

FIELD BOOK *of*
BIRDS *of the* PANAMA
CANAL ZONE))



BERTHA B. STURGIS

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SWAINSON'S TOUCAN.

Rhamphastos swainsonii.

Field Book of Birds
of the
Panama Canal Zone

A Description of the Habits, Call Notes and Songs of the Birds of the Panama Canal Zone, for the Purpose of Identifying Them. Many of These Birds are Also Common in Central and South America

28-22241

BY

BERTHA BEMENT STURGIS

WITH OVER 100 ILLUSTRATIONS, COLOUR PLATES, PEN-AND-INK SKETCHES, AND A MAP OF THE PANAMA CANAL ZONE

G. P. PUTNAM'S SONS

NEW YORK — LONDON

The Knickerbocker Press

1928

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YTO GADMAN
OR

FIELD BOOK OF
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FOREWORD

There has long been a demand for a popular book on the birds of the Canal Zone. Americans resident in the Zone familiar with their own home birds, wish to make friends with the feathered folk of their new surroundings but hitherto there has been no one volume that would help them to achieve this end.

During her three year's residence in the Zone Mrs. Sturgis herself experienced this want and after returning to the United States, where material for study was available, she filled it with the present volume. Local variations in the distribution of bird-life often make it impossible to draw the line between species that, regionally, are common and those that are rare. To meet this difficulty Mrs. Sturgis has included in her work descriptions of all the birds known from the Zone. Her book, therefore, should be useful to beginners as well as to more advanced students, and it may also assist those who wish general information about tropical American bird life.

FRANK M. CHAPMAN.

PREFACE

During a residence of several years in the Canal Zone I became deeply interested in the wonderfully abundant and varied bird life of the region and numberless times felt the want of a convenient book to enable me to recognize and learn the names of the species that are found there. The birds of this region have been the subject of considerable study, but the published information on them is scattered in technical works, more or less expensive and difficult to procure, or in volumes of scientific periodicals. These are inaccessible except to those having the use of a library well provided with scientific books, and the technical language in which much of this literature is written makes it difficult to use without some training in ornithology.

This book is an attempt to fill the want as well as the time, knowledge and other resources available to me would permit. It does not assume to be anything approaching a treatise or handbook, but merely an aid to the study of the birds of the region, giving descriptions by which I hope it will be possible to recognize the species observed and enable others to avoid many of the difficulties that I myself experienced. It records also such observations on their habits, calls, songs, etc., as I have been able to make and verify with a sufficient degree of certainty, or which I have collected from other authors.

PREFACE

If this book is accepted for what it is intended to be, and is not judged by standards justly applicable to more ambitious undertakings, it may be found a useful aid to those wishing to become familiar with the Canal Zone birds. If it does this, I shall feel that it has accomplished its purpose.

As it is intended for those without a scientific knowledge of ornithology, technical language has been avoided. The descriptions have been prepared with regard to the wants of the bird student or bird lover who studies the birds in the field and forest, not those of a bird collector. The large number of species to be dealt with has made very brief descriptions necessary, and while it is hoped they will be sufficient to distinguish the Canal Zone species from each other, they will not always bring out the differences that separate them from related species and subspecies of other countries. But that is not essential to the purpose of this book.

While I have drawn freely from information given by a number of authors, I wish to acknowledge especial indebtedness to Ridgway's great work, "The Birds of North and Middle America." Among other works which have been of the most service, I would mention especially the comparatively recent lists of Witmer Stone, "Birds of the Panama Canal Zone with Special Reference to a Collection made by Lindsay A. Jewel," *Proceedings of the Academy of Natural Sciences of Philadelphia*, 1918, pp. 239-280;* Thomas

* Stone's list above referred to, is of especial usefulness as it includes all birds recorded from the Canal Zone up to

PREFACE

Hallinan's "Notes on Some Panama Canal Zone Birds with Special Reference to Their Food," *Auk*, vol. xli, No. 2, April 1924; also the volumes on birds of the *Biologia Centrali-Americana*, by Salvin and Godman; M. A. Carriker, Jr.'s "Annotated List of the Birds of Costa Rica, including Cocos Island," *Annals Carnegie Museum*, vol. vi, No. 4, Aug., 1910, and "Notes on a Collection of Birds from Eastern Nicaragua and the Rio Frio, Costa Rica," by Charles W. Richmond, *Proc. U. S. National Museum*, xvi, 1893.

The plates are by Mr. F. L. Jaques and the remainder of the illustrations used throughout the text were drawn by Mr. Rudyerd Boulton, of the Carnegie Museum, Pittsburgh, Pennsylvania.

Whatever merits this work may possess are largely due to the advice and assistance of the staff of the Department of Ornithology of the American Museum of Natural History in New York, including Dr. Frank M. Chapman, Mr. De Witt Miller, Dr. Robert Cushman Murphy, Dr. James P. Chapin and Mr. Ludlow Griscom, who not only have allowed me the unrestricted use of the facilities of the Museum, with its splendid series of specimens of birds of the American tropics, but have also devoted much time and trouble to giving me personal assistance on many im-

that time (1918), giving many notes on habits, nesting, colors of the bill and feet when fresh, etc., not previously published. Its introduction also gives a summary of the ornithological work done on the Isthmus, with references to the more important literature concerning it.

portant points. In addition, Mr. Ludlow Griscom (now of the staff of the Museum of Comparative Zoology, Cambridge, Mass.) has given me much valuable information and encouragement and has corrected and brought up to date the scientific names used in this book.

It was, however, at the suggestion of Dr. Willard G. Van Name of the American Museum of Natural History, that I undertook the preparation of this book, and, but for his untiring interest and the advice and assistance given at frequent intervals during its progress, I might not have been able to overcome the difficulties which my inexperience in such work placed in the way of its completion.

I am also indebted to Dr. James Zetek of the United States Department of Agriculture, Resident Custodian of the Barro Colorado Island Laboratory, for the opportunity of making a visit there, and to Dr. Ignacio Molino, the Assistant Custodian; also to Mr. Carlos Arosamena, of New York City, for information regarding the Spanish names of the birds.

BERTHA BEMENT STURGIS

Washington, D. C.

April, 1928.

INTRODUCTION

The tropical part of America has a more varied and abundant bird fauna than any other part of the world. The Republic of Panama, situated at the junction of the two continents, and possessing many species characteristic of each as well as peculiar to itself, is excelled in the number of its species by few, if any, regions of the same extent.

The climate of the Canal Zone is tropical throughout; there is no elevation great enough to moderate the temperature. On the Atlantic side, the rainfall is about 135 inches, while on the Pacific side it is only about 65 inches. During the dry season, the air on the Atlantic side remains somewhat moist, the trees greener; the forest is the so-called "rain forest" of the Atlantic slope; on the Pacific side, no rain falls during that season, the earth becomes parched and cracked in the sabanas and many of the trees lose their leaves. Due to this climatic disparity, there is some variation in the distribution of bird-life, but, owing to the absence of high mountains, the climatic difference and that in the species of birds occurring on the two sides of the Zone, are much less than in other parts of Panama.

The ornithology of many parts of the Republic has been as yet insufficiently studied; however in the case of the Canal Zone, the birds are now pretty well known, though there still remain a number of species that seem

likely to occur there occasionally from what is known of their distribution, but which have thus far not been recorded.

In this book approximately 434 species are dealt with. It has seemed best not to restrict its geographical scope exactly to the political limits of the Canal Zone, but to include the nearby islands of the Bay of Panama (Taboga, Tabogilla, Otoque, Chamé, etc.) with a few notes on the birds of the more distant Pearl Islands; also the coastal region in the vicinity of Old Panama, Juan Diaz, etc., since these places may be visited by the tourist. This has involved including only a few additional species, most of which doubtless actually occur in the Zone itself, though there may be as yet no records of the fact. Were the entire Republic of Panama to be taken for the geographical limits, the number of species and subspecies would be more than doubled. Some of these additional ones may sooner or later be added to the list of the Canal Zone birds, but most of them are either confined to the distant eastern or western parts of the Republic, or else are mountain birds which never descend to the low altitudes of the land in the immediate vicinity of the Canal.

The birds of this region may be divided into two main classes, true natives, and migrants. The true natives remain all the year breeding in the Zone or in parts of tropical America not far distant; while the migrants spend their summers and breed in North America, usually in the United States or in some cases as far away as northern

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Canada, and pass their winters in Central or South America. Some migrants may be found all winter in the vicinity of the Canal; others pass farther south for their winter quarters and occur in Panama only in the spring and fall. There is great opportunity for even comparative beginners in bird study to make valuable observations on these migrants, by recording the times of their arrival and departure and noting whether they spend the winter or not. There are a number of other migrants that undoubtedly sometimes pass through the Canal Zone, though not recorded there, so that anyone may be able, with a little careful observation, to add some of these species to the list of birds of the region. I may add that these migrants will all be found described in detail and in most cases illustrated in color in the standard works on the birds of North America, so that as far as they are concerned, the bird student need not be dependent on the brief descriptions and statements in this work. About 21 per cent of the Canal Zone species are migrants (see list, page 439), but some of the native species are more or less irregular or even accidental visitors that only occasionally wander into the territory covered by this book.

The study of the birds of the Canal Zone has passed the stage where its progress can be greatly advanced by making collections. As already stated, we know pretty well what birds are to be found there, and what is most needed now are observations on their habits, migrations, nesting, songs, call notes and

other characteristics that can only be learned by careful study of the birds in life in their natural surroundings. Most of the species can be reliably identified with a field glass by one familiar with their appearance and habits, and the idea that in order to become proficient in the knowledge of them one must shoot them and make a collection is altogether wrong. Of course one will often get only an unsatisfactory view of a bird, but if careful notes are made of the features that are seen, it will probably not be long before the chance comes to get a better and closer view. The land birds of the tropics are often remarkably stationary in their habits; one may go back to the same thicket or even the same tree or bush after a long period and find there the same species, perhaps the same individual. Familiarity with the bird life of a country cannot be gained in a day. Bird study with a field glass requires patience and persistence, but in a region where so much collecting has been done as in the Canal Zone, the collection that anyone could make without devoting to it years of work, would avail but little in identifying the species, for it would consist chiefly of common or conspicuously marked kinds easily recognizable at sight.

There is need, however, for a collection of the Panama birds in some public museum or other institution where it would be accessible for study to those who are interested. There is much greater need for such a collection from this region than from the United States or Europe, for there are numerous reasonably

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priced books, with good colored illustrations, covering the birds of those parts of the world.

EXTERMINATION OF SPECIES

There is another very important reason for desiring a good public collection of the native birds of Panama, and of other groups of animals as well, and that is, to arouse the interest of the public in them. We are confronted with the unfortunate fact that not only in the Canal Zone but in every part of the Republic of Panama that is being opened up by means of road building or that is accessible by water transportation, the wild birds and animals are diminishing. This is due in part to hunting or other intentional destruction by man, and in part to the clearing or burning of the forest, drainage of the marshes for mosquito control, settlement of the country, and other effects of civilization. Some of this is an unavoidable result of the economic development of the country; much of it, however, is the result of carelessness, neglect, indifference and wanton and needless destructiveness, which can be checked.

There is no better way to accomplish this than by arousing a general interest in the wonderfully rich and varied wild life and natural scenery in the Canal Zone and Republic. In these things the region has some of its most attractive features, affording subjects for study of the most fascinating kind whether it is taken up in an amateurish fashion or in the serious manner of a professional scientist. The hope that this small

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work may do something toward arousing the residents of the Canal Zone and the Republic to the importance of preserving the animals, birds and some of the most interesting forests, has been one of the incentives that has led to my undertaking it. If the larger and more interesting animals and birds are exterminated and all the wonderful old growth tropical forests are destroyed, it will be a cause of much regret after it is too late to remedy it.

PROTECTION OF DISAPPEARING SPECIES

The way to prevent the extermination of a species is not to allow it to get rare. The time to begin efforts to preserve it is while it is still common and widely distributed. After it is reduced to a mere remnant of a few individuals and is restricted to a fraction of the geographical area it formerly inhabited, it becomes difficult to restore it to abundance again and, in many cases, impossible to prevent the constant diminution of its numbers until it finally becomes extinct.

Many of the birds are valuable to man as destroyers of insects, as game birds, or as food; while those that are not useful are for the most part quite harmless and often very beautiful and interesting creatures, which all who have a love of nature enjoy seeing and becoming familiar with.

It cannot be too strongly emphasized that now is the time to begin systematic and earnest efforts to preserve the wild life of the Isthmus, and to set aside reservations for

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that purpose while it still can be accomplished with a minimum of trouble and expense. Ten or fifteen years hence the difficulties and cost will be many times greater and it will be too late to save many of the larger and rarer species of birds and animals, as far as the Canal Zone and the more accessible parts of the Republic are concerned.

The difficulties in the way of checking this destruction are no doubt very great, but results are not usually accomplished by majorities, but by minorities. Were the Isthmus to have an active and wisely conducted natural history society that would work for the preservation of the native birds and animals, even if its numbers were few at first, it might after a time become a power capable of influencing public opinion and of producing important results.

In the wilder and more inaccessible regions of Panama, game laws are not to be thought of as yet; but, on the other hand, there are parts of the Republic where protection for some of the birds and animals is already badly needed, and this area will increase as time goes on. Until recently, the Republic had no game laws whatever. Anyone has been at liberty to kill to the extent that he could, anywhere and at any season, regardless of whether the species was becoming exterminated, or whether it was the breeding season when killing the adults means also the starvation of the young and the prevention of reproduction. This matter does not concern alone the citizens of the Republic of Panama but those of the Canal Zone also,

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for the latter is a small area whose game nearly all comes from the surrounding territory of the Republic. If no game or no wild animals of any account are left there, there will be none in the Canal Zone either.

NEED OF BIRD SANCTUARIES AND RESERVATIONS

Many of the native birds are inhabitants of the old growth forest and cannot live in other surroundings, and when the large trees are cut, they desert the locality permanently. They require, or at least strongly prefer, the tall trees and deep shade of such woods, and many of them breed in hollows in trees which they can rarely find of suitable size and character in the second growth vegetation that replaces the old forest when it is destroyed. Contrary to the common belief, the primeval forest does not reproduce itself after its destruction, at least not within a period of many centuries. A scrubby growth of dense jungle does immediately spring up, which in time may develop into a forest of some size and height, but the trees are of different kinds for the most part from those characteristic of the old forest, and they are of course young and without the heavy trunks and branches with roomy cavities and the abundant growth of leaves and parasitic plants that characterize the trees many centuries old, of the primeval woods and make them so well adapted to the needs of forest birds and animals. Probably in the course of centuries, the new growth would approximate in character to

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the old forest, but the process is so slow that for all practical purposes the primeval forest once destroyed is gone forever.

This makes it most important to preserve some areas of the original forest both on account of its beauty and interest and because many species of birds and animals can be preserved in no other way. The Canal Zone having been a thickly settled region for some centuries, now possesses very little of such forest and what remains needs careful protection when this is practicable.

The establishment of the Barro Colorado Island reservation has been a great step in this direction. Barro Colorado is an island formerly the upper part of a large hill converted into an island by the rising of the waters of the Chagres River, on the completion of the Gatun dam. The birds and animals at that time fled to safety on the higher ground and as a result are concentrated in the more limited area of this refuge.

Topographically the island is very hilly, with ravines containing streams flowing down into Gatun Lake. It is in part covered with primeval rain forest, and though the larger portion is only second growth, much of it was cleared so long ago that it has again become a dense and heavy growth of trees of considerable size. The shore line is broken by numerous deep indentations or coves, and along the shore are great numbers of dead trees killed by the rising of the water and covered with parasitic vegetation.

Due to the efforts of Dr. Thomas Barbour of the Museum of Comparative Zoology,

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Cambridge, Mass., and Dr. James Zetek of the United States Department of Agriculture, this island was set aside by Governor J. J. Morrow of the Canal Zone as a reservation, assigned to the Institute for Research in Tropical America, and equipped with a fine laboratory erected on an imposing site overlooking Gatun Lake and the mountains to the north and east. For the observation of birds, animal and plant life, the island is almost unsurpassed. Trails have been cut through the forest so that it is possible to explore remote parts of the jungle and view these interesting subjects pursuing their normal life in the conditions of their primeval habitat, uninfluenced by the effects of civilization.

Yet this reservation is not extensive enough to afford a permanent sanctuary to the many species of large forest animals and birds that now inhabit it, unless extended by coöperation of the Canal Zone and Panamanian governments to include a considerable area of the wild and well forested country on the west side of the lake. By so doing, a really effective sanctuary, capable of permanently protecting most of the larger species, both of birds and animals, could be established.

TRAFFIC IN CAGE BIRDS AND WILD ANIMALS

The subject of the destruction of the bird and animal life of this region should not be passed by without some comment on the needless cruelty, and almost invariable death under most pitiful circumstances which

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this traffic brings to thousands of the most beautiful and interesting creatures. To catch and confine in a small cage a wild animal, more especially a bird, accustomed to vastly more freedom and activity than we ourselves, is bad, even when they are otherwise well cared for and provided with proper food; but this is scarcely ever their good fortune. The dealers obtain them for a small price and give them correspondingly small consideration. Dozens are often crowded into a cage so small they can scarcely move, and many perish from suffocation in the hot and poorly ventilated compartments of the ships on which they are sent to other countries. Often the bottoms of these cages are found thickly strewn with the bodies of the victims of this inhuman treatment when at last they are given food and attention. Those which survive to find a purchaser are rarely any more fortunate. The chances are that they are bought by tourists or sailors having no knowledge of how they should be cared for and fed, and no opportunity of giving them what they need; and in any case, being usually taken to colder climates, they succumb to pneumonia or tuberculosis if they do not sooner die from neglect.

Various small and brightly colored tanagers, honey creepers and finches, members of the oriole family and parakeets are the most frequent victims of the cage bird traffic, but many other native birds are from time to time offered for sale in the markets. Among animals, the monkeys are the most frequent sufferers. Great numbers of sloths are shipped

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away for scientific purposes and for purchase by zoological gardens, though the Three-toed Sloth rarely lives to reach the foreign port. It is not probable that many of the live birds and animals offered for sale in the cities of the Isthmus are taken in the Canal Zone, but cases of trapping wild song birds there have come to the writer's notice.

B. B. S.

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FIELD BOOK OF BIRDS
OF THE PANAMA CANAL ZONE

COMMONEST BIRDS OF THE CANAL ZONE

In spite of the fact that clearing the land and the increase of human population in the Zone have practically exterminated or driven away no small numbers of interesting birds once found there, the bird student will discover that the abundance and variety of birds present a greater difficulty and perplexity than any scarcity either of individuals or species.

It may be a help to the visitor who makes only a brief stay in the Canal Zone, to mention particularly the birds that are common in or about the towns and cities and those most likely to be noticed from the trains in crossing the isthmus, or in trips to nearby islands in Panama Bay. The season of the year makes some difference in the variety of birds present; for, aside from the migrants from the north, found only during a part of the year, many of the strictly native species have somewhat different haunts during the wet and dry seasons, at the breeding period and at other times. As the majority of visitors to Panama will come in the winter and early spring months, and as this, being the dry season, is also the most propitious time to study birds, species most in evidence at that time will be considered.

Of all the birds in the Zone, the Turkey Vulture (*Cathartes a. aura*) and the Black

Vulture (*Catharista urubu*), both commonly called Buzzards, must be mentioned first, for one has only to look toward the sky in almost any direction, to see individuals of one or both species circling and soaring high in the air. The former is more widely distributed, though the Black Vulture often outnumbers it along the seashore or in the vicinity of towns. A favorite haunt where both congregate in numbers, is on the edge of the corrugated iron roof of the Panama City market, a point of vantage whence they engage in their scavenging operations. Also often to be seen sailing high over the land (though really a sea bird), is the Frigate Bird (*Fregata magnificens rothschildi*), so pneumatic that it can float in the air for hours, its immensely long wings outspread and apparently motionless.

Of the birds frequenting the trees or gardens about the towns, and even in the city parks of Panama, the Panama Robin (*Planesticus grayi*) should head the list. Resemblance to its familiar northern relative will make it easily recognizable in spite of a duller coat; its song is softer and more melodious. One of the most familiar and droll of bird neighbors in the Zone is the Panama House Wren (*Troglodytes musculus inquietus*) which will be identified immediately from its similarity in appearance and habits to the species of the United States.

A monotonously repeated song from the tree tops, resembling the Red-eyed Vireo's of the United States, is that of the Yellow-green Vireo (*Vireosylva f. flavoviridis*) of the

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same genus as the northern one. A very well known bird that nests about buildings in the city as well as in the country, is the Gray-breasted Martin (*Progne c. chalybea*), much like the Purple Martin of the United States. Other swallows are common; among the migrants, especially the Barn Swallow (*Hirundo erythrogaster*), and among the native species, the Panama Rough-winged Swallow (*Stelgidopteryx ruficollis uropygialis*), and the Mangrove Swallow (*Iridoprocne albilinea*).

The Baltimore Oriole (*Icterus galbula*), another winter visitor, is frequently seen in the early spring in Ancon, at that time probably on its journey north. A larger, lighter-yellow native species, Salvin's Oriole (*Icterus mesomelas salvinii*), is not uncommon and is widely distributed; in the spring, in passing along the roads, one's attention is often attracted to it by its clear, high-pitched whistles. The Great-tailed Grackle (*Megascopus major assimilis*) is abundant in the winter and spring months; his piercing, inquiring whistle may greet one on isolated, almost barren rocks in Panama Bay, as well as from low trees in park or garden. The females are brown and much smaller.

The tanagers form a group of conspicuous birds, in the majority of cases of colorful plumage. The Blue Tanager (*Thraupis cana diaconus*), a bird about the size of the Summer and Scarlet Tanagers (both of which occur as migrants and winter residents in the Canal Zone), is frequently seen in the parks and gardens, as is the somber-colored Palm Tanager (*Thraupis palmarum atripennis*),

found more often in the palm trees. Here one may also catch an occasional glimpse of the gorgeous crimson and black of the "Sangre de Toro" (*Ramphocelus dimidiatus isthmicus*) but this species is more at home in the seclusion of the gardens or farther afield in the second growth or on the edge of the jungle. Of the small tanagers or Euphonias, those that might be seen in or near the towns are the steel-blue and yellow, thick-billed "Pico Gordo" (*Tanagra crassirostris*) and the Mrs. Wilson's Tanager (*Tangara larvata centralis*) of variegated black, blue, white and golden-buff plumage. Other strikingly colored tanagers may be seen not far from the roads in the Zone and near Panama City in the taller trees. Among these are the Yellow-rumped Tanager (*Ramphocelus icteronotus*) and the White-shouldered Tanager (*Tachyphonus luctuosus panamensis*). Thicket and brush-haunting species are the Ant Tanager (*Phænicothraupis fuscicauda*) and the Gray-crested Tanager (*Eucometis cristata*). In the spring months the lovely notes of the male Panama Thrush Tanager (*Rhodinocichla rosea eximia*), ringing from out the jungle, proclaim its presence there and may lead the fortunate observer to a glimpse of its rose-red breast.

The finches do not form as important a group of the bird fauna in Panama as in North America, though there are a number of common species. Along roadsides and in the open places, as well as in gardens, the busy little seedeaters, especially Hick's Seed-eater (*Sporophila aurita*) and the Blue-black Grassquit (*Volatinia jacarini splendens*) that

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flocks with it, are very numerous, particularly towards the end of the dry season. The Lafresnaye's Sparrow (*Arremonops s. striaticeps*) skulks in hedges and thickets like the Song Sparrow of the United States. In the spring, it has a very remarkable and characteristic call, a sequence of whistles, suggesting the starting of a locomotive in the retarded initial notes, with subsequent acceleration finally merging the notes into a continuous sound. The saltators resemble grosbeaks in size and habits; two species, the Buff-throated Saltator (*S. intermedius*) and the Streaked Saltator (*S. striatipectis isthmicus*), are common, especially the latter, whose plaintive whistles, sometimes beseeching, at other times conversational, are heard repeatedly during the spring and early summer months.

At least three of the Panama species of honey creepers may occasionally be seen; one, the Blue Honeycreeper (*Cyanerpes c. cyanus*), is at times found in Ancon.

Many of the numerous North American warblers are likely to turn up almost anywhere, especially during the migration season. The Yellow Warbler (*Dendroica æ. æstiva*), a winter resident, is by far the most abundant of the migrating species; the Redstart (*Setophaga ruticilla*) and the Chestnut-sided Warbler (*Dendroica pensylvanica*) are perhaps the most common of the other migrant warblers, and the Mangrove Warbler (*Dendroica erithachorides*), closely allied to the Yellow Warbler, is the commonest native one; it is always to be found in the mangrove swamps.

Besides the House Wren already men-

tioned, several other wrens frequent the shrubbery near houses; the rather light-colored Panama Wren (*Thryophilus modestus elutus*) with its cheerful, matter-of-fact song, is the most common on the Pacific side; also the Chestnut-backed Wren (*Thryophilus rufalbus castanonotus*), whose fascinating and haunting notes will long dwell in the memory if once heard. One song of this wren, consisting of flute-like phrases, is a completed melody and should give him a high place among the skilled songsters of America.

The flycatchers constitute so large an element of the Panama bird fauna and are so noisy and conspicuous that they will probably outnumber all the other insectivorous birds that will be noticed. The two Elæniæ (*E. flavogaster subpagana* and *E. c. chiriquensis*), alike in their plain and unattractive plumage, harsh notes and saucy habits, but differing considerably in size, are ubiquitous, occurring anywhere about habitations, provided there are a few trees. Usually their loud, assertive, lispings whistle, starting with a statement followed by an argument, will attract one's attention to them. A King-bird (*Tyrannus melancholicus chloronotus*), with a gray back and pale yellow underparts, abounds in many parts of the Zone and in the nearby islands of Panama Bay, preferring the vicinity of water, as does the common King-bird (*Tyrannus tyrannus*) of the United States, often seen in Panama during migration. The Noble Flycatcher (*Myiodynastes maculatus nobilis*), suggesting the Crested Flycatcher of the United States in size and

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habits but with heavily streaked plumage, is frequently seen about the trees in Ancon and elsewhere. Several other flycatchers, notably two large, handsomely-colored species of *Myiozetetes* (*M. c. cayanensis* and *M. similis columbianus*), may be found along the shores of the Canal and Gatun Lake and elsewhere, but chiefly where there is water nearby, and may be recognized by their black and white striped head and the deep yellow abdomen. A very much larger though similarly colored flycatcher with an unusually stout bill, may attract attention, perched on a branch near the top of some tall tree from which he sallies out after insects or to chase away some other bird; this is the Boat-billed Flycatcher (*Megarynchus pitangua mexicanus*), the largest found in Panama. The smaller flycatchers are too numerous to be covered here, though two species might be mentioned; the Panama Wood Pewee (*Myiochanes b. brachytarsus*), whose call is reminiscent of that of the North American Wood Pewee, and the minute Tody Flycatcher (*Todirostrum cinereum finitimum*), a quarrelsome little bird often found in the shrubbery about houses and recognizable by his yellow underparts and black cheeks. The Fork-tailed Flycatcher appears in great numbers at certain times of the year, sometimes gathering in large flocks and sitting on telegraph wires in rows, balancing in the wind, their long tails tilting at different angles.

The antbirds (the smaller species of which are called Ant Wrens) are numerous in species, but the majority of them must be sought in the forest and jungle. One very common

species on the Pacific side of the Zone is so striking in its pert demeanor and the difference in color between the sexes, as to require special mention. This is the Black-crested Ant Shrike (*Thamnophilus doliatus nigricristatus*). It has an erect and pointed crest; the male is cross-barred black and white, the female plain rich reddish brown, the cheeks narrowly streaked with black and white. It frequents brush and shrubbery and is not at all afraid of observers.

The members of the related families of woodhewers and ovenbirds, cotingas and manakins, are birds of the forest and jungle; but the wild plaint of Lawrence's Woodhewer, resounding through the forest as it flies from tree to tree, will arouse the curiosity of the passerby. Near Patillo Point two beautiful little manakins, the yellow and black Gould's Manakin (*Manacus vitellinus*), and the Sharp-tailed Manakin (*Chiroxiphia lanceolata*), the male of which is red-capped and wears on his shoulders a sky-blue mantle, may be heard, and seen by sharp eyes, flitting about in the underbrush of the forest. It will pay any bird-lover to take a ramble in that direction to make their acquaintance, also that of several antbirds and the Ant Tanager.

Though many of the numerous representatives of the hummingbird family inhabit forest or heavy jungle, there are also many to be found wherever there are flowering shrubs; among them, Duchassain's Hummingbird (*Lepidopyga cæruleogularis*), Wilson's Hummingbird (*Saucerottia edwardi*), Rief-

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fer's Hummingbird (*Amazilia t. tzacatl*), easily identified by its long rufous tail, and the Allied Emerald (*Chlorostilbon assimilis*).

Two or three swifts abound in the Zone but are exceedingly difficult to tell apart.

The commonest and most widely distributed woodpecker is a small species, Wagler's Woodpecker (*Centurus rubricapillus wagleri*), that will nest anywhere it can find a rotten limb of a tree in which to make a hole. Its loud and characteristic call will betray its proximity.

If the traveler by rail keeps a sharp lookout, he can hardly fail to see one or more kingfishers along the shores of the lake or canal. The large Ringed Kingfisher (*Megaceryle t. torquatus*) and, during the winter months, the common Belted Kingfisher (*Megaceryle a. alcyon*) of the United States, may be seen; but by far the most numerous species about the lake is the small *Chloroceryle americana isthmica*.

The cuckoos are mainly birds of the jungle, but in the late winter and spring the strange minor whistles of the "Tres Pesos," the Northern Striped Cuckoo (*Tapera nævia excellens*), variations of *tres, tres, tres, pesos; pesos, pesos, pesos*, will be heard frequently along the road to Gamboa in the Zone, and near the Panama golf course. Tracing the source of the whistle, the performer will be located stolidly perched on a low tree or high bush, monotonously reiterating his complaint, answered from some distance by a fellow malcontent. Straggling flocks of anis may be seen sitting on the fence posts of pas-

tures and roadsides or following the footsteps of the cattle, or possibly even perched on the back of a steer. The two common species (*Crotophaga ani* and *Crotophaga sulcirostris*) are hard to tell apart and careful observations as to their relative abundance and distribution in the Canal Zone would be a real contribution to ornithology.

Two of the little ground doves (*Chamepelia r. rufipennis* and *C. minuta elæodes*) are abundant and very tame, in fields, gardens and along roadsides, scurrying out of the way rapidly on their little short legs only when approached within a few feet. Of the larger members of the family, Verreaux's Dove (*Leptotila v. verreauxi*) is the only one that is at all familiar in its habits. One may often be seen flying across the Gamboa road in front of a car; its mournful *coos* may be heard from patches of thick brush almost in the towns.

If the traveler by railroad expects to see the vast flocks of herons and other native birds on Gatun Lake described in the book of a certain enthusiastic writer, he will be disappointed. Undoubtedly such birds were much more abundant when the lake was first filled up and more of the old water-killed trees were still standing, and when the shores were less inhabited by banana growers; but nowadays, one is lucky to see half a dozen herons from the train, and most of these will probably be the Little Blue Heron (*Florida cærula*), white when young, or piebald in the intermediate plumage. However, late in the spring, it is still possible to see hundreds of these herons on the mud flats at low tide below Old

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Panama City. Great Blue Herons, cormorants, anhingas, pelicans, jacanas and ospreys, are birds also occasionally seen along the lake from the windows of the train.

A flock of Muscovy Ducks (*Cairina moschata*), large birds, dark-colored with white wing-areas conspicuous in flight, is not a rare sight on the upper Chagres near the Gamboa station.

Birds of prey are quite numerous in species, but aside from the vultures, rather few in individuals. The Plumbeous Kite (*Ictinea plumbea*), the Large-billed Hawk (*Rupornis magnirostris ruficauda*), the Mexican Black Hawk (*Urubitinga a. anthracina*), the Osprey (*Pandion haliaëtus*), and in the winter months, the Marsh Hawk (*Circus hudsonius*), are perhaps the most likely to be noticed. In the Pearl Islands the Yellow-headed Caracara (*Milvago chimáchima cordata*) is common.

One bird that will probably not be seen, the little tinamou (*Crypturus soui panamensis*), a secretive inhabitant of thick jungles and brush, must nevertheless be mentioned because its calls may be heard and cannot fail to arouse curiosity in the hearer. The pure, remote, silvery whistle of several successive notes ascending by changes of pitch of about a quarter of a tone is repeated at intervals by day and by night, the angelus of the jungle.

Shore birds, practically all migrants, are more abundant on the Pacific side than elsewhere. The enormous numbers of the Semipalmated Plover (*Charadrius semipalmatus*) and the large flocks of the genus *Ereunetes*,

are mentioned elsewhere in this book. The little Spotted Sandpiper (*Actitis macularia*) is not a rare sight along the shores in winter and always may be identified at some distance by its habit of teetering on its legs with tail tilting up and down.

Sea birds are likewise vastly more numerous on the Pacific side and breed in immense numbers on the islands of the Bay, though the species represented are rather few. The endless streams of cormorants flying in formation down the coast in the afternoons toward Old Panama are a striking spectacle.

Laughing Gulls are abundant about Panama Harbor and common along the Canal; occasional Royal Terns visit the harbor of Panama. Brown Pelicans and frigate birds are usually about the harbor and along the shore, but are much more numerous farther out, where are also to be seen numbers of several species of gannets (*Sulidæ*).

In giving this account of the birds, it must be remembered that, with few exceptions, only those have been named that can hardly fail to be seen by the observer who keeps his eyes open for them. Whether he notices and recognizes them or whether they are just birds to him, will depend on his interest in and knowledge of ornithology. If he covers much ground, he will be sure to see at least as many additional species without going far out of the beaten tracks of tourists or residents; while, if he has the opportunity and energy to explore the jungles and forests, or to visit Barro Colorado Island, his list of species observed will be greatly lengthened.

SCIENTIFIC NAMES AND CLASSIFICATION OF BIRDS

These are subjects too extensive to deal with in a book of this kind but a few words in regard to them may prove of help to some readers.

The scientific name of any bird consists of two or three words of Latin or Greek, or in some cases of words from other sources, especially proper names of persons or places with Latin terminations added. The first of these words designates the *genus*, or group of birds to which it belongs, and the second the *species*, or particular kind of bird. A genus (plural *genera*) is a group of species separated only by small differences (usually those of color, size, proportion of parts or similar superficial characters), but closely resembling each other in all important respects. Genera of birds usually consist of but few species; in many cases a species, if no others closely resembling it exist, constitutes a genus by itself. Genus names are always written beginning with a capital letter.

In the case of many birds, these two names, *genus* and *species*, sufficiently designate them for scientific purposes, yet we often find that birds belonging to the same species but inhabiting different geographical areas within the general range occupied by the species, differ more or less in their characters, though

we cannot consider them as distinct species because of intergrading individuals not definitely assignable to either form. Such intermediates occur especially in the areas lying between the territories occupied by the extremes of variation. These geographical races or varieties are designated *subspecies*, and when they are found to exist, we require for their designation a third word, the *subspecies* name, added to the bird's scientific name.

Thus in the name of the Panama House Wren (*Troglodytes musculus inquietus*) *Troglodytes* is the genus which includes all the house wrens of North and South America, *musculus* is one of the distinct kinds of house wrens which constitute that genus, and *inquietus* designates the geographical race or subspecies of the species *musculus* that inhabits the Canal Zone.¹

In the case of birds of stationary habits, only one subspecies of any species is usually to be found in a given area; that is, each subspecies has its own territory, but in the case of birds that migrate—though this rule generally still applies during the breeding

¹ The reader has very likely observed that the name of some person is often added to the last word (species or subspecies name) of scientific names. This is the *authority* or author who originally described the species or subspecies as the case may be. If his name is not inclosed in parentheses he is authority for the whole name as it stands; if it is inclosed in parentheses he is authority for the last word of the name only, the bird being now placed in some genus other than that in which its original describer included it. This matter of authorities for scientific names is, however, not one that any except ornithologists need be concerned with.

SCIENTIFIC NAMES AND CLASSIFICATION

season—it may not do so at all the seasons, so that more than one subspecies may be found in the same locality.

SCIENTIFIC CLASSIFICATION

In the scientific classification of birds, the attempt is made to arrange them according to their natural relationships. The small groups or genera (designated by the first word of the scientific name) are grouped into *families* or groups composed of related genera. The thrush family, *Turdidæ*, the tanager family, *Tangaridæ*, and the heron family, *Ardeidæ*, are examples. Though these families comprise several or many genera and numerous species, every member of one of these families has the characters of a thrush, a tanager or a heron, as the case may be. Families in turn are grouped into *orders*, while all the orders, that is all birds collectively, constitute the *class* Aves, which is one of the classes of vertebrate animals.

For more detailed and exact classification groups of intermediate grade may be used, such as *suborders*, intermediate in rank between orders and families, and *subfamilies*, intermediate between families and genera, etc.

Family names (and no others) always end in the termination—*idæ*; subfamily names, always in the termination—*inæ*. There are no rules prescribing uniformity in the terminations of names of the other grades.

In this book some brief statements regarding the characteristics, distribution, etc., of

BIRDS OF THE PANAMA CANAL ZONE

the different families are given, but owing to limitations of space, the subject of the classification of families into higher groups and the characters of the latter, has not been entered into.

DESCRIPTIONS OF SPECIES

In the descriptions in this book, since they have been prepared especially to aid those observing the birds while living and usually therefore at some distance, details and characters not likely to be noticed by the observer have often been disregarded. Such adjectives as large, short, dark, etc., are necessarily used in senses more or less relative, so that they must be construed with regard to the usual characters of the birds of the family to which the species belongs. The dimensions, length (total length from tip of bill to tip of tail feathers) and tail (length of longest tail feathers), that are given are those which will be of most service in giving an idea of the size of a bird. Even if the total length is known, only an indefinite idea is obtained of the real size unless it is also known how much of this is taken up by the tail. In this connection the reader should be cautioned that as the basal portion of the tail feathers is covered for some distance by the short feathers of the posterior part of the body called the *tail coverts*, the tail actually appears proportionately shorter, relative to the body and the total length, than its dimensions in inches or millimeters indicate.

Wherever it has been possible to do so, the dimensions in millimeters have been taken from Ridgway's "Birds of North and Middle America," using the average of the measure-

ments (usually based on several or many specimens) which that author gives. The dimensions given also have been converted from millimeters to the nearest tenth of an inch. It must be understood that individual birds vary more or less above or below these averages, the usual range of variations being, in small birds, only a few millimeters, but often many centimeters in large birds.

It is of course very difficult to estimate the actual length of a bird seen at a distance, but by comparing its size mentally with that of some familiar species whose dimensions may be looked up (if they do not happen to be remembered), an approximation may be arrived at near enough to assist in identifying the bird.

Where the males and females differ in color, young males usually first resemble females in plumage, and acquire their adult plumage more or less gradually. During this process they pass through intermediate stages in which various combinations of the adult male and female colors may occur. It has not been possible to deal with these stages in the descriptions. Though they sometimes prove puzzling to the bird student, the difficulty can usually be cleared up by considering the plumage of the adults of both sexes.



FIG. 2. Diagram of a bird

1. Family TINAMIDÆ

The Tinamous

A family of terrestrial birds found in South America (where it is represented by a considerable number of species) and in Central America north to southern Mexico. The tinamous range in size from that of a small quail to that of a grouse, and bear a superficial resemblance to the partridges, but form a very distinct group having a number of primitive characters, so that the family is made an *order* by itself. They are stout-bodied rather short-legged birds, with a very short tail, slender neck, small head and narrow bill, though the mouth is cleft to a point below the eyes. The wings are short and rounded, and though they can fly swiftly for a short distance, they generally try to escape by running. Their plumage is not brightly colored. The tinamous nest on the ground, laying rather numerous eggs having a highly polished shell. They are by no means wary and being very good eating, some of the South American species have been brought to the verge of extermination by sportsmen and market hunters. Many of them have very striking and characteristic whistled calls or songs.

CHESTNUT-HEADED TINAMOU

I. *Tinamus major castaneiceps* Salvadori Chestnut-headed Tinamou

Tinamus castaneiceps STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 241.

Length, about 406 mm. (16.00 in.); tail, about 94 mm. (3.70 in.).

Male.—Above, olive brown with somewhat sparse irregular black bars on back, rump and wings; top of head chestnut brown, the forehead tinged with blackish; upper neck and sides of head pale tawny chestnut, finely barred with black; throat whitish; lower neck, chest, breast and sides, grayish olive, the lower breast and abdomen pale grayish buff finely and indistinctly barred with dusky. Bill, blackish olive above, lighter below; feet olive grayish.

Female.—Similar to male.

A bird very similar in habits to *Crypturus*, the following species, but frequenting chiefly wilder places and more inclined to avoid the vicinity of human habitations. It is often seen on Barro Colorado Island wandering about the woods singly or in pairs, or is flushed by those walking along the trails. The common call resembles that of *Crypturus*, whose notes Dr. Chapman says are like those of a piccolo, while those of this species are louder and more flute-like. The call was often heard on Barro Colorado Island at intervals during the day and night.

2. *Crypturus soui panamensis* (Cabanis)
 Pileated Tinamou "Perdiz de Rastrogo"

Crypturus soui modestus STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 241.

Sexes similar.—Length, about 230 mm. (9.00 in.); tail, about 43 mm. (1.70 in.). General color of plumage brown, dull and dark on the

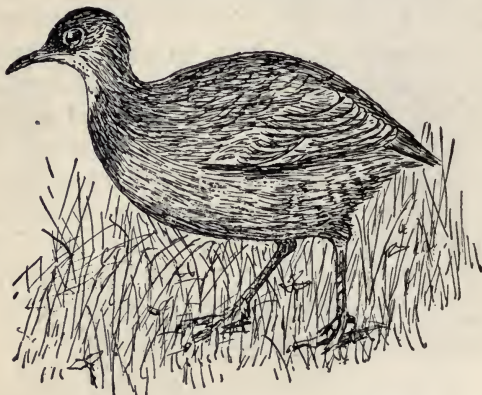


FIG. 3. *Crypturus soui panamensis*

top and sides of the head and shading to a warm rich chestnut brown on the tail; chin and upper throat white; foreneck and upper chest grayish brown; breast and abdomen tawny rufous. Bill brownish gray above, lighter below; iris brownish yellow; feet yellowish green.

Young.—Similar to adults but more olive brown above; wing coverts and upper tail coverts barred at the tips with pale orange brown.

Found in most places where there is dense brush or undergrowth. The most mysterious

PLATE II.



Photograph by Dr. Alfred O. Cross.

PILEATED TINAMOU ON NEST, BARRO COLORADO ISLAND.

and thrilling of all the bird calls in the Canal Zone is the tremulous whistle of this small tinamou, consisting of a varying number of plaintive silvery notes ascending with very slight changes of pitch. I was told that the West Indians called it the "three hour bird" and I often noted this call at three in the morning, nine in the night and at three in the afternoon. This beautiful sound floating out from the jungle at Barro Colorado at night is one of the most exquisite memories of that enchanting island. Another common call is two or three dragging downward notes dying away in a minor note. We flushed several along the sides of the trails, just a whirr of wings and flash of brown. More often, though, it will run off in the undergrowth rather than fly when it is approached, and were it not for its unmistakable calls, its wide distribution in the Canal Zone would hardly be realized.

2. Family CRACIDÆ

The Curassows and Guans

A small tropical American family of arboreal birds related to the domesticated fowls. They are large-winged, large-tailed, noisy, turkey-like birds chiefly frequenting the big trees of the old forests. They are disappearing with the destruction of the latter, aside from the fact that the hunting, which their large size and excellent flesh induces, brings about their scarcity in settled

regions. Their flight is slow and heavy but when once started they can glide for considerable distances with the wings held steady. They are among the Panamanian birds most in need of such protection from extinction as laws and reservations can give.

1. *Crax globicera* (Linnæus)

Great Panama Curassow

Crax panamensis STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 242.

Length, about 856 mm. (34.00 in.); tail, about 338 mm. (13.30 in.).

Male.—Plumage black glossed with dark green, the feathers of the conspicuous crest curled at their tips; the middle of the abdomen, flanks and under tail coverts, white. Bill blackish horn, the base and wattle yellow; iris dark brown.

Female.—Very dissimilar in coloring. Crest black with a band of white across the middle third; sides of head and neck barred black and white; remainder of plumage rufous chestnut with the tail chestnut barred with black and buff, the abdomen marbled with black and buff. Bill grayish green, terminally yellow.

Large and handsome birds, the sexes very different in coloring, but in both the crest is formed of a double line of long, upstanding and recurved feathers. They are of shy and retiring habits, sometimes feeding on the ground but more often



GREAT PANAMA CURASSOW, MALE (above) AND FEMALE (below)

CRESTED GUAN

found in bands in the tops of the trees of deep forest

2. *Penelope cristata cristata* (Linnæus)

Crested Guan. "Pavon"

Sexes alike.—Length, about 881 mm. (35.00 in.); tail, about 356 mm. (14.00 in.). Olive above, glossed with coppery green, the conspicuous crest darker, the lower back and rump changing to dull chestnut; tail dull chestnut glossed with coppery green; chest and breast dull olive, the feathers finely margined with white, presenting a streaked appearance; abdomen dull chestnut. Iris, carmine; bare skin of throat, dull carmine; feet coral red

Young.—Similar to adults.

A bird which, at the present time at least, is confined to the heavy forests of uninhabited districts and is much sought after by hunters, who call it *turkey*, as they do also *Crax globicera*. It is one of the most striking and interesting birds to be seen at Barro Colorado Island where it is still fairly common; it is usually found in pairs or small flocks in the upper parts of the largest trees, though often descending to the ground to feed. As seen in the tree tops, the plumage appears very dark, the crimson skin of the neck conspicuous in contrast and the large wings and broad tail, which spreads as it half leaps, half flies from limb to limb, make its size appear very impressive. In the evenings several often ap-

GRAY-HEADED GUAN

peared near the laboratory, and sometimes were seen to fly across the small clearing in front of the building. They would make the distance with a few flaps of the wings at the start, gliding the rest of the way.

