a motmot sent to the Paris Museum by Colonel Velasquez de Leon and recorded by Bonaparte in 1837 as *Momotus superciliosus* of Sandbach.

1843*a*. DELATTRE, M. A.—'Description d'un Oiseau-mouche nouveau, *Ornismya Helenæ*.' Rev. Zool., 1843, p. 133.

Said to come from "Vera-pax, propter Petinck in republica Guatemala." A reprint from 'Echo du Monde Savant,' 1843, No. 5, column 1068.

1843*b*. DELATTRE, M. A.—'Echo du Monde Savant.' 1843, No. 5, columns 1069, 1070.

Descriptions of *Ornismya* (=*Phœthornis*] *longirostris* and *Ornismya* [=*Eupherusa*] *eximia* from Coban, Guatemala.

1843*c*. DELATTRE, M. A.—'Note sur les moeurs du *Couroucou Pavonin*, et détails sur les contrées qu'il habite.' Rev. Zool., 1843, pp. 163–165.

The first authentic account to reach Europe of the Quetzal or Paradise Trogon, based on field experience in 1842 in Vera Paz. It is written with a dash of Latin hyperbole.

1844. HARTLAUB, G.—'Descriptions de sept oiseaux de Guatemala.' Rev. Zool., 1844, pp. 214–216.

Turdus rufitorques is the only really endemic Guatemala species described. No hint is given as to the source of the specimens, which are presumably in the Bremen Museum.

1846. BOURCIER, J., AND MULSANT, E.—'Description de vingt Espèces nouvelles d'Oiseaux-mouches.' Ann. Sci. Phys. et Nat. Lyons, IX, 1846, pp. 321, 326, 328.

Descriptions of *Trochilus* [=*Oreopyra*] *viridipallens* from Coban, *Trochilus* [=*Agyrtria*] *candidus* from Coban, and *Trochilus* [=*Amazilia*] *corallirostris* from Escuintla, Guatemala. This paper is cited because it gives the only locality record other than Vera Paz for Guatemala until 1859. It would be interesting to know the history of the Escuintla specimen.

1847. DUBUS, B.—'Note sur quelques espèces nouvelles d'oiseaux d'Amérique.' Bull. Acad. Roy. Belg., XIV, pt. 2, 1847, pp. 101–108.

Among others, DuBus describes *Pitylus poliogaster* [=*Cary-*

othraustes], *Monasa inornata*, and *Prionites carinatus* [=*Electron*] from "Guatemala."

1848. DuBus, B.—'Esquisses Ornithologiques.' Livr. 4, 1848.

Records *Cyanocorax unicolor* [=*Aphelocoma*] and *Cyanocorax* [=*Xanthoura*] *luxuosa* from Vera Paz.

1859. Sclater and Salvin.— Contributions to the Ornithology of Central America.' Ibis, 1859, pp. 1–22, 117–138, 213–234.

The territory included in Central America comprised Yucatan, British Honduras, Guatemala, and Honduras. The species listed number 382, but by no means all of them came from Guatemala. There is an introduction on previous publications and the sources of their own list, which so far as Guatemala was concerned, consisted almost entirely of the birds sent to Europe by Delattre, Constancia and Skinner. Field notes were supplied by Salvin, based on his work at Dueñas during his first expedition.

1859. Moore, Thomas J.—'List of Mammals and Birds Collected by Mr. Joseph Leylands in Honduras, Belize and Guatemala. P. Z. S., 1859, pp. 50–65.

Leyland collected at Omoa, Honduras, and Belize, and thence to Lake Peten. A minority of the birds came from Peten. Leyland obviously picked up a few trade-skins from elsewhere, such as the Quetzal and the Rivoli Hummingbird, which do not occur in Peten. His specimens went to the Derby Museum at Liverpool. His records were all included in Sclater and Salvin's paper by special permission.

1860*a*. Salvin, O., and Sclater, P. L.—'Contributions to the Ornithology of Guatemala.' Part 1, pp. 28–45; pt. 2, pp. 272–278; pt. 3, pp. 396–402.

Additions and corrections to the first list, based primarily on a study of the collections made by Salvin in his first expedition. Adds 120 species to Guatemala.

1860*b*. Salvin, Osbert.—'History of the Derbyan Mountain-Pheasant (*Oreophasis derbianus*).' Ibis, 1860, pp. 248–253.

Classical account of the habits and haunts of this remarkable Guan.

1860*c*. Salvin, Osbert.—'Notes on the Hummingbirds of Guatemala.' Ibis, 1860, pp. 259–272.

Notes on the habits and haunts of 22 species. Special attention was paid to seasonal abundance and the ratio between the sexes.

1861*a*. Owen, Robert.—'On the Nesting of Some Guatemalan Birds. With remarks by Osbert Salvin.' Ibis, 1861, pp. 58–69.

Descriptions of the nests, eggs, and breeding habits of 23 species, the territory covered being the vicinity of San Geronimo and the mountains of Santa Cruz and Chilasco to the north.

1861*b*. Salvin, O.—'Quezal Shooting in Vera Paz.' Ibis, 1861, pp. 138–149.

Classical account of this famous bird. Valuable incidental notes on the country, climate, and various birds encountered, including several new to Guatemala.

1861c. SALVIN, O.—'A list of Species to be Added to the Ornithology of Central America.' Ibis, 1861, pp. 351–357.

Corrections and addition of 28 species, all from Guatemala. Based primarily on a collection sent by Robert Owen, but actually made by two natives at Chisec and the Rio Polochic in Alta Vera Paz.

1865. SALVIN, O.—'The Sea-Birds and Waders of the Pacific Coast of Guatemala.' Ibis, 1865, pp. 187–199.

An extensively annotated list, based on thorough collecting near Champerico and Huamuchal. This paper and Salvin's earlier work on the coast of British Honduras is the only careful exploration ever made of water birds anywhere in Central America.

1866. SALVIN, O.—'A Further Contribution to the Ornithology of Guatemala.' Ibis, 1866, pp. 188–206.

Further corrections and addition of 81 species. Based on Salvin's second and third expeditions, and collections received from other sources. An introduction gives an account of Salvin and Godman's travels, and the various collectors who worked for them elsewhere. The statement is made that a total of 612 species are now known from the original area. As the first list of 1859 included birds from Yucatan, British and Spanish Honduras, at least 30 species must be deducted.

1873. SALVIN, O.—Extracts of letters to editor. Ibis, 1873, p. 428.

Contains brief account of the recently formed museum kept by the Sociedad Economica de Guatemala, including several birds new to Guatemala.

1874. 'NEWS OF MR. SALVIN.'—Editorial. Ibis, 1874, pp. 99, 188.

Extracts from Salvin's letters to Sclater, reporting on his fourth expedition to Guatemala. Announces the discovery of several species new to Guatemala, such as *Claravis mondetoura* and *Vireo huttoni*.

1878. BOUCARD, ADOLPHE.—'Liste des Oiseaux recoltés au Guatemala en 1877.' Reprinted and separately paged from the Annales Soc. Lin. de Lyon, pp. 1–47.