It is quite noisy at times, having several loud and strident calls repeated again and again. One resembling the syllables *quenk, quenk, quenk*, many times reiterated and given in a resonant metallic tone is perhaps the commonest of them.

3. *Ortalis cinereiceps cinereiceps* (Gray) Gray-headed Guan. Chacalaca. "Faisana"

Sexes alike.—Length, about 560 mm. (22.00 in.); tail, about 243 mm. (9.60 in.). Top of

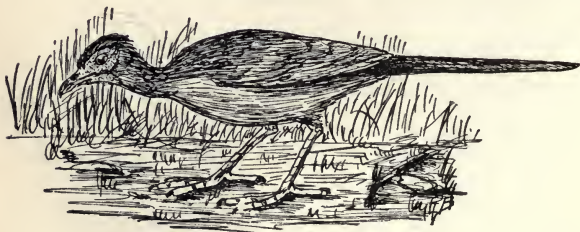


FIG. 4. *Ortalis c. cinereiceps*

head and nape dark gray; remaining upper parts grayish brown; tail darker brown and broadly tipped with grayish buff; longer wing quills bright chestnut; chest grayish brown shading to grayish buff on breast and remaining under parts. Bill short, horn color; throat bare, except for a narrow middle line of blackish feathers.

FAMILY PERDICIDÆ

An inhabitant of partly open places as well as of the forest, often seen in tall trees or on or near the ground. A common name of this conspicuously crested, long-tailed bird is derived from its call, chiefly heard in the early morning and evening, a harsh and far reaching reiteration of *chacalaca, chacalaca*.

3. Family PERDICIDÆ

The Quails and Partridges

These are more or less completely terrestrial, stout-bodied, rather short-legged birds closely related to the grouse and pheasants, but of a smaller size and having a short tail. The bill is very short, the head often crested, the wings rounded, the plumage usually handsomely variegated but lacking in brilliant colors.

The quails mostly frequent brushy or more or less open localities, feeding on seeds and insects and nesting on the ground. They lay numerous eggs and the brood often remains together in a flock until the following year. Though they fly swiftly, they are good runners and often prefer to make their escape on foot.

1. *Odontophorus guianensis panamensis*

Chapman

Marbled Guiana Quail

Odontophorus guianensis marmoratus STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 242.

Length, about 230 mm. (9.00 in.); tail, about 76 mm. (3.00 in.).

MARbled GUIANA QUAIL

Male.—Brown with an elongated brown crest, the lower back buffy brown, the wing coverts with heavy black markings, the wing quills



FIG. 5. *Odontophorus guianensis panamensis*
(Nat. Size)

barred on the outer webs with brownish buff; throat, sides of neck and upper back tinged with gray; lower parts finely and not very distinctly barred with brownish and buff and dusky. Bill black; bare skin orange; feet grayish.

Female.—Similar to male, the feathers of the crest less elongated.

An abundant species but very difficult to see. They are found in low jungle, brush, and open grassy country and can conceal themselves absolutely in tufts of grass. I had two in captivity for three weeks. They were terrified at being approached. They have many lovely, sweet and liquid whistling notes varied by a tremulo,

FAMILY COLUMBIDÆ

all delivered rapidly and almost breathlessly. After learning their notes I heard them near the Gamboa road and the Cruces Trail, but only once caught a glimpse of one.

4. Family COLUMBIDÆ

The Pigeons and Doves

The domestic pigeons make the characters of this group familiar to everybody, though its members vary much in size. They are graceful, rather stout-bodied birds, with a small head, rather small and narrow bill, the wings generally rather long and pointed, giving a powerful flight and producing a whistling or rustling sound as they fly; the plumage usually smooth and rather subdued in color, but often with some metallic luster, especially on the neck; and with short legs and a tail of varying length and shape, never forked. There are several hundred species found in all temperate and tropical regions; they are especially numerous in New Guinea and adjacent islands. They have a tough gizzard for grinding up the seeds of which their food largely consists. In habits they vary from chiefly arboreal to more or less terrestrial. Their notes are generally soft and cooing, as in the domestic pigeons, but those of the different species are generally distinguishable by one familiar with them.

The members of this family are an important source of food for the Indians and residents of the less thickly settled parts of the Panama region, and are so constantly

SCALED PIGEON

hunted that the larger species are very wild. This and their general similarity when seen at a distance and the small differences between their call notes, make the larger species difficult for the bird student. The little ground doves are however, among the tamest of all birds.

1. *Columba speciosa* (Gmelin) Scaled Pigeon. "Paloma de Montana"

Lepidænas speciosa RIDGWAY, Birds of N. and M. Amer., VII, p. 316, 1916.

Length, 300 mm. (11.80 in.); tail, 103 mm (4.10 in.).

Male.—Top (including nape) and sides of head purplish maroon passing to chestnut on



FIG. 6. *Columba speciosa*
(Nat. Size)

remaining upper parts including scapulars and lesser wing coverts, the neck all around and upper chest glossed with metallic purple, bronze

PALE-VENTED PIGEON

or green, and with heavy scale-like markings of black spotted with white, these white spots continuing to the upper back, increasing in size and changing to cinnamon; tail grayish brown and black: lower chest and breast pale purple drab, the feathers margined with brown: abdomen and under tail coverts white. Iris, brown; bill red with white tip; feet purplish.

Female.—Similar to male but duller.

Young.—Duller in coloration than adults and with only a suggestion of scaling and spotting.

A handsome, strikingly marked and unmistakable species. Both Hallinan and Jewel record it, Hallinan on very high trees and Jewel, in a thicket.

2. *Columba rufina pallidicrissa* (Chubb)

Pale-vented Pigeon. "Torcaza"

Chlorænas rufina pallidicrissa RIDGWAY, Birds of N. and M. Amer., VII, p. 305, 1916.

Length, 317 mm. (12.50 in.); tail, 113 mm. (4.45 in.).

Male.—Forehead and front of crown vinaceous drab passing on remainder of top of head and nape to gray, and brightly glossed with metallic green and bronze; sides of head light gray, fading to whitish on chin and upper throat and deepening to gray on lower throat; neck all around and breast vinaceous or purplish drab, fading to ashen on lower abdomen and under tail coverts;

SHORT-BILLED PIGEON

back and scapulars the same color as neck and somewhat glossed; rump and tail plain gray. Iris orange red; bill black; feet red.

Female.—Similar but duller.

Young.—Similar to adults but duller.

“It frequents the trees along the margins of rivers, or in open woodland, or the clumps of trees scattered about in pastures and coffee plantations.” (Carriker.) In March, 1926, one was seen in the trees around a lagoon on Pedro Gonzales, one of the Pearl Islands.

3. *Columba nigrirostris* (Sclater) Short-billed Pigeon

Cenenas nigrirostris RIDGWAY, Birds of N. and M. Amer., VII, p. 328, 1916.

Length, 274 mm. (10.80 in.); tail, 112 mm. (4.45 in.).

Male.—Top of head and hindneck strong, vinaceous drab, (the latter sometimes with indistinct paler spots) passing to lighter vinaceous drab on sides of head and neck; remaining upper parts brownish drab; under parts vinaceous drab, paler on chin and throat; eyelids, legs and feet crimson. Iris rose pink; bill black.

Female.—Similar to male but usually duller.

Young.—General color of head, neck and under parts rusty brown.

Found in the tops of forest trees.

4. *Chæmepelia minuta elæodes* (Todd)

Plain-breasted Ground Dove. "Cocochita"

Length, 149 mm. (5.85 in.): tail, 50 mm. (2.00 in.).

Male.—General color above grayish brown passing to bluish gray on forehead and hind-neck; two bars of bluish black spots and some irregular spots of the same color on the wings, the inner edges of the longer quills reddish chestnut, the under surface of the wings mostly reddish chestnut (visible in flight); middle pair of tail feathers brownish gray, the remaining ones grayish brown crossed by a band of black broadening outwardly and narrowly tipped with white; under parts strong vinaceous buff, paler on throat and abdomen. Iris light yellowish brown; bill gray; feet pink.

Female.—Similar to male but the vinaceous drab replaced by light drab or grayish drab.

Young.—Similar to female but paler.

Common and widely distributed and very tame. It may be found along the sides of the Gamboa road in small flocks on the ground during the spring months.

5. *Chæmepelia rufipennis rufipennis* (Bonaparte)

Ruddy Ground Dove

Length, 165 mm. (6.50 in.); tail, 62 mm. (2.45 in.).

Male.—Cinnamon brown above, the top of the head brownish gray, paler and tinged with

SHORT-BILLED PIGEON

back and scapulars the same color as neck and somewhat glossed; rump and tail plain gray. Iris orange red; bill black; feet red.

Female.—Similar but duller.

Young.—Similar to adults but duller.

“It frequents the trees along the margins of rivers, or in open woodland, or the clumps of trees scattered about in pastures and coffee plantations.” (Carriker.) In March, 1926, one was seen in the trees around a lagoon on Pedro Gonzales, one of the Pearl Islands.

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Female.—Similar to male but usually duller.

Young.—General color of head, neck and under parts rusty brown.

Found in the tops of forest trees.

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Plain-breasted Ground Dove. "Cocochita"

Length, 149 mm. (5.85 in.): tail, 50 mm. (2.00 in.).

Male.—General color above grayish brown passing to bluish gray on forehead and hind-neck; two bars of bluish black spots and some irregular spots of the same color on the wings, the inner edges of the longer quills reddish chestnut, the under surface of the wings mostly reddish chestnut (visible in flight); middle pair of tail feathers brownish gray, the remaining ones grayish brown crossed by a band of black broadening outwardly and narrowly tipped with white; under parts strong vinaceous buff, paler on throat and abdomen. Iris light yellowish brown; bill gray; feet pink.

Female.—Similar to male but the vinaceous drab replaced by light drab or grayish drab.

Young.—Similar to female but paler.

Common and widely distributed and very tame. It may be found along the sides of the Gamboa road in small flocks on the ground during the spring months.

5. *Chæmepelia rufipennis rufipennis* (Bonaparte)

Ruddy Ground Dove

Length, 165 mm. (6.50 in.); tail, 62 mm. (2.45 in.).

Male.—Cinnamon brown above, the top of the head brownish gray, paler and tinged with

BLUE GROUND DOVE

wine color on the forehead and hindneck; wings reddish chestnut with two black bars; middle pair of tail feathers cinnamon brown, the remaining ones mostly black; sides of head pale grayish vinaceous fading to whitish on chin and upper throat and deepening to tawny vinaceous on under parts; most of the under surface of the wings reddish chestnut. Iris red; bill light with a darker tip; feet reddish pink.

Female.—Similar but without vinaceous tint. Buffy brown above and buffy drab or drab gray below fading to whitish on abdomen, chin and upper throat.

Similar in habits to *Chæmepelia minuta elæodes* and often found associating with that species, though somewhat less common.

6. *Claravis pretiosa* (Ferrari-Perez)

Blue Ground Dove. "Cococha"

Length, 204 mm. (8.00 in.); tail, 76 mm. (3.00 in.).

Male.—General color plain bluish gray fading to whitish on forehead; back dark bluish slate; wings with black spots and bars; the middle pair of tail feathers slate gray, the remaining ones black; under wing coverts light bluish gray. Iris light pinkish yellow; bill greenish with a dark line along the ridge; feet pink.

Female.—Deep buffy brown above, paler on forehead and changing to cinnamon brown or russet on middle tail feathers; remaining tail

VERREAUX'S DOVE

feathers black; markings on wings chestnut (instead of black); foreneck and chest pale drab passing to white on chin and throat and paler on remaining under parts, the under tail coverts russet.

Young.—Similar to female, the immature male in intermediate plumage.

Unlike the other small ground doves this one frequents the thick jungle and forest singly or in pairs, flying up when startled with a whistling sound produced by its wings. The contrast in coloring between male and female assists in identification. I saw a pair up the Chilibri River, my attention being attracted to them by their soft dove-like coos, although unfortunately I did not make a note on them at the time. They were walking about on the shore of the stream under some bushes. Another time I saw a pair near Gamboa fly out of a thicket.

7. *Leptotila verreauxi verreauxi* (Bonaparte) Verreaux's Dove. "Paloma Rabiblanca"

Length, 266 mm. (10.50 in.); tail, 102 mm. (4.00 in.).

Male.—Drab gray above fading to pale vinaceous gray on forehead, the sides of the crown tinged with vinaceous, the hindneck glossed with metallic purplish bronze and green; the middle tail feathers like upper parts, the outer tail feathers darker, the four outermost pairs tipped with white; sides of head and neck, fore-

CASSIN'S DOVE

neck and most of the under parts pale vinaceous drab or pinkish gray fading to whitish on chin and abdomen; under surface of wing cinnamon, (visible in flight). Iris orange yellow; bill black; feet red; bare skin surrounding eye blue.

Female.—Similar to male.

Young.—Coloration much duller than in adults.

The commonest and most widely distributed of the larger doves of the Canal Zone. It is an inhabitant of the brushy jungle and of the dry and more open country, rather than of the forest. It also occurs in the islands of Panama Bay and is often found about, and even in, the towns and cities, if not too much molested. Usual note a slow soft mournful coo; when heard nearby it is often four-syllabled, but the third is louder and longer than the others and carries to a much farther distance, being therefore often the only one heard. The final syllable is indistinctly separated from the third and slightly higher, giving an inquiring tone to the call. This bird also makes such motions with its head and tail as are described for the next species, *L. c. cassini*. It generally keeps in rather low trees on or near the ground.

8. *Leptotila cassini cassini* (Lawrence)

Cassin's Dove

Length, 246 mm. (9.70 in.); tail, 86 mm. (3.40 in.).

Male.—Above olive brown, grayer and glossed

RUDDY QUAIL DOVE

with purplish on hindneck, top of head concolor with back, passing to pale gray on forehead; tail the same color as upper parts; the outermost feathers (one to three pairs) black terminally and tipped with white; sides of head pale brownish gray passing to pale purplish gray on neck and chest and to creamy white on throat and lower abdomen, the middle under parts tinged with vinaceous; under surface of wings mostly cinnamon (visible in flight). Iris light yellow; bill black; bare skin surrounding eye red; feet red.

Female.—Similar to male.

Young.—Very different. Feathers of top of head and nape finely streaked with cinnamon russet; some of the wing quills tipped with cinnamon or russet; chest dull brown, the feathers tipped with paler or with cinnamon.

A bird of the deep forest, preferring damp and heavily shaded places and usually found on the ground. It allows a near approach before flying up and generally alights on some low perch where it sits moving its head back and forth and its tail up and down, keeping the body quite still. Note is a mournful *coo* of more uniform pitch and less resonant than that of the last species.

9. *Oreopeleia montana* (Linnæus)

Ruddy Quail Dove

Length, 229 mm. (9.00 in.); tail, 75 mm. (3.00 in.).

FAMILY RALLIDÆ

Male.—General color of upper parts reddish chestnut, paler on the forehead, the hindneck and back and sometimes the top of the head faintly glossed with metallic purple; a broad stripe of pinkish cinnamon through the cheeks bordered below by a patch of chestnut, confluent with the color of hind neck; throat light pinkish cinnamon; face, neck and chest vinaceous fawn color, fading to buff on abdomen. Bill red tipped with dusky; legs and bare skin of face purplish red.

Female.—Very different in color. Light olive replacing the chestnut of upper parts of male, the forehead paler and tinged with cinnamon, sides of head to front of cheeks like forehead and bordered by a patch of darker below.

Young male.—With dusky bars and terminal spots of reddish brown on back, scapulars and middle of quills.

Young female.—Upper parts darker and with conspicuous transverse spotting on wing coverts; chest grayish brown, the feathers more or less distinctly tipped with cinnamon.

A rather small species found on or near the ground in heavy forest. It is very shy and retiring. Neither Jewel nor Hallinan took it. "Cana and Pablo Stations, Canal Zone" (Ridgway).

5. Family RALLIDÆ

The Rails, Coots and Gallinules

This is a varied assemblage of birds related to the cranes and less closely to the herons,

CAYENNE WOOD RAIL

but of much smaller (sometimes very small) size and with shorter legs and neck. The bill varies from long and slender to short and more or less conical, the wings are usually short and rounded and the tail very short and held cocked up. They are birds of swamps and marshes and usually have the toes lengthened to increase their support for walking on soft mud. A few species (the coots and gallinules) swim well and spend much of their time on the water, but the majority of them skulk in the reeds, grass and undergrowth in wet places and are not easily flushed from their concealment. They are slow fliers; nevertheless some of them perform extensive migrations. Most of them have short, sharp alarm notes, and often curious, prolonged calls heard chiefly or only during the breeding season.

1. *Aramides cajanea cajanea* (P. S. L. Müller) Cayenne Wood Rail

Sexes similar.—Length. about 304 mm. (12.00 in.); tail, about 63 mm. (2.50 in.). Back brownish olive changing to black on rump; head and hind neck slate gray, extending to upper back, the head tinged with chestnut; tail black; sides of head and neck gray shading to white on throat; chest and breast orange chestnut; abdomen black; thighs slaty gray. Bill rather short, greenish orange at base; bare skin around eye red; feet red.

SORA RAIL

A retiring inhabitant of damp forest, especially near water. If seen at all it is usually noticed sneaking off into the adjacent vegetation from the bank of some river or other water,



FIG. 7. *Aramides c. cajanea*

where it has been feeding. Jewel reports it from the Chagres River below Gatun, also a nest at Toro Point. "It is common in the mangroves near Colon" (Griscom).

2. *Porzana carolina* (Linnæus) Sora Rail

Sexes alike.—Length, 203 mm. (8.00 in.): tail, about 59 mm. (2.00 in.).

Adult.—General color above olive brown varied with broad black, and narrow white streaks: the feathers surrounding bill, a streak through the crown, and the central line of the throat, black; a narrow streak above eye, sides of face and neck, and chest, gray; middle of

WHITE-THROATED CRAKE

breast and abdomen white; sides of breast and flanks pale olive brown barred with dusky and white. Bill short, yellow at base; iris bright chestnut.

Young.—Similar but without the black on the face and throat; the sides of the neck and the chest light brown (shading to whitish on the throat) instead of gray.

A migrant of retiring habits found in marshes; apparently not common in the Canal Zone.

3. *Creciscus albigularis* (Lawrence)

White-throated Crake

Sexes similar.—Length, 147 mm. (5.80 in.); tail, 32 mm. (1.25 in.). General color above reddish chocolate brown shading to bright chestnut on hindneck and upper back; wings and tail dusky brown; throat white; chest whitish heavily washed with chestnut; middle of breast and abdomen white, the sides of the breast, flanks and under tail coverts evenly barred black and white. Bill short, black.

An inhabitant of grassy fields and meadows, not necessarily wet, though it is probably rarely found far from water. Said to be common at times at Monte Lirio.

4. *Ionornis martinica* (Linnæus)

Purple Gallinule

Sexes alike.—Length, 315 mm. (12.40 in.); tail, 71 mm. (2.80 in.). Head, neck and under

FAMILY HELIORNITHIDÆ

parts purplish blue, shading to black on abdomen; remaining upper parts olive green, the upper back and wings light blue tinged with greenish; tail black; under tail coverts white. Frontal shield blue; bill short, red, tipped with pale greenish; legs yellow.

Young.—Resembling adults but head, neck and upper parts washed with brownish.

A handsomely colored bird with a conspicuous frontal shield of blue and a red bill. Frequent swamps and waters with abundant aquatic vegetation. One was seen sitting on a low stump on Gatun Lake in March, 1924, and others at various times in the large patches of water-hyacinths at the mouth of the Chilibri River.

6. Family HELIORNITHIDÆ

The Finfoots

A very small group of aquatic birds of the tropical regions of both hemispheres. They somewhat resemble grebes in size, general appearance and in the structure of their feet, but have a better developed tail. In some of their anatomical characters a relationship to the rails seems to be indicated. There is but one American species, which frequents quiet woodland streams. Not very much has been learned regarding its habits. The family seems to be a survival of a much larger group most of which have become extinct.

PLATE IV.



Photograph by Dr. Alfred O. Gross.

PURPLE GALLINULE WITH NEST, YOUNG, AND PIPPED EGGS. BARRO COLORADO ISLAND.



AMERICAN FINFOOT

1. *Heliornis fulica* (Boddaert)

American Finfoot

Sexes alike.—Length, 305 mm. (12:00 in.); tail, 89 mm. (3.50 in.). Grayish brown above, the back tinged with olive; tail dark brown



FIG. 8. *Heliornis fulica*

narrowly tipped with white; top of head, hind-neck and sides of neck black, the black converging at the base of the throat, enclosing the white chin and throat; a line above and extending behind the eye, feathers surrounding eye and a line extending along sides of neck to back, white; hind part of cheeks and ear coverts buffy chestnut; chest grayish; breast and abdomen white; sides and flanks grayish brown. Bill red, passing to white below; feet yellowish white, the toes barred with black. Tail graduated and fan-shaped when spread.

An inhabitant of forest streams and shaded swamps, apparently not at all common in the Canal Zone. It occurs on Gatun Lake and its larger tributaries. "A very shy bird. Its call a peculiar 'bark' of one to three notes" (Jewel). "When disturbed, they swim at once for cover, to reach which they are sometimes obliged to cross the river, and will fly if hard pressed or if the distance is considerable. . . . A bird will often sink below the surface leaving only the head exposed, but as it always faces the object in pursuit, its white breast is readily seen, even under water. . . . My observations are to the effect that it only dives as a last resort." (Richmond).

7. Family COLYMBIDA

The Grebes

A small family of swimming birds of small or medium size, having the feet adapted for swimming by means of lobate projections along the side of the toes which are connected by continuous webs, only near their bases. The bill varies from long and slender to rather short and stout, and is not broadened as in the ducks; the wings are rather short, the tail rudimentary and the plumage very compact.

The grebes are among the most expert swimmers and divers; they spend most of their time on or under the water, and though able to fly well, almost invariably attempt to escape from their enemies by diving, being

able to traverse long distances under water and to swim with only the head exposed when they wish to escape notice. The family is represented in most parts of the world.

1. *Colymbus dominicus brachypterus*
Chapman
Mexican Grebe

Length, about 203 mm. (8.00 in.); practically no tail.

Sexes alike.—Brownish gray washed into black above, the top of the head black; sides of head and neck all around, slate gray; chin and throat speckled with black and dull white; chest washed with cinnamon buff; remaining under parts silvery gray irregularly marked with dusky and washed with buff. Bill rather thick and very short.

A small short-necked, short-billed grebe. It is not recorded by either Stone or Hallinan.

2. *Podilymbus podiceps* (Linnæus)
Pied-billed Grebe

Length, 345 mm. (13.50 in.).

Sexes alike.—**Summer plumage.**—Upper parts glossy brownish black; throat black; chest, front and sides of neck and body, brownish, indistinctly marked with black; breast and abdomen white. A black band across bill.

FAMILY PUFFINIDÆ

Winter plumage.—Throat white. Bill without black band.

Young.—Similar to adults in winter.

Dr. Chapman informs me that Mr. Van Tyne has found this grebe nesting in the vicinity of Barro Colorado Island.

8. Family PUFFINIDÆ

The Shearwaters and Fulmars

The shearwaters, the only Panama representatives of the family, are long-winged, web-footed sea birds, gull-like in size and build, but distinguishable by the bill, which is fairly long, hooked at the tip and has the nostrils produced into a pair of very short, forwardly directed tubes ending obliquely. Their plumage is brown or dusky, at least on the upper parts.

Shearwaters are oceanic birds, spending their time ranging low over the ocean and picking up what food they can from its surface. They come ashore only to nest, breeding in burrows in the ground or crevices in rocks.

1. *Puffinus creatopus* (Coues)

Pink-footed Shearwater

Sexes alike.—Length, 510 mm. (20.00 in.); tail (middle feathers) 97 mm. (3.80 in.). Above dusky grayish brown with paler edges to feathers of back: below white, the sides of the neck and

SOOTY SHEARWATER

the flanks mottled with grayish. (There is a variation in the amount of grayish mottling on the under parts). Bill pale yellowish flesh color; feet flesh color.

May occasionally visit the Bay of Panama under the same conditions as the following species *P. griseus*, with which it associates. Its only known breeding places are on Juan Fernandez and Santa Clara Islands off Chile.

2. *Puffinus griseus* (Gmelin) Sooty Shearwater

Sexes alike.—Length, about 458 mm. (18.00 in.); tail about 106 mm. (4.20 in.), graduated 23 mm. (0.90 in.). Plumage generally sooty brown, grayer below, the throat and breast paler. Bill blackish.

Breeds far south in the southern hemisphere, migrating to the North Atlantic and North Pacific. It is mostly likely to occur in the Bay of Panama in summer or fall. "The flight of the Sooty Shearwater is swift, graceful and strong; like the other species of *Puffinus* it can sail for long distances on its long, stiff wings without even a tremor, except to adjust them slightly to the wind, rising at will over the crests of the waves or gliding between the valleys of them. . . . Although usually to be found only far offshore, shearwaters are occasionally driven in near the land by stormy weather, particularly when gathering in flocks or migrating." Bent,

SLENDER-BILLED SHEARWATER

"Life Histories of North American Petrels and Pelicans and Their Allies," *Bull. 121, Nat. Mus.*, p. 87.

3. *Puffinus tenuirostris* (Temminck) Slender-billed Shearwater

Sexes alike.—Length, about 356 mm. (14.00 in.); tail about 89 mm. (3.50 in.). Sooty black above, shading to black on wing quills and tail feathers; below smoky gray, paler on throat; under tail coverts sooty blackish. Bill (dry) dusky greenish yellow; feet (dry) yellowish.

Breeds in the Australian and New Zealand regions, migrating north in the season that is summer in the north. Apparently of only accidental occurrence in the Bay of Panama.

Hallinan says, "Naos Island June 8, 1915. Male. Picked up on the water. There were several floating on the water in the vicinity, apparently exhausted. . . . This observation extends the known range of this species southward into Central America."

9. Family HYDROBATIDÆ

The Petrels

A large family of sea birds very closely related to the shearwaters, but mostly of smaller size (some of them scarcely larger than an ordinary song bird) with more perfectly developed tubular nostrils and usu-

LEAST PETREL

ally with longer legs. Their plumage is dusky, sometimes relieved by areas of white. They are perhaps the most perfectly oceanic of all birds, keeping far out at sea, flitting close to the tops of the waves, and rarely approaching land except to breed or when blown in by storms. Like the shearwaters, they nest in burrows in the ground or in crevices, laying only one or two eggs.

1. *Halocyptena microsoma* Coues

Least Petrel

Sexes alike.—Length, 140 mm. (5.50 in.); tail, 50 mm. (2.00 in.). General color brownish black, browner below. Bill and feet black.

A very small petrel with no white in the plumage, found on the Pacific coast from Lower California to Ecuador. One flew aboard the *Albatross* and was captured in the Bay of Panama in 1888. "Known to breed only on San Benito Island off the Pacific coast of Lower California." Bent, "Life Histories of North American Petrels and Pelicans and their Allies," *Bull. 121, Nat. Mus.*, p. 125.

2. *Oceanodroma melania* (Bonaparte)

Black Petrel

Sexes alike.—Length 229 mm. (9.00 in.); tail, 102 mm. (4.00 in.). Plumage sooty brown above, more smoky below and grayer on wing

BLACK PETREL

coverts, blacker on wing quills and tail. Bill and feet black.

An entirely dark-colored petrel with a somewhat forked tail. In flight it alternately glides



FIG. 9. *Oceanodroma melania*

and flutters, dragging its feet on the tops of the waves. On a trip to the Pearl Islands in July, 1924, we saw two of these petrels near our boat about sunset. After dark one flew aboard and we caught and examined it. It answered the description of this species.

3. *Oceanites oceanicus* (Kuhl)

Wilson's Petrel

Sexes alike.—Length about 173 mm. (6.80 in.); tail about 63 mm. (2.50 in.). General color dark sooty brown, paler below, pale gray on wing coverts, black on wings and tail; *upper tail coverts and sides of rump white*; under tail coverts mixed with whitish. Bill and feet black, the webs between the toes with a large yellow area. Legs long; tail slightly rounded.

Widely distributed on both the Atlantic and Pacific Oceans and probably the commonest and best known of the small Stormy Petrels or Mother Cary's Chickens. It breeds on the antarctic islands. Its flight is irregular, a swallow-like fluttering alternating with short glides.

10. Family HÆMATOPODIDÆ

The Oyster Catchers

A family consisting of a single genus of large, stout-bodied shore birds having the legs and neck of moderate length and the bill rather long, straight and compressed, ending squarely in a vertical, chisel-like edge. The few species are distributed over most regions of the world.

1. *Hæmatopus palliatus palliatus* Temminck

American Oyster Catcher

Male.—Length, 432 mm. (17.00 in.); tail, 98 mm. (3.85 in.). Head, neck and upper

AMERICAN OYSTER CATCHER

breast black; back and wing coverts olive brown; wings and tail (except base), fuscous; area on wing, and upper tail coverts white, base of tail white; lower breast and abdomen

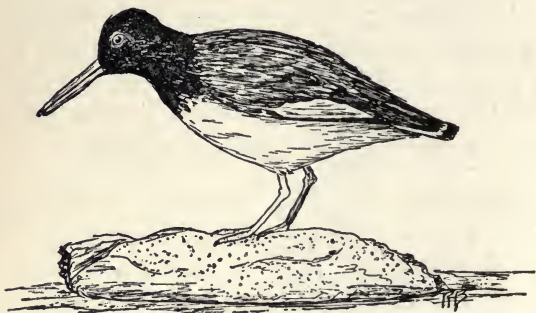


FIG. 10. *Hæmatopus p. palliatus*

abruptly white. Bill twice as long as head, compressed from side to side, *bright red*; eye ring red; feet flesh color.

Female.—Like male but a little larger.

Young.—Color duller, the black, dusky; bill brownish, feet dull grayish.

This large, heavily built bird frequents the sea coast, usually in pairs, seeming to prefer rocky shores. It has a loud prolonged call which it often utters at night as well as in the day time. It is not uncommon in spring on the islands of Panama Bay, and has been recorded from the beaches just east of Panama City.

II. Family CHARADRIIDÆ

The Plovers

A widely distributed family of shore birds very closely related to the snipe family, from which they differ in usually having but three toes, the hind one generally wanting, the head proportionately larger, the bill not longer than the head, and hard and pointed terminally. With one exception the Canal Zone species are migratory. The remarks in regard to wanton destruction by gunners made under the snipe family, apply to these birds also. The turnstones, sometimes made a separate family, are here included among the plovers.

1. *Squatarola squatarola* (Linnæus)

Black-bellied Plover

Length, 280 mm. (11.00 in.); tail, 77 mm. (3.00 in.).

Sexes alike.—**Adults in summer.**—Upper parts grayish white, nearly pure white on forehead, over the eyes and on a stripe down the sides of neck, but thickly spotted with transverse markings of black on back and rump; tail white, narrowly barred with dusky; *below, including sides of head, entirely black* except thighs and under tail coverts which are white. Bill and feet dark gray, the hind toe present but very minute.

Adults in winter.—Upper parts grayish brown with dark grayish markings and white margins

WILSON'S PLOVER

to the feathers; below white obscurely streaked and washed with gray on foreneck and chest.

Young.—Somewhat similar to winter adults but with yellowish spots and edgings to feathers of back.

A rather uncommon migrant found singly or in small flocks, recorded by Hallinan from the mouth of the Rio Venado, in March. It is chiefly a bird of the beaches, recognizable in any plumage by its large size, stout build and large round head.

2. *Pagolla wilsonia beldingi* Ridgway Belding's Plover

Length, 190 mm. (7.50 in.); tail, 45 mm. (1.80 in.).

Sexes similar.—**Adult.**—In general similar to *Charadrius semipalmatus*, but the bill noticeably larger and stouter, the back lighter, the sides of the head brownish gray like back, and the white of the forehead extended back into a line over the eye. No colored eye ring.

Young.—Similar, but breast band grayish brown, and fore part of crown grayish brown instead of black. Bill black; feet flesh colored.

A bird of sandy beaches, a rare migrant in the Canal Zone. Recorded by Hallinan from near Panama City in August.

3. *Oxyechus vociferus vociferus* (Linnæus)

Killdeer

Sexes alike.—Length, 255 mm. (10.00 in.); tail, 95 mm. (3.70 in.). Forehead, streak over the eye, throat, ring around the neck, and rest of underparts, white except for two black bands crossing chest, the upper one broadest; crown and back grayish brown; rump and upper tail coverts tawny; tail feathers largely tawny, becoming black towards the end and tipped with white. Bill black; feet light grayish.

A migrant recorded by Jewel from Gatun. Seen also at Patillo Point in the spring. Found in open places inland as well as along the shore. Its commonest note is a shrill two-syllabled call from which it gets its name. The tawny, black and white of the rather long tail is conspicuous when the bird is flushed.

4. *Charadrius semipalmatus* (Bonaparte)

Semipalmated Plover

Ægialitis semipalmata STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 244.

Sexes similar.—Length, 178 mm. (7.00 in.); tail, 55 mm. (2.20 in.). Above brownish gray; front of crown, band across base of bill, sides of head below eye, and band on breast that almost encircles neck, black; forehead, throat, ring around neck above the black band, parts of outer tail feathers, and under parts, white.

COLLARED PLOVER

Bill black, orange at base; ring around eye orange; feet yellow. In immature and winter plumage black replaced by brownish gray.

A migrant generally found in small flocks along the beaches and mud flats, often associating with the small sandpipers. About the first of April this species occurs in almost inconceivable numbers along the rocky shores on the Pacific side. Flocks seen near Panama about the end of March sometimes contained as many as 25,000 individuals at the lowest estimate, covering the rocks along the shore when they alighted; or flying in dense clouds over the water, their white under parts gleaming in the sunlight when they banked in making turns.

5. *Charadrius collaris* (Vieillot) Collared Plover. "Chiros"

Ægialitis semipalmatus STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 245.

Sexes alike.—Length about 145 mm. (5.70 in.); tail about 44 mm. (1.75 in.). Similar to

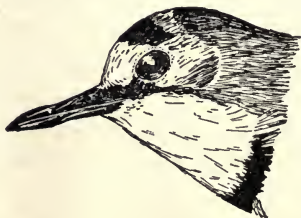


FIG. II. *Charadrius collaris*
(Nat. Size)

RUDDY TURNSTONE

Charadrius semipalmatus, but forehead and sides of head with more white interrupted by black band from bill to eye.

This very small South and Central American species is found both along the coast and rivers, but appears to be rare in the Canal Zone.

6. *Arenaria interpres morinella* (Linnæus) Ruddy Turnstone

Length, 241 mm. (9.50 in.); tail, 60 mm. (2.40 in.).

Male in Summer.—Strikingly variegated with black, white and rufous. Head and neck largely white, the crown streaked with black; back and scapulars mostly bright rufous chestnut with broad black bands; lower back white, upper tail coverts black, tail white with a black band; throat and bar on wing white; chest and breast black, a black band extending forward and upward across forehead, and two extending up on sides of neck and chest; rest of under parts white. Bill not longer than the head, tapering from the middle to an acute tip, black; legs orange red.

Female in summer and both sexes in winter.—With a similar pattern of coloration, but colors duller, plain brown replacing the rufous chestnut, the black areas broken by dull whitish tips to the feathers, and restricted in extent and intensity.

Young.—Still plainer than winter adults, the black areas replaced by dusky or grayish brown and less well defined, often much restricted on

FAMILY RECURVIROSTRIDÆ

the chest and breast, the under parts being mostly white.

A migrant, found along the sea shore, both on beaches and in rocky places, usually singly or in small groups, and often in association with other shore birds. It has a single sharp note often very rapidly repeated and blended into a prolonged call. Hallinan records it from Naos, Venado and Cocori Islands in May. Noted at Patillo Point in April, 1926.

12. Family RECURVIROSTRIDÆ

The Avocets and Stilts

This family, represented in the Canal Zone by a single species, is a small one, including only three genera and less than a dozen species, but is quite widely distributed. They are slender, very long-legged birds with a long narrow bill which is either straight or more or less turned upward.

1. *Himantopus mexicanus* (P. S. L. Müller)

Black-necked Stilt

Length, 381 mm. (15.00 in.); tail, 71 mm. (2.80 in.).

Male.—Top of head, back of neck and much of upper parts glossy greenish black, the lower back and rump white; tail pale gray; a spot above and one below the eye, the forehead and entire under parts immaculate white. Bill black, and

FAMILY SCOLOPACIDÆ

slightly upcurved; feet rose pink, the toes extremely long and partially webbed.

Female.—Similar but back and scapulars grayish brown.

Recorded by Jewel from Gatun Dam. Seen on the mud flats near Amador and Old Panama, at low tide, always solitary, wading in the salty pools left by the tide. "The flight, with neck and legs extended, is unlike that of any shore bird, and reminds one more of the Jacanas." Barbour, "Birds of Cuba," *Mem. Nutt. Ornith. Club*. They have a single sharp call, often repeated several times.

13. Family SCOLOPACIDÆ

The Snipe, Sandpipers and Their Allies

This family comprises shore birds having a more or less elongated, straight or gently curved bill with a somewhat blunt, soft and sensitive tip, so that it is adapted to probing in soft sand or mud after the burrowing worms and other small creatures on which they chiefly feed. Their legs are long or moderately so, their wings long and pointed, and the plumage streaked and exhibiting more or less seasonal change.

These birds range in size from sandpipers no larger than a sparrow to curlews having the stature of a small heron. They frequent beaches and marshes and perform extensive migrations, most of them breeding far north. Their habit of flying in dense flocks and the

HUDSONIAN CURLEW

confiding, unsuspecting nature of all but some of the larger species, has made this family one of the greatest sufferers from hunting. One American species is extinct in consequence and several others have been brought near that condition. The killing of most of the species has been made illegal in the United States and Canada and some protection for them in the Central and South American regions to which they migrate would be very desirable. It is difficult to imagine a more degraded and degrading form of "sport" than firing into a flock of the gentle little creatures, which, when many of their number have been so killed, are as likely as not to circle around and alight again within range of the gunner, and most of which are too small to afford more than a mouthful of meat, if indeed they are killed for any other purpose than the pleasure that slaughter of beautiful and harmless creatures affords such people. It is only fair to the Panamanians to say that those most frequently guilty of it are not the natives of that Republic.

I. *Numenius hudsonicus* Latham Hudsonian Curlew. "Chirela"

Phæopus hudsonicus, RIDGWAY, Birds of N. and M. Amer., VIII, p. 402, 1919.

Sexes alike.—Length, 458 mm. (18.00 in.); tail 95 mm. (3.75 in.). Crown dusky brown with a buff central stripe; rest of upper parts blackish brown mottled with buff; sides of head and neck

DOWITCHER

and under parts light buff; a brownish streak through the eye; neck and breast spotted with brown. Bill blackish, lighter-colored near the

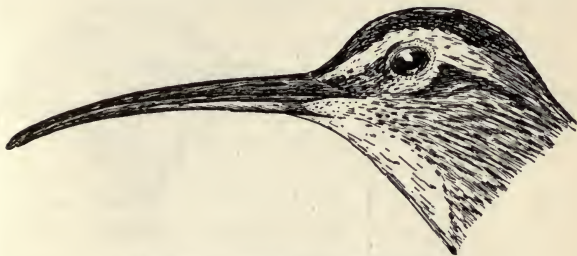


FIG. 12. *Numenius hudsonicus*

base; legs and feet grayish. Bill variable, averaging about 87 mm. (3.40 in.) long, gradually curved downward.

A migrant found singly or in small groups along the coast and larger rivers. Its flight is swift and steady with rapid beats of the wings and its curved bill is quite conspicuous. Note, a clear flute-like whistle often repeated five or six times in rapid succession.

2. *Macrorhamphus griseus griseus* (Gmelin) Dowitcher

Limnodromus g. griseus RIDGWAY, Birds of N. and M. Amer., VIII, p. 197, 1918.

Sexes alike.—Length 280 mm. (11.00 in.); tail 54 mm. (2.20 in.).

Adult in summer.—Upper parts mostly dull cinnamon buff streaked and spotted with black, the lower back, rump, and upper tail coverts

white, spotted and barred with blackish; tail barred with white and blackish; a dark streak through the eye; sides of head and neck and

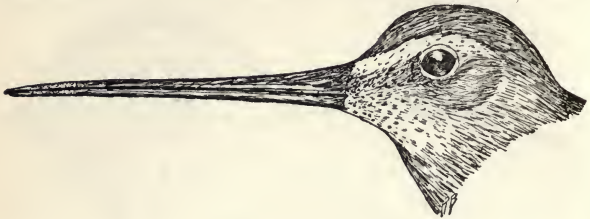


FIG. 13. *Macrorhamphus g. griseus*

under parts dull cinnamon more or less spotted with dusky and becoming white on abdomen.

Adults in winter.—Head, neck and back nearly plain gray; remaining upper parts as in summer; chest and sides also gray more or less intermixed with white; remaining under parts white; a whitish line over the eye.

Young.—Similar to adults in winter, more variegated with black above; under parts more buffy.

Bill very long, 57 mm. (2.25 in.) and perfectly straight, blackish olivaceous near base; legs greenish olive.

A migrant frequenting mud flats along the shore, sometimes found in flocks; apparently not common in the Canal Zone.

3. *Catoptrophorus semipalmatus* (Gmelin)

Willet

Length, 380 mm. (15.00 in.); tail, 75 mm. (3.00 in.).

Sexes alike.—Adults in summer.—Brownish gray above, the crown and hindneck streaked and the back spotted and barred, with dusky, wings dusky *with a very large white area on the quills*, upper tail coverts white, tail light brownish gray; below white, spotted and barred with dusky except on abdomen.

Adults in winter.—The brownish gray of the upper parts unstreaked, otherwise as in summer.

Bill blackish, rather long and straight; legs and feet gray.

Migratory. A large and often stupidly tame species, occurring both about inland waters and on the coasts; now greatly reduced in numbers. Conspicuous from the large white areas on the wings and from its loud, whistled notes. Recorded by Hallinan from the mouth of the Juan Diaz River in October.

4. *Totanus melanoleucus* (Gmelin)

Greater Yellowlegs

Neoglottis melanoleuca RIDGWAY, Birds of N. and M. Amer., VIII, p. 330, 1919.

Sexes alike.—Length 355 mm. (14.00 in.); tail, 77 mm. (3.00 in.). Upper parts dark ashy gray streaked and spotted with white; upper tail coverts white; tail white or ashy barred with black; under parts white, the breast spotted and the sides barred with blackish.

Adults in winter and Young.—Similar but upper parts more ashy and marking on under parts less distinct.

Bill long and straight, blackish; legs and feet bright yellow.

A migrant; a bird of slender build with long legs and long pointed wings. It has a loud whistle of several syllables by imitating which it may be easily induced to approach. The white rump is rather conspicuous in flight.

5. *Totanus flavipes* (Gmelin)
 Lesser Yellowlegs

Neoglottis flavipes RIDGWAY, Birds of N. and M. Amer., VIII, p. 337, 1919.

Sexes alike.—Length, 273 mm. (10.70 in.); tail, 63 mm. (2.50 in.). Similar to *Totanus melanoleucus*, except for its smaller size.

A migrant resembling the last species but smaller, apparently more common in the Zone. Observed in April and recorded by Jewel in May, August and October from Gatun and Mindi, on the Atlantic side.

6. *Tringa solitaria solitaria* (Wilson)
 Solitary Sandpiper

Helodromas s. solitarius STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 245.

Sexes alike.—Length, 213 mm. (8.40 in.); tail 55 mm. (2.20 in.).

Adults in summer.—General color of upper parts deep grayish brown, rather sparsely

SPOTTED SANDPIPER

speckled and streaked with whitish, the upper tail coverts and several of the outer tail feathers conspicuously white barred with dusky; under parts white, the sides and front of neck and chest, streaked with grayish dusky.

Adults in winter and Young.—More grayish above, the white speckling less distinct; under parts very indistinctly streaked; otherwise similar.

Bill greenish, black toward end; feet greenish.

A migrant frequenting inland waters, even the smallest streams; usually found singly. Fairly common and easily recognizable by its slender bill, dark coloration and conspicuously white outer tail feathers. Notes rather sharp and high pitched.

7. *Actitis macularia* (Linnæus)

Spotted Sandpiper

Sexes alike.—Length, 190 mm. (7.50 in.); tail 50 mm. (2.00 in.).

Adults in summer.—Upper parts bronzy grayish brown, head and neck more or less streaked, and back barred or spotted with black; outer feathers barred with white; line over the eye and under parts white, the latter with round black dots and spots.

Adults in winter and Young.—Back less conspicuously, if at all, marked; under parts white, unspotted.

Bill flesh colored, black tipped; feet pinkish.

UPLAND PLOVER

A migrant very common all winter in the Canal Zone both about fresh water and along the sea shore, including the islands in Panama Bay. Not gregarious. Recognizable by its note *peetweet* and its habit of teetering. When started, it usually flies off low over the water, and before alighting sails for a little distance with its wings held pointing slightly downward.

8. *Bartramia longicauda* (Bechstein)

Upland Plover

Sexes alike.—Length, 292 mm. (11.50 in.); tail, 89 mm. (3.50 in.). Above grayish brown and buffy, streaked and barred with blackish, buff predominating on tail which is rather long, graduated, and barred with blackish, the feathers with white tips; below buffy whitish streaked on neck, the chest and sides with V-shaped blackish markings. Bill yellowish green.

A migrant occurring only in spring and fall, now reduced in numbers nearly to the point of extinction due to hunting in both North and South America. Frequents grassy fields; has mellow whistled notes. Its tail is longer than is usual in this family; though resembling a plover in its short bill, it is a true sandpiper.

9. *Ereunetes pusillus* (Linnæus)

Semipalmated Sandpiper

Sexes alike.—Length 160 mm. (6.30 in.); tail, 40 mm. (1.60 in.).

SEMIPALMATED SANDPIPER

Adults in summer.—Dingy brown above, streaked with buff, cinnamon and black, the latter occupying the center of each feather; an



FIG. 14. *Ereunetes pusillus*
(Nat. Size)

indistinct light line over eye; upper tail coverts and most of tail black, the outer tail feathers ashy gray; below white, the chest and breast tinged with buff and streaked with dusky.

Adults in winter.—General coloration grayer above than in summer, the dusky streaks on breast and chest very faint.

Young.—Similar to summer adults but without well defined streaks on chest and breast.

Bill black; average length in twenty-four specimens 19.4 mm. (.075 in.); legs and feet dark.

A migrant, found in large flocks or smaller groups on mud flats and beaches on the sea coast and inland. Very tame and easily approached. Though they scatter while feeding, they usually gather into a compact flock when they fly.

10. *Ereunetes mauri* (Cabanis)
Western Sandpiper

Closely resembling *Ereunetes pusillus* in size and color, though in summer its tone of coloration is more reddish above and the lower parts

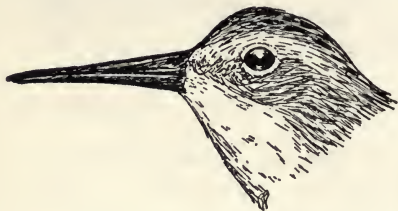


FIG. 15. *Ereunetes mauri*
(Nat. Size)

more heavily streaked. Chiefly distinguishable from that species by the longer bill, which averaged in twenty-four specimens 24.1 mm. long (0.95 in.).

A migrant from western North America, similar in habits to *E. pusillus* and often found associating with it. Sometimes very abundant. Not distinguishable in life from the preceding species except by the considerably larger bill.

11. *Tryngites subruficollis* (Vieillot)
Buff-breasted Sandpiper

Length, 215 mm. (8.50 in.); tail, 60 mm. (2.40 in.).

Sexes alike.—Light grayish buff above, the center of each feather black or dark olive; webs

LEAST SANDPIPER

of wing quills white, marbled with black; tail feathers mostly buff, becoming black toward the end and tipped with buffy white; below pale cinnamon buff (the feathers more or less tipped with whitish) passing to buffy white on abdomen.

Bill rather short, dusky greenish; legs and feet greenish.

A migrant, now rare, resembling *Bartramia longicauda* in habits though much smaller. Recorded by Jewel from dry pasture land at Gatun in October.

12. *Pisobia minutilla* (Vieillot) Least Sandpiper

Length, 145 mm. (5.70 in.); tail, 38 mm. (1.50 in.).

Adults in summer.—Closely similar to *Ereunetes pusillus*, distinguishable chiefly by its somewhat smaller size, shorter bill (average length in



FIG. 16. *Pisobia minutilla*
(Nat. Size)

thirty-eight specimens 17.9 mm.) and more olivaceous feet, which are not webbed at base of toes.

Adults in winter.—More streaked below than in *E. pusillus*.

A common migrant, the smallest of the sandpipers. It is similar in habits to *Ereunetes pusillus*, but prefers marshes to the beaches of the sea shore, though often found there also, in association with the latter species.

13. *Pisobia maculata* (Vieillot)

Pectoral Sandpiper

Male.—Length, 228 mm. (9.00 in.); tail, 60 mm. (2.40 in.). Streaked above with black, brown and buff, the blackish brown feathers being broadly bordered with buff, the lower back and upper tail coverts largely buff; tail pointed, the shorter outer feathers brownish gray edged with white; below white thickly streaked with dusky on sides of head and neck and on chest and breast.

Female.—Like male in plumage but a little smaller.

Immature specimens and adults in winter are browner above and have the breast washed with buff, with the dusky streaks less distinct.

An uncommon migrant resembling the Semipalmated and Least Sandpipers in plumage, but much larger. Unlike them it is almost exclusively a bird of grassy marshes. Though sometimes seen in flocks, when flushed they usually fly off singly or in pairs, with a squeaky grating call. Recorded by Jewel from Mindi.

14. *Pisobia fuscicollis* (Vieillot)

White-rumped Sandpiper

Length, 190 mm. (7.50 in.); tail, 50 mm. (2.00 in.).

Sexes alike.—Similar in coloration to *Pisobia maculata* in summer, but the tail is less pointed, and the longer upper tail coverts are largely white. In winter the streaking both above and below is less distinct.

A rare migrant. It may be looked for on the beaches and flats along the coast in association with the other small sandpipers.

15. *Gallinago delicata* (Ord.)

Wilson's Snipe

Length, 280 mm. (11.00 in.); tail, 56 mm. (2.20 in.).

Sexes alike.—Mottled above with black and different shades of buff, the latter forming four



FIG. 17. *Gallinago delicata*

conspicuous streaks; head with a median light streak and one over the eye; the tips of the

FAMILY JACANIDÆ

greater wing coverts white; throat white; neck and breast yellowish buff streaked with blackish; abdomen white; the sides barred with black; tail variegated with black, rufous and white. Bill very long and perfectly straight; legs rather short; eyes rather high and far back on head.

A migrant apparently not common in the Canal Zone. It is a bird of inland marshes, which rises with a swift zigzag flight and rasping call when flushed. The four lengthwise buff streaks on the back are conspicuous in flight. Recorded from a grassy marsh at Mindi in October, by Jewel.

14. Family JACANIDÆ

The Jacanas

A family of small birds showing relationship to the plovers in their structure, but having a superficial resemblance to the rails in their build, in their very short tail and greatly elongated toes, which with their small size and light weight enable them to walk over the softest mud and the leaves of water lilies that float on the surface. Their wings bear a sharp spur. The family consists of but few genera, only one of which is American.

1. *Jacana nigra* (Gmelin)

Black Jacana. "Gallito de Cienegas"

Length. **Male**, 190 mm. (7.50 in.); tail, 40 mm. (1.60 in.). **Female**, 255 mm. (10.00 in.); tail, 48 mm. (1.90 in.).

BLACK JACANA

Sexes alike.—Above greenish black, wing quills dull greenish yellow narrowly tipped with black; wing spur bright yellow; head all around and under parts black with a greenish gloss.

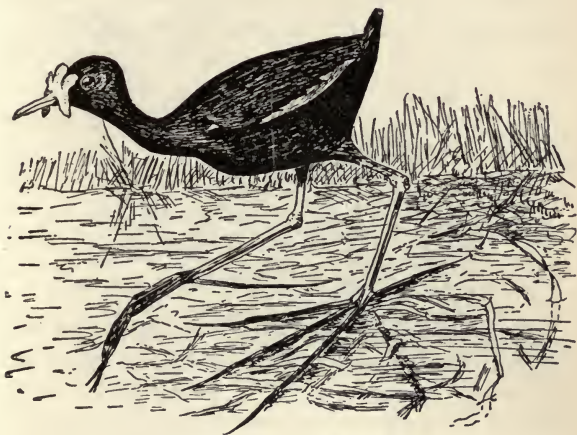


FIG. 18. *Jacana nigra*

Bill greenish changing at base, to pink above and yellow below, frontal shield lavender; feet green washed with blue.

Maroon phase, formerly regarded as a distinct species (*J. melanopygia*). Back, wing coverts and sometimes rump, maroon.

Young.—Head, back and wing coverts grayish brown; hindneck and rump black; a white stripe from bill over eye along sides of head; below that a broad black stripe from eye joining black of hindneck; cheeks, and under parts buffy white.

FAMILY EURYPYGDÆ

This little bird is exceedingly common on the lily pads and water hyacinths along the Chilibri River; often seen also about the shallow parts of Gatun Lake. The greenish yellow area on the wings is conspicuous as it flies, so that its appearance is totally different from that of any other bird. It does not have the retiring and secretive habits of the rail family, but is quite willing to be seen out in the open on the muddy shores or floating vegetation.

15. Family EURYPYGDÆ

The Sun Bitterns

This tropical American family consists only of the species here described and one other of the same genus. They have variegated plumage, moderately long neck and legs, the tail is rather long, broad and rounded when spread, and the bill rather slender, nearly straight and not very acute. They frequent rivers and inland waters and are said to feed largely on insects.

1. *Eurypyga major* Hartlaub

Greater Sun Bittern. "Pairta de Tierra"

Length, about 432 mm. (17.00 in.); tail about 153 mm. (6.00 in.).

Sexes similar.—Top and sides of head black, a white streak through the cheeks; neck brown shading to cinnamon buff on the chest and finely barred with blackish; the upper back more cinna-

GREATER SUN BITTERN

mon and shading to gray on wings and more heavily barred with black; conspicuous white spots forming a band on the wing coverts; wings with a chestnut patch, their quills variegated

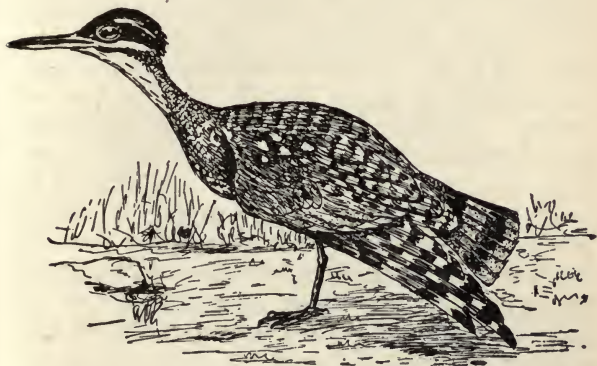


FIG. 19. *Eurypyga major*

with buff, black, white and gray; lower back and rump finely barred with black and white, the tail barred with gray mottled with white, chestnut and black; chest and breast cinnamon buff barred with dark brown; remaining under parts buffy white. Bill dark above, light below.

This bird may occasionally be found sitting quietly on a log or stump, sometimes widely spreading its wings and tail so as to display its handsome markings, resembling those of certain moths. Seen on the Lake and along small forest streams tributary to it on Barro Colorado Island.

16. Family THRESKIORNITHIDÆ

The Ibises and Spoonbills

The ibises are rather long-legged, long-necked birds closely related to the herons, from which they differ in the long, slender bill which is curved gradually downward throughout its whole length, like that of a curlew. They correspond in size to the small and medium sized herons, and resemble them in many of their habits, but fly with both neck and legs extended and by alternately flapping their wings and sailing. The so-called "wood ibis" is a stork and is described under that family. The true ibises are represented in both the Old and New Worlds, chiefly in the warmer portions of them.

The spoonbills, often made a separate family (*Plataleidæ*), are birds of quite similar size and habits, but have the bill long and straight, and broad and flattened at the end, as their name indicates. They do not vary their flight by sailing, as the ibises do.

1. *Guara alba* (Linnæus)

White Ibis

Length, 635 mm. (25.00 in.); tail, 127 mm. (5.00 in.).

Sexes alike.—Plumage all white, the tips of outer wing quills black. Legs, bill and bare skin of head, red.

Young.—Upper back and wings grayish brown, the head and neck streaked with grayish brown.

Found in mud flats, marshes and lagoons. I have observed occasional individuals in the inlets and ponds along the Canal. A number of them were noted on a precipitous jungle-covered cliff on Pedro Gonzales in the Pearl Islands in March 1926.

2. *Ajaia ajaja* (Linnæus)

Roseate Spoonbill. "Pato Cuchara"

Sexes similar.—Length about 840 mm. (33.00 in.); tail about 115 mm. (4.50 in.). Head and throat, bare neck and upper back white, sometimes suffused with pink; lesser wing coverts, upper and under tail coverts rich carmine; sides of breast and tail tawny buff; remainder of plumage pink. Bare skin of head varied with green, yellow, orange and black; iris carmine; legs red.

Young.—Similar to adults but the pink paler, the head and throat feathered, the tawny yellow and carmine of the adults replaced by pink.

If one is fortunate enough to see one of these birds of rare and exquisite coloring, there can be no mistake in their identification. The species is one of those which have suffered the most from the plume hunters, and has been exterminated from most of its former haunts. Hallinan reports one from the mouth of the Rio Juan Diaz; I saw one from the Canal on the shore of a small, secluded pond not far from Gatun Lake.

17. Family CICONIIDÆ

The Storks

This family, comprising not much more than a dozen species, is chiefly found in the Old World. They are large long-legged, long-necked birds, some of immense size, and are superficially somewhat similar to the herons, to which they are related, though they are distinguished from them by a number of structural characters. The head and neck are usually more or less bare of feathers, the bill long and very large and stout, and often somewhat curved up or down. The storks have great powers of flight and often soar or circle at a great height with the wings apparently motionless. Unlike the herons, they fly with the long neck and legs both outstretched.

1. *Mycteria americana* (Linnæus)

Wood Ibis

Length about 1015 mm. (40.00 in.).

Sexes alike.—**Adult.**—Plumage white except the quills of wing and tail which are glossy black. Bill and skin of the head and upper neck (which are unfeathered), grayish dusky.

Young.—Head partly and neck entirely covered, with dusky feathers; rest of plumage dull white, except the quills of wings and tail which are sooty.

Occasionally seen flying over Gatun Lake, but no longer common in the Canal Zone.

2. *Jabiru mycteria* (Linnæus)

Jabiru

Length about 1373 mm. (54.00 in.).

Sexes alike.—**Adult.**—Plumage white, neck mostly bare, the skin dark above and bright red lower down. Bill tapering, very large, long, slightly upcurved, black; legs and feet black.

Young.—Plumage brownish gray, the back of the head with a crest of blackish hair-like feathers.

This enormous stork, one of the largest of existing birds, occurs in the wilder parts of the Republic, both east and west of the Canal Zone, which it doubtless occasionally crosses.

18. Family ARDEIDÆ

The Herons

Large or rather large, generally gregarious wading birds with a long slender neck, narrow head, long, sharply-pointed, spear-like bill, long legs, short tail, and narrow compressed body, which appears much larger than it is on account of the loose plumage. Herons are easily recognized by their flight. They do not sail or soar, but keep the wings, which are quite large and long, in continual motion, and they carry the legs stretched out straight behind but the head drawn back close to the shoulders, the neck being bent in an S-shaped curve, though when starting their flight, the

neck is at first held more outstretched. The head and neck are well feathered and the head usually crested. Elongated plumes, sometimes of great beauty, are borne on certain parts of the body of some species, in some cases during the breeding season only. The "aigrettes" of the millinery trade are the best known examples of these plumes, and the demand for them has threatened with extinction the species unfortunate enough to produce these beautiful decorations. Their importation and sale are now forbidden in the United States. Herons frequent marshes and inland waters; to a less extent also the sea coast, feeding on small fishes and aquatic animals. Most of them, except the bitterns which are terrestrial and solitary, habitually perch on and nest in trees, often in colonies. They occur in all but the coldest parts of the world. The boatbills (genus *Cochlearius*) differing from the other herons in the wide bill resembling an inverted boat, are sometimes made a separate family.

1. *Ardea herodias herodias* Linnæus
Great Blue Heron. "Grullo"

Ardea herodias lessonii STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 246.

Length, about 1168 mm. (46.00 in.); tail about 190 mm. (7.50 in.).

Sexes alike.—**Adults.**—Center of crown and throat white, rest of crown black; neck pale grayish brown, a narrow line of mixed black,

AMERICAN EGRET

white and buff markings down the foreneck; back, wing coverts, tail and wings slaty gray; bend of wing chestnut; under parts streaked black and white with some rufous; thighs rufous. Bill mostly dull yellowish; legs and feet black.

Young.—Similar but plainer, no white on crown, which is entirely black; neck brownish gray washed with buffy.

This large heron, recognizable by its great size and prevailing blue gray coloration, is not uncommon about the Lake, Canal and sea coasts, but is usually seen singly or only a few together. Its usual note is a short "quok," briefer and in a somewhat different tone from that of the Black-crowned Night Heron.

2. *Herodias egretta* (Gmelin)

American Egret

Length about 990 mm. (39.00 in.); tail about 153 mm. (6.00 in.).

Plumage entirely white. Adults in the breeding season have long straight "aigrette" plumes growing from between the shoulders and extending beyond the tail. These are wanting at other seasons and in young birds. Bill yellow; legs and feet black.

No longer common in the Canal Zone, though single birds may occasionally be seen. On account of destruction for its plumes, this bird is everywhere greatly reduced in numbers and in

SNOWY EGRET

many regions entirely exterminated. Its much larger size, slender graceful build, black legs and yellow bill easily distinguish it from the immature individuals of *Florida cærulea*.

3. *Egretta candidissima candidissima* (Gmelin) Snowy Egret

Length 610 mm. (24.00 in.); tail 100 mm. (4.00 in.). Plumage entirely white. Adults in breeding plumage have delicate upwardly curving plumes growing from the region between the shoulders. These are wanting at other seasons and in young birds. Bill black, yellow at base; legs black, feet yellow.

This delicate, beautiful little heron is now rare in the Canal Zone and everywhere greatly diminished in numbers owing to the merciless destruction of the plume-hunters. Though not greatly different in size from *Florida cærulea*, it may be distinguished from the white, immature birds of that species by its black legs.

4. *Hydranassa tricolor ruficollis* (Gosse) Louisiana Heron

Length about 660 mm. (26.00 in.); tail about 90 mm. (3.50 in.).

Sexes alike.—**Adults.**—Head, neck and upper parts bluish slate gray, darker on head and neck, which bear maroon purplish plumes; chin and throat white, continued in streaks (mixed with

rufous and gray), down the foreneck; rest of lower parts plain white. Bill dark above, yellow below; legs blackish or greenish.

Young.—Head and neck light rusty, chin and throat white, foreneck streaked white and rusty; back and wings gray; rump and upper tail coverts white; lower parts white, the breast with slaty streaks.

Not very common in the Canal Zone. It is distinguishable by its very slender neck and bill, and its white lower parts contrasting with the slaty back. Occasionally to be seen on the beach at old Panama at low tide.

5. *Florida cærulea cærulea* (Linnæus)

Little Blue Heron

Length about 610 mm. (24.00 in.); tail about 108 mm. (4.25 in.).

Sexes alike.—**Adult.**—Head and neck maroon chestnut, rest of plumage bluish slate color, legs and feet black.

Immature.—Plumage white, more or less washed with slaty; tips of longer quills bluish slate color; bill dark; legs and feet greenish yellow.

The commonest of the herons in the Canal Zone. Most of the white herons seen are the immature of this species. They can be distinguished from the egrets by their greenish yellow feet, broader and more rounded wings and more irregular flight.

In June 1924, I saw immense numbers of them in blue and in white plumage on the mud flats at low tide along the beach east of old Panama City.

6. *Butorides virescens virescens* (Linnæus)
Green Heron

Butorides virescens hypernotius STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 247.

Length about 457 mm. (18.00 in.).

Sexes alike.—**Adult.**—Top of head greenish black; rest of head and neck maroon chestnut, the throat white, and the foreneck with a white streak mixed with chestnut extending down it; back and wings dark greenish, the wing coverts tipped with buff and the elongate scapulars grayish; breast and abdomen whitish. Bill dark above, yellowish below; legs greenish yellow, rather short.

Young.—Similar but duller, the neck dull rusty shaded with buff; the under parts streaked with dusky; the light border of the wing coverts broader.

This small heron is common in winter and spring along the rivers, and elsewhere in the vicinity of water. It is more or less solitary, usually allowing a close approach and then flying off, uttering several shrill squawks of alarm. Stone designates it as a migrant. There is some question as to whether a race of this bird breeds

STREAKED HERON

in the Zone or not. On the Pearl Islands a dark resident subspecies, *maculata* (Vieillot) occurs rather commonly.

7. *Butorides striata* (Linnæus)

Streaked Heron

Length 370 mm. (14.50 in.).

Sexes alike.—**Adult.**—Top of head greenish black, a black streak under eye; sides of head and neck gray; a stripe of white with brown streaks down the foreneck, this stripe widens on the chest; back mostly grayish green; wings grayish, the coverts margined with buff, the long scapulars glossy grayish green; lower back and rump pale gray; tail greenish black; breast and under parts gray, paler on abdomen. Bill dark, yellow at the base; feet yellow.

Similar in habits to *Butorides virescens*, frequenting the same localities. The gray neck and prevailing grayer colors of the plumage readily distinguish it from that species.

8. *Nycticorax nycticorax nævius* (Boddaert)

Black-crowned Night Heron

Length about 635 mm. (25.00 in.); tail about 127 mm. (5.00 in.).

Sexes alike.—**Adult.**—Top of head glossy black, the head usually with several long, very narrow white plumes; forehead, sides of head and throat white; neck and back gray; under parts white, the sides washed with gray.

YELLOW-CROWNED NIGHT HERON

Young.—Light brown above, each feather with a median white stripe, outer webs of outer wing quills pale rufous, tail ash gray, sides of head and neck and under parts striped with grayish brown and white; throat white.

A common species inland and along the sea coasts, recognizable by its rather short legs, stout bill and thick neck. Stone designates it as a migrant. It commonly roosts in trees, often far from water by day, flying to marshes and mud flats to feed in the evening. It has a single, rather hoarse note like the syllable *quark*, which is often heard after dark as the birds fly over in a straggling flock, one bird answering another after a deliberate interval.

9. *Nyctanassa violacea* (Linnæus)

Yellow-crowned Night Heron

Length about 610 mm. (24.00 in.); tail about 115 mm. (4.50 in.).

Sexes alike.—**Adults.**—Slaty bluish gray above and below, streaked with black on the back; top of head and elongated patch on side of head white or yellowish, separated by a black stripe; rest of head and throat black. Legs greenish.

Young.—Crown black streaked with buffy white; rest of upper parts dark grayish brown with wedge-shaped buffy spots, wing quills slate color; under parts brownish white, streaked with dusky.

Legs rather short, neck slenderer than in *N. nycticorax nævius*.

Not common in the Canal Zone, though numerous on some parts of the coast and islands of Panama Bay. Adults are easily recognized by the black and white striped appearance of the head. It is similar in habits to *N. nycticorax naevius* but perhaps less nocturnal. The young of this species differs in lacking the rufescent tinge to the wing quills.

10. *Tigrisoma cabanisi* Heine
Cabanis' Tiger Bittern

Length about 850 mm. (33.50 in.). Forehead and crown black; sides of head gray, bordered below by a black line; neck black barred with buff, a white stripe down its side; remainder of plumage above black, finely barred with buff (the feathers with black shafts); outer wing quills bluish gray tipped with white, a line of white down outside edge of wings; under parts gray broadly barred with chestnut. Bill dark above, light below; legs and feet dark.

Young.—Conspicuously barred above and below, the back and wings grayish brown barred with tawny buff, the tail blackish brown with narrow bars of white; head and neck barred with buff and dusky, the head tinged with chestnut; remaining under parts buffy white barred with dark brown.

Fairly common on the Pearl Islands where it may be often seen on the rocks along the shore, but apparently rare in the Canal Zone.

LEAST BITTERN

11. *Ixobrychus exilis* (Gmelin)

Least Bittern

Length 330 mm. (13.00 in.).

Adult male.—Top of head, back and tail glossy greenish black; sides of head and hind-neck chestnut rufous; wing coverts partly buff; throat whitish shading into buff on rest of under parts, the sides yellowish brown. Bill dusky above, yellow below; legs greenish, feet yellowish.

Female and immature male.—Similar to male, but the back chestnut, and under parts darker and lightly streaked with dark brown.

Rare, probably chiefly a migrant. It frequents reedy swamps, usually easily escaping observation by its small size, rather slender build, secretive habits and protective coloration.

12. *Botaurus lentiginosus* (Montagu)

American Bittern

Length unusually variable, the male generally larger than the female. Average about 710 mm. (28.00 in.).

Sexes alike.—**Adults.**—Top of head and hind-neck slaty; a glossy black streak each side of upper neck; back and wing coverts brown, the feathers mottled and bordered with buff and buffy yellow; throat white; rest of under parts creamy buff coarsely streaked with buffy brown. Bill yellow; legs olive.

ZELEDON'S BOAT-BILL

Young.—Similar to adults but the buffy shades deeper and more yellowish.

A rare migrant. This bird frequents open swamps and meadows and is solitary in habits, hiding among the reeds and low vegetation with which its brown streaked coloration harmonizes. It does not usually perch on trees.

13. *Cochlearius zeledoni panamensis* Griscom Zeledon's Boat-bill

Cochlearius zeledoni STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 247.

Length about 460 mm. (18.00 in.).

Sexes alike.—**Adult.**—Forehead white, head with elongated bluish black plumes; sides of head, neck all around and under parts bluish slate gray washed with rusty, a patch of black across the upper back, remainder of upper parts pale gray. Bill very broad and flattened, upper mandible deeply grooved each side of ridge; feet dull yellow.

Young.—Cinnamon rufous above, darker on back, lighter on wing coverts; lower back and upper tail coverts dusky gray washed with rufous; tail gray; crown black; no crest; under parts white washed with gray on sides of head and rufous on neck.

Common in the deeper mangrove swamps in parts of the Republic, but shy and secretive; nocturnal in habits. A flock of these birds fre-

quented a swamp (since drained) near France Field in 1923.

Richmond says the note of this species is a squawk something like that of the Night Heron.

19. Family ANATIDÆ

The Ducks, Geese and Swans

This large and well known family is represented in Panama by a few species of ducks, birds that will readily be recognized by the characters familiar in the domestic birds. The heavy, somewhat flattened body, short legs placed far back, webbed feet, long neck, and broad bill more or less widened toward the end, with a small, downwardly projecting nail on the tip of the upper mandible, and the rather large pointed wings, are characteristic. Their flight is fast, with rapid, regular beats of the wings which often make a whistling sound. The neck is held outstretched in flight, the legs drawn in close. The majority of the ducks known from the Canal Zone do not habitually dive, but frequent marshes and the shallow parts of the fresh waters to obtain their food, where a heavy toll is taken from their numbers by sportsmen.

Many of the ducks undergo an extra molt in summer after the breeding season, by which the adult males temporarily assume a plainer plumage more or less like that of the female (except for the wings, which remain as before), regaining their usual plumage in the fall. As the Canal Zone species that do this are the migrants, they are not likely to

MUSCOVY DUCK

be found there at the season when this plumage, called the *eclipse plumage*, is worn.

1. *Cairina moschata* (Linnæus)

Muscovy Duck. "Pato real"

Adult male.—Length 815 mm. (32.00 in.); tail 230 mm. (9.00 in.). Head, neck and under parts glossy brownish black; upper parts metallic blackish green; wing coverts pure white. Bare skin about base of bill red; bill pinkish.

Female.—Much smaller. Length 610 mm. (24.00 in.); tail 140 mm. (5.50 in.).

A native species; a large dark colored duck with the white wing coverts conspicuous in flight. It often occurs on the Chagres and other rivers.

2. *Dendrocygna viduata* (Linnæus)

White-faced Tree Duck

Length about 456 mm. (17.90 in.); tail about 85 mm. (3.80 in.).

Fore part of head white, rest of head and upper part of neck black with a white patch on fore neck; lower part of neck and chest all around rich chestnut; rest of upper parts reddish brown; abdomen including under tail coverts, black.

A specimen of this South American duck was shot on one of the rivers entering Gatun Lake, in June 1924, and sent to me by Commander Marshall Collins, U.S.N.

BLACK-BELLIED TREE DUCK

3. *Dendrocygna autumnalis* (Linnæus)

Black-bellied Tree Duck. "Wichity"

Length about 555 mm. (22.00 in.); tail about 102 mm. (4.00 in.).

Sexes alike.—**Adult.**—Head, neck, chest and upper parts reddish brown, abdomen black, under tail coverts white spotted with black. Bill red. Neck and legs rather long.

Young.—Colors duller, the reddish brown replaced by dingy grayish tinged with rusty; bill and feet dusky.

This native species is the commonest duck on the marshes and rivers of the Canal Zone and neighboring parts of the Republic, and is the species that the sportsman most often obtains. It has a call resembling the syllable *wichity*, *wichity*, which gives it the name by which it is commonly called. It nests in and often perches on trees, as the name "tree duck" indicates. The species of this genus, show in their long neck and legs, the form of the bill and other characters, a nearer relationship to the geese than the ordinary ducks, though they are of small size.

4. *Anas platyrhynchos* Linnæus

Mallard

Adult male.—Length 572 mm. (22.50 in.); tail 102 mm. (4.00 in.). Head and neck glossy green, breast chestnut separated from the green by a white collar, back dark brownish gray shading to black on tail which is white-bordered;

wings mainly brownish gray; wing patch greenish purple bordered with black and conspicuously with white; breast and abdomen grayish white with fine wavy black lines; the four small, upper tail feathers are curled upwards. Bill greenish yellow; feet orange red.

Female.—Dark brownish above, the feathers edged with buff; head and neck lighter than body and finely streaked with dusky, an indistinct darker streak through eye; wing patch duller than in male; under parts buff, the feathers with blackish spots and edgings. Bill varying from dull orange to greenish olive.

Young.—Similar to female.

A migrant. The variously colored domestic ducks are derived from this species, which is found throughout most of the Northern Hemisphere. The wild birds are of slenderer build than the domesticated races.

5. *Mareca americana* (Gmelin)

Baldpate. American Widgeon

Adult male.—Length 487 mm. (19.00 in.); tail 102 mm. (4.00 in.). Forehead and crown white; sides of head whitish tinged with buff and speckled with green, with a large glossy green patch from the eye to the nape; hindneck and back pale purplish brown with many blackish cross lines, rump darker, wings and tail mostly gray, the wings with a metallic green patch in front of which (and separated by a black bar) is a large white area; chin and throat black, fore-

BLUE-WINGED TEAL

neck, breast and sides purplish brown; abdomen white, under tail coverts black. Bill and feet bluish gray.

Female.—Slightly smaller than male. Head and neck whitish finely streaked with blackish (more heavily on top); no green on sides of head; back buff barred with dusky; wing patch largely blackish, the white in front of it, more restricted than in male; breast and sides reddish but more or less spotted with dusky.

Young.—Similar to female.

A migrant occasionally taken on the rivers entering Gatun Lake.

6. *Querquedula discors* (Linnæus)

Blue-winged Teal

Length 393 mm. (15.50 in.); tail 89 mm. (3.50 in.).

Adult male.—Head and neck deep gray, black on crown, a broad white crescent bordered with black in front of eye; back grayish brown marked with buff; a conspicuous area on wing coverts light sky-blue separated from the glossy green wing patch by a white bar; breast and abdomen pale reddish buff spotted and barred with dusky gray; under tail coverts black. Bill dark grayish; feet yellowish.

Female.—Top of head dusky, sides of head and neck dull whitish finely marked with dusky spots, an indistinct dark line through eye; rest of upper parts mainly dusky, the feathers with pale edgings; wings much as in male but blue

CINNAMON TEAL

more restricted and white bar less perfect; under parts brownish white, with streaks and spots (faint or absent on the throat and abdomen). Bill greenish dusky; feet yellowish or flesh colored.

The commonest of the North American ducks which visit the Canal Zone in winter.

7. *Querquedula cyanoptera* (Vieillot) Cinnamon Teal

Length 406 mm. (16.00 in.); tail 90 mm. (3.50 in.).

Male.—Head, neck and lower parts uniform rich chestnut, the top of head blackish, the belly duller, wings much as in *Q. discors*.

Female.—Similar to *Q. discors* but the plumage darker and more heavily streaked, the breast deeply tinged with brown.

Young.—Similar to female.

A species common throughout the western United States. Three were shot by a party with Commander Marshall Collins, U.S.N. early in January 1925, on the Rio Chico.

8. *Dafila acuta tzitzihua* (Vieillot) Pintail

Dafila acuta STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 247.

Adult male.—Length 715 mm. (28.00 in.); tail 215 mm. (8.50 in.). Head and throat olive

LESSER SCAUP DUCK

brown ending abruptly, a blackish streak down the hindneck bordered by white lines extending up from the white breast; foreneck white, rest of body whitish marked with fine wavy lines of blackish (faint on under parts), giving a gray effect; wing coverts dark brownish gray, the greater ones brown tipped; wings with a purplish green patch narrowly bordered with white behind. Middle tail feathers greatly elongated, slender and tapering. Bill and feet slate gray.

Female.—Length 578 mm. (22.75 in.); tail 120 mm. (4.75 in.). Upper parts mottled gray, buff and brown, breast buffy brown spotted with dusky, otherwise whitish below with dark markings on sides; wing patch chiefly grayish brown, white-bordered. Tail pointed, but middle feathers not greatly elongated.

Young.—Similar to female.

A rare migrant. Its pointed tail and unusually long neck are noticeable in life.

9. *Marila affinis* (Eyton)

Lesser Scaup Duck

Length 408 mm. (16.00 in.); tail 65 mm. (2.50 in.).

Adult male.—Head, neck, chest and most of upper parts black, the head with purplish reflections; upper part of back and scapulars white with fine wavy black bars; wing patch white; upper tail coverts and tail black; breast abruptly white; abdomen and sides white marked with

MASKED DUCK

wavy black bars. Bill and feet bluish gray, the feet with blackish webs.

Female.—Region around base of bill white; head, neck, chest and upper back dark brown; wing patch white; sides grayish brown with wavy white bars shading into the white abdomen. The dark color of the head, neck and chest does not end abruptly as it does in the male. Bill and feet duller.

Young.—Similar to female.

A migrant. It was abundant on Gatun Lake on November 16, 1911, according to Jewel. Unlike the other ducks here recorded from the Canal Zone, this species is an expert diver and can get its food in comparatively deep water. It is of stout build, the head and bill rather large.

10. *Nomonyx dominicus* (Linnæus)

Masked Duck

Length about 380 mm. (15.00 in.); tail about 102 mm. (4.00 in.).

Male.—Head black; entire neck and remaining upper parts chestnut with heavy, solid, black U-shaped markings on wing coverts and back; quills black with a conspicuous patch of white; tail black and graduated, the feathers narrow, the tips pointed; chest rusty chestnut fading to buffy grayish brown with indistinct black markings on breast and abdomen. Bill black.

Female.—Above dark brown mottled with buff on neck. Elsewhere feathers edged with

FAMILY LARIDÆ

buff; a small patch of white on wings; remaining under parts grayish buffy coarsely and irregularly mottled with brown; chin and sides of face buffy, a conspicuous black streak through the eye and another from the bill through the cheeks to behind the ear coverts.

Young.—Similar to female, the breast and abdomen paler and less distinctly marked.

A shy and retiring duck, living in dense vegetation like a rail, and rarely flying, preferring to hide or dive. It is found in the wilder parts of Lake Gatun.

20. Family LARIDÆ

The Gulls and Terns

The members of this large family of web-footed, short-legged, long-winged sea birds are found on the coasts and larger inland waters of every continent from the polar regions to the tropics, and cannot fail to attract attention by their graceful flight and usually pure white plumage, relieved by an area of delicate gray on the back and wings which is termed the *mantle*. They remain as a rule near the coasts, few of them wandering very far out to sea as the petrels do, and their nostrils are simple slits, not tubular as in the latter birds.

The terns are birds of rather slender build with very pointed wings and usually a long, deeply-forked tail. They are exceptionally graceful in flight and obtain their food (chiefly

FRANKLIN'S GULL

quills blackish; tail gray at base, broadly black toward end; forehead and under parts white more or less washed with dusky. Bill and feet dusky.

Very abundant on both coasts, especially on the Pacific side; less common on the Lake and Canal.

2. *Larus franklini* (Richardson) Franklin's Gull

Chroicocephalus franklinii RIDGWAY, Birds of N. and M. Amer., VIII, p. 641, 1919.

Length 355 mm. (14.00 in.); tail 100 mm. (4.00 in.).

Sexes alike.—Very similar to *Larus atricilla*, both in plumage and other characters, though slightly smaller. The bill is stouter, and the black of the outer primaries does not extend to the ends, their tips being rather broadly white.

A migrant from the interior regions of the United States, where it breeds about fresh water lakes and marshes, apparently frequenting the sea coast only in its winter haunts.

3. *Sterna maxima* Boddaert Royal Tern

Thalasseus maximus RIDGWAY, Birds of N. and M. Amer., VIII, p. 467, 1919.

Length about 510 mm. (20.00 in.); tail 178 mm. (7.00 in.).

CABOT'S TERN

Sexes alike.—**Adults.**—Head somewhat crested; crown, crest and hindneck black; back, scapulars and wings pale gray, tail pale gray, rest of plumage white; bill reddish orange; feet black. In fall and winter forehead and more or less of crown white or partly white. Tail long and considerably forked.

Young.—Similar to winter adults but more or less spotted with dusky above; tail shorter and less forked.

A migrant, common about the harbor and bay near Panama City.

4. *Sterna sandvicensis acuflavida* (Cabot)

Cabot's Tern

Thalasseus sandvicensis acuflavidus RIDGWAY, Birds of N. and M. Amer., VIII, p. 476, 1919.

Length 406 mm. (16.00 in.); tail 128 mm. (5.00 in.).

Sexes alike.—**Adult.**—Top of head and crest black, back and wings light pearl gray; rest of plumage white. Bill black with the tip yellowish; feet black. In fall and winter the crown is largely white. Tail long, considerably forked.

Young.—Similar but back spotted with blackish; tail shorter and less forked. Yellow tip to bill inconspicuous or wanting.

A migrant. Several individuals seen sitting on a floating log on Panama Bay, March 13, 1926.

5. *Hydrochelidon nigra surinamensis* (Gmelin)
Black Tern

Length 255 mm. (10.00 in.); tail 79 mm. (3.10 in.).

Sexes alike.—**Adult.**—**Summer plumage.**—Head, neck and under parts sooty black or grayish black; under tail coverts white; upper parts slate color; bill and feet black. **Winter plumage.**—Forehead, back of neck and under parts white; rest of upper parts deep pearl gray.

Young.—Similar to winter adults, but the upper parts somewhat washed and tipped with brownish; the sides washed with grayish.

Tail only slightly forked.

A migrant. Recorded by Jewel from Gatun Lake in December and June. In size and manner of flight it bears some resemblance to the night hawks (*Chordeiles*).

6. *Anous stolidus* (Linnæus)
Noddy

Length 395 mm. (15.50 in.); tail 155 mm. (6.10 in.).

Sexes alike.—Adults very dark sooty brown, shading through gray to white on the forehead, the under parts somewhat lighter than the back. Tail short, rounded.

Young.—Similar to but somewhat lighter than adults; no white on forehead; a whitish line above eye.

The Noddy strikingly differs from other terns in having a rounded fan-shaped tail; this species is a sooty brown bird with a hoary crown. It appears to breed somewhere about the Bay of Panama. Many were seen flying off Chepillo Island in March 1926. Nests in trees or bushes.

21. Family PHAËTHONTIDÆ

The Tropic Birds

The members of this small family are like stout-bodied terns in build and appearance, though actually related to the gannets and pelicans, resembling them in having all four toes connected by webs. The middle tail feathers are slender and greatly elongated and stream out behind in a conspicuous manner in their flight, which is very graceful and buoyant. Their wing beats are rapid and pigeon-like, but they sail and glide with great ease, and plunge for their food like gannets, often from a height of many yards. They are inhabitants of the tropical and subtropical regions and are great wanderers, not fearing to range far out to sea. The tropic birds nest on the ground on islands, or more often in holes or crevices, or on ledges on rocky cliffs.

1. *Phaëthon æthereus* Linnæus

Red-billed Tropic Bird

Sexes alike.—Length about 760 mm. (30.00 in.); tail (middle feathers) 485 mm. (19.00 in.);

bill 62 mm. (2.40 in.). Plumage white, finely barred above with black, excepting the head, a black streak through the eye terminating in a crescent on the cheek; wing quills black, the shafts of the tail feathers black. Bill red.

This tropic bird is the only one found on the Pacific side. It breeds at points along the west coast from the Gulf of California southward and at the Galapagos, so that its presence in the Bay of Panama is doubtless frequent, though it usually keeps well off shore. On the Atlantic side its occurrence is also possible, as it breeds in the Lesser Antilles and off the Venezuelan coast, but it is much less numerous in the Caribbean than the Yellow-billed Tropic Bird.

2. *Phaëthon lepturus* (Brandt) Yellow-billed Tropic Bird

Sexes alike.—Length about 660 mm. (26.00 in.); tail (middle feathers) about 405 mm. (16.00 in); bill 47 mm. (1.80 in.). Similar to *P. æthereus* but not barred above with black; and with more solid black areas on wings; under parts and tail feathers sometimes tinted with salmon or rosy in fresh plumage. Bill ordinarily yellow; orange to red in breeding season.

Young.—Similar to adults but finely barred on the back with black, thus much like the adult of next preceding species, but distinguishable by smaller size and relatively smaller bill.

PLATE V.



Photograph by Mr. F. L. Jaques.

PELICANS FEEDING IN PANAMA BAY.

Found along the Atlantic coast. Any tropic bird seen near the Atlantic entrance to the Canal is most likely to be of this species, which breeds in Cuba, Jamaica and others of the Greater Antilles, and at Bermuda, and is the common species in the Caribbean. It is not found on the Pacific side.

22. Family PELECANIDÆ

The Pelicans

The characters and appearance of these birds are well known. Their great size, somewhat duck-like build with very long wings and short legs, completely webbed feet (the hind toe being directed laterally and also joined to the others with a web), long neck, long bill hooked at the end and provided below with an immense pouch of skin and the very long wings and short tail, give them a distinctive appearance that will be recognized on first sight. The few species of pelicans occur in tropical regions and also in many temperate ones if they have not been exterminated.

1. *Pelecanus occidentalis* Linnæus

Brown Pelican

Sexes similar.—Length about 1275 mm. (50.00 in.); tail about 152 mm. (6.00 in.). Most of top of head and sides of neck bordering throat pouch, white; rest of neck chestnut brown; remaining upper parts ashy gray, the feathers bordered with dusky; lower parts brown striped

BROWN PELICAN

with white on the sides, some yellow at base of foreneck. Bill grayish mottled with brown and tinged with red; pouch greenish, bare skin around eyes blue; feet black.

Young.—General color brownish gray, head with a conspicuous flattened crest which is not present in adults.

The young appear to be larger than the adults and are often taken by the casual observer for another species. The plumage of the adults is subject to seasonal changes, the fresh plumage following the moulting period differing somewhat from the worn plumage preceding it.

For so large a bird the pelican is very abundant in the Canal Zone. It is likely to be the first bird seen on entering the harbor of Cristobal, as it often occurs on Gatun Lake, but it is on Panama Bay that it is especially numerous. It breeds in large numbers on some of the Pearl Islands and probably also on some of the nearer islands of the Bay. It nests during the winter months; the colonies on different islands at more or less different times. On Pedro Gonzales, one hot calm afternoon in February, several on nests presented an appearance most ludicrous and pathetic, their bills open, the hot sun beating down on them. When the fish are running at the turn of the tide at the Pacific entrance of the Canal, the sea is white with splashes of the pelicans plunging after their prey. Sometimes they disappear completely under the water; again they float near the shores for hours, alone or

two or three together, scooping down with their bill and, if they catch a fish, throwing up their bill and contorting their throat to swallow it. Like the cormorants, the pelicans fly in lines and V formations very perfectly maintained. Sometimes they associate with their less aristocratic allies, and a flock of cormorants may be seen headed by one or more pelicans, whose dignity will not permit them to accept any other position in the formation, though they have to exert themselves to maintain it in such fast company.

23. Family SULIDÆ

The Boobies and Gannets

A small family of sea birds related to the pelicans and like them in having feet with all four toes connected by a web, but they have only a rudiment of a pouch beneath the bill which is long, stout at the base and tapering, but not hooked at the tip. They are birds of trim, somewhat gull-like build and of fairly large size, with very long pointed wings which give them great powers of flight and they spend most of their time ranging over the sea, catching the fish on which they feed, by plunging for them. They nest in large colonies on cliffs or outlying islands, usually on the ground (rarely in trees or bushes) and generally lay but one egg.

BLUE-FACED BOOBY

1. *Sula dactylatra* Lesson Blue-faced Booby

Length about 890 mm. (35.00 in.); tail 200 mm. (7.90 in.).

Male.—Plumage white, including lesser wing coverts, the remainder of the wings and the tail, excepting middle feathers, dark brown, middle feathers whitish. Iris yellow; bill greenish yellow, pinkish at base; bare skin of throat and surrounding eyes lead gray; feet olive drab.

Female.—Similar to male but feet bluish gray; bill greenish yellow, brightening to orange at base of mandible.

Young.—Head, neck and upper parts smoky brown, the feathers edged with white and with a collar of white across lower hindneck; chest, breast and under parts white. Approaching adult plumage the brown feathers are more mixed with white.

This large species is widely distributed in the tropical regions and may occur on either side of the isthmus singly or in association with flocks of the more common species.

2. *Sula piscator* (Linnæus) Red-footed Booby

Sexes alike.—Length about 710 mm. (28.00 in.); tail 210 mm. (8.30 in.). General color white, the head and nape tinged with straw color; outer wing quills hoary grayish brown;

BLUE-FOOTED BOOBY

tail white. Iris gray; bill black; bare skin of face pink; legs and feet red or dark pink. •

Young.—Sooty brown above and below, paler on breast and abdomen, the plumage becoming more exclusively white as the adult plumage is approached. Bare skin surrounding eye lead gray. This booby is notable for its many phases of coloration, ranging from sooty or dark grayish brown, through intermediate stages in which the rump, tail and portions of the under parts are white, to the white plumage with grayish brown outer wing quills of the adult. The changes in the plumage are not fully understood; individuals still in partly grayish brown plumage are known to breed.

This species occurs on both sides of the Isthmus and is often to be seen on the Caribbean not far from Colon, and about the Pearl Islands on the Pacific side. Their flight is powerful and graceful, suggesting, as one writer has said, that of a large shearwater, being interrupted by periods of gliding, the flocks maintaining perfect formation and acting in perfect unison. It is the only booby that nests in trees or bushes.