Boucard was in Guatemala from June 1–30, 1877, visiting Escuintla, Antigua and Guatemala City. He devoted himself almost exclusively to collecting insects, but employed several native hunters, most of whom worked in Vera Paz. In all, 263 species of birds were brought back. It is difficult to conceive of a paper with less information. No precise localities are ever given, in the great majority of cases none whatever. The statements "rare," "common," "terres chaudes," etc., are largely hearsay for most of the species. No reference is made to the work or discoveries of any one else. Two new species are described: one a well-known Ant-wren, the other an abnormal Rivoli Hummingbird. Obvious and egregious errors occur, where the author gives field notes based on his own observations. Thus the only gull listed is *Larus occidentalis*, "very common" along the Pacific coast in June; but this is impossible

for a gull that has never been found in winter south of western Mexico. Solitary sandpipers are recorded in large flocks running rapidly along the edge of the sea! Most remarkable of all is a sight record of several pairs of *Ara militaris* nesting in holes in the cliffs of a wild ravine. It is largely for these and similar reasons that Salvin and Godman completely ignored this paper in the 'Biologia Centrali Americana,' though their disposal of the new species shows that they were familiar with it.

1879–1904. SALVIN, O., AND GODMAN, F. D.—'Biologia Centrali Americana.' Aves, 3 vols of text, 1 of plates, the introduction published last in 1904.

An invaluable reference work of an encyclopedic nature. It is almost inconceivable that it should ever become out of date. The authors were not interested in racial variation, but their critical notes are invaluable to those who are. As regards Guatemala birds the great field experience of Salvin makes the habit and distributional notes of the greatest value. In case after case the lapse of seventy years has added nothing to our essential knowledge of the bird. Salvin died in 1898, and the third volume was completed by Godman with the assistance of Sharpe and Ogilvie-Grant. All ideas of a supplement were abandoned, and the introduction was very brief and sketchy. The most unfortunate point is the absence of a gazetteer of localities. Salvin left no record of the whereabouts of many Indian hamlets, which had disappeared long before the great work was concluded.

1882. SALVIN, O.—'Cat. Strickland Coll.'

Incidentally lists all the Guatemala species forwarded by Constancia to Strickland.

1888–1898. SHARPE, R. B., *et al.*—'Catalogue of the Birds of the British Museum.' Vols. XI to XXVII.

Guatemala specimens in the British Museum listed throughout. In many cases the volumes of this work appeared prior to the part containing the same family in the 'Biologia,' so that many records were first published here.

1899. LANTZ, D. E.—'A list of the Birds Collected by Col. N. S. Goss in Mexico and Central America.' Trans. Kansas Acad. Sci., XVI, (1897–1898), pp. 218-224.

A mere check list giving the localities where specimens were collected, many of them either the Pacific or Atlantic lowlands of Guatemala. Lantz correctly locates Santo Tomas in Guatemala, and gives the Colonel's itinerary. There are numerous obvious errors of identification, such as *Antilophia galeata* and *Rhamphastos ariel*. Accordingly I have ignored all records in this paper referring to critical groups, our concept of which is radically different today from what it was forty years ago. Salvin and Godman were unacquainted with this paper, and Ridgway did not know of it until part 4 of the 'Birds of North and Middle America.'

1901–1919. RIDGWAY, R.—'Birds of North and Middle America.' Bull. 50, U. S. Nat. Mus., pts. 1–8.

The standard reference work for the systematic ornithology of Central American birds. From part 4 on, all recorded localities in Central America for every species are given. In the earlier parts, localities are given only for endemic forms with local ranges. In addition to previously recorded localities, others also appear, when based on specimens in the National Museum or the Biological Survey. This is thus far our only clue to the specimens collected by Nelson and Goldman in northwestern Guatemala. We do not yet know what species they collected in the families included in the first three parts, except that species new to Guatemala are recorded. In a few cases, other localities given by Ridgway are obviously based on old trade-skins acquired years ago. The majority of these are defective or erroneous. An outstanding example is a collection of hummingbirds from "Guatemala City," the great majority of the species not occurring there. Such localities are omitted in this work.

In one minor detail the distributional records are occasionally erroneous. Prior to 1860 precise localities were not regarded as necessary and were rarely given. The trade-skins reaching Europe, obtained by native collectors, were frequently assumed to come from Vera Paz, because at least 90 per cent did come from there. Salvin and Godman pointed out every error of this sort in the 'Biologia,' and gave the localities where the species actually occurred. In nearly all such cases, Ridgway gives BOTH THE RIGHT AND THE WRONG ONES. An example is *Icterus maculi-alatus*, originally assumed to come from Vera Paz. Salvin and Godman showed that it occurred rarely and locally on the eastern slope of the Pacific cordillera, a range amply confirmed by recent collecting. Ridgway includes Vera Paz in its range.

1907. DEARBORN, NED.—'Catalogue of a Collection of Birds from Guatemala.' Field Museum of Natural History, Pub. 125, Ornith. Series, I, No. 3, pp. 69–138.

Valuable report on a most successful four-months' expedition. Over 300 species were secured, and over 1000 specimens. Several novelties are described, and there are many new or interesting records of rare birds.

APPENDIX

Gazetteer of Guatemala Collecting Stations

The greatest difficulty has been encountered in locating many of the old names used by Salvin and his native collectors. A great deal of antiquarian research has been involved. Every one is in its correct faunal area, and all but one is located within a mile or two. As mentioned elsewhere, Salvin never lived to write up his travels, and Godman declared, in the final introductory volume of the 'Biologica,' that it was impossible to locate the stations after fifty or more years had elapsed. All workers in Latin America have had similar experience. Place-names are too often haciendas or coffee fincas, which disappear. Indian hamlets are notoriously fugacious, or if the community prospers and grows the native Indian name is replaced by a Spanish one. It took me two weeks to locate Choctum, one of the most famous of stations in Alta Vera Paz; but nearby hamlets, where only a few birds were collected, still appear on some modern maps. Sakluk in Peten has become La Libertad, and Cosamalguapa has gradually been transmogrified into Santa Lucia, though there are at least a dozen in other parts of the country. The railroad has made a great difference also. In Salvin's day the mule track from Guatemala City to Antigua and Escuintla had numerous places en route where travelers stopped, and where Salvin collected. Many of these have disappeared, and old books of travel were of the greatest service in unearthing them. All altitudes are approximate. Localities which do not appear on any modern map seen by the writer are marked with an asterisk. The number in parentheses is a position number on the locality map.

*Acapam (Salvin).—A lagoon about two leagues from the port of Champerico on the Pacific coast (No. 1).

Acatenango (Salvin and Godman).—An Indian village just above Calderas on the Volcan de Fuego in the Department of Chimaltenango and about twelve miles west of Dueñas.

*Aceytuno (Salvin and Godman).—Also Aceituno. A coffee plantation three miles northeast of Guatemala City (No. 2).

Achil (Salvin and Godman).—An Indian hamlet near Coban in Alta Vera Paz (No. 3).

*Agua Caliente (Salvin and Godman).—A hamlet near Chuacus on the road to Salamá in Baja Vera Paz (No. 4).

Aguna (Salvin and Godman, Fraser).—A hamlet in the Department of Escuintla on the road between Santa Lucia and Patulul (No. 5).

Alotenango (Salvin and Godman).—An Indian village in the Department of Sacatepequez above Dueñas. Constantly visited by Salvin and his native hunters (No. 6).

ALOTEPEQUE (1384 m.).—A small town close to the frontier of Honduras in the southern corner of the Department of Chiquimula. Visited by Godman.