3. *Sula nebouxii* Milne-Edwards Blue-footed Booby

Sexes alike.—Length about 867 mm. (34.00 in.); tail 215 mm. (8.50 in.). Head, upper part and sides of neck smoky grayish streaked with white; front of forehead and throat nearly white,

COMMON OR WHITE-BELLIED BOOBY

remaining upper parts dusky brownish, the lower hindneck and a band across the lower back white; outer wing quills black; remaining under parts white. Bill dull olive blue; iris bright yellow; bare skin around bill and eyes, and throat pouch, slate blue; legs and feet bright greenish blue.

Young.—Resembling adults but with a white spot between the shoulders, the feathers above tipped with grayish. Bill and pouch plumbeous.

This species is found only on the Pacific side, its range being from the Gulf of California to Peru. We saw them in considerable numbers in the Pearl Islands on Pacheca and Galera on the ledges of the cliffs. The air was full of their cries which resembled the quack of a duck, though deeper pitched.

4. *Sula leucogastra* (Boddaert) Common or White-bellied Booby

Male.—Length about 760 mm. (30.00 in.); tail and 195 mm. (7.70 in.). Head, neck and upper parts, including wings and tail, dark sooty brown; breast and remaining under parts abruptly white. Iris gray; bill bluish horn; feet greenish blue.

Female.—Similar but a little larger. Bill whitish horn; feet yellow.

This booby is known to nest in tropical America only on the Atlantic side. It is a very



Photograph by Dr. Robert C. Murphy.

BLUE-FOOTED BOOBY *Sula nebouxi*.

common species in the West Indies and may often be seen within a short distance of Colon. On the Pacific side of the Isthmus, it is replaced by the next species, *Sula etesiaca*.

5. *Sula etesiaca* Bangs
Colombian Booby

Male.—Length about 760 mm. (30.00 in.); tail 195 mm. (7.70 in.). Head and throat hoary gray, becoming lighter on the forehead and face, and shading into brown on the back and chest. Rest of under parts white.

Female.—Length about 800 mm. (31.50 in.); tail 205 mm. (8.10 in.). Almost indistinguishable from *Sula leucogastra*. In immature plumage the white of the breast is mixed with brown.

We discovered this booby, which is found only on the Pacific side, nesting in considerable numbers on the island of Galera. The nests were on the ground, which was whitened and bare from the droppings of the birds, among gaunt leafless trees. Many birds were flapping back and forth, while higher overhead innumerable hordes, including *S. nebouxii*, frigate birds and a couple of hawks, circled over the island. The roar of the surf on the reef-bound, rocky cliffs and the raucous cries of the birds combined to make it a wild and tumultuous scene set in the weird, pale greenish light of the grove. We noted a male and female sitting on adjacent nests; several solitary chicks covered with white down were walking about; one came toward us with a wide-

FAMILY PHALACROCORACIDÆ

open mouth. The nests were untidy heaps of twigs on which were deposited two whitish eggs speckled with brown.

24. Family PHALACROCORACIDÆ

The Cormorants

These are gregarious, aquatic, fish-eating birds related to the pelicans, having a long bill somewhat hooked at the tip with a rudiment of a pouch beneath it and feet with all four toes connected by a web. In size they are comparable to, or larger than the ducks, but have the neck longer and the wings broader and less pointed. They are among the most expert swimmers and divers, and seek their food by swimming under water like grebes or sea ducks, but have to spend much of their time perched on rocks drying their plumage, which seems to be less waterproof than that of many aquatic birds. Their flight is characteristic, performed with steady beats of the wings, the flocks maintaining wonderfully perfect formation in long, oblique lines or V-shaped figures. They are birds of sombre plumage and disagreeable uncleanly habits, and are represented on the coasts and larger inland waters of most parts of the world.

1. *Phalacrocorax vigua vigua* (Vieillot)

Brazilian Cormorant

Length about 610 mm. (24.00 in.); tail about 152—165 mm. (6.00—6.50 in.).

PLATE VII.



Photograph by Dr. Robert C. Murphy.

BRAZILIAN CORMORANTS *Phalacrocorax v. vigua*.

Sexes alike.—Head, neck, lower back, rump, tail and under parts glossy black; upper back, scapulars and wing coverts of a deep ash color margined with black. Naked skin on throat bordered narrowly with white feathers. Plumage browner in breeding season.

Young.—Above grayish brown, including the top of the head and the back of the neck, sides of head and neck and under parts, buffy white stippled with grayish brown; the abdomen darker.

One of the most abundant sea birds of the Canal Zone, occurring along the Atlantic shore, on Gatun Lake and along the Canal, but especially on the Pacific side, where they can be seen in the afternoons streaming by, sometimes for hours, in vast flocks, flying in their characteristic regular formations from their fishing grounds, where they congregate in great numbers on the surface of the sea, to the islands where they breed or roost. Some of the rocks of Panama Bay are snowy white from their droppings. On the islands on which they roost along the shores, the trees are scabrous and bare and the ground below white. Like grebes, they have the power of swimming with only the head and neck or the head alone, above water. They are repulsive in appearance but birds of beautiful flight.

25. Family PLOTIDÆ

The Anhingas or Snake Birds

A family consisting of a single genus closely related to the cormorants but differing in the

SNAKE BIRD

very long neck, very small head, long bill, not hooked but tapering to a sharp point at the tip, and the larger tail. They inhabit swamps and rivers in the wooded regions and are of solitary habits. Like the cormorants they are expert swimmers and divers, and often swim with the body submerged, the head and neck then resembling that of a serpent swimming; hence the name Snake Bird. The few species are confined to tropical parts of the Old and New Worlds.

1. *Anhinga anhinga* (Linnæus)

Snake Bird. Water Turkey. "Cuervo"

Length 867 mm. (34 in.); tail 266 mm. (10.50 in.).

Male.—Glossy greenish black with broad silver gray wing band, the lower hindneck



FIG. 20. *Anhinga anhinga*

spotted and the scapulars and inner wing quills streaked with silver gray; tail tipped with paler.

Female.—Similar to male but head, neck and back more brownish, the front of the neck and breast pale fawn color in contrast to the dark remaining under parts.

Young.—Similar to female but black parts duller.

A rather strange appearing bird, with its straight, slender, sharply pointed bill, its large tail, stiff and fan-shaped when spread, and snake-like neck. It perches on a tree or stump above the water, and darts down pursuing its prey under water. One was always seen on the same tree along the bank of the Chilibri River on my many trips up there. It is not uncommon on Gatun Lake where it may sometimes be seen from the railroad trains, sitting on some stump with wings and tail outspread to dry after the manner of a cormorant.

Notes, "A rasping, chattering croak uttered when fighting or coming to the nest." Chapman.

26. Family FREGATIDÆ

The Frigate Birds

Sea birds related to the pelicans but of very different appearance and habits. There is but one genus with very few species found in most tropical seas. The body is small and light, the bill long and hooked at the tip, the

FRIGATE BIRD

tail very long and deeply forked, the wings very large, long and pointed, the legs exceedingly short and the feet small. There is a pouch under the bill that can be inflated to a considerable size in the case of the male.

Few birds have more wonderful powers of flight, and they often soar to considerable heights. Often they keep practically motionless over one spot, heading into the wind, and maintaining their position by scarcely perceptible movements of their immense wings. They nest in colonies in trees; the male performing his share in the incubation. When on the nest the males inflate the pouch under the bill, which is bright red and very conspicuous.

1. *Fregata magnificens rothschildi* Matthews Frigate Bird

Fregata minor palmerstoni STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 248.

Length about 950—1025 mm. (37.50—40.40 in.); tail about 450—480 mm. (17.70—18.85 in.).

Male.—Brownish black glossed with green or purplish. Bare skin of throat scarlet.

Female.—Brownish black, the breast white.

Young.—Similar to female but head and neck also white.

This remarkable bird is one of the features of the tropical coasts that cannot fail to attract the attention of even the least observing visitors. The way in which they float in the air almost



Photograph by Dr. W. G. Van Name.

FRIGATE BIRDS NESTING ON PACHECA, ONE OF THE
PEARL ISLANDS.

motionless and stationary, high above the water or sometimes over the land, maintaining their position in spite of the movement of the wind, is one of the mysteries of bird flight. Sometimes one may be seen to pursue some slower flying species, as a gull or tern, and they are said to live largely by robbing these of their prey; but few birds seem so little interested in feeding or spend so little time and effort in getting their living, as Frigate Birds. Time seems to be no object to them, and if they are concerned about what is going on below them as they float lazily in the bright sunshine, they seldom show it. The Frigate Bird nests in trees. Colonies of them breed in the winter on islands in Panama Bay. I have seen them nesting on the Fortified Islands, Chamé Island, and on Pacheca and Galera in the Pearl Island group. On approaching Chamé, a small, high, jungle-covered island, one is amazed to see trees apparently bearing large scarlet blossoms; on closer inspection they prove to be the inflated pouches of the males on the nests. On Pacheca we heard the hungry young birds clattering their bills to attract the attention of their inattentive parents. The very young birds are covered with whitish down.

27. Family CATHARTIDÆ

The American Vultures

Though the Old World vultures differ little in structure from the birds of the hawk family and are ordinarily included in that family,

KING VULTURE

the American vultures while superficially like the Old World ones and resembling them in their filthy, carrion feeding habits and wonderful powers of eyesight and flight, have so many small peculiarities in their skeleton and anatomy that they are always made a family apart. The bill is hooked but rather slender and weak, the nostrils large, the feet with slender toes and blunt claws suggesting those of a chicken, the wings very large, the plumage sombre, the head and neck more or less bare and the vocal organs almost wanting so that they can produce only a weak, hissing noise. The few species inhabit North and South America, and include the condors, two of the largest of flying birds. Unlike most birds of prey, the females are no larger than the males.

1. *Gypagus papa* (Linnæus)

King Vulture

Length 815 mm. (32.00 in.); tail 255 mm. (10.00 in.).

Sexes alike.—**Adult.**—Head, upper neck and middle of chest bare; an erect caruncle at base of upper mandible; feathers of lower neck, ruff, slaty gray; upper back, shoulders, most of outer webs of inner quills, wing coverts and remaining under parts, excepting bare skin of chest, cream color; rump and tail black. Bare skin of head and throat variously colored (red, yellow, orange and blue), but red predominating; bare skin of chest pinkish; bill black basally, red or orange terminally; iris white.

BLACK VULTURE

Young.—Plumage entirely blackish brown; bare skin of head and neck dusky.

So strikingly colored and marked as to be unmistakable. One in adult plumage seen soaring over the high part of Barro Colorado on April 5th, 1926, and one in young plumage in the Monkey-cap palm forest near Fort Sherman in April 1924.

2. *Catharista urubu* (Vieillot)

Black Vulture

Sexes alike.—Length 610 mm. (24.00 in.); tail 203 mm. (8.00 in.). Plumage black, the under surface of the wings with small transverse whitish patch near the tip. Head unfeathered, the bare skin blackish. Bill and feet black.

Commonly called Buzzard, like its near relative *Cathartes aura aura*. It is not so common or so generally distributed throughout the country as that species, but often exceeds it in numbers in the vicinity of towns and cities and along the sea coast. Aside from the difference in the color of the bare skin of the head, there are differences in general conformation that are noticeable both when flying and at other times. The tail of this species is shorter than that of the Turkey Vulture and its wings are broader. Its plumage is blacker and has a small whitish patch extending across the quills a little way from the end of the wing on the under side, while the

TURKEY BUZZARD; TURKEY VULTURE

Turkey Vulture is a somewhat lighter-colored bird and has a large obliquely limited gray area on the under surface of the wings which are proportionately longer and narrower than in the present species and have a noticeable bend.

3. *Cathartes aura aura* (Linnæus)

Turkey Buzzard; Turkey Vulture

Sexes alike.—Length about 760 mm. (30.00 in.); tail about 280 mm. (11.00 in.). Plumage brownish black, the head unfeathered and covered with rough red skin; under surface of wings with a large, obliquely bordered gray area. Bill whitish; feet flesh-colored.

This is a longer-tailed, narrower-winged bird than the Black Vulture (see note on that species). Extremely common throughout the Canal Zone, a few being usually in sight in the sky anywhere and at any time during daylight. Numbers may usually be seen over Ancon Hill, circling and soaring and flying before the wind. On sunny afternoons several would sit for long periods with wings extended on a large tree near our house. A Troupial I had in captivity in a cage on the porch was terrified every time one of these odious birds flew by, and, uttering a cry of fright, took refuge under the upturned corner of a zinc pan in the bottom of the cage. On one occasion, I saw a Summer Tanager hide in a scarlet-flowered hibiscus hedge when one lit nearby, although I never saw a buzzard attack or molest a bird.

28-29. Families FALCONIDÆ and
ACCIPITRIDÆ

The Hawks, Eagles and Their Allies

These two families are here treated together since their members are all included in one family (*Falconidæ*) in most books. In the classification of Miller and Wetmore, (see the Auk for July, 1926, pp. 337-346), the Falconidæ include only the falcons and the genus *Polyborus* (the latter not found in the Canal Zone) the remaining forms constituting the family *Accipitridæ*.

These birds of prey are so distinct in appearance and habits that no lengthy description is needed. Their predacious mode of life demands that they have size, strength, activity, and powers of flight superior to the creatures on which they live.

They are therefore, with comparatively few exceptions, rather large birds, some of them very large. Their colors are never brilliant, but the plumage is often handsomely variegated. The bill is short and sharply hooked at the end for use in tearing up their prey; it is provided with a tumid, soft portion called the *cere* at the basal part of the upper mandible. The feet, which are developed into powerful talons, not the bill, are used in catching and carrying their prey.

The numerous members of these families are found in all parts of the world. It is one of the most difficult groups for the bird student, as most of the species are wary and

can be seen only at some distance, usually flying, and often with the sky for a background, making recognition of the colors difficult. Many of the species are, moreover, quite rare and there will be few opportunities for observing them. Their colors usually vary greatly with age and sometimes also with sex, while some also have color phases independent of those factors. Their size, build, the form and proportions of their wings and tail, and their manner of flight must therefore be depended upon in recognizing the species.

There are several distinct types of hawks, in one or another of which most members of the group can be placed, and it will aid in identifying a species if it can be referred to one of these types.

The *falcons* are small to medium sized, with pointed long wings, the courageous members of the group usually capturing their prey, which consists of birds (or in the case of very small species, of large insects), in the open, chasing and catching them by means of their superior speed, strength and endurance and ability to turn and maneuver in the air. They do not usually fly at great heights.

The *Accipiter* type comprises birds of rather slender build, but very active and rapacious. They range from small to rather large in size, and have short, more rounded wings and a longer tail than the falcons, giving them great maneuvering power among the branches of trees, and great speed for short distances. They commonly approach their prey rapidly or by stealth and depend

on a sudden burst of speed to seize it. Familiar examples in the United States are the Sharp-shinned and Cooper's Hawks.

The *Buteo* type comprises medium sized and large species, having rather large broad wings, the tail usually short and rounded and a rather heavy body. They can usually soar well but are not particularly active, spending much of their time sitting quietly on some perch, often in deep woods, watching the ground for the small mammals or reptiles, which, rather than birds, form the bulk of their prey; most of them are not above feeding on dead animals if, as often happens, they can catch no living ones. The comparatively tame and easily killed species of this group, generally harmless and often useful creatures, are the usual victims of the hostility which the chicken-killing habits of the *Accipiter* group arouse. Familiar species of this type in the United States are the Red-tailed and Red-shouldered Hawks.

The *eagles* are very large-sized species, most of which conform more or less to the *Buteo* type.

The *kites* are medium-sized, light-bodied species with very large wings and usually quite a square tail. They have great power of long-sustained flight, ranging over the country in an irregular manner, flying usually at a moderate height and searching the ground below for their prey, which they pick up with a graceful swoop, but which consists mostly of very small creatures only. There are no familiar and common representatives in the United States; the Marsh Hawk has rather

RED-THROATED CARACARA

kite-like habits and flight except that it nearly always flies very low.

ACCIPITRIDÆ

1. *Ibycter americanus americanus* (Boddaert) Red-throated Caracara.

Male.—Length 495 mm. (19.50 in.); tail 235 mm. (9.20 in.). Black glossed with green, in-



FIG. 21. *Ibycter a. americanus*

cluding under surface of wings; the abdomen and thighs white. Bill yellow, cere bluish black; bare skin of face and throat and legs red; feet black. Head slightly crested; tail long, somewhat rounded.

Female.—Similar to male but larger.

A strikingly colored species, strictly arboreal in habits. Carriker says invariably seen in pairs.



Photograph by Mrs. Ludlow Griscom.

FRIGATE BIRDS, PEARL ISLANDS.

YELLOW-HEADED CARACARA

Exceedingly noisy, having a peculiar and disagreeable cry resembling the word *ca-ca-o*.

2. *Milvago chimachima cordata* Bangs Yellow-headed Caracara

Milvago chimachima STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 248.

Sexes alike.—Length 405 mm. (16.00 in.); tail 185 mm. (7.20 in.). Above brown excepting

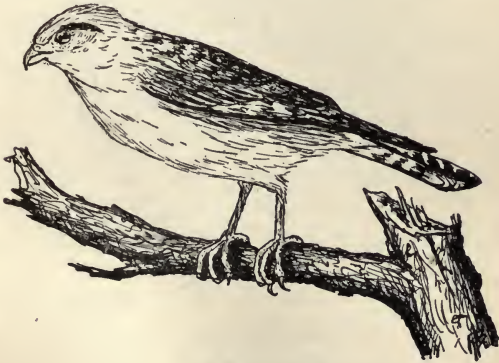


FIG. 22. *Milvago chimachima*

head and neck, the feathers of back and wing coverts with ashy margins, wing quills with a conspicuous cream patch; tail two thirds buffy white barred with brown, terminally brown; head, neck all around, and under parts including under wing coverts, buffy white; a brown streak in continuation of eye. Bill ivory; bare skin yellow.

MARSH HAWK

Young.—Resembling adults but sides of head to cheeks, and neck all around streaked brown and yellowish buff, the top of the head brown spotted with yellowish buff; a brown patch on ear coverts, cheeks yellowish white deepening to straw color on under parts and streaked with brown on chest and breast, under wing coverts barred with brown. Two tufts on back of head.

A small, common South American hawk, sluggish and rather tame and stupid. A scavenger. Very common on various islands in Panama Bay; a nest located on the island of Pedro Gonzales in a rather low tree in March 1926, a female sitting on the nest. In the same tree were two or three pelicans, also nesting. One of these hawks was observed on several occasions sitting motionless on the rocks at low tide on the same island. It is primarily an open country or savannah species, and does not occur in the forest.

3. *Circus hudsonius* (Linnæus)

Marsh Hawk

Male.—Length 480 mm. (19.00 in.); tail 230 mm. (9.00 in.). Above bluish gray, the top of the head streaked with whitish and tinged with rusty; *upper tail coverts white*; tail more ashen gray barred with blackish and narrowly tipped with white; breast pearl gray; abdomen white spotted or barred with rufus; under surface of wings white, a few rusty bars on under wing coverts, quills terminated with black.

Female.—Length 558 mm. (22 in.); tail 253 mm. (10.00 in.). Above dusky brown, head and neck streaked, wing coverts spotted with rufous; *upper tail coverts white*; tail brown, paler at tip and barred with blackish; under parts tawny buff streaked except on chin and throat with brown.

Young.—Resembling female.

A winter visitor often seen flying low over marshes, sabanas and other open places such as the Gatun Dam, Panama golf links, etc. The long wings and rambling, irregular flight, as it searches the grass and brakes for its food, often raising its wings at an angle as it banks on its turns, and especially its conspicuous white rump, help in recognizing it.

4. *Micrastur melanoleucus* (Vieillot)

Black and White Hawk

Sexes similar.—Length, male 530 mm. (21.00 in.); tail 230 mm. (9.00 in.); Female about 610 mm. (24.00 in.); tail, about 240 mm. (9.50 in.). Black above including crest, upper tail coverts tipped with white; tail black with three narrow white cross bands visible from below; sides of head, neck, a collar across hindneck, and under parts white, a narrow black patch behind ear coverts and cheeks; under wing coverts cream, under surface of quills barred black and white.

Young.—Brown above, the back and wing coverts barred with rufous tawny, a collar of

CASSIN'S BARRED HAWK

rufous and buff spots crossing hindneck; tail with tip and six cross bars, white; under parts white heavily barred with brown and washed with rufous; under wing coverts white spotted and barred with brown.

A large hawk of typical *Accipiter* build with an elongated crest. A rare species confined to forests.

5. *Micrastur guerilla interstes* Bangs Cassin's Barred Hawk

Length, about 355 mm. (14.00 in.; (tail, about 178 mm. (7.00 in.).

Male.—Above blackish slate including sides of head to cheeks, the wings passing to brown; tail tipped with white and crossed by three white bars not conspicuous on under surface; throat and cheeks pale gray; remaining under parts dull white thickly and narrowly cross-barred with blackish, bars narrower and sparser on abdomen; under surface of wings barred. Bill horn, cere yellowish; feet yellow. Tail long.

Female.—Resembling male, the bars below broader and darker but similar in distribution.

Young.—Head including sides blackish; back brown with indistinct rufous bars, feathers of nape and sides of neck elongated and spotted with buff, forming a conspicuous ruff; tail blackish with four white cross bars; under parts white and excepting throat, barred with brown.

Like *M. melanoleucus*, a forest bird. It preys on smaller birds, staying near the ground. A specimen of this little hawk was seen perching quietly in an upright position on a low branch in deep forest on Barro Colorado Island in April, 1924.

6. *Geranospizias cærulescens niger* (Du Bus)
Blackish Crane Hawk

Geranospizias niger STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 243.

Sexes alike.—Length, 480 mm. (19.00 in.); tail, 245 mm. (9.60 in.). Plumage entirely slaty black, the tail crossed by two broad white bands; under surface of wings black with a few indistinct and narrow white bars indistinguishable from a distance. Bill black; legs reddish orange.

Young.—Upper parts black, the forehead and line over eye white, the front of the crown streaked with white; chin white; remaining under parts black indistinctly striped with white, shading to buff on abdomen.

—Slender, with long wings and a very long tail and legs, a small head and weak bill. Sluggish in habits, and found near marshes and ponds in heavy forest. It is rare throughout its range.

7. *Accipiter bicolor* (Vieillot)
Four-banded Hawk

Length, Male about 393 mm. (15.50 in.); tail, about 170 mm. (6.70 in.). Female larger.

BROAD-WINGED HAWK

Sexes alike.—Bluish slate above, the sides of head and neck paler, top of head sooty; tail blackish with four narrow gray bands; below pale bluish gray, the thighs bright chestnut; under wing coverts white, the under surface of quills ashen barred with dusky. Bill black, cere and feet yellow.

Young.—Brownish above, the feathers margined with rufous; top of head black, sides brownish streaked on cheeks with white, a white streak striped with black over eye; tail blackish with three white bands and tipped with white; under parts buffy, unmarked.

Tail long and rounded. Wings rather short and rounded, the tips of the quills spreading in flight. Flight swift, a succession of rapid flaps followed by a short sail. Rarely seen above the tree tops.

8. *Buteo platypterus platypterus* (Vieillot) Broad-winged Hawk

Sexes alike.—Length, about 395 mm. (15.50 in.); tail, about 178 mm. (7.00 in.). Above dusky, the feathers somewhat margined with buffy and rufous; tail crossed by two to four bands of grayish white and tipped with whitish; chin white; chest and breast whitish, heavily barred with brownish tawny; abdomen white barred with dull rufous.

Young.—Tail grayish brown with three to five distinct blackish bars and a narrow white

tip; under parts buffy white streaked with dusky, a dark streak along lower part of cheeks.

A migrant from North America, of heavy, sluggish flight but sometimes soaring. We witnessed large flocks of them on their northward migration, slowly drifting over the Radio Station at the entrance to Darien Harbor, San Miguel Bay, March 14, 1926.

9. *Asturina nitida nitida* (Latham)

Shining Buzzard Hawk

Sexes alike.—Length, about 405 mm. (16.00 in.); tail, about 175 mm. (6.80 in.). Ashy gray above, barred with silvery white; tail black tipped with whitish and crossed by a broad white band, the under surface paler and crossed by a second narrower white band; sides of face and throat dull whitish, the remaining under parts barred gray and white, the bars diminishing in width on abdomen; under surface of wings white, the quills sparsely barred with gray. Bill black, cere and growth around bill, gray; feet yellow.

Young.—Very different, blackish brown above, feathers for the most part margined with rufous; crown buffy white streaked with blackish; forehead, sides of crown and face and under parts buffy white sparsely but heavily spotted with brown on breast, abdomen and sides; a black line over and in continuation of eye; under wing coverts tawny, under surface of quills ashy

LARGE-BILLED HAWK

narrowly and indistinctly barred with dusky; thighs not barred.

A rather stout medium sized hawk of the *Buteo* type, wings somewhat rounded, tail short and square. Arboreal and somewhat inactive in habits, feeding chiefly on small mammals, insects and lizards. Seen at Pearl Islands, March, 1926.

10. *Rupornis magnirostris ruficauda* (Sclater and Salvin)

Large-billed Hawk

Sexes alike.—Length, about 370 mm. (14.50 in.); tail, about 150 mm. (5.90 in.). Above brownish ashen, the feathers with paler margins except on head; inner margins of wing quills deep chestnut barred with black; tail chestnut with four or five black bars, the upper tail coverts barred buff and brown; throat and chest brownish ashen, the throat streaked with buff; remaining under parts barred grayish chestnut and white; under surface of wings buffy, the under wing coverts speckled and the quills barred with dusky. Bill black, cere and feet yellow.

Young.—Similar but less shaded with ashen and obscurely barred above with tawny; more bars on tail.

Typical *Buteo* build, tail conspicuously rufous. Its prey are snakes, lizards and mice. One of the commonest hawks of the Zone; found on the edge of the forest or in second growth.

11. *Busarellus nigricollis nigricollis* (Latham)
Black-collared Hawk

Male.—Length, about 455 mm. (18.00 in.); tail, about 190 mm. (7.50 in.). Above bright chestnut finely striped with black, head and neck creamy buff, the crown washed with chestnut and narrowly striped with black; the longer outer wing quills terminated with black; tail chestnut crossed by black bands and black terminally tipped with white; *lower throat conspicuously black*; remaining under parts bright chestnut, under wing coverts chestnut. Bill black; feet yellow.

Female.—Length, about 558 mm. (22 in.); tail, about 203 mm. (8.00 in.). Similar to male but larger.

Young.—Above chestnut irregularly barred with dusky; below variegated brown and chestnut.

A fish-eating hawk, with broad wings and a short tail resembling the osprey *Pandion haliaëtus* in flight. Very sluggish, tame and stupid; found only along swampy river banks and in marshes. Its chestnut coloration and light buff head and neck render it absolutely unmistakable in life.

12. *Urubitinga anthracina anthracina* (Nitzsch)
Mexican Black Hawk

Sexes alike.—Length, about 595 mm. (23.50 in.); tail, about 230 mm. (9.00 in.). General

GHIESBRECHT'S HAWK

color of plumage black, the tail tipped with white and crossed by one broad white band; upper tail coverts narrowly tipped with white; surface of wings black. Bill blue black; bare skin of face, cere, and feet yellow.

Young.—Dusky brown above, back black; head, neck all around and under parts whitish broadly streaked with black and washed with tawny.

A large heavily built hawk of sluggish habits. Not at all shy. It is not uncommon near the coast and about the islands of Panama Bay and along the larger rivers.

13. *Leucopternis ghiesbreghti costaricensis* Sclater

Ghiesbrecht's Hawk

Leucopternis ghiesbreghti STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 250.

Sexes alike.—Length, about 585 mm. (23.00 in.); tail, about 215 mm. (8.50 in.). General color of plumage white, tail with a subterminal band of black; wings black and white. Bill black, cere gray; feet yellow.

Young.—Similar to adults but the top of the head striped with black.

This beautiful white hawk of typical *Buteo* build, is a bird of the deep forest, perching on high trees where it is shaded and concealed from



GHIESBRECHT'S HAWK.
Leucopternis ghiesbreghti.

view. It has a loud, shrill, prolonged screech, several times repeated, which it utters both when flying and perching. An adult was seen sitting on an upper branch, crossing the trail, of a high tree near the Monkey-cap palm grove, in April, 1924. One was seen twice at Barro Colorado Island, each time with a snake held by the neck in its claws, on April 3 and April 4, 1926.

14. *Thrasaëtus harpyia* (Linnæus)

Harpy Eagle

Sexes alike.—Length, 965 mm. (38.00 in.); tail, 405 mm. (16.00 in.). Head and neck all around ashen gray; remaining upper parts and chest brownish black; tail mottled ashen and dusky crossed by four imperfect black bands and tipped with white; remaining under parts white with the feathers of under tail coverts elongated and plume-like. Bill black; feet yellow.

Young.—Above ash gray marbled with black; tail with about five broken black bands; head, neck, and under parts white, the longer crest feathers and chest tinged with ash gray; under surface of wings ashy barred with black.

A magnificent eagle with a conspicuously long crest and a frill on center of hindneck. Its wing spread about seven feet, flight sluggish and heavy. Kills prey as large as sloths, pigs and fawns. Seen over Monkey-cap palm grove near Fort Sherman, in May, 1924; it lit on the top-most branch of a tall tree.

15. *Herpetotheres cachinnans cachinnans*
(Linnæus)
Laughing Hawk

Sexes alike.—Length, about 480 mm. (19.00 in.); tail, about 230 mm. (9.00 in.). Brown above, the slightly crested head and neck buffy white, finely streaked with black; sides of head to front part of cheeks black; front part of cheeks, a patch under the eye, a collar around the neck, and under parts, white; upper tail coverts buff; wing quills brown and rufous barred with black; tail brown crossed by four bands of whitish buff. Bill grayish black; cere orange; feet yellowish.

A conspicuously marked hawk, its prey principally reptiles. It is particularly fond of perching on the top of a tall dead tree in some clearing in the forest, and has a strange cry, loud and far reaching. Doctor Frank M. Chapman says, "Resembling a call of a man in great pain and ending in an agonized wail." "The guttural laugh which precedes the long call of this species can be heard only a short distance." (Richmond.)

16. *Elanoides forficatus yetapa* Bonn and Vieillot
Swallow-tailed Kite

Elanoides forficatus STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 250.

Sexes alike.—Length, about 535 mm. (21.00 in.); tail, 330 mm. about (13.00 in.). Tail cleft

more than one half its length. Head, neck all around, rump, and under parts, including under wing surface, immaculate white; back, wings and tail black glossed with green and purplish. Bill black; feet light grayish blue.

Easily recognizable by its conspicuous coloration and long swallow tail. It has a remarkably graceful, plunging flight. Nests in trees at a great height, preys on reptiles, frogs, beetles, grasshoppers, bees, and other insects, feeding on the wing.

17. Chondrohierax uncinatus (Temminck)
Red-collared Hawk

Leptodon uncinatus STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 250.

Sexes similar.—Length, male about 407 mm. (16.00 in.); female about 431 mm. (17.000 in.); tail, (both sexes) about 190 mm. (7.50 in.). General color bluish slate, browner below and with narrow and irregular bars of white; tail white crossed by two broad black bars; under surface of wings barred. Bill black; cere and bare skin of face yellow.

First mature plumage.—Slate replaced by brown except on head; under parts more broadly barred tawny brown and white.

Another phase of plumage.—The tawny brown below replaced by dark brown.

Another phase.—General color blackish gray, the basal half of tail white.

PLUMBEOUS KITE

Young.—Brown above, a white collar crossing hindneck, tail with three cream and ashy bands and tipped with whitish; under parts buffy white including under wing coverts; under surface of quills barred.

A tame and sluggish hawk. Its flight is heavy and flapping. Found in open swamps and marshes.

18. *Ictinea plumbea* (Gmelin) Plumbeous Kite. "Gavilan Azul"

Sexes alike.—Length, 355 mm. (14.00 in.); tail, 152 mm. (6.00 in.). General color lead gray



FIG. 23. *Ictinea plumbea*

shading to blackish on tail, and distinctly paler on head; tail with three white bands (two visible from below); tips and outer webs of wing quills lead gray, inner webs chestnut (conspicuous in

DUCK HAWK

flight); feathers surrounding eye black. Bill black.

Young.—Blackish above, the feathers tipped with white; head, neck and lower parts whitish striped with blackish; under surface of wings blackish barred with white, but indistinctly on under wing coverts.

A small hawk with large and long pointed wings and a moderately long square-tipped tail. A common and widely distributed species which occurs in all parts of the Canal Zone. Of swift and graceful flight, it is sometimes seen at a considerable height and at other times flying close to the ground.

FALCONIDÆ

19. *Falco peregrinus anatum* (Bonaparte)

Duck Hawk

Length.—Male, 405 mm. (16.00 in.); tail, 165 mm. (6.50 in.). Female, 480 mm. (19.00 in.); tail, 190 mm. (7.50 in.).

Sexes alike.—Above dark bluish, slaty outer wing quills barred with tawny; tail inconspicuously barred with blackish and tipped with white; a black patch from bill extending down sides of throat; below cream buff barred and spotted with black except on throat and chest.

Young.—Above dusky with rusty edges to feathers; ear coverts buffy; below buffy streaked with black; bars of under surface of tail tawny buff.

WHITE-THROATED BAT FALCON

This bird, a subspecies of the Peregrine Falcon formerly used for hawking in the Old World, has an amazingly swift flight. It preys on game, shore birds and other birds. Large falcons



FIG. 24. *Falco albigularis*

apparently of this species have been seen at several places in the Zone, but especially at the Pacific canal entrance. On April 11th, 1926, one was seen to chase and dive six or eight times at a turkey buzzard (*Cathartes aura*), for what purpose I do not know, unless for diversion. The buzzard apparently had no difficulty in avoiding its attacks, though made very swiftly from a great height, by turning and side slipping at the last instant.

20. *Falco albigularis* Daudin White-throated Bat Falcon

Length.—Male, about 228 mm. (9.00 in.); tail, about 102 mm. (4.00 in.). Female, about 305 mm. (12.00 in.); tail, 137 mm. (5.40 in.).

PIGEON HAWK

Sexes alike.—Above slaty black; wing quills barred with white on inner web; tail black crossed by four or five narrow indistinct grayish bands; sides of neck white slightly tinged with rufous; breast and sides black finely barred with white; remaining under parts chestnut; under surface of wings brown inconspicuously barred with white. Bill black; cere and feet yellow.

Small and of typical falcon build and flight. It frequents clearings in the forest and perches on branches whence it darts after its prey, consisting of birds, grasshoppers, etc. Its cry resembles that of the Killdeer Plover (*Oxyechus vociferus*).

21. *Falco columbarius* (Linnæus)

Pigeon Hawk

Length, 290 mm. (11.50 in.); tail, 140 mm. (5.50 in.).

Male.—Slaty bluish gray above, long outer wing quills barred with white; a rusty collar across hindneck; chin, throat and sides of neck white; tail with three or four grayish bands and white tip; under parts buff washed with tawny and streaked with blackish.

Female.—Resembling male but as in young, more buffy or whitish below.

Young.—Above dusky, a broken buffy collar across hind neck; long outer wing quills barred with tawny; tail black tipped with whitish and crossed by three broken buffy bars; below, similar to adults.

SPARROW HAWK

Migratory. A small and bold falcon frequenting open country.

22. *Cerchneis sparveria* (Linnæus)

Sparrow Hawk

Length, 255 mm. (10.00 in.); tail, 120 mm. (4.80 in.).

Male.—Back rufous, more or less incompletely barred with black; tail rufous with a subterminal band of black and tipped with white; top of head slaty blue with probably a rufous patch on crown; sides of head with two vertical narrow-black bands, the enclosed spaces covering part of cheeks and whitish ear coverts; *wing coverts slaty blue* spotted with black; under parts cream tinged with tawny on breast and abdomen and spotted on abdomen and sides with black.

Female.—Resembling male but *wing coverts rufous* and with back and tail distinctly barred with black; under parts cream streaked with tawny.

Young.—Resembling adults but colors more blended.

A common winter visitant. It frequents open places, and is often seen perched on telegraph poles along roadsides. Notes, a long drawn-out shrill repetition of *killy killy*. It has one habit by which it may often be recognized, that is of hovering in the air without moving forward, but keeping up rapid beats of its wings.

23. *Pandion haliaëtus carolinensis* (Gmelin)

Osprey

Length, 586 mm. (23.10 in.); tail, 215 mm. (8.40 in.).

Sexes similar.—Above dusky, the tail grayer tipped with white and crossed by six or seven dusky bands; head, neck, and lower parts white, a conspicuous dusky streak through eye and ear coverts, breast sometimes spotted with brown, (never immaculate in female).

Young.—Resembling adults but feathers above tipped with white.

The osprey feeds entirely on fish, flying above the water and plunging after its prey, which it seizes in its talons. Notes, a succession of high, petulant whistles. Common in the Canal Zone. Fond of soaring at a considerable height. The snowy white under parts and dark wings and a noticeable bend in each wing when sailing, due to the quills being held directed slightly backward instead of fully outstretched, make it easy to recognize.

30-31. Families TYTONIDÆ and
BUBONIDÆ

The Owls. "Buho"

The owls are birds of prey superficially resembling the hawks in their hooked bill and in having the claws developed into strong talons used in catching and carrying the

FAMILIES TYTONIDÆ AND BUBONIDÆ

prey; but they are modified for nocturnal life and their anatomy shows them to be more closely related to the goatsuckers than to the hawks. Their other conspicuous characters are the large eyes which are directed forward and are surrounded by an area of radiating feathers forming what is called the *facial disk*, and the soft fluffy plumage usually of mottled brown, buff and blackish shades, making them inconspicuous in subdued light and giving them a noiseless, stealthy flight. Some of the species can, however, see well and hunt by daylight, especially in cloudy weather. Their cries and calls are very different in the different species, and are often very peculiar.

Owls are found in practically all parts of the world, though the group is a rather small one. The Barn Owls (*Tytonidæ*), are separated from the other owls (*Bubonidæ*) because of having certain anatomical peculiarities and the outline of the facial disk triangular rather than rounded.

The so-called *horns* or *ears* that many owls have on the head are merely tufts of feathers. The true organs of hearing in the owls are, however, highly developed as a part of their adaptation to nocturnal life.

Key to the Owls

- a. With ear tufts.
- b. Very small, length about 230 mm. (9.00 in.); face and ear tufts barred brown and buffy; facial rim and an eye ring dark brown; under parts with fine bars forming herring bone pattern.....
.....*Otus choliba luctisonus*

STRIPED HORNED OWL

- bb. Larger, length about 335 mm. (13.20 in.) or more.
 - c. Face white; ear tufts mostly black; facial rim black; upper and under parts with heavy blackish streaks.....*Rhinoptynx clamator*
 - cc. Cheeks rusty chestnut; eyebrows white and ear tufts mostly white; upper parts reddish brown and unstreaked...*Lophostrix cristata stricklandi*
- aa. Without ear tufts.
 - b. Larger, length about 420 mm. (16.50 in.); a broad brown band across chest; face brown with conspicuous white markings around eyes.....
.....*Pulsatrix perspicillata*
 - bb. Smaller, length about 380 mm. (15.00 in.) or less; under parts without broad brown band across chest.
 - c. Under parts barred or striped.
 - d. Under parts white barred with black; face black.....*Ciccaba n. nigrolineata*
 - dd. Under parts pale cinnamon buff mottled and heavily striped with dusky; face buffy brown.....*Ciccaba v. virgata*
 - cc. Under parts with dusky dots; face white with a conspicuous heart-shaped, tawny facial rim..
.....*Tyto perlata guatamalæ*

i. *Rhinoptynx clamator* (Vieillot)

Striped Horned Owl

Length.—**Male**, about 355 mm. (13.20 in.); tail about 130 mm. (5.10 in.). **Female**, about 369 mm. (14.50 in.); tail, about 140 mm. (5.50 in.).

Sexes alike.—Above light or tawny buff coarsely vermiculated and heavily streaked with brownish black; tail mottled and barred with dark brown; ear tufts black, the inner webs of the feathers edged with whitish; face dull white with a black rim broken into spots on throat; foreneck white; remaining under parts white

SPECTACLED OWL

washed with tawny and heavily streaked with black spots.

Conspicuously streaked, with black ear tufts. Hallinan records two from Balboa.

2. *Pulsatrix perspicillata* (Latham) Spectacled Owl

Length.—**Male**, about 407 mm. (16.00 in.); tail, about 182 mm. (7.20 in.). **Female**, about 459 mm. (18.00 in.); tail, about 190 mm. (7.50 in.).



FIG. 25. *Pulsatrix perspicillata*

CHOLIBA SCREECH OWL

Sexes alike.—Chocolate brown above, including sides of face, neck and throat; conspicuous buffy white eyebrows; a patch of white below cheeks extending behind ear coverts; foreneck white; remaining under parts tawny buff separated from neck by a broad band of brown covering chest.

A large owl without ear tufts and with conspicuous white eyebrows and a broad brown band covering chest. I am informed by Mr. Ludlow Griscom that there are two races in the Zone, the darker form (*P. p. saturatior*) occurring on the Pacific side.

3. *Otus choliba luctisonus* Bangs Choliba Screech Owl

Otus choliba RIDGWAY, Birds of N. and M. Amer., VI, p. 711, 1914; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 251.

Sexes alike.—Length, about 228 mm. (9.00 in.); tail, about 90 mm. (3.50 in.). Above light grayish brown, entirely vermiculated with dusky mottled with brownish buff and narrowly streaked with blackish brown on head, and more sparsely on back; wing coverts with conspicuous white spots; wing quills banded with cinnamon, the bands outlined and mottled with dusky; tail crossed by bands of dusky and cinnamon; face including eyebrows dull buff finely barred with brown; rim around eye brown; facial rim brownish black; ear tufts finely barred buff and brown

STRICKLAND'S OWL

with narrow brown streaks; under parts whitish with conspicuous narrow streaks and bars of blackish brown forming a herringbone pattern.

Rufous phase.—Of extremely rare occurrence.

Young.—General color mixed dull white and dull buff barred with dusky, blackish facial rim as in adults.

A small owl with a distinct brown facial rim. Very common. Often found near habitations perching in bushes or trees and uttering at certain times of the year during the night a plaintive purring note followed by a cat-like *ow*. Seen and heard often at Quarry Heights during the three years of my residence there.

4. *Lophotrix cristata stricklandi* (Sclater and Salvin)

Strickland's Owl

Length, about 396 mm. (15.50 in.); tail, about 180 mm. (7.00 in.). Above chocolate brown thickly vermiculated with buffy, paler on wings, lower back and rump; scapulars with some large white spots; wing quills but narrow sparse bars of buff; head blackish brown with a broad white eyebrow, the feathers immediately surrounding eye black and a chestnut rufous patch on cheeks; ear tufts two inches long of white and dark brown, vermiculated with buff; below grayish buff vermiculated with dusky.

An owl occurring only in heavy forest.

5. *Ciccaba virgata virgata* (Cassin)
Cassin's Barred Owl

Sexes alike.—Length, about 321 mm. (12.60 in.); tail, about 133 mm. (5.20 in.).

Lighter phase.—General color of upper parts dusky with mottlings and irregular bar-like spottings of grayish buffy; tail brownish black with tip and four bars of mottled grayish brown and white; eyebrows buff, the feathers tipped with sooty, face buffy brown and dusky, variously streaked and barred; facial rim buffy flecked with dusky; under parts pale cinnamon buff usually mottled with dusky on sides of breast; sides of breast and abdomen with broad stripes of sooty brown, these stripes sometimes extending across breast.

Darker phase.—The ground color darker below.

Smaller than *C. n. nigrolineata* and differing in coloring; dusky above, mottled and barred, cinnamon buff below. A forest bird. An owl apparently of this species seen at Barro Colorado Island in April, 1924.

6. *Ciccaba nigrolineata nigrolineata* (Sclater)
Black and White Owl

Sexes alike.—Length, about 379 mm. (14.90 in.); tail, about 165 mm. (6.50 in.). Above brownish black, the hindneck and upper tail coverts barred with white; tail with tip and four

FAMILY TYTONIDÆ

narrow bands of white; face black with eyebrows of white spots; under parts white conspicuously barred with black.

A medium sized owl with no ear tufts, conspicuously black and white. Hallinan records one from Gatun and one from Tiger Hill, both found in the dense jungles. "It had a cat-like call."

Family TYTONIDÆ

The Barn Owls

7. *Tyto perlata guatemalæ* (Ridgway) Central American Barn Owl

Sexes alike.—Length, about 364 mm. (14.30 in.); tail, about 141 mm. (5.55 in.). Ground color above tawny, mottled with dusky grayish and speckled with black and white; the tail mottled with dusky and crossed by about five bands of dusky; face white, facial rim orange tawny above, passing to black below; under parts white suffused with tawny buff and with numerous small dusky dots.

Usually frequents and nests in buildings, sometimes right in the cities. Hallinan reports finding one in Old Panama in the ruins of the Merced Convent tower. Jewel shot one of a pair living in ventilators of a building at Gatun; he notes that they always came out at dusk and flew in the same direction.

32. Family PSITTACIDÆ

The Parrots

This family included, in older classification, all the parrots, parakeets, macaws, cockatoos, etc., though in modern ones some of the less typical Old World forms are made one or more separate families. The group is a large one of several hundred species and many genera, and occurs in all tropical regions, though few extend into temperate climates except in Australia and New Zealand. They live mostly on vegetable food, although the hooked bill and their habit of using the feet to grasp their food is suggestive of birds of prey. Their feet are, however, quite different, having two toes directed forward and two backward. Their plumage is often very highly colored and variegated, a characteristic green being perhaps the most prevailing color. The upper mandible has considerable power of independent motion and the tongue is fleshy and capable of much movement. The bill is habitually used as a help in climbing.