AMATITLAN (3901 feet) (Goss).—A large town at the western end of the lake, and capital of the Department.

ANTIGUA (Alt. 5072 feet) (Salvin and Godman).—Don Vicente Constancia lived there and most of his birds came from there, many going to the Museum of the Sociedad Economica de Guatemala. "The old and first capital of Guatemala at the base of Volcan de Agua. Most of the forest has been cleared to admit planting of cane and coffee, but the slopes of Agua and the mountains to the north still have plenty of original forest, where conditions must be as they were when Pedro Alvarado marched here from Mexico and established the Capital. The sides of the Volcano Agua are planted with corn to an altitude of about 7000 feet, where the "rain forest" begins, a dense wall of tropical growth, with the usual vines to make climbing almost out of the picture. Three miles from this station is found Dueñas, where Salvin made his headquarters for three years. Several hours were spent about a small lake near San Antonio and not far from Dueñas, known as Lake Dueñas, also Lake San Antonio. This station is also known as Puebla Vieja to distinguish it from the present town of Antigua, established after the first capital was destroyed by the Volcan de Agua in the early history of Spanish rule." (Anthony, MS.)

ATITLAN (W. B. Richardson).—The general vicinity of Lake Atitlan and the volcano is probably meant (No. 7).

*BARRANCA DE LOS CHOCOYOS (Salvin and Godman).—A ravine in the mountains between Patzum and Godines (No. 8).

*BARRANCO HONDO (Alt. about 4000 feet) (Salvin and Godman).—A ravine on the slopes of the mountains near Alotenango (No. 9).

BARRILLOS (Alt. 5200 feet).—Some twenty-five miles east of San Mateo. "Forest largely alder and oak with brush-land near the town. Rain forests crowned the ridges and summits of the higher elevations." (Anthony, MS.)

*BARSINAS (Salvin and Godman).—Now Barcenas. A village about half-way between Santa Lucia in Sacatepequez and Villanueva.

*BOLAS (Salvin and Godman).—See Patio Bolas (No. 10).

*BUENAVENTURA (Salvin).—A village near Panajachel on Lake Atitlan. It has either disappeared or its name has been changed since Salvin's day.

CAHABON (Alt. 800 feet; 220 m.) (Salvin and Godman, Skinner, Champion).—A small village on the river of the same name in Alta Vera Paz about forty miles northeast of Coban.

CALDERAS (Alt. 7300 feet) (Salvin and Godman, Skinner).—An Indian hamlet on the Volcan de Fuego.

CALEL (Nelson and Goldman).—A village in the Altos of Quetzaltenango, in the northern angle of the Department, on the road from Quetzaltenango to Huehuetenango (No. 11).

CANTOÖLOC (also Candoloc) (Salvin and Godman).—An Indian hamlet in the lowlands of Alta Vera Paz northwest of Cubilguitz (No. 12).

CAPETILLO (Alt. 1250 m.; Boucard) (1394 m., Sapper) Costa Grande district, Pacific slope.—A hacienda visited by Boucard (1877) at the base of volcanoes Agua and Fuego (No. 13).

CARRANZA (Salvin and Godman).—A village on the Pacific slope only a few miles from the sea, just above the mouth of the Rio Nahualate, in the Department of Suchitepequez.

CARRIZAL (Salvin and Godman) (1361 m.).—A small village about ten miles due north of Guatemala City.

*CERRO DE PARAMOS (Alt. at least 6000 feet) (Salvin and Godman).—Local name given to a ridge above Dueñas.

CERRO DE ZUNIL (Salvin and Godman, Champion).—General name given the mountains in the vicinity of the Volcan Zunil, southwest of Quetzaltenango.

CHAMÁ (Alt. 1200 feet).—A coffee finca thirty miles northwest of Coban, on the Rio Negro, here called the Rio Chixoy (No. 14). "The coffee plantation furnished most of the ground required for collecting, the shade growth being rubber and cacao with a sprinkling of the native forest." (Anthony, MS.)

CHAMPERICO (Salvin).—A port on the Pacific coast.

CHANQUEJELVE (Alt. 5000 feet).—A ranch on the north side of the Chuchumetan Mountains about fifty miles north of Huehuetenango (No. 15). "Oak, pine and alder forest with many old corn-fields grown to weeds." (Anthony, MS.).

CHIACAMAN (Alt. 4000 feet; 1370 to 1440 m.) (Salvin).—A hamlet in the Sierra de Chiantla (in Salvin's day), now called Sierra Cuchumetan in El Quiché. It is on the Rio Negro, east of Uspantan. Formerly in the Department of Totonicapam, in 1893 in Huehuetenango (No. 16).

*CHIAPAM (Salvin and Godman).—A lagoon half a mile from Champerico on the shores of the Pacific (No. 17).

CHICHICASTENANGO (Alt. 6500).—Also on some maps as Santo Tomas. In the District of El Quiché, about fifteen miles south of the city of that name (No. 18). "Most of the land near the town was planted to corn, but on the hills to the west the forest still furnished cover for plenty of bird-life." (Anthony, MS.)

CHILASCO (Alt. 6000 feet; 1800 m.) (Salvin and Godman, Delattre, R. Owen).—An Indian hamlet in the mountains of Santa Cruz, nearly due east of Salamá and northeast of San Geronimo (No. 19).

CHIMALAPA (210 to 240 m.) (Salvin).—A town in the Motagua Valley, about ten miles west of Zacapa.

CHIMALTENANGO (Alt. 5650 feet; about 1900 m.) (Salvin and Godman, Dearborn).—A large town in the department of the same name, northwest of Antigua.

CHIMOXAN (Alt. 1500 feet).—A few miles north of Chipoc (No. 20). "Forest typical of the coast tropics." (Anthony, MS.)

*CHIMUY (200 m.) (Sarg).—An Indian ruin near Chialal in the lowlands of eastern Alta Vera Paz, where a few tropical rain forest birds were collected by Sarg (No. 21).

CHIPOC (Alt. 1250 feet; 620 m.).—In Alta Vera Paz a few miles north of Finca Sepacuite (No. 22). "Mostly brush-land with some forest along the river a mile below." (Anthony, MS.)

CHIQUIMULA (Alt. 1244 feet; 379 m.) (Museum of the Sociedad Economica de Guatemala).—A large town east of Guatemala City in a valley draining into that of the Rio Motagua, due south of Zacapa, and capital of the Department of Chiquimula.

*CHIRIQUYU (Salvin and Godman).—An Indian hamlet near Coban, in Alta Vera Paz, not found on modern maps.

CHISEC (190 m.) (Salvin and Godman).—An Indian village in the lowlands of northern Alta Vera Paz on the north slope of the Sierra de Chamá, about twenty-five miles north of Coban.

*CHOCTUM (Alt. about 1200 feet) (Salvin and Godman).—An Indian hamlet in the interior of Alta Vera Paz, northwest of Coban between Cubilquitz and Yaxcamnal. One of the great collecting stations in the tropical rain forest (No. 23).

CHOL (1500 m.) (Salvin and Godman).—A village in Baja Vera Paz in the high ridge of mountains between Rabinal and the Motagua Valley, and about fifteen miles southwest of Salamá (No. 24).

CHUACUS (800 m.) (Salvin and Godman, R. Owen).—A small village in Baja Vera Paz near the great valley of the Rio Motagua on the road from Guatemala City to Coban, and a few miles south of Salamá.

CHUIPACHÉ (Richardson).—A village in the Altos of Quetzaltenango.

CUIDAD VIEJA (Alt. 5151 feet; 1080m.) (Salvin and Godman).—On the Rio Guacalate about a mile south of Guatemala City.

COBAN (Alt. variously given from 3800 to 4356 feet; 1320 m.) (Salvin and Godman, Delattre, Skinner).—The capital of Alta Vera Paz.

*COSAMALGUAPA (Salvin and Godman).—Also Santa Lucia Cosamalguapa, now Santa Lucia. A village on the Pacific slope, just west of Pantaleon and twelve miles west of Escuintla.

COSTA GRANDE (Salvin and Godman).—The general name in Guatemala for the Pacific coastal plain.

CUBILGUITZ (Alt. 1050 feet; about 290 m.) (Salvin and Godman).—An Indian hamlet in Alta Vera Paz, about fifteen miles north and a little west of Coban.

CUNEN (Alt. 5942 feet; 1790 m.) (Sarg).—A village formerly in the Department of Huehuetenango, now in El Quiché, about ten miles west of Uspantan.

CUYOTENANGO (Alt. 1500 feet; 310 m.) (Salvin and Godman).—A town in the Pacific coast region between Retalhuleu and Mazatenango.

DOLORES (Alt. less than 1500 feet) (Salvin and Godman).—A pine ridge in Peten. The village is due north of Poctum, and nearly fifty miles southeast of Flores on Lake Peten.

DUEÑAS (Alt. 4500 feet) (Salvin and Godman).—A town in Sacatepequez at the base of the Volcan de Agua. Chiefly coffee plantations according to Anthony.

*EL BAOUL (also spelled El Baul) (Salvin).—A ranch on the Pacific slope near Escuintla (No. 25).

EL PARAISO (Salvin and Godman).—A village in the Pacific coastal plain of Retalhuleu about ten miles north of Champerico (No. 26).

EL RANCHO (Dearborn).—A village on the railroad near the upper end of the arid portion of the Rio Motagua Valley.

EL RINCON (Richardson).—A district in the Altos in the Department of Huehuetenango near the Rio Rincon which flows into Chiapas.

ESCUINTLA (Alt. 1450 feet; 400 m.) (Salvin and Godman, Fraser).—A large city in the lowlands bordering the Pacific, capital of the Department of the same name.

ESTANSUELAS (Salvin).—A village in the arid plains of Zacapa on the railroad, just north of Zacapa (No. 27).

FINCA CAROLINA (Alt. 3500 feet).—A coffee plantation in San Marcos ten miles south of Tumbador (No. 28). "On this plantation and for many miles in every direction the original forest growth has been cut to make room for coffee, the

shade, so necessary for the growth of the coffee, being furnished by bananas planted between the coffee trees. This condition has made the avifauna very restricted and collecting poor." (Anthony, MS.)

FINCA CIPRES (Alt. 2000 feet).—A coffee plantation some nine miles from Mazatenango, on the Pacific slope, at the base of the Volcan Zunil (No. 29). "The original forest had been cleared only enough to permit the planting of coffee, leaving, as is often done, half or more of the native trees for shade." (Anthony, MS.)

FINCA CONCEPCION (Alt. 3750 feet).—A coffee plantation thirty-five miles east of Coban (No. 30). "The native growth being cleared and coffee the chief remaining tree, there was but little to note." (Anthony, MS.)

FINCA EL ESPINO (Alt. 150 feet).—A ranch fifteen miles south of Mazatenango (No. 31). "Mostly virgin forest of the Pacific coast." (Anthony, MS.)

FINCA EL SOCHE (Alt. 3400 feet).—A coffee plantation twenty miles northeast of Uspantan in a deep basin on the west side of the Rio Negro (No. 32). "The forest here was typical of the rain belt, well tangled with vines and creepers." (Anthony, MS.).

FINCA LA MONTAÑITA (Alt. 3000 feet).—Located on the slopes of the Sierra de las Minas, fifteen miles north of El Rancho, a station on the railroad between Guatemala City and Puerto Barrios (No. 33). "Open forest of pines and oak, draped with long streamers of gray moss, which is chiefly found in forests of this nature only when shrouded by more or less constant fog. Most of the collecting was done well above the 3000 feet contour line, up to 4500 feet." (Anthony, MS.)

FINCA LA PERLA (Alt. 4400 feet).—A coffee plantation in the District of El Quiché about forty miles northeast of Barrillos (No. 34). "Strictly rain forest, on slopes so steep that collecting was almost impossible." (Anthony, MS.)

FINCA SEPACUITE (Alt. 3200 feet).—Forty miles east of Coban in Alta Vera Paz (No. 35). "An important station, as it was situated on the divide between the Rio de la Pasion, flowing northwest to the Gulf of Mexico and the waters of the Rio Polochic that flow to the Caribbean on the east. Much of the collecting was done along an old abandoned coffee plantation, but virgin forest was within easy distance and often visited." (Anthony, MS.)

GODINES (Alt. 6900 feet; 2090 m.) (Salvin and Godman).—A small village situated in the mountains at the eastern end of the upland lake of Atitlan.

*GORGE OF LA CAMPAÑA (Salvin and Godman).—Somewhere on the Rio Chixoy, in the Department of El Quiché.

GUALAN (120 m.) (Salvin and Godman, Dearborn).—A town in the Motagua Valley on the boundary line between the Caribbean rain forest and the arid country to the west.

GUASTATOYA (490 m.) (Salvin and Godman).—A village in the Motagua Valley, about five miles from El Rancho on the railroad (No. 36).

GUATEMALA CITY (Alt. 4997 to 5013 feet) (Salvin and Godman).—The capital city of the country.

HACIENDA CALIFORNIA.—A cattle ranch on the Pacific coast, six miles from Ocos and about the same distance from the Chiapas border (No. 37). "Enough of the native forest still stands to furnish homes for a rich avifauna, while the marsh, bordering the Ocosita River abounds in species favoring such location." (Anthony, MS.)

*Hacienda Chancol (Nelson and Goldman).—"Located at nearly 11,000 feet, near the crest of a high range of mountains, about twenty-five miles northeast of Huehuetenango." (Goldman.)

Hacienda de la Concepcion (Salvin).—Five miles northwest of Escuintla (No. 38).

Huamuchal (Salvin and Godman).—A fishing station near the Mexican border and the port of Ocos (No. 39).

Huehuetenango (Alt. 6800 feet; about 1890 m.).—"Capital of the District of the same name, located at the base of the Cuchumetan Mountains, the highestd and most extensive range in the Republic, the mean elevation being about 10,000 feet, with many peaks extending much higher. The open pine and oak forests were not up to expectations." (Anthony, MS.)

Iguana (170 m.) (Salvin and Godman).—A village in the arid section of the Rio Motagua Valley, near the upper end of this zone.

Istan (Salvin).—A hamlet on the Pacific, about five miles south of Champerico (No. 40).

Joyabaj (Alt. 4300 feet) (Heyde, in U. S. National Museum).—A village in the southeastern corner of El Quiché. Misspelled Toyabaz in Ridgway.