The parrots are mostly very noisy birds with harsh voices; the conversational ability for which they are noted is confined to a comparatively few genera, among which is however, *Amazona*, represented by several species in the Canal Zone. They usually nest in hollow trees, the larger species of the Canal Zone are birds of the deep forest, that disappear from cleared districts. They remain rather quiet during the hot part of the day,

SCARLET OR RED, BLUE AND YELLOW MACAW

but fly about in pairs or small groups in the early morning and at dusk, when their short hooked bill, slow laborious flight and noisy calls make them conspicuous wherever they are still found. The small parakeets however do not object to bright sunshine.

The bird student will often find the species difficult to distinguish on account of their wildness and the peculiar character of their plumage, which though really brightly colored, appears blackish in the poor light of evening and under the conditions (usually flying with the sky as background) under which they are most commonly seen.

1. *Ara macao* (Linnæus)

Scarlet or Red, Blue and Yellow Macaw.
"Garuaca Mayo"

Length 845 mm. (33.30 in.); tail 545 mm. (21.45 in.).

Sexes alike.—Head, neck, back, shoulders, lesser wing coverts, most of tail and under parts scarlet; middle wing coverts orange yellow; greater wing coverts and quills dull blue; rump azure blue; bare skin pinkish white; bill, upper mandible pinkish white with a triangular patch of black near base and tipped with black, lower mandible black.

Fairly common in some parts of the Republic where they are usually seen in pairs or in small flocks and frequent the tops of tall trees. If any macaws still occur in the Canal Zone, they are probably this species. I had one in cap-

VERAGUA PARRAKEET

tivity for a short time; it was extremely noisy, had a voracious appetite and was most destructive if allowed to ramble around.

2. *Eupsittula ocularis* (Sclater and Salvin)

Veragua Parrakeet

Length 229 mm. (9.00 in.); tail 109 mm. (4.30 in.).

Sexes alike.—Upper parts apple green, passing to bluish green on top of head and to greenish blue on wings; yellowish green below; sides of head, throat and chest buffy brown with a patch of orange yellow on front of cheeks below the whitish bare skin surrounding the eye. Bill light horn color. Tail long, graduated and tapering to a rounded tip.

Young.—Similar to adults but without the orange spot on cheeks.

Two of this species were seen on the upper branches of a tree on the top of one of the banks of a cut on the Panama Railroad line near Frijoles, April 12, 1926. The long tail forms a distinguishing character.

3. *Brotogeris jugularis* (Müller)

Tovi Parrakeet. "Perice"

Length 164 mm. (6.50 in.); tail 62 mm. (2.40 in.).

Sexes alike.—General color bright yellowish green, a patch of bright orange on chin and upper throat; tail feathers tapering to rounded or pointed tips. Bill pale flesh color; bare skin whitish.

SALVIN'S PARROT

One of the common and widely distributed birds of the Canal Zone. Early in the morning and before sunset these parrakeets go in flocks from tree to tree, and flying and feeding keep up a shrill, incessant chattering. During the day, sitting in trees, one will give a single call, a flat *wääk*, answered by a chorus of *weechee, weechee, weechee*, etc., the performance repeated indefinitely. In captivity I have heard them utter poignantly beautiful whistles, sometimes in answer to my whistling. This gentle little bird is one of the greatest sufferers from the cage bird traffic. Dozens of them are often packed into cages or boxes, so closely that they can scarcely move, and shipped north, or sold to sailors or tourists who have neither the knowledge nor the means of caring for them. A large proportion of them perish from suffocation or starvation long before reaching their intended destination. It is cruel and wasteful to cage these lovely and beautiful little creatures, as they do not long survive in captivity, unable to continue in their active habits and improperly fed, aside from the barbarousness of depriving them of their liberty.

4. *Amazona autumnalis salvini* (Salvadori)

Salvin's Parrot

Length 313 mm. (12.30 in.); tail 116 mm. (4.55 in.).

Sexes alike.—Forehead, and extending to in front of eyes, red; remainder of top of head pale

PLAIN-COLORED PARROT

green and violet, a band of bluish across hind-neck and all the feathers tipped with black; remaining upper parts parrot green, a patch of red on the wing quills; sides of head and neck and under parts yellowish green with possibly some red on throat.

The present species was identified by its red forehead on Pedro Gonzales in the Pearl Islands. Their smaller size and somewhat higher pitched screams will often help to distinguish them from *A. farinosa inornata*.

5. *Amazona farinosa inornata* (Salvadori)

Plain-colored Parrot. "Loro"

Length 387 mm. (15.30 in.); tail 134 mm. (5.30 in.).

Sexes alike.—General color parrot green, the feathers of the top of the head, upper back and more especially the hindneck tipped with dusky; a patch of red on wing quills; tail parrot green terminated in yellowish green. Bare skin of face white; iris red; bill horn color with a yellowish spot on the side.

A large parrot still fairly common in the forested areas of the Canal Zone. I heard it utter a series of single harsh staccato squawks while flying. When there are several in the tops of the trees squawking, it sounds like many revolving, ancient and long ungreased cart wheels. They remain quiet during most of the day but early in the morning and before dark,

PANAMA PARROT

they fly over the forests in pairs, fours or sixes (less often is any odd number seen), giving their characteristic cries and traveling slowly and apparently laboriously with rapid beats of their wings.

6. *Amazona ochrocephala panamensis* (Cabanis)

Panama Parrot. "Loro real"

Length 307 mm. (12.10 in.); tail 105 mm. (4.10 in.).

Sexes alike.—Upperparts yellowish parrot green, the forehead and middle of crown bright yellow; a patch on the wing quills red, the outer quills terminating in blue and bluish black; tail parrot green, the terminal third of all excepting the middle pair of feathers, light yellowish green; sides of head and neck and under parts light yellowish green. Bare skin of face white; bill whitish; iris yellow.

Young.—Similar to adults.

A large proportion of the smaller Amazonas of the Canal Zone probably belong to this species, although opportunities for clearly observing its colors are infrequent. It was identified at Barro Colorado and at Pedro Gonzales in the Pearl Islands.

7. *Pionus menstruus* (Linnæus)

Blue-headed Parrot. "Casanga"

Length 244 mm. (9.60 in.); tail 73 mm. (2.85 in.).

RED-NECKLACED PARROT

Sexes alike.—Head and neck a beautiful gentian blue, the feathers indistinctly tipped with dusky and with a patch of black on the ear coverts; remaining upper parts parrot green; wings and middle tail feathers grass green, the remaining tail feathers with the inner webs red, the outer webs blue (bluish green terminally); throat grayish white mixed with blue and with a red patch at the base; chest dull blue; remaining lower parts lighter parrot green, the under tail coverts red. Iris brown. Bill lighter at base and with a large red spot on the sides of lower mandible.

Young.—Similar to adults but blue of head and neck duller, usually with a red patch on sides of forehead.

A small parrot seen at Barro Colorado and elsewhere about Gatun Lake. On one occasion a flock of some size was observed. The comparatively short tail is noticeable in flight. Jewel reports it from Agua Clara near the Rio Trinidad, "A noisy species."

8. *Eucinetus hæmatotis coccinicollaris* (Lawrence)

Red-necklaced Parrot

Pyrrhula hæmatotis coccinicollaris RIDGWAY, Birds of N. and M. Amer., VII, 1916, p. 206; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 251.

Length 214 mm. (8.40 in.); tail 67 mm. (2.60 in.).

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Male.—Top and sides of head and middle of throat dull grayish olive passing to tawny olive on hindneck, a spot of whitish on sides of forehead and a patch of red on ear coverts; remainder of upper parts yellowish parrot green; wings greenish blue, dark blue and green, the longer quills black; middle tail feathers yellowish green tipped with dark blue; remaining tail feathers blackish; chin whitish; sides of neck dusky; chest tawny olive, the upper part mixed with red, forming a broken red collar; remaining under parts light yellowish green. Bill dull light buff.

Female.—Similar to male but duller.

Young.—Similar to adults but with no red on ear coverts.

A very small parrot with a short tail. Hallinan reports a male from Las Guacas on the Chagres. "In a cultivated plantation. There were several flocks in this locality."

33. Family ALCEDINIDÆ

The Kingfishers

The appearance and actions of these birds are too familiar to make any long introduction necessary. They constitute a moderately large family, best represented in the warmer parts of Asia, Africa and Australia, but with only six American species, all of which are found in the Canal Zone. King-

FAMILY ALCEDINIDÆ

fishers range in size from that of a small song bird to that of a crow, the large head and long, stout tapering, sharply pointed bill, the strikingly and often brilliantly colored plumage, their active habits and loud, harsh calls make them easy to recognize. Their feet have the third and fourth toes closely joined. The typical kingfishers frequent the vicinity of water, feeding on small fishes which they catch in their bill by plunging after them, though many of the Old World kingfishers frequent woods and other localities far from water, feeding on insects, land snails, lizards, etc. They nest in holes in banks or trees and lay pure white eggs.

Key to the Kingfishers

- a. Larger, length over 276 mm. (10.80 in.).
 - b. Upper parts bluish gray.
 - c. Very large, length 3.80 mm. (15.00 in.); underparts mainly chestnut.
 - d. Gray band across chest.
.....*Megaceryle t. torquata*, female
 - dd. No gray band.*Megaceryle t. torquata*, male
 - cc. Smaller, length about 305 mm. (12.00 in.); underparts mainly white; gray band across chest.
 - d. Chestnut on sides..*Megaceryle a. alcyon*, female
 - dd. No chestnut on sides.
.....*Megaceryle a. alcyon*, male
 - bb. Upper parts dark metallic green, under parts mainly white, no chestnut below.
 - c. Band of chestnut across chest.
.....*Chloroceryle amazona*, male
 - cc. Sides of chest dark metallic green.
.....*Chloroceryle amazona*, female

RINGED KINGFISHER

- aa. Smaller, length not over 215 mm. (8.50 in.); upper parts dark metallic green.
- b. Under parts mainly white.
 - c. Chest chestnut.....
.....*Chloroceryle americana isthmica*, male
 - cc. Two bands of dark greenish spots across breast..
.....*Chloroceryle americana isthmica*, female
- bb. Under parts mainly orange chestnut with gray band across breast in female only.
 - c. Larger, length about 215 mm. (8.50 in.).....
.....*Chloroceryle inda*
 - cc. Smaller, length about 132 mm. (5.20 in.).....
.....*Chloroceryle a. aenea*

i. *Megaceryle torquata torquata* (Linnæus) Ringed Kingfisher

Streptoceryle torquata torquata RIDGWAY, Birds of N. and M. Amer., VI, p. 409, 1914; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 251.

Length 380 mm. (15.00 in.); tail 121 mm. (4.75 in.).

Male.—Head crested. Dark bluish gray above with a white collar, a white spot before eye and one on lower eyelid; throat white; sides of foreneck bluish gray, rest of underparts chestnut; under wing coverts white.

Female.—Similar to male but foreneck and chest bluish gray, and a white band crossing upper breast; under wing coverts chestnut.

Common about the Lake and seashore. Call quite similar to that of *M. a. alcyon*. Easily recognizable by its large size, and mostly chestnut underparts.

BELTED KINGFISHER

2. *Megaceryle alcyon alcyon* (Linnæus) Belted Kingfisher

Streptoceryle alcyon alcyon RIDGWAY, Birds of N. and M. Amer., VI, p. 415, 1914; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 252.

Length 303 mm. (11.90 in.); tail 88 mm. (3.50 in.).

Male.—Head crested. Above bluish gray with a white collar; wings spotted and with concealed bars of white; a white spot before the eye; under parts mostly white with a broad band of bluish gray crossing chest.

Female.—Similar to male but sides, flanks and a band (sometimes incomplete) crossing chest, chestnut.

Young.—Similar to adult female.

A winter visitant from North America. It has a loud, rattling call.

3. *Chloroceryle amazona* (Latham) Amazon Kingfisher

Length 276 mm. (10.90 in.); tail 79 mm. (3.10 in.).

Male.—Above dark metallic green with a broad white collar across hindneck; tail with a few broken bars of white; a crescent of white below the eye; under parts white, the last crossed by a broad band of reddish chestnut covering chest and upper breast; a broken streak of bronze green below cheeks extending along sides of neck;

ISTHMIAN GREEN KINGFISHER

sides and flanks broadly streaked with bronze green.

Female.—Similar to male but no chestnut on under parts. Middle of the chest and upper breast white; sides of chest bronze green.

Not very common. Seen about the Lake and along the Chilibri River. Distinguishable from the other green kingfishers by its large size, crested head and broad white collar.

4. *Chloroceryle americana isthmica* (Goldman) Isthmian Green Kingfisher

Length 189 mm. (7.50 in.); tail 57 mm. (2.25 in.).

Male.—Not noticeably crested. Above dark metallic bronze green with a white collar, wings and tail banded and spotted with white; the front part of cheeks greenish black, the back part white broken by a conspicuous stripe of greenish black spots extending along sides of neck; a narrow stripe of greenish black below cheeks; under parts white, with sides of the chest reddish chestnut, and the sides of the breast and flanks conspicuously spotted with greenish black.

Female.—Similar to male but without any chestnut on under parts, the white chest and breast each crossed by a band of greenish black spots.

This small species is the commonest of the green kingfishers. It has a single short "*chep*" and a buzzing trill representing the rattling call of the larger species.

GREEN AND RUFOUS KINGFISHER

5. *Chloroceryle inda* (Linnæus)

Green and Rufous Kingfisher

Length 215 mm. (8.45 in.); tail 64 mm. (2.50 in.).

Male.—Above dark metallic green spotted with white on upper back and shoulders; tail irregularly barred with white; a few spots and speckles of white on wings; under parts bright orange chestnut fading to orange buff on throat; under wing coverts orange tawny.

Female.—Similar to male but the orange buff of throat separated from the deeper color of breast by a band of metallic green mixed with white.

Young male.—Similar to female.

Not common. This species is the handsomest kingfisher in the Canal Zone, its coloring being the most striking. I saw a male and female in the spring of 1924 on adjacent trees by the side of the canal near Gamboa.

6. *Chloroceryle ænea ænea* (Pallas)

Least Green Kingfisher

Length 132 mm. (5.20 in.); tail 36 mm. (1.40 in.).

Male.—Above very dark metallic green, the wings and tail spotted with white; cheeks and sides of neck orange tawny, paler on throat; chest, sides and flanks orange chestnut, the middle of the breast and the abdomen, white.

FAMILY MOMOTIDÆ

Female.—Similar to male but a band of greenish black speckled with white crossing chest.

Young male.—Similar to adult male but under parts paler and chest streaked indistinctly with blackish.

Young female.—Similar to adult female.

Rare. This species is easily distinguishable by reason of its diminutive size. One seen perched on a branch over the Rio Chilibri in about the same location and at the same time of year in 1923 and in 1924.

34. Family MOMOTIDÆ

The Motmots. "Culebrero"

The motmots form a small, tropical American group rather closely related to the kingfishers (*Alcedinidæ*). They are beautiful birds of blue, green and russet plumage, with a graduated tail of which the middle pair of feathers is much elongated and has the shafts denuded for about an inch a little above the extremity, forming racket-shaped tips. This is done by the bird itself "nibbling off the barbs"; the purpose of this extraordinary mutilation is not known.

They are found in the deep forests or dense thickets, stupidly sitting in one place for long periods of time, often twitching their tail from side to side in a characteristic way. They nest in holes that they excavate in banks of streams, though some species select natural caves or crevices.



GREAT RUFIOUS MOTMOT.

Baryphthengus martii semirufa.



GREAT RUFOUS MOTMOT

I. *Baryphthengus martii semirufa* (Sclater) Great Rufous Motmot

Urospatha martii semirufa RIDGWAY, Birds of N. and M. Amer. VI, p. 468, 1914; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 252.

Sexes alike.—Length, 456 mm. (17.90 in.); tail, 277 mm. (10.90 in.). Head, neck and under parts (excepting feathered thighs and under tail coverts) bright chestnut shading to tawny on throat, foreneck and chest, sharply outlined above against the parrot green of remaining upper parts; the outer wing coverts light bluish green and the outer wing quills for the most part bright turquoise and violet blue; tail greenish blue; a broad, velvety patch of elongated black feathers from bill through eye, including ear coverts, and a small tuft of black feathers on middle of foreneck; thighs and under tail coverts bluish green. Bill and feet black. Middle tail feathers denuded, with racquet shaped tips.

Young.—Similar to adults.

This bird frequents the lower, well-shaded parts of the tops of the tall trees in heavy forest, being usually found in small groups. It is not very wary, nor very active in its movements. Its commonest note is a rather loud whooping or cooing call of about five rapid syllables, somewhat like that of some pigeons, but louder and more resonant, which is repeated many times and is one of the characteristic sounds of the Barro

SMALL-BILLED MOTMOT

Colorado forest. To this bird I also attribute a slow, monotonous note like *wahk, wahk, wahk*, repeated again and again.

2. *Momotus subrufescens conexus*

(Thayer and Bangs)

Small-billed Motmot

Sexes alike.—Length, 386 mm. (15.20 in.); tail, 224 mm. (8.80 in.). Front of forehead and patch through eye ending in a point behind ear coverts, velvety black; front of crown clear light greenish blue (turquoise) shading to violet on sides of crown and across nape; remainder of crown black; remaining upper parts plain parrot green tinged with tawny chestnut, the greater part of the outer wing quills light bluish green; tail bluish green, peacock blue terminally; a conspicuous line of pale turquoise and violet blue feathers below cheeks; chin pale bluish green; remaining under parts olive tawny shading to tawny on abdomen. Bill black, feet flesh color; middle tail feathers denuded to form racquet tips.

Unlike *Baryphthengus* and *Electron*, this is a bird of the dryer thickets and jungles along the Pacific coast, not of the heavy forest, although like them it is inactive in habits and easy to approach. In May, 1924, not far from Old Panama, my attention was attracted by some black-winged ants coming out of a dense thicket which was guarded by bull thorn bushes, the home of a particularly vicious little fire-ant,

whose name is descriptive of its sting. Catching a glimpse of a long-tailed flying bird, that appeared to be feeding on the ants, I forced my way into the thicket, where I made out in the dimness one of these beautiful motmots sitting on a branch nearby. In March, 1926, two years later, I found another or perhaps the identical individual in the same thicket. On both occasions it was silent.

3. *Electron platyrhynchus minor* (Hartert)
 Lesser Broadbilled Motmot

Sexes alike.—Length, 306 mm. (12.00 in.); tail, 170 mm. (6.70 in.). Somewhat similar to *Baryphthengus martii semirufa*, the chestnut and tawny area extending only to breast and considerably duller, but the chin light bluish green; the breast and remaining under parts dull light bluish green. No turquoise and violet blue on the wings. Bill black, broad and flat; feet black; middle tail feathers denuded, with racquet-shaped tips.

A forest bird rather similar in habits to *Baryphthengus martii semirufa*, though possibly more solitary. It has rather deep notes, not unlike the syllable *wakk*, but I have not heard from it anything resembling the whooping call of *Baryphthengus*. Like the latter it is frequently to be seen on Barro Colorado Island.

35. Family CAPRIMULGIDÆ

The Goatsuckers

A large family of insectivorous birds of wide distribution in warm and temperate latitudes, whose members are mainly nocturnal in habits and have the soft, mottled plumage of black, white and brown shades characteristic of birds of the night. In certain structural characters, they show relationship to the owls, but have small weak feet, long wings and though the bill is very small and short, the mouth is enormous when opened, and serves to engulf their insect food which they catch in their flight like swallows and swifts.

They usually lay their eggs (one or two in number) on the ground without any nest. Nearly all of them have loud and characteristic calls.

1. *Nyctidromus albicollis albicollis* (Gmelin)

Parauque

Length, 251 mm. (9.90 in.); tail, 140 mm. (5.50 in.).

Male.—Above brownish gray finely vermiculated with dusky, and streaked with black on the center of crown and back, the wing coverts with large white and tawny spots and black markings; larger wing quills brown crossed by a broad oblique white band; four middle tail feathers brownish gray with splashes and indistinct bars of dusky, the outer tail feathers mostly white;

PARAUQUE

ear coverts chestnut; a white collar crossing throat; remaining under parts buffy finely

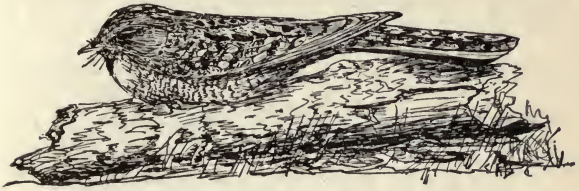


FIG. 26. *Nyctidromus a. albicollis*

barred with dusky. Tail long and slightly rounded.

Female.—Similar to male but with less white on outer tail feathers; the band on the wing quills narrower and mostly tawny buff, the white throat band less distinct.

There is a phase in which the general color of the upperparts is more tawny.

A very common bird of the Canal Zone, very numerous in the spring along the sides of the Gamboa road. When driving along that road at night, one may see their eyes shine out from the darkness like miniature headlights. They have a habit of jumping a few inches from the ground repeatedly but settling back in the same spot after each jump. I saw numbers of them along the paths around Gatun at night, especially under the street lights. "During the mating season two or three of these birds get together and utter low guttural noises impossible to describe. The ordinary note may be represented by *kwe-ah-reo*, uttered in a clear, ringing, and

NIGHT HAWK

rather tremulous voice, and can be heard a long distance, the call from a distant bird sounds like *ah-reo.*" (Richmond.)

2. *Chordeiles virginianus virginianus* (Gmelin) Night Hawk

Length, 242 mm. (9.50 in.); tail, 112 mm. (4.40 in.).

Male.—Above mottled black, brown, gray and tawny, black prevailing; outer wing quills crossed by a broad white band; tail blackish with grayish marbled cross bars and crossed by a broad interrupted white subterminal band; the throat with a V-shaped patch of white, lower throat and chest with spots of buffy or white, the remaining underparts regularly barred buffy whitish and dusky.

Female.—Similar to male but the V-shaped patch on throat more or less tawny instead of white and the white subterminal band of tail lacking.

Young.—Similar to female but without well defined white throat patch.

Wings long and narrow, tail slightly notched or emarginate.

A migrant or winter visitor from North America. Less nocturnal than many members of the family. It migrates by day in straggling flocks, flying at a moderate height, feeding as it goes on insects that it catches in the air. On cloudy days or toward evening it may often be

TEXAS NIGHT HAWK

seen flying at a greater height, and occasionally giving its rather loud, penetrating call which resembles the syllables *pee-a*, though it is much more silent in its winter haunts than it is in the breeding season.

The long narrow wings with a white area on each are characters conspicuous when it is seen in flight.

3. *Chordeiles acutipennis texensis* (Lawrence) Texas Night Hawk

Length, 216 mm. (8.50 in.); tail, 102 mm. (4.00 in.).

Male.—Similar to *C. virginianus virginianus* but smaller and with somewhat lighter and more blended coloration, the white wing patch nearer to the tip than to the bend of the wing, instead of about midway between the bend and the tip, as in *C. virginianus virginianus*.

Female.—Similar to male but the white markings replaced by tawny, those on the wings and tail much broken up into tawny spots.

A common winter visitor, sometimes to be seen at dusk near Colon in large flocks.

36. Family NYCTIBIIDÆ

The Potoos

A small family of tropical American birds related to the goatsuckers and commonly made a subfamily of that group in older clas-

sifications. They are distinguished from the goatsuckers by several structural characters in spite of much superficial resemblance to them, there being differences in the feet, in the upper mandible (toothed near the end) and in the existence of areas of peculiarly modified soft feathers on the sides and breast. Like the goatsuckers they are nocturnal and some of them are noted for their extraordinary calls.

1. *Nyctibius griseus panamensis* Ridgway
Panama Potoo. "Bohio"

Male.—Length, 344 mm. (13.50 in.); tail, 201 mm. (7.90 in.). Female.—Dimensions not available.

Sexes similar.—Plumage mottled, vermiculated and spotted grayish brown, cinnamon buff and black, the head broadly striped with black, the scapulars spotted with black, edge of wing black, the longer wing quills blackish barred on outer webs with creamy buff; tail brownish black with irregular speckled bands of grayish buff; feathers of under parts with black shafts, some of those of breast with black terminal spots.

"The locality was not far from the stub upon which we had originally discovered *Nyctibius* and we had little doubt that the individual seen was the one we had heard calling. . . . The inexpressibly sad, human quality of 'Poor me one's' call affects every one who hears it. Waterton, we have no doubt refers to it when he compares

the voice of 'the largest Goatsucker in Demerara' to the wailing of Niobe for her poor children before she was turned to stone. . . ." Brewster and Chapman. Notes on Birds observed in Trinidad, *Auk*, XII, No. 3, July, 1895, p. 210.

2. *Nyctibius grandis* (Gmelin)

Great Potoo

Sexes alike.—Length, about 500 mm. (19.50 in.); tail, 260 mm. (10.25 in.). Ground color of plumage mixed white and buffy in various proportions barred, marbled or vermiculated with dusky; wing quills blackish with narrow grayish bars and spots; tail marbled with gray (sometimes suffused with buff or pale rusty), and dusky, the markings forming many more or less interrupted transverse bars. On the breast the dark markings fuse into irregular spots or blotches.

On Barro Colorado in April from sundown through the early evening there issued from the depths of the jungle a resonant deep-toned *potoo*, *potoo*, *potoo*, interminably repeated, which is said to be the call of this bird, and is truly an extraordinary, unforgettable sound.

37. Family CYPSELIDÆ

The Swifts

A moderately large family of insectivorous birds remarkable for their very long narrow wings and extraordinary powers of flight.

SMOKY SWIFT

They are all of small size, with extremely small and weak feet, and usually do not perch, but rest by clinging to some vertical or oblique surface, supporting the body partly with the tail, whose feathers are in many species stiffened and pointed at the tip for this purpose. The bill itself is very small and short, though the mouth is large and wide when opened. They spend most of their time in the air catching the insects on which they feed, in flight. Their plumage is usually entirely dusky, though sometimes relieved with white areas. Among their most remarkable characters is the great development of the salivary glands which produce a sticky secretion by which they fasten together the materials of their nest and attach it to cliffs, sides of caves or hollow trees, etc.

Swifts are not likely to be mistaken for any other birds except possibly swallows, but their narrower wings, blackish plumage and shrill screaming or twittering notes are characteristics that the bird student will quickly recognize, though the species are often hard to tell apart. In spite of their very different bill, plumage and habits, their nearest relatives appear to be the humming birds, which much resemble them in the structure of their long, narrow wings.

1. *Chætura cinereiventris fumosa* (Salvin)

Smoky Swift

Length, 102 mm. (4.00 in.); tail, 40 mm. (1.60 in.).

CHAPMAN'S SWIFT

Sexes alike.—Glossy blue black above with the rump pale gray; throat grayish white, passing to mouse gray on chest and to blackish slate on remaining under parts, the under tail coverts slate black.

See note on next species.

2. *Chætura chapmani* Hellmayr Chapman's Swift

Sexes alike.—Length, about 120 mm. (4.70 in.); tail, about 50 mm. (2.00 in.). Resembling *C. cinereiventris fumosa* but larger, the rump and upper tail coverts smoky gray in less noticeable contrast to the color of remaining upper parts; the under parts deep sooty gray, the throat and chest paler.

Swifts of about this size and appearance are common in the Canal Zone and will often be seen flying over the squares and about the suburbs of Panama City. Whether they are all of this species seems somewhat doubtful; the swifts of this region require further investigation and other species beside the two here recorded, will doubtless be proved to occur here.

38. Family TROCHILIDÆ

The Hummingbirds

The hummingbirds are an immense family of birds so distinct in habits and appearance

FAMILY TROCHILIDÆ

as to be recognized by everybody at sight. Their very minute size (the family includes the smallest of all birds and none that would not be called small in any other family), their beautiful and varied plumage, usually iridescent with metallic tints, their distinctive build and unique flight with the beats so rapid that the wings appear as a blur and produce the whirring or humming sound that gives the family its name, are all characteristic and unmistakable.

In anatomy and in the structure of their long, narrow wings they show resemblances to the swifts, but have a long, awl-like bill and slender tongue adapted to extracting the minute insects and the sweet juices from the flowers before which they hover with rapidly beating wings. Their notes are shrill and squeaky and generally sound too much alike to human ears to be of much assistance in distinguishing the species. In character they are nervous and pugnacious, the males chasing away birds many times their size from the vicinity of their nests, which are beautiful specimens of bird architecture. Two plain white eggs are laid.

The hummingbirds are entirely confined to the New World, most of them occurring in tropical America, a few in the temperate regions (in the eastern United States only one species).

The males are usually so conspicuous and characteristic in plumage that the difficulty of the bird student in recognizing them is chiefly due to their minute size, rapid, darting flight and incessant activity. The females



Photograph by Dr. W. G. Van Name.

TREES CROWNING PACHEC PEAPI ISLANDS. ROOSTING PLACE OF HUNDREDS OF BROWN AND COMMON NESTS

FAMILY TROCHILIDÆ

are usually more plainly colored and those of most species are so much alike that their recognition in life is difficult or impossible.

Key to the Male Hummingbirds

- a. Extremely small, length about 67 mm. (2.60 in.); a conspicuous crest of elongated tawny feathers; a buffy line across rump. *Lophornis delattrei*
- aa. Larger, length 77 mm. (3.00 in.) or more; no crest.
 - b. Underparts mainly dull buffy, grayish tawny or grayish rufous without bright metallic coloring; bill relatively very long and curved; size medium to small.
 - c. Tail broad and rounded; under parts dull rufous. *Glaucis hirsuta affinis*
 - cc. Tail not broad and rounded.
 - d. Middle tail feathers excessively elongated, terminally white.
 - e. Upper parts bright metallic bluish green; rump metallic greenish blue. *Phæthornis guyi coruscus*
 - ee. Upper parts dull metallic bronze, the rump tawny barred with black. *Phæthornis longirostris cassini*
 - dd. Middle tail feathers not excessively elongated but tail extremely graduated.
 - e. Larger, length about 110 mm. (4.30 in.); rump metallic bronzy green; a tawny chestnut area on throat and chest. *Threnetes ruckeri dariensis*
 - ee. Smaller, length about 87 mm. (3.40 in.); rump chestnut; under parts dull grayish tawny. *Phæthornis adolphi nelsoni*
- bb. Under parts not mainly dull buffy, grayish tawny or grayish rufous. With or without metallic coloring below.
 - c. Under parts with extensive and conspicuous white areas.
 - d. Tail extensively white.

FAMILY TROCHILIDÆ

- e. Under parts pure white; top of head bright metallic royal purple. *Heliiothryx barroti*
- ee. Head, neck and chest metallic blue; a white band across hindneck; abdomen dull white. *Florisuga mellivora*
- dd. Tail bronze like rump and lower back; head, throat and chest metallic emerald green. *Saucerottia edward*
- cc. Under parts without extensive and conspicuous white areas.
- d. Chin, throat, chest, middle of breast and abdomen velvety black; tail extensively metallic purplish. *Anthracothorax n. nigricollis*
- dd. With no black on under parts.
- e. Rather large length about 118 mm. (4.60 in.) or over; under parts metallic green; tail broad and rounded.
- f. Under parts metallic emerald green; tail bronzy bluish black. *Chalybura buffoni micans*
- ff. Under parts dull grayish bronzy green; tail dull silvery green. *Phæochroa c. cuvieri*
- ee. Smaller; length 112 mm. (4.40 in.), or under; under parts with bright or brilliant metallic coloring.
- f. Under parts with bright metallic violet blue or bluish purple.
- g. Larger; crown, upper back and abdomen bright metallic bluish purple. *Thalurania c. columbica*
- gg. Smaller; with no metallic bluish purple in upper parts.
- h. Breast and abdomen bright metallic violet blue; throat brilliant emerald green. *Damophila panamensis*
- hh. Chest bright metallic violet blue.
- i. Tail golden bronze, not forked. *Hylocharis elicix*
- ii. Tail dark colored, forked.
- j. Crown brilliant metallic emerald green (from front); chin and

RUCKER'S HERMIT

- upper throat metallic green
(black from front).....
.....*Polyerata amabilis*
- jj. Crown metallic green (not brilliant like remaining upper parts); chin and upper throat metallic violet blue.....
.....*Lepidopyga cæruleogularis*
- ff. No bright metallic violet blue or bluish purple in under parts.
- g. Very small; tail metallic blackish blue, decidedly forked; under parts glittering metallic grass green; bill short....
.....*Chlorostilbon assimilis*
- gg. Larger; tail not blackish blue and not decidedly forked.
- h. Bill medium; tail bright chestnut; throat and chest bright metallic emerald green.....*Amazilia t. tzacatl*
- hh. Bill very long and straight; tail metallic green tipped with white on outer feathers; crown bright metallic greenish blue; throat bright metallic magenta..*Anthoscenus l. longirostris*

1. *Threnetes ruckeri dariensis* Bangs Rucker's Hermit

Threnetes ruckeri RIDGWAY, Birds of N. and M. Amer., V, p. 336, 1911; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 253.

Sexes alike.—Length, about 110 mm. (4.30 in.); tail, about 33 mm. (1.30 in.). Above metallic bronzy green, including middle pair of tail feathers; remaining tail feathers black, white for basal half, and all tipped with whitish; a patch under eyes and ear coverts dusky, outlined below by a buffy streak through cheeks, and

LESSER HAIRY HERMIT

above the ear coverts by a buffy streak in continuation of the eye; throat dusky; chest bright tawny chestnut; breast and abdomen buffy grayish.

Bill very long, stout and curved; mandibles yellow with black tips; tail decidedly rounded, the feathers pointed at the tips.

Of medium size, chest conspicuously tawny chestnut in both sexes in contrast to the dusky throat; no brilliant plumage. "Nearly always to be found in patches of wild plantain or wild cane." (Carriker.) Jewel says, "A noisy species found in the jungle."

2. *Glaucis hirsuta affinis* (Lawrence)

Lesser Hairy Hermit

Length, about 110 mm. (4.30 in.); tail, about 36 mm. (1.40 in.).

Male.—Above metallic bronzy green including middle pair of tail feathers, remaining tail feathers chestnut, with a broad band of black terminally, all tipped with white; sides of head dusky; sides of neck and sides of chest metallic bronze green; whole under parts reddish tawny brown, paler on throat and duller on abdomen.

Female.—Similar to male but under parts entirely tawny cinnamon.

Bill bright red, very long, much curved, fairly stout and sharply pointed; tail rounded.

"A bird of the thick jungle always well below the top foliage." (Jewel.)

3. *Phaethornis guyi coruscus* Bangs
Bang's Hermit

Male.—Length, 143 mm. (5.60 in.); tail, 43 mm. (1.70 in.). Plumage generally bright metallic bluish green shading to greenish blue on rump



FIG. 27. *Phaethornis guyi coruscus*

and upper tail coverts, and passing to dull slate on lower abdomen; a narrow tawny patch on the middle of the throat; tail terminally black, the narrow pointed tips of the middle pair of tail feathers whitish. Bill black above, reddish below.

Female.—Length, 158 mm. (6.20 in.); tail, 68 mm. (2.70 in.). Similar to male above, but two middle tail feathers longer and broader and with more rounded tips; a streak of tawny from above eye over ear coverts and one from bill below cheeks and ear coverts; remaining underparts mouse gray excepting a narrow tawny patch on throat and chest and a dusky streak each side of throat.

Bill very long and arched; tail graduated, the middle pair of feathers much elongated.

NICARAGUAN HERMIT

A common forest species in Panama, likely to be found on the Caribbean side of the Zone.

4. *Phaethornis longirostris cassini* Lawrence Nicaraguan Hermit

Phaethornis longirostris cephalus RIDGWAY, Birds of N. and M. Amer. V, p. 321, 1911; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 254.

Length.—Male, 159 mm. (6.25 in.); tail, 67 mm. (2.60 in.). Female, 147 mm. (5.80 in.); tail, 66 mm. (2.60 in.).

Sexes alike.—Top of head brownish glossed with bronze green; back, scapulars and lesser wing coverts dull metallic bronze green; rump and upper tail coverts tawny buff barred with dusky, tail terminally black tipped with whitish, *the middle pair of feathers much elongated and terminated with white*; a streak of buffy white above, and in continuation of eye; a dusky patch below the eye and extending to cover the ear coverts, bordered below by a streak of dull whitish; chin and throat creamy buff bordered on each side by a stripe of brownish buff; remaining underparts dull buffy gray, barred with brownish gray.

Bill very long and much curved, black with base of mandible yellow.

A very large species with elongated middle tail feathers and very long curved bill. Very common in jungle and wild banana thickets. Hovers in a very upright position. Builds its nest on the

DUSKY HERMIT

under side of a leaf at the tip, to which it is fastened by webs. "It is fond of flowers of wild plantain and feeds on nothing else while they are in bloom." (Carriker.)

5. *Phaethornis adolphi nelsoni* Bangs and Barbour Dusky Hermit

Phaethornis adolphi saturatus RIDGWAY, Birds of N. and M. Amer., V, p. 236, 1911; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 254.

Length, about 89 mm. (3.50 in.); tail, about 34 mm. (1.40 in.).

Male.—Upper parts dull metallic bronze; rump and upper tail coverts chestnut, the tail dusky tipped with whitish; patch under eye and ear coverts dusky; a streak of cinnamon buff below and one above ear coverts; chin and throat dusky, remainder of under parts reddish cinnamon.

Female.—Resembling male but chin and throat paler. Tail extremely graduated and tapering.

A small species of deep woods and ravines, distinguishable by its graduated tail and bronze and cinnamon coloration. It usually flies very low, often hovering motionless except for its wings which make a characteristic buzzing sound. One was observed dipping repeatedly into a pool of water after small insects in a ravine on Barro Colorado Island.

JACOBIN HUMMINGBIRD

6. *Florisuga mellivora* (Linnæus)

Jacobi Hummingbird

Male.—Length, 118 mm. (4.60 in.); tail, 38 mm. (1.50 in.). Head, neck and chest dark metallic blue, a more or less concealed white bar across hindneck, remainder of upperparts and wing coverts metallic green or bronze, tail white tipped with black; remaining underparts white, the sides metallic green, this color sometimes extending across the breast.

Female.—Length, 100 mm. (3.95 in.); tail, 34 mm. (1.35 in.). Upper parts metallic bronze green, tail bluish green, terminated in black tipped with white, the outer pair of feathers edged with grayish white; underparts spotted white and slate gray producing a scaled effect, the chin, center of breast, and abdomen pure white.

Bill short, straight, curved at tip. Tail very large and broad, slightly rounded, broader and longer in male; the tail coverts as long as middle tail feathers.

The metallic blue, and the broad white tail of the male are very conspicuous. A bird of the jungle, reported from Gatun by Jewel.

7. *Phæochroa cuvieri cuvieri*

(De Lattre and Bourcier)

Cuvier's Hummingbird

Sexes alike.—Length, 118 mm. (4.60 in.); tail, (Female) 44 mm. (1.75 in.). Upper parts metallic

LOVELY HUMMINGBIRD

bronze green; two outer pairs of tail feathers terminated with grayish white; chin, throat and breast dull metallic bronze green; center of breast and abdomen dull gray. Bill pink, the terminal half black, stout and almost straight.

A large species with dull coloring. Seen at Gatun in thickets below the Dam.

8. *Polyerata amabilis* (Gould)

Lovely Hummingbird

Length, 87 mm. (3.40 in.); tail, 28 mm. (1.10 in.)

Male.—Forehead and crown brilliant metallic emerald green; remaining upperparts metallic bronze green, shading to bronze on rump and middle pair of tail feathers; chin and throat dull bronze green appearing black if seen from in front; chest brilliant metallic violet blue; breast dull metallic green passing to brownish gray on abdomen.

Female.—Resembling male but forehead and crown same color as back, the metallic blue of the chest more restricted and the dull grayish white of under parts spotted with metallic green.

Bill straight and narrow, black above, yellowish below with black tip; tail slightly forked.

A small and very beautiful species observed in the jungle below the dam at Gatun and also recorded from Gatun by Jewel. "It is usually found in clearings and plantations, but occasionally in open woods." (Richmond.)

DUCHASSAIN'S HUMMINGBIRD

9. *Lepidopyga cæruleogularis* (Gould) Duchassain's Hummingbird

Length 90 mm. (3.55 in.); tail 31 mm. (1.20 in.).

Male.—Above bright metallic green shading to bronzy on middle pair of tail feathers, remaining tail feathers blue-black; whole chin, throat, and chest bright metallic violet-purple; rest of underparts metallic bluish green.

Female.—Above metallic bronze green; tail resembling that of male but outer tail feathers tipped with grayish white; underparts white, the sides of chest and breast metallic green.

Bill nearly straight, upper mandible pink with black tip; tail forked.

An equally beautiful and more widely distributed species than the last; often found in the shrubbery about houses and in gardens.

10. *Saucerottia edward* (De Lattre and Bourcier) Wilson's Hummingbird

Length 90 mm. (3.50 in.); tail 30 mm. (1.10 in.).

Male.—Whole top of head, hindneck and upper back metallic green; lower back scapulars and wing coverts and tail coppery bronze; cheeks, chin, throat, breast and sides bright metallic emerald green, abdomen abruptly white.

Female.—Similar to male.

Jewel notes "Obtained in forest." Hallinan records it from Sosa Hill, and it was observed in

RIEFFER'S HUMMINGBIRD

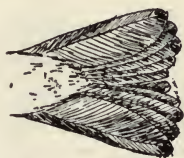
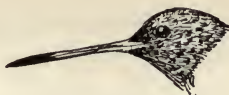


FIG. 28. *Saucerottia edward*
(Nat. Size)

trees near the shore on Taboguilla and other islands in Panama Bay early in March, 1926.

11. *Amazilia tzacatl tzacatl* (De la Llave) Rieffer's Hummingbird

Length 96 mm. (3.80 in.); tail 33 mm. (1.20 in.).

Male.—Above metallic bronze green with practically the whole of the upper tail coverts and tail chestnut brown; cheeks, chin, throat, chest, and sides of breast brilliant metallic emerald green; abdomen and middle of breast brownish gray.

Female.—Similar to male. Green of underparts not so brilliant.

Bill black, stout, long, and slightly curved. Tail slightly double rounded in both sexes.

A very common and widely distributed species, found about the borders of thickets and often seen near human habitations. Its generally

ELICIA'S GOLDEN-TAIL

green plumage and conspicuously brown tail make it easy to recognize.

12. *Hylocharis eliciæ* (Bourcier and Mulsant) Elicia's Golden-tail

Male.—Length, 88 mm. (3.50 in.); tail, 25 mm. (1.00 in.). Above metallic green changing to bronze on upper tail coverts and to bright golden bronze on tail; chin cinnamon buff, throat bright metallic violet blue; breast, sides and flanks metallic bronze green; abdomen buffy brown.

Female.—Length 77 mm. (3.00 in.); tail 25 mm. (1.00 in.). Underparts paler, less violet blue on throat.

Bill rather stout, longer than head and red, black terminally. Tail slightly rounded and feathers broad.

Small, tail bright golden bronze; throat with metallic violet blue; the red bill conspicuous. Seen at Quarry Heights, April, 1926.

13. *Damophila panamensis* Berlepsch Panama Hummingbird

Male.—Length 86 mm. (3.35 in.); tail 30 mm. (1.20 in.). Upperparts metallic green; more bronze on rump; tail glossy blue black; sides of head and neck, chin, and throat, brilliant metallic green; remainder of underparts metallic violet blue; white tufts on thighs.

Female.—Length 77 mm. (3.05 in.); tail 26 mm. (1.05 in.). Resembling male above, outer

ALLIED EMERALD

tail feathers broadly tipped with pale gray, under parts grayish white with sometimes some metallic green spots.

Tail graduated, feathers rather narrow but with rounded tips. Bill straight.

A small hummingbird, the male very brilliant; one of the common species of the Canal Zone. Often seen in the gardens at Quarry Heights during my stay there. Recorded by Hallinan from the Cruces trail and Corozal.

14. *Chlorostilbon assimilis* Lawrence Allied Emerald

Length 77 mm. (3.00 in.); tail 26 mm. (1.00 in.).

Male.—Upperparts dark metallic grass green; tail glossy blue black; underparts bright metallic



FIG. 29. *Chlorostilbon assimilis*
(Male Nat. Size)

grass green shading more to bronze on breast and abdomen.

Female.—Above bright bronzy metallic green; tail blue black, the outer feathers tipped with pale gray; sides of the head, excepting cheeks, dusky with a streak of whitish in continuation of eye; cheeks and underparts whitish gray spotted on the sides with metallic green.

Tail forked in males, slightly double rounded

COLOMBIAN WOOD NYMPH

in females; bill black above, orange brown below tipped with black, slender, straight, not long.

Male metallic green, brighter below but no brilliant metallic plumage; female more bronzy above, white tips to outer tail feathers. A very small species, not uncommon about the borders of thickets and in gardens. Noted at Quarry Heights, near Bella Vista and at Mt. Hope. Two nests were found at Quarry Heights, one in November, 1924, on a branch of a hibiscus bush, which extended under a corrugated iron porch roof; another in January, 1923, on one of the lower branches of a large mango tree.

15. *Thalurania columbica columbica* (Bourcier) Colombian Wood Nymph

Length about 96 mm. (3.80 in.); tail (**Male**) 40 mm. (1.60 in.); (**Female**) 30 mm. (1.20 in.).

Male.—Forehead and front of crown bright metallic purple; remainder of top of head dull bronze green; hindneck, back and rump metallic bluish green passing to purple on upper back and shoulders; chin, throat and breast brilliant metallic emerald green rounded in outline on the lower edge, the lower part of breast and abdomen metallic bluish purple. Tail glossy blue black.