Juntecholol (Salvin).—An Indian hamlet in Peten, twenty miles south of Flores on Lake Peten.

Jutiapa (Salvin and Godman).—The capital of the Department of Jutiapa in southwestern Guatemala.

*Kampamak (Salvin and Godman).—An Indian hamlet near Yaxcamnal in Alta Vera Paz (No. 41).

*Khamkal (Salvin and Godman).—An Indian hamlet a little below Coban in Alta Vera Paz (No. 42).

*Kokak (Salvin).—An Indian hamlet near Lanquin in Alta Vera Paz.

La Concepcion (Salvin and Godman).—See Hacienda La Concepcion.

La Grande (Salvin and Godman).—A town on the Rio Nahualate, about ten miles above its mouth in Suchitepequez.

La Magdalena (Salvin and Godman).—A village in the Motagua Valley, now called Santa Magdalena (No. 43).

La Perla (Alt. 4400 ft.).—"A coffee finca some miles east of Barrillos. Typical tropical forest, so thick that collecting was very difficult." (Anthony, MS.)

La Primavera (Alt. 3200 feet).—A sugar finca some fifteen miles east of Finca El Soche and the same distance south of Coban, in Alta Vera Paz (No. 44). "Forests pine, oak and alder, with 'rain forest' along the ridges, where the heavier rains fell." (Anthony, MS.)

La Trinidad (Salvin).—A village in the northeastern corner of Escuintla.

Laguna (660 m.) (Salvin and Godman).—A village in the Motagua Valley, almost due northeast of Guatemala City.

Lake of Amatitlan (Alt. 3895 feet; 1189 m.) (Wyke, Dearborn).—A large lake in the Altos south of Guatemala City.

Lake Atitlan (Alt. 5112 feet; 1510 to 1558 m.) (Dearborn).—A large crater lake in the mountains of Sololá.

Lake of Dueñas (Salvin, Constancia, Fraser).—A small lake near Dueñas (No. 45).

Lake of Peten (Leyland).—A large lake in the center of the northern Department of Peten.

Lake of Yzabal (Salvin).—A large lake in the eastern lowlands.

LANQUIN (Salvin and Godman) (about 380 m.).—Also San Agustin Lanquin; on road between Coban and Cahabon, about twenty miles northeast of Coban (No. 46). Spelled Langin on modern maps.

LAS NUBES (Salvin and Godman).—A village in the Department of Guatemala, about ten miles southeast of Guatemala City (No. 47).

LAS SALINAS (130 m.) (Salvin and Godman).—A hamlet in extreme northwestern Alta Vera Paz near the Chixoy River, twice as far from Coban as Choctum (No. 48).

LIVINGSTON (Salvin and Godman).—Seaport on the east coast at the mouth of the Rio Dulce.

LOS AMATES (Dearborn).—A town on the railroad in the lowlands of eastern Guatemala.

LOS ENCUENTROS (Alt. 8400 feet) (Salvin).—A village in the Altos in the northern part of Sololá on the direct road between Tecpam and Totonicapam (No. 49).

MASAGUA (Salvin and Godman).—A town in the Costa Grande on the railroad between San José and Escuintla.

MAZATENANGO (380 m.) (Dr. Bernoulli, Salvin, Dearborn).—A city in the Costa Grande, the capital of the Department of Suchitepequez.

*MEDIO MONTE (Salvin and Godman).—A locality somewhere on the Pacific slope, on the old road between Antigua and Escuintla. The very few birds collected here (nine species) are all characteristic of the rain forest of the upper Tropical Zone.

*MIRANDILLA (Alt. 1700 feet) (Salvin and Godman).—A village in the Costa Grande about fifteen miles northwest of Escuintla (No. 50).

MIXCO (1707 m.) (Salvin and Godman).—A village a few miles due west of Guatemala City.

MOMOSTENANGO (Alt. about 6500 feet).—About fifty miles west of Chichicastenango and in the district of Totonicapan, twenty miles north of that city. "Forest, open pines and oaks with very little undergrowth." (Anthony, MS.)

NAGUALATE (Salvin).—A river in the Pacific lowlands in Suchitepequez. Salvin's birds were collected near La Grande. Now spelled Nahualate.

NARANJO (96 m.) (Salvin and Godman, Goss).—A town on the railroad in the Pacific lowlands just north of San José.

NEBAJ (Alt. 6700 feet; 1920 m.).—About fifty miles northwest of Quiché. "The more or less level land near the town was chiefly planted to corn with many of the lower slopes cleared and pastured. The upper levels, however, were timbered, the ridges being rain forest with its usual fauna." (Anthony, MS.)

NENTON (800 m.) (Nelson and Goldman).—A town near the Chiapas border in the northwest corner of Huehuetenango.

OCOS.—"Formerly a busy port on the Pacific side, three miles from the Mexican border, now abandoned by all but a handful of natives. Bordering the coastline is a series of tide lagoons with a growth of mangroves with few if any equals on the coast of Central America. Bird-life was abundant but it was impossible to collect without a cayuca, and as the natives refused to rent me the boats, very little could be done with these rich fields." (Anthony, MS.)

PACICIA (2090 m.) (Salvin and Godman).—Now Patzizia. A town in the center of Chimaltenango.

*Pajal Grande (Alt. about 5000 feet) (Salvin and Godman).—An open space in the forest on the slopes of the Volcan de Fuego.

Palin (Alt. 3753 feet; 1130 m.) (Salvin and Godman, Goss).—A town on the railroad southwest of Amatitlan.

Panajachel (Alt. 4900 feet) (Salvin and Godman, Richardson).—A town on the north shore of the Lake Atitlan. "The growth that is still to be found near the town is of pine, oak and alder, with a sprinkling of species from the rain belt of the lower sections." (Anthony, MS.)

Panzos (About 50 m.).—A town on the Rio Polochic, west of Lake Yzabal.

Paraiso (Richardson).—A town in Quetzaltenango about twenty miles south of the city of San Marcos.

Paramos (Altitude, 6,000 feet; 1740 m.) (Salvin and Godman).—A village on the hills above Dueñas.

*Patio (Salvin and Godman).—See next locality.

*Patio Bolas (Alt. about 4000 feet) (Salvin and Godman).—A few huts on the road between Retalhuleu and Quetzaltenango, at the base of the Volcan de Santa Maria.

Patulul (Dearborn).—A large town in the Costa Grande in the Department of Sololá.

Patzum (2170 m.) (Salvin and Godman).—A large town in the Altos of Chimaltenango.

Peten (Salvin and Godman, Leyland, Sarg).—The northern third of Guatemala, practically unexplored ornithologically.

*Pié de la Cuesta (Richardson).—A hamlet on the road from San Lucas on Lake Atitlan to San Agustin in the Costa Grande (No. 51).

Poctun (Salvin and Godman).—A village on a pine ridge in the Department of Peten near the British Honduras border and at least fifty miles southeast of Flores. These hills continue northeast into British Honduras as the Coxcomb Mountains.

Progreso (Alt. 2000 feet).—A station on the railroad between the capital and Puerto Barrios in the upper end of the Rio Motagua Valley. "This station is at the western end of the dry belt. A landscape more typical of Arizona than Central America, but rich in species not found in the wet sections. Along the small streams were found a few trees and vines of the tropics, but for the most part the growth was of the leguminous type, similar to the mesquite, with several species of cactus." (Anthony, MS.)