Female.—Metallic green above, more bronzy on top of head; the outermost tail feathers tipped with grayish white; cheeks, chin, throat and chest pale drab shading deeper on breast and

abdomen and spotted on the sides with metallic green.

Bill not long, curved at tip; tail conspicuously forked in male.

"Bird of forest, feeding on wild plantains." (Carriker.) "Found in the jungle." (Jewel.) One was seen to dive repeatedly into a pool in a shady ravine at Barro Colorado Island, going partly under water, apparently after insects.

16. *Chalybura buffoni micans* (Lesson)

Buffon's Plumeleteer

Chalybura buffonii RIDGWAY, Birds of N. and M. Amer., V, p. 388, 1911; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 256.

Male.—Length about 120 mm. (4.70 in.); tail about 43 mm. (1.70 in.). Above metallic green more bronzy on upper tail coverts; middle tail feathers bronze; under parts metallic green varying from yellowish to peacock or bluish according to the light, the feathers appearing to have dusky centers in some lights.

Female.—Length 105 mm. (4.15 in.); tail 37 mm. (1.45 in.). Similar to male, the outer tail feathers tipped with pale gray; underparts including cheeks pale gray somewhat spotted with metallic green.

Bill fairly long and curved, tail slightly forked, its feathers broad.

A species of thickets and second growth jungle.

BLACK-THROATED MANGO

17. *Anthracothorax nigricollis nigricollis* Vieillot

Black-throated Mango

Length about 113 mm. (4.45 in.); tail about 36 mm. (1.45 in.).

Male.—Metallic bronze green above, including middle pair of tail feathers; remaining tail feathers deep maroon chestnut, glossed with purplish; chin, throat, and middle of breast and abdomen, velvety black, the sides metallic greenish blue next to the black area and shading to yellowish green.

Female.—Similar to male, the outer feathers of tail tipped with white; a white stripe each side of the middle black stripe of under parts; otherwise, bronze green.

“In wild banana thickets at edge of jungle.”
(Jewel.)

18. *Heliathryx barroti* (Bourcier and Mulsant) Barrot's Fairy

Male.—Length 108 mm. (4.25 in.); tail 45 mm. (1.80 in.). Forehead and crown bright metallic royal purple; in front of and below the eye and ear coverts velvety black, a tuft of metallic purple terminating ear coverts; a band through the cheek to sides of neck of very brilliant metallic emerald green; remaining upper parts metallic green; whole under parts, and outer tail feathers, pure white.

LONG-BILLED STAR-THROAT



FIG. 30. *Heliothryx barroti*
(Male Nat. Size)

Female.—Length 124 mm. (4.90 in.); tail 61 mm. (2.40 in.). Upper parts entirely metallic green, no green band through cheeks, the white of under parts extending to cover cheeks; no purple tuft on ear coverts, chest sometimes spotted with dusky.

Bill nearly straight, tail long, graduated, fan-like when spread, the feathers broad and rounded at tips, considerably longer in the female.

The white under parts and extensive white areas on the long tail are very conspicuous. A bird of the jungle and open forest. A nest of this species attached to the side of a vertically hanging liana was found at Barro Colorado Island in April, 1924.

19. *Anthoscenus longirostris longirostris* (Vieillot)

Long-billed Star-throat

Length 112 mm. (4.40 in.); tail about 32 mm. (1.20 in.).

DELATTRE'S COQUETTE

Male.—Forehead and crown bright metallic blue; remainder of top of head and hindneck dark bronze; remaining upper parts bronzy green, the rump with long narrow white patch, the tail tipped with white on outer feathers; a conspicuous white streak through cheeks; chin dull black; throat metallic magenta; sides of neck and breast brownish gray fading to white on abdomen, sides and flanks; a conspicuous patch of white between flanks and rump.

Female.—Resembling male but forehead and crown dull metallic green and less metallic magenta on throat.

Bill long and straight, the outer tail feathers tipped with white, tail slightly forked.

20. *Lophornis delattrei* (Lesson)

Delattre's Coquette

Length 67 mm. (2.60 in.); tail 20 mm. (0.80 in.).

Male.—Top of head including a bushy crest of long, rigid, pointed feathers, cinnamon rufous; remaining upper parts metallic bronze green, a



FIG. 31. *Lophornis delattrei*
(Male Nat. Size)

FAMILY TROGONIDÆ

band of buff across the upper rump; lower rump and upper tail coverts dark purplish bronze; tail cinnamon rufous and bronze; sides of head, chin, and throat brilliant metallic emerald green; the remaining under parts metallic greenish bronze, a few narrow feathers tipped with white at base of throat; the under tail coverts cinnamon rufous.

Female.—Like male above but without crest, a broad subterminal band of black across tail; chin and throat and under tail coverts cinnamon rufous, a patch of purplish bronze at base of throat, remaining under parts dull bronzy.

Bill not long and very slightly curved. Tail rounded in female and double rounded in male.

A very small species, the male with distinctive crest and coloration.

39. Family TROGONIDÆ

The Trogons

A rather small family of arboreal birds of the tropical forests of America, Asia and Africa, but most numerous in America. They resemble the perching birds, but have feet with two toes directed forward and two backward, though unlike all other birds, the trogons have the first and second toes the backwardly directed ones instead of as usual the first toe and the fourth or outer toe. They have a short, somewhat conical bill whose cutting edge is often serrated, and a very thin, tender skin and soft lax plumage, the feathers coming out very easily. Their

FAMILY TROGONIDÆ

coloration is always brilliant. Their food consists both of insects and their larvæ, and fruits of various kinds. In habits they are rather quiet and inactive.

Their peculiarities and lack of near relatives and the wide distribution of the family, in spite of the few genera composing it, indicate that the trogons are survivors of a much larger group, most of whose members have become extinct.

In this family is the glorious Quetzal, sacred bird of the Aztecs, and national emblem of Guatemala, a rare species, but found in the mountains of Central America from Guatemala to near the Canal Zone.

Key to the Trogons

- A. Size noticeably larger and stouter; length about 320 mm. (12.60 in.); bill sharply serrate; abdomen crimson (*Curucujus*).
 - a. Chest and upper parts metallic green.
 - b. White band between green of breast and crimson of abdomen.*C. melanurus macrourus*, male
 - bb. No white band.*C. m. massena*, male
 - aa. Chest and upper parts slate gray.*C. melanurus macrourus*. *C. m. massena*, females (the two species practically alike).
- AA. Size noticeably smaller and slenderer; length not over 267 mm. (10.50 in.); bill not serrate; abdomen yellow or orange (*Trogon* and *Trogonurus*).
 - a. Upper parts mostly metallic green.
 - b. Under side of tail pure white; wings black; abdomen orange.*Trogon strigilatus chionurus*, male
 - bb. Under side of tail white barred with black; abdomen paler than orange; vermiculation of black and white on wings.



GRACEFUL TROGON. FEMALE (left), MALE (right).

Trogonurus curucui tenellus.

GRACEFUL TROGON

- c. Head and chest distinctly golden green; abdomen yellow.....*Trogonurus curucui tenellus*, male
- cc. Head and chest purplish blue; abdomen orange yellow.. *Chrysotrogon caligatus*, male
- aa. Upper parts and chest gray or brown.
 - b. Upper parts and chest brown; abdomen light yellow....*Trogonurus curucui tenellus*, female
 - bb. Upper parts and chest slate gray; abdomen orange yellow.
 - c. Under side of tail feathers white barred basally with black.....*Trogon strigilatus chionurus*, female
 - cc. Under side of tail feathers barred black and white.....*Chrysotrogon caligatus*, female

i. *Trogonurus curucui tenellus* (Cabanis)

Graceful Trogon

Male.—Length 224 mm. (8.80 in.); tail 134 mm. (5.30 in.). Upper parts including chest bright metallic green with a golden tinge; tail barred black and white on the under surface when closed; wing coverts gray (fine, wavy lines of black and white); remaining under parts orange yellow.

Female.—Length 242 mm. (9.50 in.); tail 138 mm. (5.40 in.). Brown above and below to cover the lower margin of the chest and shading to cinnamon rufous on the tail; remainder of under parts yellow.

A male probably of this, the commonest of the yellow bellied species, was seen along the Chili-brillo River in February, 1924. It remained in the same vicinity for several hours, uttering

GARTERED TROGON

a low whistle of about four ascending notes, answering an imitation of its call as long as it was attempted. Several of both sexes were seen at Barro Colorado in April, 1926. The ascending call, and one of a long followed by two short notes were heard. The orange yellow of the abdomen appears to be even a more protective coloration than the red of *C. massena*, as it was often difficult to distinguish them even when looking directly at them.

2. *Chrysotrogon caligatus* (Gould)

Gartered Trogon

Length 230 mm. (9.00 in.); tail 125 mm. (4.90 in.).

Male.—Head and nape black; hindneck greenish blue; remaining upper parts metallic green with golden tinge; under surface of tail when closed evenly barred and tipped with black and white; wings black with gray coverts (minute, wavy lines of black and white); chest metallic greenish blue; remainder of under parts yellowish orange.

Female.—Similar to and difficult to distinguish from the female of *T. strigilatus chionurus*, the gray extending only to cover the chest; under surface of tail when closed, black, the feathers tipped and barred with white.

Frequents the jungle as well as more open forest. Tame enough to permit a close inspection.

WHITE-TAILED TROGON

3. *Trogon strigilatus chionurus* (Sclater and Salvin)

White-tailed Trogon

Length 267 mm. (10.50 in.); tail 146 mm. (5.80 in.).

Male.—Head, neck and upper chest black glossed with purplish; lower chest and sides of breast metallic purplish blue; remaining upper parts metallic bluish green; no gray on wings; remainder of under parts deep orange; under surface of tail when closed pure white, not barred.

Female.—Resembling female of *T. curucui tenellus* except that the brown of the plumage is replaced by blackish slate which extends down to the lower margin of the breast; remainder of under parts bright orange yellow; under surface of tail white barred basally with black.

Reported from open forest at Gatun by Jewel. Also found at Barro Colorado Island.

4. *Curucujus melanurus macrourus* (Gould)

Large-tailed Trogon

Length 299 mm. (11.80 in.); tail 168 mm. (6.60 in.).

Male.—Similar to male of the following species *C. m. massena*; but with a relatively much longer tail. A white band between the green of the chest and vermilion of the remaining under parts. Bill red.

MASSENA TROGON

Female.—Very closely resembling female of *C. m. massena* slightly smaller, tail relatively longer.

Rare in Canal Zone. Probably like *C. m. massena* in habits.

5. *Curucujus massena massena* (Gould)

Massena Trogon

Length 319 mm. (12.50 in.); tail 171 mm. (6.70 in.).

Male.—Above brilliant metallic green; wing coverts gray (with minute frecklings of black and white); under surface of tail slate color; chest metallic bronze green changing abruptly to rich vermilion on remaining under parts. Bill red.

Female.—Chest and upper parts slate gray; remaining under parts vermilion. Bill black above, yellow below.

A fairly common bird in the deep forest, seen many times at Barro Colorado Island. It is of quiet habits, sitting motionless and rather upright for long periods, occasionally uttering its call; the two I have heard are a monotonous *qua, qua, qua, qua*, indefinitely repeated and a slow, softly whistled *cu, cu, cu, cu*. The first if imitated will bring the trogons to a tree overhead in a short time.

“These birds feed largely on berries and fruit. The birds while picking at fruit sometimes hang

FAMILY CUCULIDÆ

from the end of a branch, back downward with wings fluttering, at such times presenting a very striking appearance." (Richmond.)

40. Family CUCULIDÆ

The Cuckoos

The Cuckoos are a widely distributed family of long-tailed, for the most part arboreal but sometimes terrestrial, birds, with the fourth toe permanently turned backwards. Some species are parasitic, laying their eggs in the nests of other birds. They feed on caterpillars and insects; the larger ones also on small lizards, etc., and are mostly rather solitary birds. None of the American species are brightly colored. Their bill is usually moderately long; the upper mandible somewhat curved downward.

The anis (genus *Crotophaga*) constitute a distinct group within the family, distinguished by the glossy black plumage and the very highly arched, deep and narrowly compressed, bill.

Key to the Cuckoos

- a. Coloration brownish; bill not excessively deep; compressed and arched.
 - b. No crest.
 - c. Plumage smooth grayish brown above, bill gently curved.
 - d. A chestnut patch on wings; under parts dull white.....*Coccyzus a. americanus*
 - dd. No chestnut patch on wings; under parts cinnamon buff.....*Coccyzus m. minor*

YELLOW-BILLED CUCKOO

- cc. General color of plumage chestnut; bill strongly decurved at tip.
- d. Larger, length, 421 mm. (16.50 in.).....
.....*Piaya cayana thermophila*
- dd. Smaller, length, 257 mm. (10.10 in.).....
.....*Coccyua rutila panamensis*
- bb. Head crested.
- c. Very large, length, 488 mm. (19.15 in.); upper parts (olive or purplish brown) without distinctive markings; crest blue-black; a band of black spots across breast. . . *Neomorphus salvini*
- cc. Smaller, length, 373 mm. (14.70 in.) or less; crest not blue-black; upper parts with distinctive markings.
- d. Upper part buffy brown and (including reddish brown crest) streaked with black; tail feathers narrow and tipped with reddish buff.
.....*Tapera naevia excellens*
- dd. Upper parts dusky brown and excepting crest feathers tipped with whitish; tail feathers very broad and tipped with white.
.....*Dromococcyx phasianellus*
- aa. Coloration black; bill excessively deep, compressed and arched.
- b. Larger, length, about 458 mm. (18.00 in.); glossy blue-black.*Crotophaga major*
- bb. Smaller, length, 360 mm. (14.20 in.) or less; duller black.
- c. Sides of upper mandible with several curved grooves parallel with ridge.
.....*Crotophaga sulcirostris*
- cc. Sides of upper mandible smooth. . . *Crotophaga ani*

i. *Coccyzus americanus americanus* (Linnæus) **Yellow-billed Cuckoo**

Sexes alike.—Length, 280 mm. (11.00 in.); tail, 143 mm. (5.60 in.). Above smooth grayish brown, outer webs of primary wing feathers ru-

MANGROVE CUCKOO

fous, forming a rufous area conspicuous in flight; outer tail feathers black, broadly tipped with white; below dull white. Bill black above, mostly yellow below.

A winter visitor or migrant from the north. A quiet and rather wary bird of slender build, whose subdued coloration renders it inconspicuous even when sitting on a branch in plain sight, as long as it keeps still, so that it is usually unnoticed until too close an approach frightens it into taking flight.

2. *Coccyzus minor minor* (Gmelin)

Mangrove Cuckoo

Sexes alike.—Length, about 295 mm. (11.60 in.); tail, about 160 mm. (6.30 in.). Above grayish brown, the tail darker terminally and tipped with white; the upper two thirds of the ear coverts dusky, the lower third of the ear coverts, cheeks and remaining under parts, including under wing coverts, dull cinnamon buff. Bill black above, below the basal two thirds yellow.

Young.—Similar to adults.

The abrupt contrast between the gray-brown upper parts and the cinnamon-buff lower parts in this beautiful cuckoo is striking in life. Early in January, 1921 I heard some low and beautiful notes emanating from a large tree close to our house at Quarry Heights. I went to an upper porch and hid behind a pillar, calling back to the

PANAMA CUCKOO

bird; in a few minutes he appeared from the foliage, crouching on a branch not three feet away from me, peering toward my hiding place, uttering his exquisite notes, three very low ones, the first two major, the second higher than the first, the third and lowest, minor and delivered in a tremulo. He remained there as long as I stayed hidden, calling me. One was also seen near Patillo Point on April 15, 1926.

3. *Coccyua rutila panamensis* (Todd)

Panama Cuckoo

Sexes alike.—Length, about 257 mm. (10.10 in.); tail, about 152 mm. (6.00 in.). Almost exactly like the following species, *Piaya cayana thermophila*, in coloration, but at once to be distinguished by its much smaller size and proportionately shorter tail.

A fairly common bird in bushes and low undergrowth.

4. *Piaya cayana thermophila* (Sclater)

Central American Squirrel Cuckoo

Sexes alike.—Length, 421 mm. (16.50 in.); tail, 271 mm. (10.70 in.). Rich chestnut above, deepening to maroon on the lower back and tail; paler on head; tail feathers darker toward end and broadly white-tipped; chin, throat and upper chest pale wine-brown, changing to light gray on lower breast and smoky gray on abdo-

SALVIN'S GROUND CUCKOO

men. Iris blood red. Bill olive green; legs and feet slate gray.

This species can be seen rather frequently in low undergrowth about the edges of the jungle

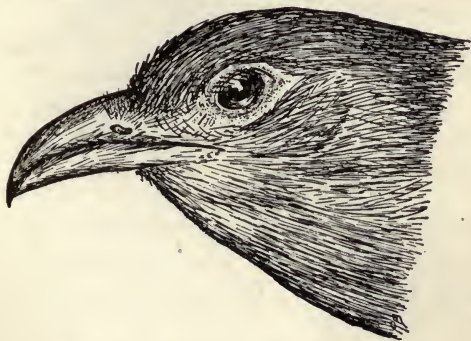


FIG. 32. *Piaya cayana thermophila*
(Nat. Size)

and is conspicuous on account of its large size, relatively long tail, which is graduated and tipped with white, and its handsome color. It is not shy and is of a somewhat inquisitive disposition, often allowing a rather close approach while it makes a half-hearted attempt to keep concealed in the foliage. Noted at Barro Colorado Island and at the Radio Station at the entrance to Darien Harbor.

5. *Neomorphus salvini salvini* Sclater Salvin's Ground Cuckoo

Sexes alike.—Length, 488 mm. (19.15 in.); tail, 264 mm. (10.40 in.). Head and forehead tawny

NORTHERN STRIPED CUCKOO

brown; crest glossy blue-black; remainder of upper parts olive and purplish brown, glossed with bronze, green and purple; tail dark olive green, glossed with purple; general color of under parts light brownish, darker and faintly cross-barred on throat, chest and sides of neck fading to buffy white on breast and deepening to chestnut on thighs; a transverse row of black spots form a band across the lower chest. Iris and bare skin around eye, red; bill yellowish green.

This large, crested, long-tailed, ground-living forest bird is rare, or at least seldom seen. "Colon; Lion Hill". (Ridgway.)

6. *Tapera nævia excellens* (Sclater)

Northern Striped Cuckoo. "Tres Pesos"

Sexes alike.—Length, about 279 mm. (11.00 in.); tail, about 163 mm. (6.40 in.). Head and crest reddish brown streaked with black; back, scapulars and wing coverts buffy brown, coarsely streaked with black; a streak of buffy white through the eye; tail grayish brown, graduated, streaked with black edged and tipped with reddish buff; lower parts murky dull white, darkening to buff on throat, chest, thighs and lower tail coverts.

A bird of the savannas and of the open, bushy country. It is called by the Panamanians "Tres pesos" on account of its characteristic slow,

PHEASANT CUCKOO

melancholy call, a whistle, one of the variations of which is *wheu wheu wheu whéuwheu, whéuwheu, whéuwheu whéuwheu* (the accented higher notes



FIG. 33. *Tapera nœvia excellens*
(Nat. Size)

minor). Perched on trees or high bushes some distance apart, they call to each other by the hour. They respond so readily to imitation that I drew one nearly into my car on the Gamboa Road.

7. *Dromococcyx phasianellus* (Spix) Pheasant Cuckoo

Sexes alike.—Length, 373 mm. (14.70 in.); tail, 222 mm. (8.70 in.). Dusky brown above, the crest tinged with rusty; the rump and feathers of the greatly elongated upper tail coverts more grayish; a conspicuous streak of white in continuation of the eye; feathers of wings and back tipped with whitish; tail feathers tipped with white; under parts white, the cheeks and throat streaked, and the chest spotted, with brownish black.

GREATER ANI

In the spring of 1924 in high open brush country, not far from the Gamboa Road, I saw one of these birds, whose appearance was not unlike that of a small pheasant. It was sitting

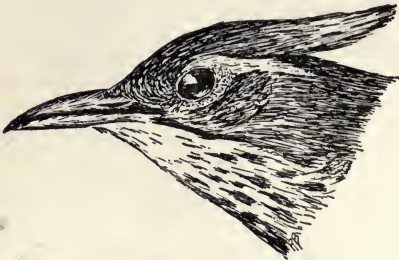


FIG. 34. *Dromococcyx phasianellus*

quietly on a branch of a low tree; its relatively small, crested head and remarkable tail, long and graduated (the feathers broad and margined with white conspicuous on the under surface) were very noticeable. This is a rare bird throughout its range, but unmistakable from its characteristic features.

8. *Crotophaga major* Gmelin

Greater Ani

Male.—Length, 458 mm. (18.00 in.); tail, 262 mm. (10.30 in.). Plumage black, the glossy blue-black feathers of top and sides of head, neck and throat margined with bronze. Bill, bare skin in front of eye, legs, and feet black. Iris light green with yellow ring around pupil. Sides of bill with curved longitudinal furrows.

Female.—Length, 436 mm. (17.10 in.); tail, 255 mm. (10.05 in.). Similar to male.

This ani frequents the jungle along the rivers in small groups and is not usually to be seen in the haunts of the common species. I saw four of these large anis along the banks of the Bayano River in June, 1924, and several in a tree with large yellow blossoms, on the banks of the Tuira River in 1926. My attention was drawn to them on each occasion by their extremely loud and harsh calls.

9. *Crotophaga ani* Linnæus
Ani. "Garrapatero"

Male.—Length, 360 mm. (14.10 in.); tail, 186 mm. (7.30 in.). Black, glossed on some of the upper parts with purplish bronze or bronze



FIG. 35 *Crotophaga ani*
(Nat. Size)

green. Bill and bare skin around eye black; sides of bill smooth, without longitudinal furrows.

Female.—Length, 328 mm. (13.05 in.); tail, 185 mm. (7.30 in.). Like male.

GROOVE-BILLED ANI

A very common bird frequenting pastures and roadsides in small, straggling flocks whose individuals are usually seen sitting sleepily here and there on bushes or fences, flying off one by one when approached. It is one of the species that the visitor to the Canal Zone will first notice, as some are usually to be seen along the railroad.

It is called the "Garrapatero" or "tick bird" by the Panamanians, and must be truly a benefactor to the tick-infested cattle, being often seen perched on their backs performing its grateful office; or on the ground near their tracks, feeding on the insects stirred up by their passage. The call most frequently heard is two slurred metallic notes, grating and interrogative. Its eggs are laid in large, communal nests.

10. *Crotophaga sulcirostris* Swainson Groove-billed Ani

Sexes alike.—Length, 302 mm. (11.90 in.); tail, 174 mm. (6.80 in.). Slightly smaller but otherwise almost exactly like *C. ani* except for having several curved longitudinal grooves on the sides of the bill.

This bird so closely resembles *Crotophaga ani* in appearance and habits that it is hard to distinguish the two species, the grooves on the bill being difficult to see clearly, except in especially favorable light, even at quite close range. The difficulty is increased by the fact that these birds

FAMILY CAPITONIDÆ

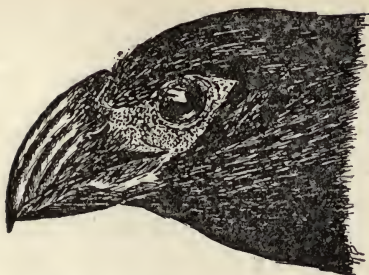


FIG. 36. *Crotophaga sulcirostris*
(Nat. Size)

become restless and uneasy when approached closely. More observations regarding the relative abundance of the two species in the Canal Zone are much needed.

41. Family CAPITONIDÆ

The Barbets

A family of arboreal birds found in the heavily forested regions of tropical Asia, Africa and America, exclusive of the West Indies. They are very closely related to the toucans in structure and resemble them in their very bright and variegated colors in which black, yellow and red usually predominate, but they average very much smaller in size, and do not have the enormously enlarged bill of the toucans. Their bill is, however, usually quite large and stout, and often more or less tumid, pointed at the tip, and surrounded by stiff bristles at its base.

Their similarity in size and in the rather

PIRRI BARBET

large head, stout body and usually rather short tail gives them some resemblance to the puffbirds, to which, however, they are not very closely related, and from which their brilliant colors and less inactive habits easily distinguish them. Though represented in the Canal Zone by only one, rare species, the family is a fairly large one.

1. *Capito maculicoronatus maculicoronatus* Lawrence Pirri Barbet

Length, 155 mm. (6.10 in.); tail, 48 mm. (1.90 in.).

Male.—Above glossy blue-black, the middle of the crown with a patch of whitish spots; mostly

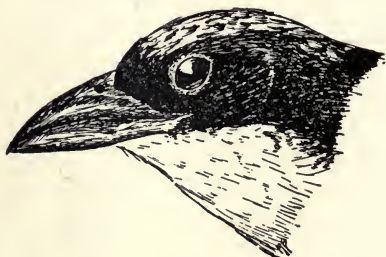


FIG. 37. *Capito m. maculicoronatus*
(Male Nat. Size)

dull white below, the breast crossed by a band of yellow, a patch of scarlet on flanks, both sides and flanks with large black spots.

Female.—Similar to male but the lower parts black as far as middle of breast.

FAMILY RHAMPHASTIDÆ

Along one of the forest trails at Barro Colorado, I heard some very soft and slow, rather wheezy notes and turning towards the direction from whence they came, saw an incredibly, vivid velvety patch of colors on a low tree; it was gone in an instant and although I followed it into the brush I never caught another glimpse of it. Examination of specimens afterward showed that what I had seen was a male of this species.

42. Family RHAMPHASTIDÆ

The Toucans

A rather small family of arboreal birds of the forest regions of tropical America (exclusive of the West Indies), closely related to the barbets, but distinguished by their larger size and enormous bill, which is often nearly as long as the body and very thick, and larger in proportion than in any other birds. It is slightly curved and in some cases serrated along the cutting edges, and is of very light, hollow structure.

The toucans nest in hollow trees and feed largely on fruits. They are somewhat gregarious and very noisy. Both the bill and plumage are usually brightly and conspicuously colored. Though somewhat resembling the Old World hornbills in habits and in the great development of the bill, the toucans are not closely related to them.

SHORT-KEELED TOUCAN

Key to the Toucans

- a. Plumage predominantly black with a yellow bib and white rump.
 - b. A white line between yellow bib and black of breast and abdomen; bill yellowish green with tip bright red and an orange red streak along lower edge of upper mandible.....
.....*Rhamphastos piscivorus brevicarinatus*
 - bb. No white line between yellow bib and black of breast and abdomen; most of upper mandible greenish and lemon yellow; base of upper mandible and most of lower mandible dark reddish shading to black in conspicuous contrast to upper part of bill.....*Rhamphastos swainsonii*
- aa. Back and shoulders green; rump red or green.
 - b. Rump red; under parts yellow, a black and red band across abdomen; a white line at base of bill.....*Pteroglossus t. torquatus*
 - tb. Rump green; under parts black with under tail coverts yellow; base of bill black. Crown black; ear coverts yellow.....
.....*Selenidera spectabilis* male
crown chestnut; ear coverts black.....
.....*Selenidera spectabilis* female

i. *Rhamphastos piscivorus brevicarinatus* (Gould)

Short-keeled Toucan

Sexes alike.—Length, Male, 468 mm. (18.40 in.); tail, 155 mm. (6.10 in.). Female, 441 mm. (17.30 in.); tail, 148 mm. (15.80 in.).

Similar to *R. swainsonii*, the following species, but smaller, with no white line between the strongly rounded lower edge of the yellow bib and the broad red line separating it from the remaining under parts. Bill mostly yellowish

SWAINSON'S TOUCAN

green, its base outlined in black; its tip bright red. A bright orange-red streak on the edge of the upper mandible extends from base to tip. Bare skin around eye green; feet bluish green.

Common at Barro Colorado Island in the tall forest. It has various grating or guttural calls but the most characteristic is a loud and somewhat harsh one which may be represented by the syllable *quenk quenk quenk* often repeated interminably in a manner somewhat suggesting the call of a guinea hen.

2. *Rhamphastos swainsonii* Gould Swainson's Toucan

Sexes alike.—Length, Male, 551 mm. (21.60 in.); tail, 161 mm. (6.40 in.). Female, 517 mm. (20.20 in.); tail, 155 mm. (6.10 in.). General color of plumage black; upper tail coverts white; sides of head and neck, throat, and foreneck lemon yellow separated from the remaining under parts by a narrow white line with a wider red one immediately below it; under tail coverts red. Bare skin around eye emerald green; lower mandible of bill and an obliquely bordered area on the base of the upper, dark reddish shading to black; rest of upper mandible lemon yellow shading to greenish yellow on middle part; legs and feet light blue.

Young.—Similar to adults but bill less brightly colored.

COLLARED ARAÇARI

This large toucan was seen only at Barro Colorado Island, where it is found in small flocks in the tall forest. It is a noisy bird, its most characteristic call being loud, four-syllabled and often incessantly repeated. The contrast between the dark lower mandible and the bright yellow of the greater part of the upper mandible is noticeable at a considerable distance.

3. *Pteroglossus torquatus torquatus* (Gmelin) Collared Araçari

Sexes alike.—Length, 412 mm. (16.20 in.); tail, 155 mm. (6.10 in.). Head and neck all around glossy black; back and shoulders greenish gray separated from black of hindneck by a collar of chestnut; rump bright red; wings and tail olive blackish; remaining under parts of body abruptly yellow below black foreneck, the breast stained with red and with a black spot in the center; a black and red band crossing abdomen; thighs chestnut; under tail coverts yellow. Bare skin around eye dark red. Bill distinctly serrated, with white line around base and a black stripe along the ridge of upper mandible which is otherwise pale yellow; lower mandible black; feet olive green.

A bird of the jungle and forest, often found in small flocks. Its characteristic calls, loud, shrill, two-syllabled whistles, are quite different in quality from those of the larger toucans.

CASSIN'S ARAÇARI

4. *Selenidera spectabilis* Cassin Cassin's Araçari

Length, 364 mm. (14.30 in.); tail, 123 mm. (4.80 in.).

Male.—Head, neck, chest, breast and abdomen glossy black with a conspicuous patch of elongated yellow feathers on ear coverts; back, shoulders, wings and rump olive green; tail blue gray, the under surface black; a conspicuous patch of orange yellow on flanks; thighs chestnut; under tail coverts red.

Female.—Similar to male but top of head and hindneck chestnut, and ear coverts black, the feathers not elongated. Bare skin around eye is turquoise blue above eye, emerald green in front of eye, orange yellow below and greenish yellow behind, eye. Bill above apple green along ridge, olive along edge; below olive. Both upper and lower mandible black at the base and at the end.

An uncommon species confined to dense heavy forest.

43. Family GALBULIDÆ

The Jacamars

These are a rather small group of arboreal birds confined to the forests of tropical America, excluding the West Indies. They have a long, tapering, sharply pointed bill with stiff bristles about its base, feet with

PENARD'S JACAMAR

two toes directed forward and two backward, and very brilliant coloration in which greens, blues and yellows predominate. They frequent heavy forests, singly or in very small parties, and their food is believed to consist chiefly of large insects. Their nearest allies are the puffbirds, sometimes also included in this family. "They perch quietly in the forest like flycatchers, sallying out after passing insects, their flight and actions then resembling swallows" (Griscom).

I. *Jacamerops aurea penardi* Bangs and Barbour Penard's Jacamar

Jacamerops aurea RIDGWAY, Birds N. and M. Amer., VI, p. 362, 1919; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 258.

Length, 282 mm. (11.10 in.); tail, 129 mm. (5.10 in.).

Male.—Above, including most of wings, bright metallic green, bluish on forehead and crown,

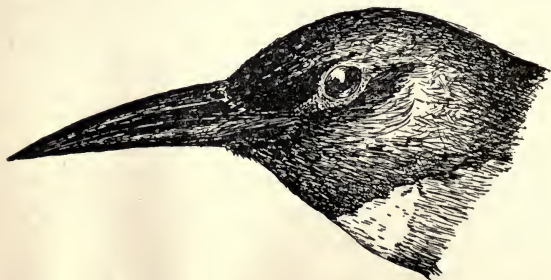


FIG. 38. *Jacamerops aurea penardi*

FAMILY BUCCONIDÆ

and reddish bronze on back and golden on rump; tail metallic bluish green and violet blue; chin, upper throat and sides of head metallic green shading to golden green on sides of neck; a patch of white covering the lower throat; remaining underparts rich tawny. Bill longer than head, broad at base, black and curved.

Female.—Similar to male but throat entirely tawny, with no white patch.

Very rare in the Canal Zone. Found in the heavy jungle, quite tame and stupid, and not easily flushed when closely approached.

44. Family BUCCONIDÆ

The Puffbirds

A rather small family of arboreal birds closely allied to the jacamar family and in some classifications made a subfamily of it. Like the jacamars they are confined to the forests of tropical America, excluding the West Indies, but they differ from them in being of stouter build, with a large head, stouter and shorter bill slightly hooked at the tip, and loose fluffy plumage in which bright colors are lacking, though the color pattern is often striking.

They are fearless, inactive and apparently stupid birds which get their name from sitting motionless on some branch for a long time with their feathers puffed out.

DYSON'S PUFFBIRD

Key to the Puffbirds

- a. Plumage mostly black above; white below, with a black band across chest.
 - b. Larger, length 206 mm. (8.10 in.) or more; white collar across hindneck; tail not spotted with white.
 - c. Forehead white; white collar complete around neck. *Notharchus hyperrhynchus leucocrissus*
 - cc. Forehead black; black of chest extensive, interrupts white collar on sides of neck.
. *Notharchus pectoralis*
 - bb. Smaller, length about 147 mm. (5.75 in.); white collar does not extend across hindneck; tail and back with white spots.
. *Notharchus tectus subtectus*
- aa. Plumage brownish or slate color, not white below.
 - b. Plumage brownish above; bill not red.
 - c. Larger, length 181 mm. (7.10 in.); plumage variously spotted and streaked with buffy; bill dark above, paler below, deep at base.
. *Malacoptila p. panamensis*
 - cc. Smaller, length 140 mm. (5.50 in.); plumage unspotted and unstreaked; bill bluish gray, long and narrow. *Nonnulla frontalis*
 - bb. Plumage slate color; bill red
. *Monasa fidelis, Monasa similis*

1. *Notharchus hyperrhynchus leucocrissus* (Cabanis and Heine)

Dyson's Puffbird

Notharchus hyperrhynchus dysoni RIDGWAY, Birds of N. and M. Amer., VI, p. 576, 1914; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 259.

Length 239 mm. (9.45 in.); tail 86 mm. (3.35 in.).

Sexes alike.—Forehead and front of crown, chin, throat, chest and a collar across the hind-

BLACK-BREASTED PUFFBIRD

neck white; a patch in front of eye and remainder of crown glossy black; rest of upper parts blackish slate with most of the feathers narrowly tipped with white; sides and flanks blackish slate irregularly barred with white; remaining under parts white, a broad band of black across the breast. Bill black.

A black and white bird similar in habits to the following species, *N. pectoralis*, but distinguishable by its larger size and the broad white collar across the hindneck.

2. *Notharchus pectoralis* (Gray)

Black-breasted Puffbird

Length about 206 mm. (8.10 in.); tail about 80 mm. (3.15 in.).

Sexes alike.—Top of head, cheeks, nape, upper back, sides of neck, chest and upper breast, glossy greenish blue-black, dull black in front of eyes and on fore part of cheeks; throat, a conspicuous spot on the ear coverts and a narrow collar across hindneck, white, the lower edge of the white throat semicircular and sharply outlined against the black of the chest; remaining upper parts, including wings and tail, blackish slate, most of the feathers with narrow whitish tips; remaining under parts white, the sides and flanks obscurely barred with blackish gray. Bill black.

I saw one of this species two or three times in the same tree on the edge of a clearing at

PANAMA PIED PUFFBIRD

Barro Colorado Island in April, 1926. It sat flat on the branch with its feathers puffed out, and appeared stupid and tame, permitting a very close approach.

3. *Notharchus tectus subtectus* (Sclater)

Panama Pied Puffbird

Length about 147 mm. (5.80 in.); tail about 56 mm. (2.20 in.).

Sexes alike.—General color above, black, the forehead and front of crown speckled with white and a narrow stripe of white over the eye; a conspicuous white spot on each side of the back; tail coverts tipped with white and a broken patch of white crossing the middle of the tail; under parts white with a conspicuous black band across the chest. Bill black.

Two of these birds, probably a pair, were noted in April, 1926, at Barro Colorado Island, on the edge of the clearing around the laboratory. Quiet and unafraid, they remained in the same tree or near it during the several days of my stay, and I heard them utter notes of a thin, wheezy character.

4. *Malacoptila panamensis panamensis*

Lafresnaye

Panama Malacoptila

Length 181 mm. (10 in.); tail 76 mm. (3.00 in.).



BLACK-BREASTED PUFFBIRD.

Notharchus pectoralis.

GOLDMAN'S NUN BIRD

Male.—Above grayish brown (including sides of head), passing to chestnut on rump, the top of the head, hindneck, back, and wing coverts, dotted, the forehead, ear coverts and sides of neck, streaked with buff; long, drooping mustache-like tufts of whitish at front of cheeks; chin and sides of throat brown narrowly streaked with white, the middle of the throat and chest plain tawny buff; remaining under parts pale buffy tinged with tawny and heavily streaked on breast and sides with dusky. Iris red; bill about as long as head, tapering and curved at tip, dusky above and greenish below. Plumage of soft, loose texture.

Female.—Similar to male.

Not uncommon in thick jungle and forest undergrowth. A pair of these birds, and on another occasion a male alone, were seen in the jungle near one of the trails on the higher part of Barro Colorado Island. They were perched on low branches and were silent and not at all shy.

5. *Monasa fidelis* Nelson Goldman's Nun Bird

Length (based on one male specimen) about 258 mm. (10.20 in.); tail 115 mm. (4.50 in.).

Sexes alike.—Forehead, in front of eyes, fore part of cheeks, chin and upper throat, white faintly tinged with rusty brown; remaining parts of head and neck all around, black shading into bluish slaty black on chest and bluish slate

on remainder of the body. Wing quills and tail glossy bluish black. Bill bright red.

Recorded from Cerro Azul, Canal Zone, by Ridgway. The nun birds are forest birds of retiring habits, that are still too poorly represented in collections to satisfactorily determine the number and the distinguishing characters of the species composing the genus. They are rare in the Canal Zone and the two species credited to it are of doubtful validity and may not be distinct from each other.

6. *Monasa similis* Nelson
Cerro Azúl Nun Bird

Length (based on one specimen) 280 mm. (11.00 in.); tail 127 mm. (5.00 in.).

Sexes alike.—Similar to *M. fidelis*, but white patch confined to forehead and area in front of eyes, the head otherwise black and the bluish slate of the general plumage, much darker. Bill bright red.

Recorded from Cerro Azúl, Canal Zone. (See remarks on the preceding species.)

7. *Nonnula frontalis* (Sclater)
Panama Nonnula

Length about 140 mm. (5.50 in.); tail about 57 mm. (2.20 in.).

Sexes alike.—Forehead and front of crown chestnut brown, changing to olive brown on

remaining upper parts; sides of head, excepting cheeks, gray; cheeks, throat, chest and sides of breast, reddish tawny passing to buff on center of breast and to buffy white on abdomen.

This rare little bird is solitary in habits, frequenting low trees on the edge of the jungle.

45. Family PICIDÆ

The Woodpeckers

A large family of arboreal birds of medium size, widely distributed, but absent from Australia, Madagascar and Polynesia. They climb up the trunks and large limbs of trees, usually supporting themselves by the aid of the tail, whose quills are rigid and pointed to serve for this purpose, and live chiefly on the insects found under the bark and in rotten wood. The bill is strong, tapering and often chisel-like at the tip, with the edge vertical, to serve in chipping away wood; the neck muscles are very powerful, and the tongue very extensible. The feet have two toes directed forward and usually two (the first and fourth) directed backward. The woodpeckers nest in holes which they dig in dead limbs of trees, laying glossy white eggs. The colors are usually conspicuous and strongly contrasting, commonly with some bright red on the head, in the male at least; their notes are loud and characteristic, but susceptible of little variation.

FAMILY PICIDÆ

Key to the Woodpeckers

- a. Large, length 312 mm. (12.30 in.) or more; upper parts predominantly black; conspicuous scarlet crest.
 - b. White patches on back uniting to form a large V; under parts pale tawny broadly and distinctly barred with black.
 - c. Forehead and cheeks scarlet; a white patch on ear coverts bordered by a black one above it.
 *Scapanus malherbii* male
 - cc. Forehead black; cheeks entirely white in a continuation of white areas on back.
 *Scapanus malherbii* female..
 - bb. White patches on back widely separated; under parts brownish buff less distinctly spotted with black (white shoulder patch continuing in a stripe through cheeks).
 - c. Forehead and cheeks scarlet.
 *Ceophlæus lineatus mesorhynchus* male
 - cc. Forehead and cheeks black.
 *Ceophlæus lineatus mesorhynchus* female
- aa. Smaller, length 194 mm. (7.65 in.) or less; no conspicuous scarlet crest.
 - b. Medium size; upper parts with bars.
 - c. Upper parts barred black and white.
 - d. Forehead dull brownish white; sides of head buffy grayish.
 - e. Crown and hindneck red.
 *Centurus rubricapillus wagleri* male
 - ee. Crown buffy gray.
 *Centurus rubricapillus wagleri* female
 - dd. Forehead yellow; sides of head with a black patch enclosing a white spot.
 - e. Crown and hindneck red.
 *Tripsurus p. pucherani* male
 - ee. Crown mostly black.
 *Tripsurus p. pucherani* female
 - cc. Head crested, upper parts rufous chestnut barred with black on back and tail; spotted with black on forehead.

WAGLER'S WOODPECKER

- d. Cheeks and throat red.....
.....*Celeus l. loricatus* male
- dd. Cheeks and throat cinnamon rufous.....
.....*Celeus l. loricatus* female
- bb. Very small; upper parts without bars; plumage
predominantly buffy olive, top of head black.
Tail not used as support.
- c. Front of crown streaked with orange, behind that,
dotted with white.....
.....*Picumnus olivaceus panamensis* male
- cc. Front of crown without orange streaks and
sparsely dotted with white.....
.....*Picumnus olivaceus panamensis* female

I. *Centurus rubricapillus wagleri* (Salvin and Godman) Wagler's Woodpecker

Centurus subelegans wagleri RIDGWAY, Birds of N. and
M. Amer., VI, p. 73, 1914; STONE, Proc. Phila. Acad.
Nat. Sci., 1918, p. 259.

Male.—Length 108 mm. (6.60 in.); tail 53
mm. (2.10 in.). Forehead and eyebrows brown-
ish white; top of head bright red shading to

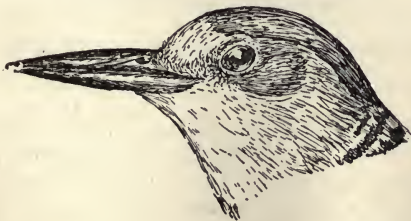


FIG. 39. *Centurus rubricapillus wagleri*
(Male. Nat. Size)

PUCHERAN'S WOODPECKER

orange red on hindneck; remaining upper parts barred black and white, the lower rump and upper tail coverts white; tail black, the middle feathers spotted with white; below pale buffy grayish shading to olive grayish; flanks and under tail coverts white broadly barred with black; lower abdomen bright red.

Female.—Length 151 mm. (5.95 in.); tail 50 mm. (2.00 in.). Similar to male but with crown brown and only hindneck red.

Young.—Similar to adult of same sex but duller and with less red on abdomen.

The commonest and most familiar woodpecker of the Canal Zone, nesting in dead trees often near houses. It makes its presence known by its noisy calls which are always recognizable when once heard and comprise an often repeated *wicka wicka* resembling the call of the Northern Flicker of the United States; also a two-syllabled note, and a loud trilled call.

2. *Tripsurus pucherani pucherani* (Malherbe) Pucheran's Woodpecker

Melanerpes pucherani pucherani STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 259.

Male.—Length 184 mm. (7.20 in.); tail 58 mm. (2.30 in.). Forehead light yellow, remainder of top of head and hindneck, bright red; back and shoulders black barred with white; rump and upper tail coverts white, sometimes sparsely barred with black; wings and tail black; some of the wing coverts and quills sparsely

FRASER'S WOODPECKER

barred with white; sides of head largely black with a white spot behind eye; an area in front of eye and the cheeks, chin and throat dull brownish white; abdomen bright red; remaining under parts yellowish olive, barred with black on lower breast and sides.

Female.—Length 173 mm. (6.80 in.); tail 57 mm. (2.25 in.). Similar to male but crown mostly black, the front and middle portion dull brownish white, the red confined to nape and hindneck.

Young.—Similar to adults of same sex but duller.

A handsomer but less common and familiar species than *Centurus rubricapillus wagleri*. Its notes and calls are quite different, lacking the resonant quality of those of that species and having a sharp tone suggesting those of the Hairy Woodpecker of the United States. It is more often found on the Caribbean side of the Zone, chiefly in forest clearings. Noted at Barro Colorado Island in April, 1926.

3. *Celeus loricatus loricatus* (Reichenbach)

Fraser's Woodpecker

Length about 194 mm. (7.60 in.); tail about 65 mm. (2.50 in.).

Male.—General color above rufous chestnut spotted with black on forehead and sparingly barred with black on back and tail; cheeks, chin and upper throat bright red; remainder of throat and upper chest cinnamon rufous be-

MALHERBE'S WOODPECKER

coming paler on breast and abdomen and with many curved or U-shaped black markings.

Female.—Similar to male, but cinnamon rufous replacing the bright red.

Head with a pointed crest in both sexes.

A rather inconspicuously colored forest bird, distinguishable among the smaller woodpeckers and woodhewers by its crest. One noted at Barro Colorado, March 27, 1924.

4. *Scapanus malherbii* (Gray)

Malherbe's Woodpecker

Length 333 mm. (13.10 in.); tail 112 mm. (4.40 in.).