Puerto Barrios (Dearborn).—The port of the United Fruit Company in the Caribbean lowlands.

Quetzaltenango (Alt. 7697 feet; 2470 m.) (Salvin and Godman, Richardson).—Capital of the Department of the same name in the Altos of northwestern Guatemala.

Quinche (Salvin and Godman).—Erroneous spelling for Santa Cruz Quiché, capital of El Quiché.

Quiriguá (Alt. 150 feet; 80 m.) (Salvin and Godman).—A village in the eastern end of the Rio Motagua Valley near Los Amates, famous for its Maya ruins. It is a station on the railroad about sixty miles from the harbor of Puerto Barrios (No. 52). "The collecting was done on one of the farms of the United Fruit Company about six miles from Quiriguá in the banana plantation. Nearly all the section was planted to this fruit, leaving only a little forest available along the edges of

the valley. The station was chiefly remarkable for what it did not produce." (Anthony, MS.)

RABINAL (Alt. 2850 feet; 940 m.) (Salvin and Godman).—A town in Baja Vera Paz about twelve miles west of Salamá. The birds were collected in the mountains between Rabinal and El Chol.

*RANCHO TUILHA (310 m.) (Salvin and Godman).—A locality on the Cahabon-Peten road just across the Alta Vera Paz border in Peten (No. 53).

*RASCHE (Salvin and Godman).—Same as Raxché. A local name given to a mountain range back of Lanquin.

RETALHULEU (Alt. 900 feet; 250 m.) (Salvin and Godman, Richardson).—The capital of the Department of the same name in the Pacific lowlands.

*RIO CHIGUATI (Salvin and Godman).—A small affluent of one of the rivers of the Pacific coast, which I cannot locate exactly. Only one bird, a *Xanthoura*, was collected here.

RIO CHIXOY (Salvin).—A large river forming the boundary between El Quiché and Alta Vera Paz. The birds were collected near Santa Ana, northwest of Salamá.

RIO CHOCAN (Goss).—Proper spelling is Caocon. A small river in the Caribbean lowlands, rising in the Sierra de Santa Cruz, north of Lake Yzabal, and flowing into the Golfete Dulce.

RIO DE LA PASION (Salvin and Godman).—A large river in southern Peten which flows north and then west into the Rio Usumacinta. It is crossed by the track from Coban to Lake Peten.

RIO DULCE (Salvin and Godman).—The outlet of Lake Yzabal.

*RIO GUACALATE (Salvin and Godman).—A river running into the Pacific, the sources of which rise in the cordillera near Dueñas. It is here that the birds labeled "Rio Guacalate" were collected.

RIO MICHATOYA (Salvin and Godman).—A river flowing into the Pacific a few miles east of San José.

RIO NAGUALATE (Salvin).—A river flowing into the Pacific in the Department of Suchitepequez.

RIO POLOCHIC (Salvin and Godman, Owen).—A large river in Alta Vera Paz running east into Lake Yzabal.

RIO SAMALÁ (Salvin and Godman).—A river that flows into the Pacific a few miles above the port of Champerico.

RIO SARSTOON (Salvin and Godman).—The boundary between British Honduras and Guatemala. The birds were collected at an Indian hamlet, Chimuchuch, which I cannot locate.

SACAHAJÁ (1320 m.) (Nelson and Goldman).—A hamlet in the Department of Quiché about twenty miles northeast of Santa Cruz and fifteen miles southeast of Sacapulas (No. 54).

SACAPULAS (Alt. 4500 feet; 1200 m.).—Twenty-five miles north of Quiché. "This station presents an interesting contrast to most of the surrounding fields. Located in the valley of the Rio Negro, here a dry, sandy wash, but surrounded by mountains that receive many times the rainfall. The flora is that of the dry sections of the Rio Motagua, with its fauna differing in similar manner." (Anthony, MS.)

*SAKLUK (440 m.) (Salvin).—A village situated in open savannas southwest of Lake Peten. Now called La Libertad.

SALACHE (Alt. about 1000 feet) (Anthony).—Six miles south of Finca Cipres. A few trips were made here, while staying at Cipres (No. 55).

SALAMÁ (920 m.) (Salvin and Godman, Skinner).—The capital of Baja Vera Paz.

SAN AGUSTIN (Alt. 2250 feet; 610 m.) (Salvin and Godman).—A hacienda near the eastern boundary of Sololá, between Patulul and Lake Atitlan, at the base of the volcano.

SAN ANTONIO (Anthony).—Three miles east of Antigua near Lake Dueñas (No. 56).

SAN ANTONIO NACOIL (Salvin and Godman).—An Indian hamlet on the northeast corner of Lake Atitlan (No. 57).

SAN BERNARDO (Alt. 2000 feet; 650 m.) (Salvin and Godman).—A hacienda in the valley of the Rio Motagua on the road from the city of Guatemala to Vera Paz (No. 58).

SAN DIEGO (Salvin and Godman).—A village near the northern boundary of the Department of Escuintla, ten miles northeast of Escuintla. It is at the base of the Volcan de Agua.

SAN GERONIMO (Alt. 2950 feet; 990 m.) (Salvin and Godman, R. Owen, Gurney, H. Hague).—A small town in Baja Vera Paz, a few miles east of Salamá. Near here was a large hacienda, the owner of which was a friend of Salvin, who became interested in his work. Salvin often stayed here, and his collectors were sure of hospitality and assistance. Robert Owen, Gurney and Champion all stayed here. Carter was the first manager and later H. Hague, who sent a few birds to the U. S. National Museum (No. 59).

SAN JOSÉ DE GUATEMALA (Salvin and Godman, Dearborn, Goss).—The main port of the Pacific coast.

SAN JOSÉ SACATEPEQUES (Salvin and Godman).—A village in Sacatepeques just south of Antigua across a range of hills.

SAN LUCAS (Alt. 4900 feet) (Salvin and Godman).—A village on the south side of Lake Atitlan. According to some authorities another name for Toliman. Some maps show two places close together (No. 60). "This station, located at the base of the Volcan Toliman or San Lucas, presents a somewhat different fauna from Panajachel, though the surrounding forest is the same. The slopes of the volcano are well broken by blocks or basalt thrown from the crater, offering cover for such species as *Salpinctes* and *Aimophila*, more common here than at any other station." (Anthony, MS.)

*SAN LUIS (440 m.) (Salvin and Godman).—A village in Peten about ten miles south of Poctun.

SAN MARCOS (2480 m.) (Richardson).—The capital of the department of the same name.

SAN MARTIN DE QUETZALTENANGO (W. B. Richardson).—A hamlet in the Altos, ten miles southwest of Quetzaltenango (No. 61).

SAN MATEO (Alt. 9000 feet).—Twenty-five miles northeast of Chanquejelve. "The forest above the town was chiefly pine with some oak and alder." (Anthony, MS.)

SAN PEDRO CARCHA (1780 m.) (Salvin and Godman).—Called Carcha on modern maps. A hamlet about five miles east of Coban in Alta Vera Paz (No. 62).

*SAN PEDRO MARTYR (Salvin and Godman).—A village in the Pacific lowlands on the Rio Michatoya.

SAN RAYMUNDO (Salvin and Godman).—A small town northwest of Guatemala City.

SANTA ANA (Salvin).—A hamlet in Peten about ten miles south of Flores.

SANTANA MIXTAN (Salvin).—A village in the Pacific lowlands of Escuintla, less than ten miles from the ocean (No. 63).

SANTA BARBARA (Alt. 4450 feet; 1500 m.) (Salvin and Godman, Owen).—A hamlet in the mountains east of San Geronimo in Baja Vera Paz (No. 64).

SANTA CRUZ MOUNTAINS (Alt. 6000 feet) (Salvin and Godman).—East of San Geronimo in Baja Vera Paz.

*SANTA ISABEL (Salvin and Godman).—A hamlet near the port of San José (No. 65).

SANTA LUCIA (Salvin and Godman).—Formerly called Cosamalguapa. A large town in the Costa Grande, fifteen miles west of Escuintla.

SANTA MARIA (below Quetzaltenango; 1670 m.) (Salvin and Godman, Nelson and Goldman, Richardson).—A village on the Pacific slope of Quetzaltenango at the base of the volcano.

SANTA ROSA (above Salamá; 1530 m.) (Salvin and Godman).—A hamlet in Baja Vera Paz north of Salamá on the road to Coban (No. 66).

SANTO TOMAS (Goss).—A hamlet on the east coast ten miles southeast of Livingston and due south of Puerto Barrios. Formerly in Honduras. Lantz is the only recent writer who locates it correctly in Guatemala (No. 67).

SANTO TORIBIO (Salvin).—A hamlet on the road from Cahabon to Peten in Alta Vera Paz.

SAONCHIL (Salvin and Godman).—Misprint for Sayuchil.

SAVANA GRANDE (Alt. 1150 feet) (Salvin and Godman).—A hamlet in the Costa Grande five miles northwest of Escuintla (No. 68).

*SAYUCHIL (Salvin).—An Indian hamlet near Cubilguitz.

SECANQUIM (Alt. 1600 feet).—Ten miles north of Finca Sepacuite. "Pine and oak forest and considerable brush land on abandoned fields." (Anthony, MS.)

SEPUR (Alt. 3000 feet).—"A coffee plantation on Finca Sepacuite, some ten miles east of the main station. Forest typical of the rain belt." (Anthony, MS.)

SIERRA DE LAS MINAS (W. B. Richardson).—A range running east through Baja Vera Paz and Zacapa, an offshoot of the main cordillera in Totonicapam, where Richardson's birds came from.

*SIERRA DE LAS NUBES (Alt. 4050 feet) (Salvin and Godman).—A finca on the slopes of the Volcan Zunil. Salvin named the mountain after the finca!

*SIERRA SANTA ELENA (Dearborn).—Local name for the mountains above Tecpam. Also called "Santa Ilania," in error.

SOLOLÁ (Alt. 7041 feet; 2146 m.) (Salvin and Godman).—A large town in the Altos of the Department of Sololá, just north of Lake Atitlan.

SUMPANGO (Salvin and Godman).—A village in the Altos of Sacatepeques, on the road between Chimaltenango and Guatemala (No. 69).

TACTIC (Alt. 4650 feet; 1450 m.) (Salvin and Godman, Owen).—A village in the hilly country of Alta Vera Paz about ten miles south of Coban (No. 70).

TAMAHÚ (Alt. 2250 feet; 1020 m.) (Sarg).—In the valley of the Polochic, fifteen miles from Coban and just west of Tucurú (No. 71).

TECPAM (2200 m.) (Dearborn).—A large town in the Altos of Chimaltenango. "Also spelled Tecpan and Texpan. The work was all done from a ranch house about three miles north of the town, which is located some sixty miles north of the city of Guatemala. The ranch is the same used as headquarters by Heller and Barber

some twenty years before and is situated in a beautiful forest of oaks, pine and alder at an altitude of 8650 feet. Several trips were made to a heavy forest of cypress, two leagues from the house at an altitude of about 10,000 feet, where several species not met with elsewhere were found." (Anthony, MS.)

TELEMAN (80 m.) (Salvin and Godman).—A town in the valley of the Rio Polochic in eastern Alta Vera Paz.

TODOS SANTOS (2470 m.) (Nelson and Goldman).—A town in the center of the Department of Huehuetenango on the main road from Chiapas to Huehuetenango.

TOLIMAN (Alt. 4900 feet) (Richardson).—See San Lucas. A village near the southeast corner of Lake Atitlan.

TOTONICAPAM (Alt. 7900 to 8150 feet) (Salvin).—The capital of the department of the same name.

TOYABAJ.—Misspelling in Ridgway for Joyabaj.

TRAPICHE GRANDE (870 m.) (Salvin and Godman).—In the Motagua Valley, about five miles before the road from Guatemala City to Coban crosses the river (No. 72).

TUCURÚ (Alt. 2000 feet; 480 m.) (Sarg).—A hamlet in the valley of the Rio Polochic, twenty miles west of Teleman (No. 73).

USPANTAN (Alt. 6000 feet; 1840 m.) (U. S. National Museum).—On the Rio Negro in the Department of El Quiché. The Rio Negro in this region flows east and is better known as the Rio Chixoy, the name invariably applied to it throughout most of its course. "Forest open pine and oak." (Anthony, MS.)

VERA PAZ (Salvin and Godman, Skinner, Owen, Sarg, Meany, Leyland).—The general region around Coban, now the Departments of Alta and Baja Vera Paz. The source of 90 per cent of Guatemala trade-skins.

VILLA LOBOS (Salvin and Godman).—Now Villabos. A village on the road from Guatemala City to Lake Amatitlan.

VILLA MARIA (Heyde, in U. S. National Museum).—Lapse for Villanueva.

VILLANEUVA (1350 m.).—A village on the road from Guatemala City to Lake Amatitlan, just beyond Villabos.

VOLCAN DE AGUA (Salvin and Godman).—A famous volcano, west of Lake Amatitlan. Birds so labeled were collected from 6000 feet to the summit (No. 74).

VOLCAN DE ATITLAN (Salvin and Godman).—On the south side of Lake Atitlan.

VOLCAN DE FUEGO (Salvin and Godman).—A famous volcano west of the Volcan de Agua. The birds so labelled were collected at various altitudes above 6000 feet.

VOLCAN DE SANTA MARIA (Alt. over 12,000 feet) (Nelson and Goldman).—A high volcano south of the capital city of Quetzaltenango (No. 75).

VOLCAN DE TACANÁ (W. B. Richardson).—On the frontier of the Mexican State of Chiapas, the second highest mountain in Central America (No. 76).

VUELTA GRANDE.—A hamlet in the upper end of the Rio Motagua Valley, due north of San Raymundo.

YAXCAMNAL (250 m.) (Salvin and Godman).—Also spelled Yaxcabnal. An Indian hamlet in northwestern Alta Vera Paz, between Cantoöloc and Cubilguitz (No. 77).

YAXHÁ (270 m.) (Salvin and Godman, Goss).—A lake in Peten, east of Lake Peten, and more than half-way to the border of British Honduras.