Male.—Whole head excepting chin and throat, bright red with an elongated patch of white on ear coverts and one of black above it—a spot of yellowish white near nostrils; remaining upper parts and throat and chest black; a large and conspicuous V-shaped white area on sides of neck and upper back; remaining under parts pale tawny distinctly barred with black.

Female.—Resembling male but whole forehead and middle fore part of crest, black, the stripe along the neck and shoulders (part of the V-shaped marking) continuing to nostril and entirely covering cheeks.

Head of both sexes with a conspicuous, somewhat pointed crest.

A very large woodpecker related to the Ivory-billed Woodpecker of the United States, though

PANAMA PILEATED WOODPECKER

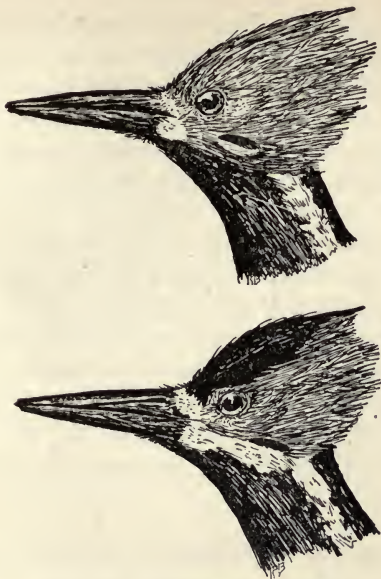


FIG. 40. *Scapanus malherbii*
(Above male; below female)

the bill is not white. A bird of the old growth forests, seen several times on Barro Colorado Island. Distinguishable from *Ceophlæus lineatus mesorhynchus* by the large V-shaped white mark on the upper back, and the barred rather than spotted under parts.

5. *Ceophlæus lineatus mesorhynchus* (Cabanis and Heine)

Panama Pileated Woodpecker

Length 312 mm. (12.30 in.); tail 113 mm. (4.45 in.).

PANAMA PICULET

Male.—Somewhat resembling male of *Scapanus malherbii* but the white on neck and shoulders forms two widely separated patches, not joining to form a V on back, and continuing, though narrow, through cheeks and changing to dull yellowish buff at nostrils; chin and throat streaked black and white; ear coverts and area immediately below eyes slate gray but cheeks red; breast and abdomen lighter and less distinctly barred or spotted.

Female.—Similar to male but forehead and front of crest black; cheeks blackish.

Young male.—Duller in coloring but similar to adult male. Less red on cheeks.

Head of both sexes with a conspicuous pointed crest.

Superficially like *Scapanus malherbii* and like that species frequenting the large trees of the old growth forest; easily distinguished by the widely separated white shoulder patches. Found at Barro Colorado Island.

6. *Picumnus olivaceus panamensis* Ridgway Panama Piculet

Length 80 mm. (3.15 in.); tail 25 mm. (1.00 in.).

Male.—Top of head black, the forehead and crown streaked with orange and behind that dotted with white; remaining upper parts buffy olive; tail dull black, the two outer pairs of feathers with outer webs pale yellow; a streak

ORDER PASSERIFORMES

of whitish spots above ear coverts; sides of head, the throat and upper breast, buffy olive; remaining under parts buffy yellow streaked with olive.

Female.—Similar to male but the crown without orange streaks and sparsely dotted with white.

A minute and apparently not very common species, which differs from most other woodpeckers in climbing without the support of its tail. An individual seen clinging to a small inclined branch and industriously hammering with its bill, in jungle near Mt. Hope in April, 1926.

Order PASSERIFORMES

The Perching Birds

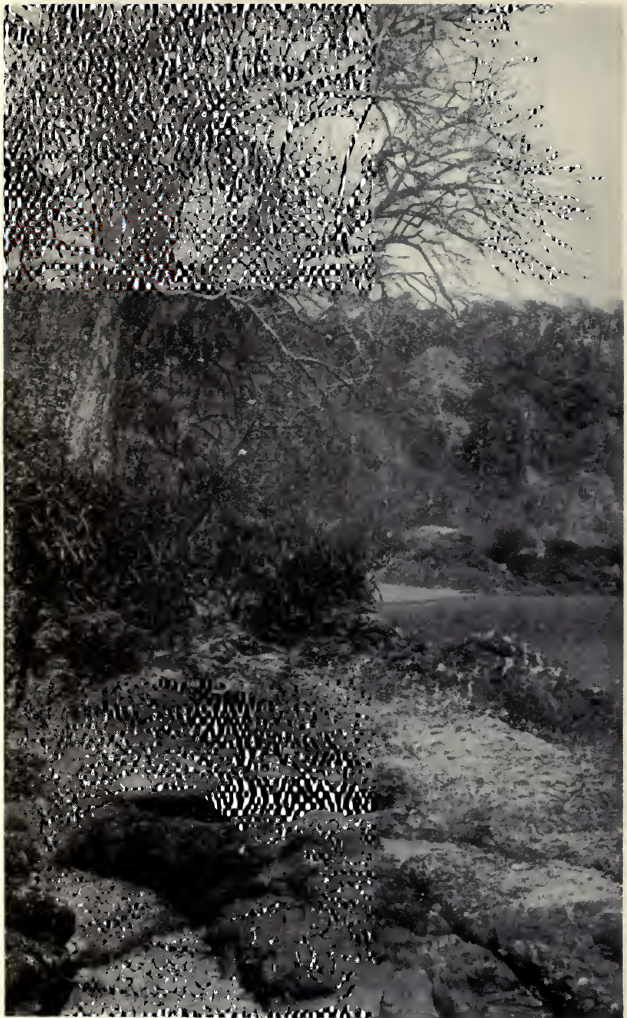
The families that remain to be dealt with are all very closely related to each other, while most of those that have been treated up to this point are well distinguished and in many cases are regarded as constituting not merely families but groups of higher rank (suborders or orders), either by themselves or with a few allied families. The rest of the families all form a single order, Passeriformes (in other classifications also called Passeres or Insectores), which comprises most of the small song and insectivorous birds, and is an immense group, including nearly, if not quite, half the existing species and sub-

ORDER PASSERIFORMES

species of birds. It is regarded as the order in which evolution has reached the most advanced stage that birds have attained, both in respect to physical structure and mental development. While many of its distinguishing characters are anatomical, there are some external ones. The feet always have four toes, the first toe being always well developed, directed backward and provided with a long claw, and inserted at the same level as the others, thus making a foot especially adapted to perching on small branches of trees. None of the other toes can be moved to point laterally or backward. The wings also have certain characters, the primary quills (the largest, and anterior or outer ones) always numbering nine or ten, the secondary quills always more than six (usually nine), and the wing coverts are always comparatively short, leaving at least half of the length of the secondaries exposed. The perching birds are mostly of small or very moderate size, the crows and ravens being the largest. The order comprises besides several small Old World groups, two great divisions or suborders, Tyranni and Oscines.

Suborder TYRANNI

This group (called Clamatores in many books) though of large extent, especially in tropical and South America, has never received any satisfactory and commonly accepted English name. It includes those perching birds which have the vocal organs with a less efficiently organized muscular



Photograph by Dr. W. G. Van Name.

COVE ON THE SHORE OF PEDRO GONZALES, PEARL ISLANDS.

system. As a consequence, though many of them produce very beautiful notes, their voices are susceptible of less modulation and the variety of their calls and song notes is less than is found in many members of the other large suborder (*Oscines*, see page 346), which, however, comprises many poor songsters as well as good ones. The six families that follow represent this suborder in the Canal Zone.

46. Family FORMICARIIDÆ

The Antbirds or Antthrushes

A very large family of birds of the group Clamatores, confined to the warm parts of America exclusive of the West Indies. They range in size from that of a thrush down to that of a small wren or warbler, and vary much in habits and appearance. The typical antbirds (also called *antthrushes* or *ant pittas*) are more or less terrestrial forest birds with rather long legs, short tail and rather short bill; they feed, as their name implies, largely on ants and termites. Many of the larger species (called *antshrikes*) are longer-tailed birds with the bill more or less hooked at the tip like that of a shrike, and are commonly found in brush and thickets. The small forms, called *antwrens*, frequent not only bushes and undergrowth, but often also the tall trees of the forest, climbing about like warblers or vireos. The plumage of the antbirds is never brightly colored,

FAMILY FORMICARIIDÆ

though often handsome from contrasting areas and markings of black, white and chestnut. Their notes are varied, often peculiar and unusual, but sometimes of soft and agreeable quality.

In the Canal Zone the antbirds form a conspicuous part of the bird fauna, and several of them are among the species that the beginner in bird study is likely to meet. They are mostly rather active and often noisy birds of characteristic appearance, and it is chiefly in the case of small antwrens that they are likely to be mistaken for members of other families. The much larger head and bill will serve to distinguish them from the warblers, and the fact that they do not hold the tail up and do not as a rule have the skulking habits of wrens, helps to distinguish them from that family.

Key to the Antbirds

- I. Length 106 mm. (4.20 in.) or less, tail relatively short.
 - A. Plumage streaked on upper parts.
 - a. Under parts white streaked with black.....
.....*Myrmotherula surinamensis*, male
 - aa. Under parts neither white nor streaked with black.
 - b. Under parts buffy tinged with tawny on breast, head rufous tawny streaked with black.....
.....*Myrmotherula surinamensis*, female
 - bb. Under parts pale primrose yellow.
 - c. Head black streaked with rufous tawny...
.....*Myrmotherula brachyura*, female
 - cc. Head black streaked with pale straw color.
.....*Myrmotherula brachyura*, male

FAMILY FORMICARIIDÆ

- AA. Plumage plain, without streaks on upper parts.
- a. Without spots on under parts.
 - b. Upper parts black.
 - c. Under parts uniform black, a broad white band on greater wing coverts.
 *Microrhophias quixensis virgata*, male
 - cc. Under parts not uniform black but with extensive patches of long white plume-like feathers on sides and flanks.
 *Myrmotherula axillaris albigula*, male
 - bb. Upper parts blackish slate or olive.
 - c. Upper parts blackish slate, a broad white band on wing coverts, under parts rufous chestnut.
 *Microrhophias quixensis virgata*, female
 - cc. Upper parts olive brownish.
 - d. Under parts buff.
 *Myrmotherula axillaris albigula*, female
 - dd. Under parts olive tawny.
 *Myrmotherula fulviventris*, female
 - aa. Conspicuously spotted on under parts.
 - b. General coloring olive brownish, throat black with large white spots.
 *Myrmotherula fulviventris*, male
 - bb. Upper parts chestnut, under parts white with a band of spots on breast.
 - c. Throat black, the band on breast of heavy black spots.
 *Hylophylax n. nævioides*, male
 - cc. Throat white tinged like chest with buff, the band on breast of less heavy olive spots (4.95 in.) or more.
 *Hylophylax n. nævicides*, female
- II. Length 125 mm. (4.95 in.) or more.
- A. With bars, streaks or spots on upper or lower parts, or on both.
 - a. Both upper and lower parts streaked, spotted or barred; tail relatively longer; birds of thickets and underbrush.
 - b. Both upper and lower parts barred.
 - c. More coarsely barred on upper parts (sides of head and neck, and throat streaked); plumage black barred with white.
 *Thamnophilus doliatus nigricristatus*, male

FAMILY FORMICARIIDÆ

- cc. Narrowly and more distinctly barred on upper parts.
 - d. Black barred with white.
 . . . *Cymbilaimus lineatus fasciatus*, male
 - dd. Black becoming rufous on head; barred with buff.
 . . . *Cymbilaimus lineatus fasciatus*, female
- bb. Both upper and lower parts spotted, throat and chest black, upper breast rufous tawny, remainder of plumage pale olive brown with black spots.
 . . . *Phænostictus mc. mcleannani* (sexes alike)
- aa. Barred or streaked only on lower parts, stout, terrestrial ant birds with long legs, tail excessively short.
 - b. Larger, length 175 mm. (6.90 in.), upper parts vandyke brown, top of head black.
 - c. Feathers of throat black with chestnut tips, under parts white with heavy U-shaped bars of black. . . *Pittasoma m. michleri*, male
 - cc. Throat white, feathers tipped with black and chestnut, under parts buffy white with lighter U-shaped bars of black.
 *Pittasoma m. michleri*, female
 - bb. Smaller, length 125 mm. (4.95 in.), upper parts dark olive brown, under parts white, heavily streaked with black on breast and tinged with tawny.
 *Hylopezus p. perspicillatus* (sexes alike)
- AA. Upper and lower parts without conspicuous bars, spots or streaks.
 - a. With white on under parts.
 - b. Under parts immaculate white; larger, length 162 mm. (6.40 in.); bill stout.
 - c. Black above. . . *Taraba t. transandeana*, male
 - cc. Chestnut above.
 *Taraba t. transandeana*, female
 - bb. Under parts partially white; smaller, length 150 mm. (5.90 in.) or less, bill narrow, terrestrial.
 - c. Throat, chest, and breast white, the chestnut of remainder of plumage encroaching in an irregular outline on white area of chest and breast.
 *Gymnophithys b. bicolor* (sexes alike)

FAMILY FORMICARIIDÆ

- cc. Abdomen white, upper parts chestnut rufous.
 - d. Throat, chest and sides of breast black..
.. *Myrmeciza longipes panamensis*, male
 - dd. Throat and chest tawny, breast white,
washed with tawny.....
Myrmeciza longipes panamensis, female
- aa. With no conspicuous white on under parts.
 - b. Plumage black or gray on upper parts.
 - c. Upper and lower parts black.
 - d. Stout, terrestrial, top of head with bare,
bright blue skin.....
..... *Gymnocichla n. nudiceps*, male
 - dd. More slender, not terrestrial, top of head
not bare.... *Cercomacra nigricans*, male
 - cc. Upper and lower parts gray, not terrestrial.
 - d. Blackish slate below (throat, chest and
breast finely streaked with white).....
..... *Cercomacra nigricans*, female
 - dd. Lower parts slate gray.
 - e. Plain slate gray.
 - f. Head with black crown; back mixed
with black.....
Thamnophilus punctatus atrin-
chus, male
 - ff. Head plain slate color, no black on
back..... *Cercomacra tyrannina*
rufiventris, male
 - ee. Throat and chest streaked with white;
middle of breast and abdomen white
..... *Dysithamnus puncticeps*, male
 - bb. Upper parts chestnut brown, olive or tawny rufous.
 - c. Upper parts chestnut or brown; terrestrial.
 - d. Stout with short tail, upper parts dark
chestnut, head black.
 - e. Throat black, chest and breast blackish
slate..... *Myrmeciza e. exsul*, male
 - ee. Chin gray, remainder of under parts
vandyke brown.....
..... *Myrmeciza e. exsul*, female

FASCIATED ANTSHRIKE

- dd. Upper parts brown.
 - e. Dense compact plumage, sides of neck and narrow band across foreneck chestnut, throat black, under parts brownish gray. . . . *Formicarius analis panamensis* (sexes alike)
 - ee. Concealed white patch on back, under parts plain rufous chestnut.
....*Gymnocichla n. nudiceps*, female
- cc. Upper parts olive or tawny rufous, not terrestrial.
- d. Upper parts mostly olive brownish.
 - e. Upper parts, including sides of head, bright orange tawny.
....*Cercomacra tyrannina rufiventris*, female
 - ee. Under parts buffy olive or tawny buff.
 - f. Under parts buffy olive; more brownish above, the wing coverts tipped with buff.
Thamnophilus punctatus atrinuchus, female
 - ff. Under parts tawny buff with dusky streaks on chest; no buff tips to wing.
...*Dysithamnus puncticeps*, female
- dd. Stout; conspicuous crest, upper parts rufous chestnut, sides of head striped black and buff, under parts tawny buff
..*Thamnophilus doliatus nigricristatus*, female

1. *Cymbilaimus lineatus fasciatus* Ridgway Fasciated Antshrike

Length 167 mm. (6.60 in.); tail 68 mm. (2.65 in.).

Male.—Crest black, remaining upper parts black barred with fine lines of white; sides of head and neck and under parts minutely but more coarsely barred black and white.

HOLLAND'S ANTSHRIKE

Female.—Similarly barred with buff and black instead of white and black; the crest rufous and chestnut.

It is not difficult to identify this bird as it is so decidedly marked; the eye is bright red and conspicuous. It frequents the low underbrush and thickets. The male of *Thamnophilus dolia-tus nigricristatus* is more coarsely barred.

2. *Taraba transandeanana transandeanana* (Sclater)

Holland's Antshrike

Length 192 mm. (7.60 in.); tail 71 mm. (2.80 in.).

Male.—Black above with a conspicuous crest; under parts immaculate white.

Female.—Chestnut above, crest darker; under parts white.

In May, 1925, from a dense thicket by the side of the Cruces trail, near Clayton, came repeatedly a rather soft and tranquil call consisting of a series of rising and falling notes. One bird seemed to be answering another. On following it up I found a male and female of this species sitting very quietly not far from each other. Their large size combined with the marked contrast in the coloring of upper and lower parts, made them easily identified.

BLACK-CRESTED ANTSHRIKE

3. *Thamnophilus doliatus nigricristatus* (Lawrence)

Black-crested Antshrike

Thamnophilus radiatus nigricristatus RIDGWAY, Birds of N. and M. Amer., V, p. 37, 1911; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 260.

Length 148 mm. (5.80 in.); tail 56 mm. (2.20 in.).

Male.—The conspicuous crest black; forehead, sides of head and neck streaked black and



FIG. 41. *Thamnophilus doliatus nigricristatus*
(Nat. Size)

white; remainder of upper parts black barred with white; below white barred with black. The barring is very much coarser than in *Cymbilaimus lineatus fasciatus*.

Female.—Above plain tawny rufous shading to chestnut on crest and streaked with black on hindneck; sides of head buffy white streaked with black; chin and throat immaculate pale buff, remaining lower parts plain tawny buff.

This is an exceedingly common species, found everywhere in the Canal Zone, frequenting the

SLATY ANTSHRIKE

shrubby and open brush. Usually seen in pairs or a group. Three surprisingly different calls were identified: one beginning in an emphasized staccato note followed by a long sequence of whistles, retarding and ending abruptly in a less musical, somewhat emphasized note; the second a series of a few complaining and beseeching squawks; and the third call an indescribable harsh and rasping croak. The calls of both sexes are alike.

4. *Thamnophilus punctatus atrinuchus* (Salvin and Godman) Slaty Antshrike

Erionotus punctatus atrinucha RIDGWAY, Birds of N. and M. Amer., V, p. 49, 1911; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 260.

Length 141 mm. (5.55 in.); tail 55 mm. (2.20 in.).

Male.—Slate gray above mixed with black, the crown black, the back with a concealed patch of white; tail black tipped with white; wings black, the wing coverts tipped with white; sides of head and neck, and under parts slaty gray.

Female.—Olive brown above changing to chestnut on crest, with a concealed patch of white on the back; tail dark chestnut tipped with white; wing coverts tipped with buffy white; under parts buffy olive.

The wing coverts and scapulars are con-

spicuously tipped with white in the male; the wing coverts with buffy white, in the female.

Widely distributed in the underbrush of the jungle and in the thickets in the less densely forested regions. Common on Barro Colorado Island. "Nest found May 7, 1911, in a horizontal fork of a horizontal limb, twelve feet from the ground in a thick jungle" (Jewel).

5. *Dysithamnus puncticeps* Salvin
Spotted-crowned Antvireo

Length about 108 mm. (4.20 in.); tail 37 mm. (1.50 in.).

Male.—Upper parts slate gray, the top of the head slate gray streaked with black and dotted with white; wing coverts with white dots forming two narrow bands; sides of head slate gray indistinctly barred and streaked with white; under parts mostly slate gray, the throat and middle of the chest streaked with white, the flanks tinged with buffy olive, the middle of the breast and abdomen whitish.

Female.—Upper parts grayish olive brown, the top of the head streaked with black and dotted with buffy brown; two narrow wing bars, dots and edgings to wing quills, buffy brown; sides of head grayish brown indistinctly streaked with white, under parts buffy; more grayish olive on sides and flanks, the throat and chest sparsely streaked with dusky.

PLATE XVI.



Photograph by Dr. Alfred O. Gross

FEMALE SPOTTED-CROWNED ANTIVIREO ON HER NEST CONTAINING TWO EGGS. BARRO
COLORADO ISLAND.

PIGMY ANTWREN

Dr. Alfred O. Gross discovered a nest of this antvireo on Barro Colorado Island on July 6, 1925. "The male and female relieved each other at regular intervals of two or three hours throughout the day. The birds approached the nesting tree walking on the ground rather than flying from the branches above. Just before the shift I could hear the approaching bird singing a sweet warbling song." (Gross.)

6. *Myrmotherula brachyura* (Herrmann) Pigmy Antwren

Myrmotherula pygmæa RIDGWAY, Birds of N. and M. Amer., V, p. 64, 1911; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 260.

Length 65 mm. (2.55 in.); tail 16 mm. (0.60 in.), (one specimen).

Male.—Head and back black streaked with whitish, rump gray; two conspicuous wing bands of yellowish white; sides of head yellowish buff; a streak of black in continuation of eye and one through the cheek; chin and throat white; remainder of under parts palest yellow.

Female.—Resembling male but top of head streaked with tawny; throat tinged with pale tawny.

Extremely small; no crest. Differs from male of following species in being unstreaked below.

7. *Myrmotherula surinamensis* (Gmelin)

Surinam Antwren

Length 93 mm. (3.65 in.); tail 26 mm. 1.00 in.).

Male.—Black above, the top of the head, scapulars and the back finely streaked with white, the rump plain gray; two distinct white wing bands; below white streaked with black.

Female.—Head and hindneck rufous tawny streaked with black; back and rump as in male; middle and greater wing coverts tipped with white; under parts whitish buff tinged with tawny.

A small species without a crest, warbler-like in habits. Noted at Barro Colorado Island. Jewel found it in a clearing along the bank of the Rio Siri.

8. *Myrmotherula fulviventris* (Lawrence)

Lawrence's Antwren

Myrmopagis fulviventris RIDGWAY, Birds of N. and M. Amer., V, p. 73, 1911; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 261.

Length 98 mm. (3.80 in.); tail 34 mm. (1.30 in.)

Male.—Olive above, most of the wing coverts tipped with a buff spot; chin and throat black *conspicuously spotted with white*; remainder of under parts buffy olive.

Female.—Similar to male but throat buffy,

BLACK ANTWREN



FIG. 42. *Myrmotherula fulviventris*
(Male. Nat. Size)

without spots; remainder of under parts tawny olive.

“Found in low wet forest near the ground, creeping about the shrubbery like a warbler or vireo.” (Jewel.) Noted at Patilla Point in underbrush, April, 1926.

9. *Myrmotherula axillaris albigula* Lawrence Black Antwren

Myrmopagis melæna RIDGWAY, Birds of N. and M. Amer., V, p. 68, 1911; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 261.

Length about 91 mm. (3.60 in.); tail about 32 mm. (1.25 in.).

Male.—Plumage generally black, the wing coverts spotted with white; sides and flanks with an extensive patch of elongated soft, white feathers.

Female.—Upper parts olive passing to gray on top of head; cheeks, chin and throat buffy

whitish shading to buff on remainder of under parts.

A small antwren with a relatively short, stout bill. Noted on Barro Colorado Island in April, 1926.

10. *Microrhopias quixensis virgata*
(Lawrence)

Panama Antwren

Microrhopias boucardi virgata RIDGWAY, Birds of N. and M. Amer., V, p. 79, 1911; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 260.

Length 105 mm. (4.10 in.); tail 44 mm. (1.75 in.).

Male.—Plumage generally black with a concealed spot of white on the back; lesser wing coverts partly white and partly black tipped with white, a broad band of white across greater wing coverts.

Female.—Slate above, marked with white as in male; under parts rufous chestnut.

A small species with a rather long, rounded tail, found in the undergrowth and trees of the jungle, climbing about like a warbler. Common on Barro Colorado Island. "A noisy active arboreal species." (Jewel.)

11. *Cercomacra tyrannina rufiventris*
(Lawrence)

Tyrannine Antbird

Cercomacra tyrannina tyrannina RIDGWAY, Birds of N. and M. Amer., V, p. 93, 1911; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 261.

Length about 132 mm. (5.20 in.); tail about 55 mm. (2.20 in.).

Male.—Blackish slate color above and below; the wing coverts narrowly tipped with white and a white spot on the lesser wing coverts; tail excepting middle pair of feathers usually tipped with white.

Female.—Grayish olive above; orange tawny below, including sides of head.

Tail graduated.

Found in the thickets and brush more than in the heavier jungle. Seen near Panama, and on Barro Colorado Island.

12. *Cercomacra nigricans* Sclater
Black Tyrannine Antbird

Length 143 mm. (5.65 in.); tail 64 mm. (2.50 in.).

Male.—Plumage uniform black with small spot and two narrow bands of white on wing coverts; tail, with exception of middle pair of feathers, tipped with white.

Female.—Slate above with wings and tail as in male; chin and throat finely striped black and white; chest and breast black irregularly streaked with white; remainder of under parts blackish slate.

Tail graduated.

A bird of the thickets and undergrowth, especially in the less heavily forested areas. Seen near Patillo Point in April, 1926, in bushes in company with Dusky-tailed Ant Tanagers (*Phænicothraupis fuscicauda*), Gray-crested Tanagers (*Eucometis cristata*), a White-bellied Antbird (*Myrmeciza longipes panamensis* which was on the ground), and Galbraith's Wren (*Thryophilus galbraithii*).

13. *Gymnocichla nudiceps nudiceps* (Cassin) Bare-crowned Antbird

Length 151 mm. (5.95 in.); tail 56 mm. (2.20 in.).

Male.—Plumage uniform black; wing coverts and tail, excepting middle pair of feathers, tipped with white. Skin of the top of the head naked and bright blue.

Female.—Brown above with tips of wing coverts rufous chestnut; rufous tawny below; bare skin of head as in male.

A stout-bodied, short-tailed bird of woodlands and well shaded thickets. Reported by Jewel from Gatun and Tabernilla. He says, "Several

WHITE-BELLIED ANTBIRD

individuals were seen in the jungle climbing along roots and low stems; never saw one on the ground."

14. *Myrmeciza longipes panamensis* Ridgway White-bellied Antbird

Myrmeciza boucardi panamensis RIDGWAY, Birds of N. and M. Amer., V, p. 107, 1911; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 261.

Length 146 mm. (5.75 in.); tail 53 mm. (2.10 in.).

Male.—Forehead, sides of head and hind-neck gray, remainder of upper parts bright



FIG. 43. · *Myrmeciza longipes panamensis*
(Male)

chestnut rufous, a light patch and black spots on wings; sides of head, chin, throat and chest black, the sides of the breast gray; the middle of the breast and abdomen white.

Female.—Forehead gray; top of head brown passing to chestnut on remainder of upper parts; wings mixed and barred with black;

SCLATER'S ANTBIRD

cheeks, throat and chest tawny buff; breast and abdomen white.

“The pair I collected March 19 [at Tabernilla] had their stomachs filled with ants and I watched them for some time hopping back and forth along a trail of leafcutter ants.” (Jewel.) Seen at Patillo Point in April, 1926, feeding on the ground along a trail of army ants.

15. *Myrmeciza exsul exsul* Sclater Sclater's Antbird

Length 133 mm. (5.20 in.); tail 46 mm. (1.80 in.).

Male.—Head and neck all around slaty black; remainder of upper parts deep chestnut; chest, breast and abdomen blackish slate. Bare skin on the chin and behind the eye bright light blue.

Female.—Resembles male above; chin and throat blackish slate; rest of under parts vandyke brown. Bare skin as in male.

A stout-bodied, short-tailed bird found in thickets, climbing around close to or on the ground. One was frequently seen at Quarry Heights on the side of a thickly wooded hill above Balboa during the three years of my residence there. Its common call was a high, rapid, series of whistles descending and retarding toward the end, the opening note emphasized.

PANAMA ANTTHRUSH

16. *Formicarius analis panamensis* Ridgway Panama Antthrush

Formicarius moniliger panamensis RIDGWAY, Birds of N. and M. Amer., V, p. 124, 1911; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 261.

Sexes alike.—Length 158 mm. (6.20 in.) tail 51 mm. (2.00 in.). Top of head black, the

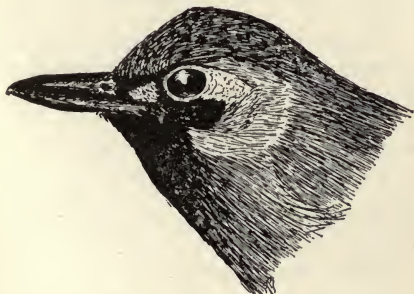


FIG. 44. *Formicarius analis panamensis*

feathers tipped with brown; remainder of upper parts brown; hindneck and sides of neck extending towards throat, buffy cinnamon; cheeks, chin and throat black; remainder of under parts dark slate mixed with olive and buff. Bare skin below and behind eye, pale bluish gray.

Rather large with dense compact plumage, a short bill, and a short rounded tail carried erect when walking or when feeding. A bird of the thick jungle and forest, usually found on the ground. It walks with the mincing gait of an ovenbird in the darkest and deepest parts of the forest, and is excessively shy and retiring. The

BICOLORED ANTBIRD

common call is one of three minor notes, the first long, the last two shorter. "It is very ventriloquist in character, but is one of the jungle sounds which, once heard, is never forgotten" (Griscom).

17. *Gymnopithys bicolor bicolor* (Lawrence) Bicolored Antbird

Anoplops bicolor RIDGWAY, Birds of N. and M. Amer., V, p. 132, 1911; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 261.

Sexes alike.—Length male, 138 mm. (5.40 in.); tail 48 mm. (1.90 in.); female, 125 mm. (4.95 in.); tail 47 mm. (1.85 in.). Above chestnut brown, the forehead and sides of head slate gray; cheeks black; chin, throat, chest, breast and abdomen, white in a somewhat restricted area, the brown of the sides of neck, breast, the sides and flanks encroaching on and forming an irregular rather spotty outline on the white. Skin bare in front of, below, and behind the eye.

A bird of more or less terrestrial habits.

18. *Hylophylax nãvioides nãvioides* (Lafresnaye) Spotted Antbird

Length 107 mm. (4.20 in.); tail 34 mm. (1.30 in.).

Male.—Chestnut brown above, the top and sides of head, and hindneck, gray; wing coverts

MCLEANNAN'S ANTTHRUSH

black with white spots on lesser, middle and greater coverts; cheeks, chin and throat black; a half moon of white on the chest outlined by a band of heavy black spots; remainder of under parts white.

Female.—Upper parts like male; chin and throat buffy white; chest spotted less heavily with olive; the remainder of under parts tinged with buff.

A small antbird with a short tail and rather stout bill. The semicircular band of spots on the chest is a definite mark for identification. This bird is rather common in shady ravines on Barro Colorado Island. Its common call is a rather high pitched but sweet toned trill, not at all loud.

19. *Phænostictus mcleannani mcleannani* (Lawrence)

McLeannan's Antthrush

Sexes alike.—Length 193 mm. (7.60 in.); tail 86 mm. (3.35 in.). Olive brown above with the hindneck chestnut, the feathers of the back and upper portion of the wings terminated with a large spot of black tipped with buff; tail black; cheeks, chin, throat and upper chest black; lower chest rufous chestnut; breast duller, changing to olive on abdomen, the plumage of both with large black spots. *Bare skin around the eye azure blue.*

This is a very distinctly spotted species with

tail relatively long for an antbird. The scale-like markings of the plumage of the back and the bright blue skin around the eye, give it an absolutely unique and unmistakable appearance.

"I saw them almost invariably with the armies of foraging ants, and when disturbed they quickly made off through the underbrush, uttering their curious low rambling notes" (Richmond).

20. *Pittasoma michleri michleri* Cassin
 Michler's Antpitta

Length 166 mm. (6.50 in.); tail 34 mm. (1.30 in.).

Male.—Head to level of eyes black; remainder of upper parts vandyke brown, the back streaked with black; wing coverts tipped with a whitish spot enclosed in black; chin and throat black streaked with white and chestnut; remainder of under parts white heavily barred with black, the bars forming a U-shape on the breast.

Female.—Resembling male in size and color, but more lightly marked and tinged with buff below.

This is a large antbird with an excessively short tail, stout bill, and a crest. "A shy species found in heavy jungle. Had a very loud penetrating whistling call '*Qua, qua, qua,*' etc., slower toward the end, gave it several times on the ground and then flew to a perch about twenty feet up and repeated it several times." (Jewel.)

21. *Hylopezus perspicillatus perspicillatus*
(Lawrence)

Lawrence's Antpitta

Sexes alike.—Length 125 mm. (4.95 in.); tail 29 mm. (1.15 in.). Olive above, passing to slate gray on top of head, the upper back streaked with buff; a conspicuous eye ring of buff; cheeks and lower parts white, the chest and breast heavily streaked with black and tinged with buff.

A terrestrial antbird with a fairly short bill and a very short tail.

47. Family FURNARIIDÆ

The Ovenbirds and their allies

A very large family of birds of the sub-order *Tyranni*, closely related to the wood-hewers (*Dendrocolaptidæ*), and sometimes considered as a subfamily (called *Furnariinæ*) of the *Dendrocolaptidæ*. The group is confined to tropical America, exclusive of the West Indies. They are mostly forest birds of medium or rather small size and plain coloration. Many of them resemble antbirds and are more or less terrestrial in habits; others creep on the trunks and branches of trees, but do not use the tail as a support, and the tail feathers are not modified as in the wood-hewers. They get the name "ovenbird" from the peculiar roofed-over nests of mud that some of them construct. The Ovenbird of the United States (*Seiurus auricapillus*), is, how-

SOOTY SYNALLAXIS

ever, not of this family but one of the warblers (*Mniotiltidae*).

Key to the Ovenbirds

- a. Habits terrestrial.
 - b. Tail feathers relatively long and spine-like with thin loose webs; plumage mostly dark slate-gray with top of head and patch on wings reddish chestnut*Synallaxis brachyura nigrifumosa* (sexes alike)
 - bb. Tail feathers not relatively long and spine-like, with loose webs.
 - c. Chunky birds with relatively long bill and short tail.
 - d. Throat and chest tawny rufous; rump and tail chestnut*Sclerurus mexicanus anomalus* (sexes alike)
 - dd. Throat whitish spotted with dusky, chest tawny, the feathers margined with dusky*Sclerurus g. guatemalensis* (sexes alike)
 - cc. Shorter bill and longer tail; throat creamy white, unspotted; brown above, shading to chestnut on tail*Automolus p. pallidigularis* (sexes alike)
- aa. Arboreal, with creeping or climbing habits; bill wedge-shaped with lower mandible sloping upward, a silky whitish crescentic marking on side of head; wings with broad tawny band*Xenops genibarbis ridgwayi* (sexes alike).

1. *Synallaxis brachyura nigrifumosa*

Lawrence

Sooty Synallaxis

Synallaxis pudica pudica RIDGWAY, Birds of N. and M. Amer., V, p. 191, 1911; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 262.

Sexes alike.—Length 148 mm. (5.80 in.); tail 69 mm. (2.75 in.). Forehead and sides of head and neck slate gray; rest of top of head

PALE-THROATED AUTOMOLUS

bright reddish chestnut; remainder of upper parts grayish brown; wings with patches of reddish chestnut, brown terminally; tail brown;



FIG. 45. *Synallaxis brachyura nigrifumosa*
(Nat. Size)

under parts dull slate gray, the chin and throat faintly barred with white and with a dark spot, in some lights, at the base of the throat.

A small, somewhat terrestrial bird with a rather long, graduated tail, the feathers spine-like with thin loose webs, the tips pointed but not stiff; no conspicuous streaks, bars or spots. Found in high grass and among low bushes in open country. Noted on the ground near Bella Vista. "It is an easy matter to bring one of these birds out into plain sight by squeaking, as they show much curiosity. In their habits they resemble the wrens but exhibit less nervousness than those birds" (Richmond).

2. *Automolus pallidigularis pallidigularis* Lawrence

Pale-throated Automolus

Sexes alike.—Length, Male, 188 mm. (7.40 in.); tail 70 mm. (2.75 in.). Female, 176 mm. (6.90 in.); tail 75 mm. (2.95 in.). Above dark

olive brown with the hindneck and top of head darker and streaked with brownish buffy; rump and tail reddish chestnut; wings reddish

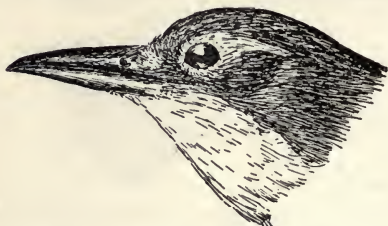


FIG. 46. *Automolus p. pallidigularis*
(Nat. Size)

brown; chin and throat cream buff; remainder of under parts buffy brown changing to tawny olive on sides; the chest indistinctly streaked with cream. Bill nearly as long as head and gradually curved towards tip; tail fairly long, the feathers broad, the tips slightly pointed.

A bird of the forest undergrowth, resembling an antbird in actions. Rather common on Barro Colorado Island. "Its note very much resembles that of the Red-breasted Nuthatch (*Sitta canadensis*)" (Richmond).

3. **Xenops genibarbis ridgwayi Hartert
and Goodson**
Mexican Xenops

Xenops genibarbis mexicanus RIDGWAY, Birds of N. and M. Amer., V, p. 172, 1911; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 262.

Sexes alike.—Length 115 mm. (4.50 in.); tail 47 mm. (1.85 in.). Brown above, darker on

MEXICAN XENOPS

head, and passing to bright chestnut on rump; tail and wings partly tawny or tawny chestnut and black, the wings when folded showing a



FIG. 47. *Xenops genibarbis ridgwayi*
(Nat. Size)

wide chestnut band across the quills and another chestnut patch behind that; a line of buff from upper eyelid over ear coverts, a conspicuous curved streak of white below the ear coverts; chin and throat buffy with dusky spots; rest of under parts buffy olive, brown. Bill short, straight above, upcurved below; tail moderately long with soft-tipped feathers.

Young.—No chestnut on head, under parts more olive.

A small bird of the jungle and forest undergrowth, climbing about like a titmouse or nut-hatch, without using the tail for support. Common on Barro Colorado Island. Note a shrill high pitched *chip*, often repeated very rapidly to form a prolonged call.

MEXICAN SCLERURUS

4. *Sclerurus mexicanus anomalus* Bangs and Barbour Mexican Sclerurus

Sclerurus mexicanus mexicanus RIDGWAY, Birds of N. and M. Amer., V, p. 166, 1911; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 262.

Sexes alike.—Length about 155 mm. (6.10 in.); tail 56 mm. (2.20 in.). Above deep warm



FIG. 48. *Sclerurus mexicanus anomalus*
(Nat. Size)

brown, with rump and tail coverts reddish chestnut; tail very dark brown; throat and chest bright tawny rufous, the chin paler; remaining under parts dark brown. Tail short with feathers broad and rounded terminally, the shafts stiff but not protruding; bill long and slender, curved and notched near tip.

Solitary and terrestrial in habits. Frequents the deep forest. To be distinguished from the following species *S. g. guatemalensis* by its bright reddish chestnut throat and chest.

5. *Sclerurus guatemalensis guatemalensis*
(Hartlaub)

Guatemalan Sclerurus

Sexes alike.—Length 161 mm. (6.30 in.); tail 59 mm. (2.30 in.). Above wholly deep vandyke brown; chin and throat whitish spotted with dusky; remainder of under parts brown, more reddish tawny on chest and indistinctly spotted with buff.

About the same size and habits as *S. mexicanus anomalus* but to be distinguished from that species by its white and spotted throat.

48. Family DENDROCOLAPTIDÆ

The Woodhewers

A family of birds of the suborder *Tyranni*, of South and tropical America, exclusive of the West Indies, which superficially resemble woodpeckers in habits and appearance (though lacking the bright colors often present in that family), but can be at once distinguished from them by their feet, which have only one toe directed backward, being of the type characteristic of the perching birds. Like the woodpeckers, they climb trunks, using the tail feathers, which are more or less rigid and spiny-tipped, to help support the body.

FAMILY DENDROCOLAPTIDÆ

Key to the Woodhewers

- a. Small, length not over 156 mm. (6.10 in.).
 - b. Bill short, wedge-shaped, the lower mandible sloping upward; throat and chest with buffy wedge-shaped spots.....*Glyphorhynchus cuneatus pectoralis*
 - bb. Bill longer, lower mandible not sloping upward; throat and chest grayish olive like breast and abdomen.....*Sittasomus sylvioides levis*
- aa. Larger, length about 181 mm. (7.10 in.) or more.
 - b. Large, plumage finely barred excepting wings and tail, bill stout, long and straight.....
.....*Dendrocolaptes s-t. sancti-thomæ*
 - bb. Medium sized, plumage with or without streaks or spots, but never barred.
 - c. Without streaks or spots; bill straight and about as long as head.
 - d. Russet brown, paler below (sides of head faintly streaked, the throat flecked with buff)
.....*Dendrocincla lafresnayi ridgwayi*
 - dd. Chestnut, paler below.....
.....*Dendrocincla homochroa ruficeps*
 - cc. With streaks or spots.
 - d. Bill excessively long, slender and strongly arched; hindneck, back, chest and breast narrowly streaked.....
.....*Campylorhampus trochilirostris venezuelensis*
 - dd. Bill not excessively long; slender and strongly arched. Wings and tail chestnut.
 - e. Bill long, straight and stout; larger birds.
 - f. Head conspicuously and distinctly spotted; under parts with streaks.
 - g. Back black with broad streaks of buff in contrast to plain chestnut of remaining upper parts.....
.....*Xiphorhynchus l. lachrymosus*
 - gg. Back brown, sparsely and indistinctly streaked with buff.....
.....*Xiphorhynchus n. nanus*

NORTHERN WEDGEBILL

- ff. Back olive, head very inconspicuously (if at all) spotted; underparts olive spotted with buff.....
Xiphorhynchus erythrogygius punctigulus
- ee. Bill shorter and more slender; smaller birds.
- f. Bill gently curved; head and under parts streaked...*Lepidocolaptes a. albolineatus*
- ff. Bill straight, whitish; head, neck and upper chest spotted with buff.....
.....*Dendroplex picus panamensis*

1. *Glyphorhynchus cuneatus pectoralis* (Sclater)

Northern Wedgebill

Sexes alike.—Length 143 mm. (5.65 in.); tail 67 mm. (2.60 in.). Top of head sooty brown;



FIG. 49. *Glyphorhynchus cuneatus pectoralis*
(Nat. Size)

back and scapulars russet brown changing to bright chestnut on rump and tail; cheeks and sides of head sooty brown finely striped with buff; chin and throat tawny buff spotted with brown; remaining under parts brownish olive, the chest indistinctly streaked with whitish. Bill short, wedge-shaped; its outline nearly straight above,

PANAMA SITTASOMUS

but up-curved below; tail feathers with rigid spine-like tips.

A little bird of the forest which climbs tree trunks, using its tail for support like a small woodpecker or creeper. Rather common on Barro Colorado Island.

2. *Sittasomus sylvioides levis* (Bangs)

Panama *Sittasomus*

Sexes alike.—Length 156 mm. (6.10 in.); tail 75 mm. (2.90 in.). Head, hindneck and sides of neck grayish olive; the under parts (excepting under tail coverts) similar but paler, back and scapular russet olive; rump and tail cinnamon rufous; wing quills rufous cinnamon with a mostly concealed area of black and a band of tawny buff on under surface of quills, visible from beneath; under tail coverts cinnamon rufous. Bill small and slender and slightly curved terminally.

A small woodhewer with a long, graduated tail, the shafts of the feathers rigid and protruding, down-curved at the tip.

3. *Dendrocincla lafresnayi ridgwayi* (Oberholser)

Brown *Dendrocincla*

Sexes alike.—Length 205 mm. (8.05 in.); tail 87 mm. (3.40 in.). Upper parts plain rich

PANAMA RUDDY DENDROCINCLA



FIG. 50. *Dendrocincla lafresnayi ridgwayi*
(Nat. Size)

russet brown shading to chestnut on tail; narrow streaks of buff below the eyes; throat and chin grayish buff flecked with paler; remaining under parts dull tawny brown. Bill not very long, curved terminally.

A medium large woodhewer, resembling the other members of the family in its woodpecker-like habits.

4. *Dendrocincla homochroa ruficeps* (Sclater and Salvin)

Panama Ruddy Dendrocincla

Sexes alike.—Length 193 mm. (7.60 in.); tail 75 mm. (3.00 in.). Upper parts chestnut, darker on back; under parts deep russet brown, slightly paler on throat. Bill as long as head, and nearly straight, though almost hooked at the end; tail feathers moderately long, with shafts bare and rigid at the tips.

LAWRENCE'S WOODHEWER

Quiet, and found in deepest jungle where it creeps about trees, keeping near the ground.

5. *Xiphorhynchus nanus nanus* (Lawrence) Lawrence's Woodhewer

Sexes alike.—Length 220 mm. (8.70 in.); tail 86 mm. (3.40 in.). Head, including sides and hindneck, dark brown with oval spots of buff edged with black, forming streaks; back and scapulars olive brown, the feathers of the upper



FIG. 51. *Xiphorhynchus n. nanus*
(Nat. Size)

back sparsely and rather inconspicuously streaked with buff; lower back, rump and tail chestnut; wing coverts brown, wing quills, chestnut; throat and chest buffy, the lower throat and chest streaked with dusky; remainder of under parts buffy brown, the breast streaked with paler. Bill long, stout and nearly straight, though very curved at tip; tail graduated, the feathers stiff and pointed.

One of the common forest birds in the Canal Zone, climbing on the lower parts of the tree trunks like a woodpecker. It is of very restless habits, flying to another tree before ascending far, and has a loud, prolonged, plaintive call of a succession of notes which rise slightly in pitch but fall again and become slower toward the end. This is one of the characteristic sounds of the forests of Panama. By imitating it, the bird can often be called in from a long distance.