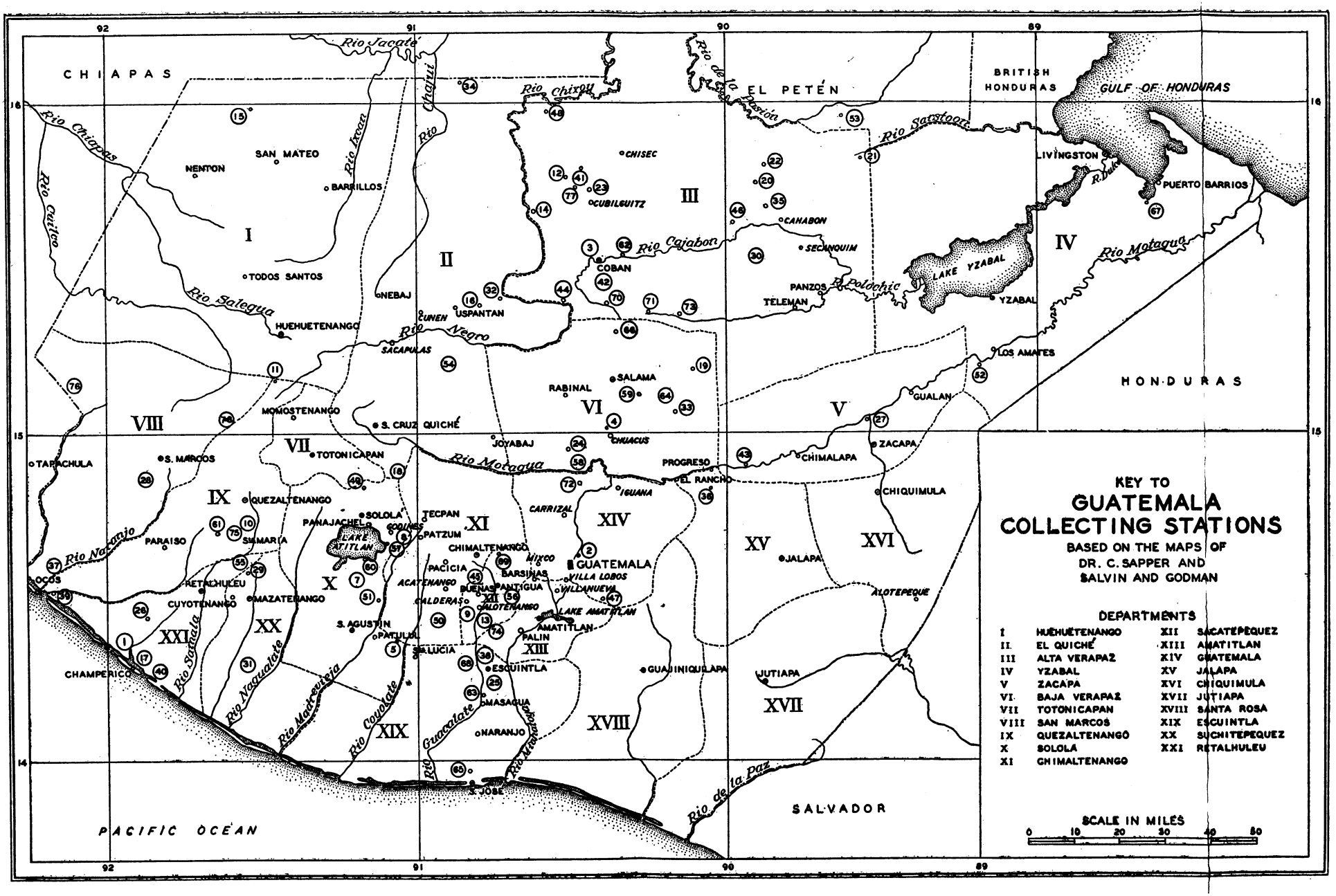
YZABAL (Salvin and Godman).—In the Caribbean lowlands on the south side of the great lake of the same name at nearly sea-level.

YZAMAL (Salvin).—Misprint for Yzabal.

ZACAPA (Alt. 449 feet; 220 m.) (Salvin and Godman).—A large town in the plain of the Rio Motagua Valley above Gualan, capital of the department of the same name, situated in arid plains.

ZANJON (Alt. 9500 feet).—An Indian camp about fifteen miles west of Momostenango (No. 78). "Pine forest and open grass land." (Anthony, MS.)

ZAPOTE (Alt. 2000 feet) (Salvin and Godman).—On the Pacific slope of the Volcan de Fuego in the Department of Escuintla.


KEY TO
GUATEMALA
COLLECTING STATIONS
BASED ON THE MAPS OF
DR. C. SAPPER AND
SALVIN AND GODMAN
DEPARTMENTS
I HUEHUETENANGO
II EL QUICHÉ
III ALTA VERAPAZ
IV YZABAL
V ZACAPA
VI BAJA VERAPAZ
VII TOTONICAPAN
VIII SAN MARCOS
IX QUEZALTENANGO
X SOLOLÁ
XI CHIMALTENANGO
XII SACATEPEQUEZ
XIII AMATITLAN
XIV GUATEMALA
XV JALAPA
XVI CHIQUIMULA
XVII JUTIAPA
XVIII SANTA ROSA
XIX ESCUINTLA
XX SUCHITEPEQUEZ
XXI RETALHULEU
SCALE IN MILES
0 10 20 30 40 50
CHIAPAS
EL PETÉN
BRITISH HONDURAS
GULF OF HONDURAS
HONDURAS
SALVADOR
PACIFIC OCEAN
Rio Jacate
Rio Chixoy
Rio de la Pasion
Rio Chiapas
Rio Chixoy
Rio Ixcan
Rio Chajul
Rio Cuilco
Rio Salegua
Rio Negro
Rio Cahabon
Rio Polochic
Rio Motagua
Rio Naranjo
Rio Sumalia
Rio Nagualate
Rio Madreselva
Rio Coyolate
Rio Guacalate
Rio Motagualapa
Rio de la Paz
NENTON
SAN MATEO
BARRILLOS
TODOS SANTOS
NEBAJ
HUEHUETENANGO
CHISEC
CUBILGUITZ
COBAN
CAHABON
SECHINQUIM
PANZOS
TELEMAN
LAKE YZABAL
YZABAL
LIVINGSTON
PUERTO BARRIOS
LOS AMATES
GUALAN
ZACAPA
CHIMALAPA
CHIQUIMULA
JALAPA
JUTIAPA
ALOTEPEQUE
EL RANCHO
PROGRESO
IGUANA
CHUACUS
SALAMA
RABINAL
CARRIZAL
JOYABAJ
S. CRUZ QUICHÉ
MOMOSTENANGO
TOTONICAPAN
TECPAN
PATZUM
CHIMALTENANGO
GUATEMALA
VILLA LOBOS
VILLANUEVA
AMATITLAN
LAKE AMATITLAN
PALIN
ESCUINTLA
GUAZINIQUILAPA
MASAGUA
NARANJO
S. JOSE
SAN MARCOS
TAPACHULA
QUEZALTENANGO
SOLOLA
PANAJACHEL
SAMARIA
PARAISO
RETALHULEU
CUYOTENANGO
MAZATENANGO
OCOS
CHAMPERICO
S. AGUSTIN
PATULUL
S. LUCIA
ACATENANGO
BUENAS AIRES
PANTIGUA
ALOTENANGO
CALDERAS
BARSINAS
Mixco
XVI
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XIV
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