6. *Xiphorhynchus erythropygius punctigulus*
(Ridgway)

Spotted-throated Woodhewer

Xiphorhynchus p. punctigulus RIDGWAY, Birds of N. and M. Amer., V, p. 255, 1911; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 268.

Sexes alike.—Length 215 mm. (8.45 in.); tail 90 mm. (3.50 in.). Head brownish olive, indistinctly streaked with buff; remainder of upper parts tawny olive, the upper back marked with oval spots of buff, the rump, wings and tail chestnut; chin and throat buff, the feathers tipped with olive; remainder of under parts olive spotted with pale buff. Bill dark horn color, pale below, long and compressed and sharply curved at tip. Tail graduated, the shafts of the feathers rigid and sharp at tip.

Found in the deep and shady forest. Climbs up the tree trunks.

7. *Xiphorhynchus lachrymosus lachrymosus*
(Lawrence)

Black-striped Woodhewer

Sexes alike.—Length 232 mm. (9.10 in.); tail 97 mm. (3.80 in.). Head and neck (including its sides), upper back and scapulars black covered with conspicuous oval spots of pale buff, forming streaks; lower back and rump, wings and tail bright reddish chestnut, feathers of under parts creamy buff margined with black, forming streaks. Bill rather long, nearly straight, though curved near the tip; tail, as in two preceding species.

A much less common bird than *X. n. nanus*, of similar habits, though easily distinguished from it by the streaked upper back and by its larger size. "Shot from a tree trunk in the submerged area of Gatun Lake." (Jewel.)

8. *Dendroplex picus panamensis* Griscom

White-throated Woodhewer

Sexes alike.—Length about 215 mm. (8.50 in.); tail 90 mm. (3.50 in.). Top of head, back and sides of neck dusky streaked with oval spots of buff; a line of buff over eye; remaining upper parts, including wings and tail, bright chestnut; chin and throat and upper chest cream buff, the feathers of throat and upper chest margined with black, forming

STREAKED-HEADED WOODHEWER

wedge-shaped spots; remainder of under parts tawny olive lightly streaked with buff on chest. Bill long, almost straight, pale horn colored; tail long, feathers rigid and sharply pointed at the tips.

Hallinan notes the species near the mouth of the Rio Juan Diaz in 1915, "creeping up a dead branch."

9. *Lepidocolaptes albolineatus albolineatus* (Lawrence)

Streaked-headed Woodhewer

-Picolaptes lineaticeps lineaticeps RIDGWAY, Birds of N. and M. Amer., V, p. 264, 1911; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 263.

Male.—Length (two specimens) 180 mm. (7.10 in.); tail 72 mm. (2.85 in.). Head and



FIG. 52. *Lepidocolaptes a. albolineatus*

neck, including sides, streaked buff and dark brown; back, scapulars and wing coverts cinnamon brown; rump and greater portion of wings bright reddish chestnut; chin and center of

VENEZUELAN SICKLEBILL

throat pale buff; remainder of under parts streaked brown and pale buff. Bill long, horn colored, paler below and considerably curved. Tail feathers with tips rigid and pointed.

A forest bird of woodpecker-like habits, less common than *Xiphorhynchus n. nanus* and easily distinguished from it by the smaller size and more curved bill.

10. *Campylorhamphus trochilirostris venezuelensis* (Chapman)

Venezuelan Sicklebill

Campylorhamphus venezuelensis RIDGWAY, Birds of N. and M. Amer., V, p. 271, 1911; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 263.

Sexes alike.—Length of male about 240 mm. (9.50 in.); tail 78 mm. (3.10 in.). Female



FIG. 53. *Campylorhamphus trochilirostris venezuelensis*
(Nat. Size)

about 225 mm. (8.90 in.); tail 78 mm. (3.10 in.). Head (including sides) and hindneck brown,

BARRED WOODHEWER

streaked with buff; back and scapulars russet brown, streaked with sparse lines of buff; wings and tail chestnut; chin and throat buffy whitish, streaked with brown; chest and breast tawny light brown streaked with cream buff; remaining under parts paler brown without streaks. Bill excessively long and slender, strongly arched; tail graduated, the feathers rigid and sharply pointed.

It climbs the tree trunks and uses its curious bill (which makes it readily distinguishable) in probing for insects.

II. *Dendrocolaptes sancti-thomæ sancti-thomæ* (Lafresnaye) Barred Woodhewer

Sexes alike.—Length 260 mm. (10.20 in.); tail 114 mm. (4.50 in.). Top of head and hindneck dull tawny rufous, back and scapulars

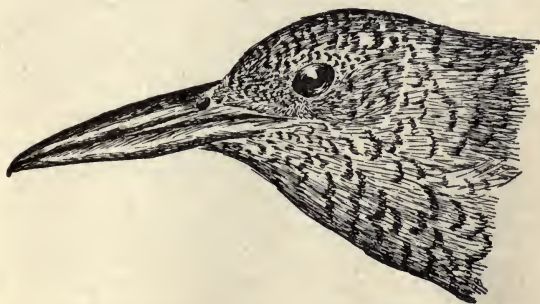


FIG. 54. *Dendrocolaptes s-t. sancti-thomæ*
(Nat. Size)

FAMILY TYRANNIDÆ

olive brown passing to dark chestnut on rump, everywhere indistinctly barred with black; wings and tail dark chestnut; under parts dull tawny buff, barred with black, the bars of crown, foreneck, chest and breast crescent-shaped. Bill stout, nearly straight; tail long, graduated and with rigid, pointed, denuded tips.

A very large woodhewer, the plumage decidedly barred, but possibly not conspicuously so from a distance, owing to lack of contrast between the brown and black.

“It is occasionally attracted by the armies of ants, where it mixes with the other species of Creepers and Ant Thrushes.” (Richmond.)

49. Family TYRANNIDÆ

The American Flycatchers

A very large, exclusively American family of insectivorous birds related to the cotingas and manakins, with both of which groups it is connected by intermediate forms, though the typical flycatchers are easily recognized even by beginners in ornithology, owing to their characteristic habits, positions and movements.

They are mostly rather solitary in habits and commonly sit in a noticeably upright position, choosing a perch affording a good lookout and making swift sallies after the insects that fly past, snapping them up with their bill and frequently returning repeatedly to the same perch. The feathers of the back

FAMILY TYRANNIDÆ

of the head are generally erectile, sometimes forming a distinct crest; the bill is wide and flattened at the base, though sharp and commonly slightly hooked at the extreme tip. In some species the plumage is conspicuously colored, but in the majority olive, brownish and gray, and on the under parts yellowish shades prevail; often, however, there is a more or less concealed bright yellow or orange patch on the crown. Their notes are varied and characteristic, but as is to be expected in the group Tyranni, usually not very musical.

The Tyrannidæ must not be confused with the Old World birds called flycatchers, which are true song-birds related to the thrushes. The Tyrannidæ are the only family of Tyranni which range northward into the United States and Canada, where they are represented by many familiar species. Tropical America is, however, their center of abundance and they form a conspicuous part of the bird fauna of the Canal Zone where, owing to the number of species more or less nearly alike, they occasion the bird student the greatest difficulty of any family. A reference to the descriptions will show that the genera *Copurus*, *Megarhynchus*, *Onychorhynchus* and *Muscivora* all have conspicuous characters making their recognition easy and certain. *Placostomus*, *Todirostrum*, *Atalotriccus*, *Oncostoma*, *Tyranniscus*, *Camptostoma* and *Terenotriccus* are all small or very small birds, some of them not very flycatcher-like in habits, that should be recognizable by a careful study of the descriptions.

FAMILY TYRANNIDÆ

The two *Elæniæ*s are common birds of plain coloration with distinct light wing bars, whose crest often appears double, the feathers of the crown patch (white in this genus) lying flat, while those each side are erected. The species of *Myiozetetes* and *Pitangus* are noisy and handsomely colored, medium sized flycatchers with white throat, deep yellow under parts, the head black or dark gray, with a very conspicuous, wide white stripe over the eye (except in *M. g. granadensis*) that frequent especially the vicinity of water, though often seen elsewhere, so that one or more of them can hardly fail to be noticed by the visitor. *Megarhynchus* is similar in color but of much larger size with a very large bill.

A large number of genera and species of medium size and without very striking characters will at first cause the bird student much confusion, but with perseverance he can learn to recognize them, providing he gets a good and reasonably near view. Their common habit of sitting still on an exposed perch makes this easier than in the case of many of the other families.

There are, however, several genera of rather small, inconspicuously olive-colored species so closely resembling each other that their determination is often difficult even for the experienced ornithologist when he has the specimen in his hands, and it is self-evident that the amateur will meet with difficulty, uncertainty and often complete failure in attempts to distinguish them with a field glass.

FAMILY TYRANNIDÆ

Keys to the Flycatchers

Owing to the size of the family, it has been divided into eight groups according to some convenient character or characters, and a key made to each group. A few of the species have characters of more than one of these groups and are therefore included in more than one of the keys.

- I. With very obvious recognition characters, elongated tail feathers, distinctive crest or yellow patch on rump.
 - a. Middle or outer tail feathers excessively elongated.
 - b. Smaller, length about 228 mm. (9.00 in.); plumage largely black. *Copurus leuconotus*
 - bb. Larger, length about 355 mm. (14.00 in.); back gray; under parts whitish or white.
 - c. Head whitish gray; flanks pink.
. *Muscivora forficata*
 - cc. Top and sides of head black; under parts white. *Muscivora tyrannus*
 - aa. No elongated tail feathers.
 - b. With a conspicuous crest, large, transversely fan-shaped, red or orange tipped with steel blue; under parts tawny buff.
. *Onychorhynchus coronatus cristatus*
 - bb. No crest, rump pale yellow abruptly contrasting with brownish olive back; abdomen yellow.
 - c. Chest tawny.
. *Myiobius sulphureipygius aureatus*
 - cc. Chest olive. *Myiobius a. atricaudus*
- II. Under parts bright sulphur or canary yellow; throat white (except in *Todirostrum cinereum finitimum*).
 - a. Small, length not over about 107 mm. (4.25 in.).
 - b. With proportionately large head and long flat bill.
 - c. Very minute; whole crown and hindneck black in abrupt contrast to yellowish green back.
. *Todirostrum nigriceps*

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- cc. Crown partly black shading to gray on hind-neck; throat yellow.....
*Todirostrum cinereum finitimum*
- bb. Head not proportionately large; bill not long and flat.
- c. Very minute with rather short tail; crown sooty brown; white line over eye; no wing bars....
*Microtriccus b. brunncicapillus*
- cc. Larger, tail longer; crown olive green; yellow line over eye; two yellow wing bars.....
*Capsiempis flaveola semiflava*
- aa. Larger, length not under about 156 mm. (6.10 in.).
- b. Crown and sides of head dusky, separated by a broad white line over eye.
- c. Very large, length about 230 mm. (9.00 in.)..
*Megarhynchus pitangua mexicanus*
- cc. Smaller, length not over 165 mm. (6.50 in.); bill narrow.
- d. Bill noticeably longer; concealed crown patch yellow; rusty margins to feathers of wings and tail.....*Pitangus lictor*
- dd. Bill shorter; concealed crown patch orange or red.
- e. Rusty margins to feathers of wings; no wing bars.....*Myiozetetes cayennensis harterti*
- ee. No rusty margins to feathers of wings; two light wing bars.....
*Myiozetetes similis columbianus*
- bb. Crown and hind-neck gray, with concealed patch of red or orange; forehead whitish. Length about 160 mm. (6.30 in.)
*Myiozetetes g. granadensis*
- III. Under parts conspicuously streaked.
- a. Larger, length about 200 mm. (7.90 in.); upper parts streaked, tail chestnut.
- b. Ground color below whitish.....
*Myiodynastes maculatus nobilis*
- bb. Ground color below light sulphur yellow.....
*Myiodynastes luteiventris*

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- aa. Upper parts not streaked.
 - b. Upper parts brown.
 - c. Small, length about 110 mm. (4.30 in.); ground color below buffy white; two conspicuous buffy wing bars.....
.....*Myiophobus fasciatus furfurosus*
 - cc. Larger, length about 144 mm. (5.70 in.); ground color below light sulphur yellow; a broad white streak above eye.....
.....*Legatus l. leucophaeus*
- bb. Upper parts olive green; light sulphur yellow below, closely streaked with olive; length about 127 mm. (5.00 in.)..... *Mionectes o. olivaceus*

IV. Under parts brownish or tawny.

- a. Larger, length about 170 mm. (6.70 in.); tail proportionately longer, russet brown; brownish above.....
.....*Cnipodectes s. subbrunneus*
- aa. Small; under parts tawny.
 - b. Length about 112 mm. (4.40 in.); throat olive; two tawny buff wing bars.....
.....*Pipromorpha oleaginea parca*
 - bb. Very minute, length about 91 mm. (3.60 in.); wings (when closed), rump and tail tawny....
.....*Terenotriccus erythrurus fulvicularis*

V. Under parts white or grayish white with little or no tinge of yellow.

- a. Large, length about 190 mm. (7.50 in.); no tinge of yellow below.
 - b. Upper parts dusky; tail tipped with white; bill normally proportioned.....*Tyrannus tyrannus*
 - bb. Upper parts gray; tail without white tips; bill obviously long and heavy in proportion.....
.....*Tyrannus dominicensis*
- aa. Smaller, length not over 158 mm. (6.20 in.); under parts with yellowish tinge.
 - b. Length not under 119 mm. (4.70 in.); dull olive above.
 - c. Whitish wing bars and whitish eye ring; habits active.

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- d. White concealed crown patch with feathers each side erectile, forming a pointed double crest; characteristic common call of lispng whistles.....
.....Genus *Elænia*, (see description)
- dd. No concealed crown patch or elongated double crest.....
.....Genus *Empidonax*, (see description)
- cc. Darker and more brownish above; two darker and less distinct wing bars; no whitish eye ring....Genus *Myiochanes*, (see description)
- bb. Very small, length not over 98 mm. (3.80 in.); greenish olive or light olive green above.
 - c. Very minute; bill long and flat; head light olive green; two yellowish wing bars.....
.....*Atalapha pilaris wilcoxi*
 - cc. Of stouter build; bill short and stout; crown dark gray; wings with yellow margins, but no bars.....*Tyranniscus vilissimus parvus*

VI. Throat and breast gray; abdomen pale yellow.

- a. Large, length not under 187 mm. (7.40 in.).
 - b. Stout; bill heavy; gray with olive tinge above, a dusky band through sides of head; throat whitish.....*Tyrannus melancholicus chloronotus*
 - bb. Bill narrower; olive above; throat gray like breast.
 - c. Inner webs of tail feathers and outer margins of longest wing quills chestnut.....
.....*Myiarchus crinitus*
 - cc. No rufous on wings or tail; no conspicuous wing bars.....*Myiarchus ferox panamensis*
- aa. Smaller or very small.
 - b. Length about 145 mm. (5.70 in.); whole top of head sooty black.....
.....*Myiarchus tuberculifer brunneiceps*
 - bb. Smaller, top of head not sooty black.
 - c. Length about 135 mm. (5.30 in.).
 - d. Olive green above; crown grayish brown with a large concealed yellow patch; sides of head streaked. . *Myiopagis viridicata pallens*

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dd. Grayish brown above; two paler wing bars; an indistinct line of white through upper eyelid; cheeks ashy gray.....
*Sublegatus arenarum glaber*

cc. Very small, length about 93 mm. (3.65 in.) or smaller; bill long, straight and flat; throat and breast indistinctly streaked with whitish; two distinct yellowish wing bars.....
*Todirostrum schistaceiceps*

VII. Throat and breast olive, abdomen yellow.

a. With an excessively broad, flat bill, black above whitish below.

b. Large, length about 150 mm. (5.90 in.); throat and chest indistinctly streaked with pale yellow.....
*Craspedoprion æquinoctialis*

bb. Very small, length about 79 mm. (3.10 in.); crown russet with concealed yellow crown patch (in male); tail very short.....
*Placostomus coronatus superciliaris*

aa. Bill not excessively broad and flat.

b. Length about 116 mm. (4.60 in.).

c. Head proportionately large; bill stout, broad and curved; upper parts bright olive green.
Genus *Rhynchocyclus*, (see description)

cc. Head not proportionately large; crown dark brown; two conspicuous tawny buff wing bars.....
*Leptopogon amaurocephalus pileatus*

bb. Very small, length not over 97 mm. (3.80 in.).

c. Bill large, deep and decidedly curved; indistinct yellow wing bars; tail short.....
*Oncostoma olivaceum*

cc. Bill short; conspicuous yellowish white wing bars.

d. Bill very short, gradually curved; a concealed yellow crown patch.....
*Tyrannulus elatus reguloides*

dd. Of stouter build; bill more slender, deeply curved; no concealed yellow crown patch.....
*Camptostoma pusillum flaviventre*

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VIII. Very small species.

- a. Under parts tawny.
 - b. Very minute, length about 91 mm. (3.60 in.); wings (when closed), rump and tail tawny.
 *Terenotriccus erythrurus fulvicularis*
 - bb. Larger, length about 112 mm. (4.40 in.); throat olive; two tawny wing bars.
 *Pipromorpha oleaginea parca*
- aa. Under parts not tawny.
 - b. Bill proportionately large and long.
 - c. Under parts sulphur yellow; crown wholly or partly black.
 - d. Very minute; throat white; hindneck black in abrupt contrast to yellowish green back
 *Todirostrum nigriceps*
 - dd. Throat yellow; hindneck gray shading into grayish olive of back.
 *Todirostrum cinereum finitimum*
 - cc. Chest gray or olive; crown with no black.
 - d. Chest gray.
 - e. Very minute; abdomen whitish; two wing bars.
 *Atalotriccus pilaris wilcoxi*
 - ee. Larger; abdomen yellowish; crown slate; two yellowish wing bars.
 *Todirostrum schistaceiceps*
 - dd. Chest olive.
 - e. Bill very wide and flat; crown russet (with yellow center in male only); no wing bars
 *Placostomus coronatus superciliaris*
 - ee. Bill long and arched; crown olive like back; two yellowish wing bars.
 *Oncostoma olivaceum*
 - bb. Bill short and deep, more or less curved; abdomen whitish or dull yellow.
 - c. Of stout build; no crown patch.
 - d. Dull yellowish white below; two distinct whitish wing bars.
 *Camptostoma pusillum flaviventre*

WHITE-BACKED COPURUS

- dd. Grayish below; yellowish margins to wing quills but no distinct bars.....
.....*Tyranniscus vilissimus parvus*
- cc. Of more slender build; abdomen canary yellow.
 - d. Chest yellowish olive, throat gray; crown dusky with patch; two conspicuous wing bars.....*Tyrannulus elatus reguloides*
 - dd. Under parts almost wholly yellow.
 - e. Very minute, with short tail; white line over eye; no wing bars.....
.....*Microtriccus b. brunneicapillus*
 - ee. Larger; tail fairly long; yellow line over eye; two yellow wing bars.....
.....*Capsiempis flaveola semiflava*

i. *Copurus leuconotus* Lafresnaye White-backed Copurus

Male.—Length 228 mm. (9.00 in.); tail (elongated middle feathers) 162 mm. (6.40 in.). Plumage generally black, the head sooty gray margined on forehead and sides by a broad band of white, the back broadly streaked with grayish white, middle of abdomen whitish. Two middle tail feathers narrow and greatly elongated.

Female.—Length 197 mm. (7.80 in.); tail (elongated middle feathers) 129 mm. (5.10 in.). Similar in color to male; tail shorter.

A forest species. It sits on a branch and flies out repeatedly to catch an insect, returning to the same perch. "Gatun. In a flock of about ten on a dead sapling in a clearing." (Hallinan.)

2. *Placostomus coronatus superciliaris*
(Lawrence)

Lawrence's Spade-billed Flycatcher

Placostomus superciliaris RIDGWAY, Birds of N. and M. Amer., IV, p. 379, 1907; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 263.

Length 80 mm. (3.10 in.); tail 22 mm. (0.90 in.).

Male.—Top of head with a large yellow, partly concealed crown patch, shading to brown



FIG. 55. *Placostomus coronatus superciliaris*
(Nat. Size)

on the sides and margined by a narrow black line; a narrow stripe of pale yellow over eye; remaining upper parts olive, a black patch on ear coverts and another on cheeks; below light yellow, chest and sides washed with olive. No conspicuous wing bars. Bill very broad and flat.

Female.—Similar to male but crown patch more orange.

A forest species. It should be easily recognized by its very small size, very short tail,

EQUINOCTIAL FLYCATCHER

broad bill and characteristic head markings. Rare, recorded from Lion Hill.

3. *Craspedoprion æquinoctialis bardus*

Bangs and Barbour

Equinoctial Flycatcher

Craspedoprion æquinoctialis RIDGWAY, Birds of N. and M. Amer., IV, p. 387, 1907; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 263.

Male.—Length 150 mm. (5.90 in.); tail 62 mm. (2.45 in.). Above olive green with fairly con-



FIG. 56. *Craspedoprion æquinoctialis bardus*
(Nat. Size)

spicuous yellowish wing bars and edgings to the wing quills; a whitish eye ring; most of under parts olive with a yellowish cast and indistinct darker streaks, especially on the sides, shading into pale yellow on the abdomen. Bill very broad, its tip distinctly hooked; black above.

Female.—Similar to male but smaller.

YELLOW-OLIVE FLYCATCHER

“Found in wild banana thickets and in the forest.” (Jewel.) A rather stoutly built flycatcher of medium size with fairly long tail, generally olive coloration with a yellowish cast, and very broad bill. Seen sitting on low branches in thick jungle on Barro Colorado Island. It was tame and unsuspecting and occasionally uttered a two-syllabled call.

Genus *Rhynchocyclus*

Small flycatchers having considerable resemblance to those of the genus *Empidonax* in size, colors and habits, but distinguished by the proportionately larger head and stouter, broader bill, which is noticeably curved downward.

4. *Rhynchocyclus sulphurescens flavo-olivaceus* Lawrence Yellow-olive Flycatcher

Rhynchocyclus flavo-olivaceus RIDGWAY, Birds of N. and M. Amer., IV, p. 391, 1907; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 263.

Male.—Length 116 mm. (4.55 in.); tail 55 mm. (2.20 in.). Resembling *R. marginatus* but brighter olive green above, the head greener, the yellow on the wings forming two more conspicuous bars; a grayish white streak from the bill to and including the upper eyelid; chest light yellowish olive green.

A bird frequenting the borders of the forest and jungle; recorded from Lion Hill Station and near Panama City. Specimens from Gatun (May 28 and July 2, 1911), are reported by Jewel, who describes the nest, placed on a branch overhanging the water. This is probably the commonest species of the genus in the Canal Zone.

5. *Rhynchocyclus marginatus* Lawrence
Yellow-margined Flycatcher

Sexes alike.—Length 120 mm. (4.75 in.); tail 50 mm. (2.00 in.). Top of head and hind-neck dark gray, rest of upper parts olive green; sides of head grayish, a white ring about the eye; wings blackish with conspicuous yellow margins and edgings but with rather narrow yellow bars; chin, throat, and chest pale gray, faintly tinged with yellow, and changing to sulphur yellow on remaining under parts. Bill rather large and broad, slightly curved down.

A small, quiet bird of the forest and its borders, having a weak, one-syllabled call. One flew into the building of the Barro Colorado Biological Station in April, 1924, and soon died, being unable to find its way out.

6. *Todirostrum cinereum finitimum* Bangs
Northern Tody Flycatcher

Sexes alike.—Length 92 mm. (3.60 in.); tail 33 mm. (1.30 in.). Forehead and more or

BLACK-HEADED TODY FLYCATCHER

less of the crown black, the rest of the head including nape dark slate streaked on the top with black and with a black area beneath and

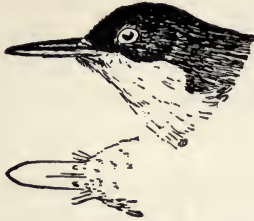


FIG. 57. *Todiostrostrum cinereum finitimum*
(Nat. Size)

behind the eye, rest of upper parts olive green; wings and tail mostly black, the wing coverts tipped with yellow forming a conspicuous wing bar; cheeks, and lower parts sulphur yellow.

A widely distributed, common and familiar little bird with a proportionately large head and bill, rather long legs and short tail, often seen in the shrubbery about habitations. Not very flycatcher-like in habits, often climbing around like a warbler or vireo to search for the insects on which it feeds. It has a call consisting of a "chip" repeated several times and also a twittering or trilled note, as well as several more or less harsh, scolding notes.

7. *Todiostrostrum nigriceps* Sclater Black-headed Tody Flycatcher

Sexes alike.—Length 75 mm. (2.95 in.); tail 25 mm. (1.00 in.). Whole top and sides of

SLATE-HEADED TODY FLYCATCHER

head black, with a white streak on the cheeks; chin and throat white, otherwise much like *T. cinereum finitimum* in plumage.

An exceedingly small and rare species only recorded from Lion Hill.

8. *Todirostrum schistaceiceps* Sclater Slate-headed Tody Flycatcher

Sexes alike.—Length 90 mm. (3.50 in.); tail 32 mm. (1.30 in.). Top of head blackish slate; rest of upper parts olive green; a white line extending from the bill through the upper eyelid; wings black with two yellow bars; below, including cheeks, pale gray indistinctly streaked with white on throat and changing to yellowish white on abdomen; sides yellow.

A little bird of thickets and brushy country, less common and familiar than *T. cinereum finitimum* and resembling it in actions and many of its habits, though more quiet and retiring. It differs also from that species in having much plainer coloration, with gray cheeks, throat and chest.

9. *Oncostoma olivaceum* (Lawrence) Lawrence's Bent-billed Flycatcher

Male.—Length 90 mm. (3.50 in.); tail 33 mm. (1.20 in.). Above plain olive green, the top of head indistinctly streaked with darker, the

PIGMY FLYCATCHER

middle and greater wing coverts tipped with olive yellow; below light olive yellow washed with olive on the sides. Bill large, rather deep and decidedly curved.

Female.—Length 80 mm. (3.15 in.); tail 29 mm. (1.15 in.). Similar to male.

A very small species with large head and abruptly bent downward bill, and short tail. "This bird perches, quite motionless, in the thick shrubbery and huddles close to the branch, with its head elevated and gives a soft peculiar call." (Hallinan.) "Has a peculiar clear note, a short song or trill of several notes. Found in dry jungles and groves" (Jewel).

10. *Atalotriccus pilaris wilcoxi* Griscom Pigmy Flycatcher

Atalotriccus pilaris pilaris RIDGWAY, Birds of N. and M. Amer., IV, p. 374, 1907; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 264.

Male.—Length 92 mm. (3.65 in.); tail 39 mm. (1.55 in.). Above light olive green; wings dusky



FIG. 58. *Atalotriccus pilaris wilcoxi*
(Nat. Size)

OLIVACEOUS MIONECTES

with two bars of sulphur yellow; sides of head and breast light drab; rest of under parts white, the chin, throat and breast lightly streaked with brownish gray; the flanks slightly yellow. Bill straight, of only moderate length and stoutness.

Female.—Length 83 mm. (3.25 in.); tail 30 mm. (1.20 in.).

“Found in second growth. Call a trill resembling the last syllable of the Wood Pewee’s note (*Myiochanes virens*) prolonged” (Jewel). Noted in jungle near the Race Track and near Bella Vista, Panama City.

11. *Mionectes olivaceus olivaceus* Lawrence Olivaceous Mionectes

Male.—Length 127 mm. (5.00 in.); tail 51 mm. (2.00 in.). Above deep olive green, including sides of head and neck; an indistinct streak of whitish in continuation of eye, ear

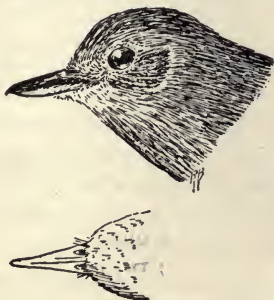


FIG. 59. *Mionectes o. olivaceus*
(Nat. Size)

BANGS' PIPROMORPHA

coverts streaked with same; two inconspicuous buff wing bars; chin, throat and upper chest grayish olive, thickly streaked with olive and passing to sulphur yellow on the rest of the under parts, the breast and sides heavily streaked with greenish olive. Bill straight, rather long and slender, well hooked at tip.

Female.—Length 117 mm. (4.60 in.); tail 45 mm. (1.75 in.). Similar to male.

“Gatun. Found in the forest” (Jewel). The deep greenish olive upper parts and heavy close streaking of greenish olive that covers the entire under parts except the strongly yellow middle part of the abdomen, is the most striking feature of this bird's plumage. It is of medium size and moderately slender build, with a tail of medium length.

12. *Pipromorpha oleaginea parca* (Bangs) Bangs' Pipromorpha

Sexes alike.—Length 112 mm. (4.40 in.); tail 44 mm. (1.75 in.). Above olive green, the upper tail coverts tawny olive; tail dusky olive; wings deep olive, the quills edged with buffy yellow and with two indistinct bars of buffy yellow; throat and chest grayish olive tinged with greenish tawny yellow and deepening to tawny or almost tarnished brassy yellow on rest of lower parts. Bill rather long and slender, light below, near base, well hooked at tip.

BROWN-CAPPED LEPTOPOGON



FIG. 60. *Pipromorpha oleaginea parca*
(Nat. Size)

A rather small and slender flycatcher with a moderately long tail, distinguishable by the peculiar tawny color of the under parts. Found in deeply shaded places in the forest. "Gatun, a forest species" (Jewel).

13. *Leptopogon amaurocephalus pileatus* Cabanis

Brown-capped Leptopogon

Leptopogon pileatus RIDGWAY, Birds of N. and M. Amer., IV, p. 463, 1907; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 265.

Sexes alike.—Length 119 mm. (4.70 in.); tail 52 mm. (2.00 in.). Top of head dark brown, darker on forehead; back, scapulars, lesser wing coverts and rump, olive green; upper tail coverts and tail brown; two conspicuous wing bars of deep tawny buff; chin, throat and chest pale olive grayish with faint paler streaking; remainder of under parts pale

The first part of the history of the county of ... is ...

The second part of the history of the county of ... is ...

THE HISTORY OF THE COUNTY OF ...

The third part of the history of the county of ... is ...

The fourth part of the history of the county of ... is ...



The fifth part of the history of the county of ... is ...

The sixth part of the history of the county of ... is ...

YELLOW-BELLIED CAMPTOSTOMA

The very bright yellow under parts will easily serve to distinguish this from the other small flycatchers. In its actions it is like a warbler or vireo; it has rather low soft conversational notes uttered with a rising inflection and non-committal tone. Common in the brushy country near Panama City, in pairs or small flocks.

15. *Camptostoma pusillum flaviventre*
(Sclater and Salvin)
Yellow-bellied Camptostoma

Sexes alike.—Length 94 mm. (3.70 in.); tail 37 mm. (1.50 in.). Upper parts greenish



FIG. 62. *Camptostoma pusillum flaviventre*
(Nat. Size)

olive, the top of the head browner; eyelids whitish and a whitish stripe over the eye; two conspicuous yellowish white wing bars and yellowish edgings to the wing quills; cheeks, chin and throat dull whitish shading to pale but clear, yellow on the lower breast and abdomen. Bill of moderate length, slightly curved.

BROWN-CAPPED TYRANNULET

A very small bird of rather stout build, with a moderately short tail; the head and bill are not conspicuously large, nor is any crest noticeable. In its actions it often suggests a warbler or vireo more than a flycatcher.

Noted in brush near the Race Track. "Sosa Hill in shrubbery" (Hallinan).

16. *Microtriccus brunneicapillus brunneicapillus* (Lawrence)

Brown-capped Tyrannulet

Sexes alike.—Length 76 mm. (3.00 in.); tail 26 mm. (1.00 in.). Top of head sooty brown;



FIG. 63. *Microtriccus b. brunneicapillus*
(Nat. Size)

rest of upper parts dull olive green; a white stripe over and extending behind eye; under parts canary yellow tinged on the sides and chest with olive green. Bill small and short.

I saw one of these tiny birds sitting quietly on a low tree on the side of the Gamboa road. It was not disturbed when I came very close to it.

RIKER'S YELLOW-CROWNED TYRANNULET

17. *Tyrannulus elatus reguloides* (Ridgway) Riker's Yellow-crowned Tyrannulet

Sexes alike.—Length 97 mm. (3.85 in.); tail 40 mm. (1.60 in.). Top of head dusky passing to slate on forehead and hindneck, with a



FIG. 64. *Tyrannulus elatus reguloides*
(Nat. Size)

mostly concealed crown patch of bright yellow; rest of upper parts pale olive green; an indistinct streak of pale gray over eye; cheeks and sides of head pale gray fading into white or grayish white tinged with yellow, on chin and throat; wings dusky with two distinct bands of yellowish white; tail dusky tipped with yellowish olive; chest yellowish olive shading to pale yellow on abdomen and under tail coverts. Bill very small.

This little bird is fairly common and widely distributed in trees and shrubbery, being usually seen in pairs. It has a characteristic soft whistled call like the syllables *dee, déa*, with a slight pause between the two parts. "Gorgona. In thick shrubbery" (Hallinan); "Toro Point" (Jewel).

LESSER PALTRY FLYCATCHER

18. *Tyranniscus vilissimus parvus* (Lawrence) Lesser Paltry Flycatcher

Male.—Length 98 mm. (3.85 in.); tail 38 mm. (1.50 in.). Top of head dusky grayish olive; rest of upper parts greenish olive; a line of



FIG. 65. *Tyranniscus vilissimus parvus*
(Nat. Size)

ashy, shading to white over eye; bend of wings and quills edged with dull yellow, the yellow wing bars indistinct; cheeks and under parts pale gray, the latter indistinctly streaked and washed with darker gray and changing to yellowish white on abdomen. A short, straight and thick bill.

Female.—Length 88 mm. (3.10 in.); tail 34 mm. (1.35 in.). Similar to male in color.

Recorded from Lion Hill Station. A small, stout bird with tail of moderate length and without unusual coloration, but it should be readily distinguishable by its peculiar bill, suggesting that of a chickadee more than a flycatcher.

NORTHERN ELÆNIA

19. *Elænia flavogaster subpagana*
(Sclater and Salvin)
Northern Elænia

Elænia martinica subpagana RIDGWAY, Birds of N. and M. Amer., IV, p. 429, 1907; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 265.

Sexes alike.—Length 158 mm. (6.20 in.); tail 72 mm. (2.80 in.). Dull olive above with a gray-

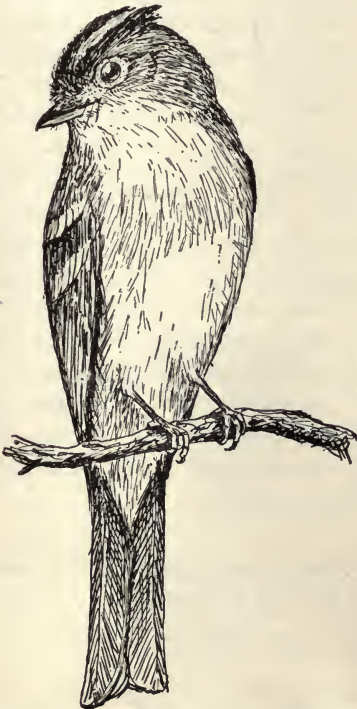


FIG. 66. *Elænia flavogaster subpagana*

ish shade, a more or less concealed white crown patch and a ring of whitish around the eye; two conspicuous light wing bars; chin and throat pale gray, rest of under parts very pale yellow. Bill rather small.

An extremely common and noisy flycatcher, very widely distributed and often seen about habitations. The feathers each side of the white crown patch are very erectile, forming a pointed crest, and when raised the bird appears to have a double crest if seen from in front or behind. The head appears rounded when the crest is laid down. The neck is rather long and slender, and the rather long tail and short bill are characteristic features, aiding in its recognition. Its habits are active and quarrelsome, its notes harsh and very characteristic in tone, so that once learned they will not be forgotten. The usual call when completely given, consists of a single loud harsh note, followed by a two or three syllabled phrase of different but decidedly disagreeable, screeching quality, repeated several times, suggesting no very good temper in the bird which utters them. The first note of the call is often given alone.

20. *Elænia chiriquensis chiriquensis*

Lawrence

Lawrence's Elænia

Sexes alike.—Length 132 mm. (5.20 in.); tail 60 mm. (2.35 in.). Resembling *E. flavo-*

PANAMA PLACID FLYCATCHER

gaster subpagana but considerably smaller, and grayer below.

A common inhabitant of brushy localities, open places with scattered trees and bushes, and the vicinity of human habitations. Closely resembling *E. flavogaster subpagana* in appearance, quarrelsome habits and notes, but these (usually at least) lack the loud characteristic first note of the call of that species.

21. *Myiopagis viridicata pallens* Bangs Panama Placid Flycatcher

Myiopagis placens accola RIDGWAY, Birds of N. and M. Amer., IV, p. 403, 1907; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 264.

Sexes alike.—Length 130 mm. (5.10 in.); tail 60 mm. (2.35 in.). Top of head grayish



FIG. 67. *Myiopagis viridicata pallens*

brown with a large concealed patch of yellow; an indistinct streak of white over the eye; ear coverts dusky, streaked with white and an in-

STRIPED FLYCATCHER

distinct dusky streak in continuation of eye; rest of upper parts olive green; chin, throat, and chest pale gray, the last tinged with olive green; rest of under parts light sulphur yellow.

A slender, rather small-billed flycatcher with a rather long tail, without wing bars. "Usually found in thickets and hedges. Gatun." (Jewel.)

22. *Legatus leucophaeus leucophaeus* (Vieillot) Striped Flycatcher

Legatus albicollis RIDGWAY, Birds of N. and M. Amer., IV, p. 439, 1907; STONE, Proc. Phila. Acad. Nat. Sci.,



THE HISTORY OF THE

REVOLUTION OF 1789

As the French Revolution of 1789 was a great event in the history of the world, it is not surprising that it has been the subject of many books. The most famous of these is the book by M. F. C. Bullen, which is a very good introduction to the subject. It is written in a simple and clear style, and is suitable for both students and general readers. It covers the whole of the revolution, from the beginning to the end, and is a very good read.

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THE HISTORY OF THE
REVOLUTION OF 1789
BY M. F. C. BULLEN

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BY J. P. MAYER

CAYENNE FLYCATCHER



FIG. 69. *Sublegatus arenarum glaber*
(Nat. Size)

A species of scrub and thickets in arid country. Ridgway records it from near Panama City. A medium sized flycatcher without very distinctive characters; the clear light ashy gray of the breast and grayish brown of the upper parts should be noticeable in a good view with favorable light.

24. *Myiozetetes cayenensis harterti* Bangs and Penard Cayenne Flycatcher

Myiozetetes cayenensis cayenensis RIDGWAY, Birds of N. and M. Amer., IV, p. 444, 1907; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 265.

Sexes alike.—Length about 158 mm. (6.20 in.); tail about 69 mm. (2.75 in.). Top and sides of head and neck deep blackish brown (almost black), the crown with a mostly concealed patch of orange, a broad stripe of white over the eye, the two of opposite sides meeting on the fore-

GRAY-CAPPED FLYCATCHER

tinged with gray; light tips to middle and greater wing coverts, forming indistinct wing bars, no

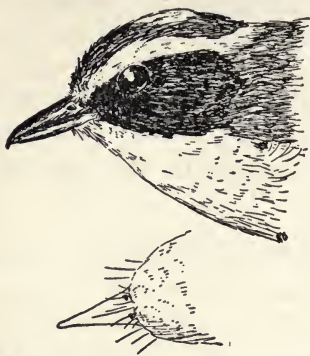


FIG. 70. *Myiozetetes similis columbianus*
(Nat. Size)

brown edging to the wing quills (see description of *M. cayenensis harterti* for comparison).

“Bird of the open and never found far from water.” (Jewel.) “Gatun on a shrub in a clearing on the Rio Algarrobo in deep jungle. Corozal, shot from a flock while they were darting after insects in a drizzling rain.” (Hallinan.) This species, while fond of the vicinity of water, seems nevertheless to be more widely distributed than Jewel statement implies. It is common and has harsh rasping call notes.

26. *Myiozetetes granadensis granadensis* Lawrence

Gray-capped Flycatcher

Male.—Length 160 mm. (6.30 in.); tail 70 mm. (2.70 in.). Top of head and hindneck gray

LICTOR FLYCATCHER

shading to white on forehead, with a concealed crown patch of flame-colored elongated feathers; sides of head dusky, this extending below eye; rest of plumage above olive green; cheeks, chin and throat white; remainder of under parts and under wing coverts bright canary yellow.

Female.—Length 155 mm. (6.10 in.); tail 67 mm. (2.65 in.). Like male but crown patch smaller or lacking. No wing bars; no brown edging to the wing quills.

A bird of similar appearance to, but less common than, the other two species of *Myiozetetes* and readily distinguishable by the absence of the stripe over the eye. It is found in forest clearings on the Caribbean side of the Zone. "Gatun. Found in the thickets." (Jewel.)

27. *Pitangus lictor panamensis* Todd

Lictor Flycatcher

Pitangus lictor RIDGWAY, Birds of N. and M. Amer., IV, p. 675, 1907; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 266.

Sexes alike.—Length 165 mm. (6.50 in.); tail 70 mm. (2.75 in.). Top of head black with a concealed patch of yellow; a very white stripe over the eye, the two of opposite sides converging on nape; sides of head sooty black, excepting cheeks, and forming a dark patch below the white stripe; remainder of upper parts olive with some rusty on upper tail coverts; conspicuous reddish brown edgings on wings and

SULPHUR-BELLIED FLYCATCHER

tail; cheeks, chin and throat white, passing into bright yellow on rest of under parts. No wing



FIG. 71. *Pitangus lictor panamensis*
(Nat. Size)

bars. Bill narrow but very much longer and straighter than in the species of *Myiozetetes*.

This bird much resembles the species of *Myiozetetes* (especially *M. cayenensis harterti*), being most easily distinguished from them by its straight and much longer bill. Like them it is fond of the vicinity of the lakes and rivers.

28. *Myiodynastes luteiventris* Sclater Sulphur-bellied Flycatcher

Sexes alike.—Length, 195 mm. (7.70 in.); tail, 81 mm. (3.20 in.). Very similar to the following species, *Myiodynastes maculatus nobilis*, in plumage but a little smaller, with the ground color of the under parts quite noticeably tinged with pale

NOBLE FLYCATCHER

sulphur yellow instead of *almost white*, and the stripe over the eye white instead of yellowish and therefore more conspicuous. The bill is also proportionately smaller.

A much less common and familiar species than *M. maculatus nobilis*.

29. *Myiodynastes maculatus nobilis* (Sclater) Noble Flycatcher

Sexes alike.—Length, 204 mm. (8.00 in.); tail, 85 mm. (3.35 in.). Pale grayish brown thickly streaked with dusky above, the head tinged with



FIG. 72. *Myiodynastes maculatus nobilis*
(Nat. Size)

cinnamon and with a large concealed crown patch of yellow; a fairly distinct stripe of yellowish white over eye, below it a dark streak through

BOAT-BILLED FLYCATCHER

the eye and below this another broad light streak; upper tail coverts and tail reddish cinnamon with dusky markings; wings edged and margined with cinnamon and whitish; below dull white very slightly washed with yellow (almost white) and sharply and conspicuously streaked with dusky.

This large flycatcher, conspicuous from its sharply streaked plumage and reddish cinnamon tail, is rather common along the roads and in the shade trees about habitations. A pair appeared to be nesting near the Ancon Hospital in April, 1924. Noted also at Barro Colorado Island.

30. *Megarhynchus pitangua mexicanus* (Lafresnaye)

Boat-billed Flycatcher

Sexes alike.—Length, 224 mm. (8.85 in.); tail, 100 mm. (3.94 in.). Much resembles *Myiozetetes*

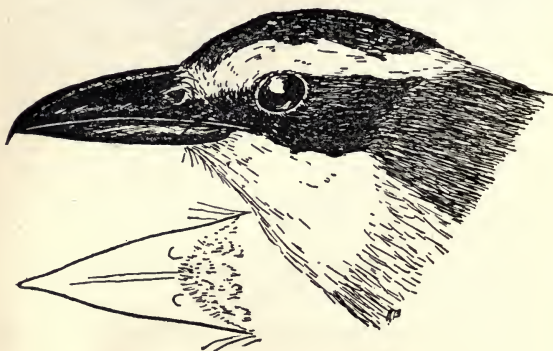


FIG. 73. *Megarhynchus pitangua mexicanus*
(Nat. Size)

COLOMBIAN ROYAL FLYCATCHER

cayenensis harterti in plumage but very much larger and with a very large stout bill which is fairly straight, but strongly hooked at the tip.

This is conspicuous as the largest and most powerful of the Canal Zone flycatchers. Its bright coloration, loud, harsh, two or three-syllabled calls, quarrelsome disposition and its habit of perching on the top of tall trees in clearings and about the edge of the jungle, make it one of the species the visitor is more likely to notice than many that actually are much commoner.

31. *Onychorhynchus coronatus cristatus* (Mensch)

Colombian Royal Flycatcher

Onychorhynchus mexicanus fraterculus RIDGWAY, Birds of N. and M. Amer., IV, p. 356, 1907; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 266.

Male.—Length, 163 mm. (6.45 in.); tail, 70 mm. (2.75 in.). A strikingly brilliant fan-shaped, laterally spreading crest of orange to scarlet, the elongated feathers with glossy steel bluish tips partially enclosing velvety black terminal spots; remainder of plumage above yellowish olive brown passing to yellowish buff on lower rump and upper tail coverts; middle wing coverts tipped with buff spots; tail tawny orange, shading to brown on the end; chin and throat pale yellowish buff shading to tawny

COLOMBIAN ROYAL FLYCATCHER

yellow on remainder of under parts, the chest faintly cross-barred with dusky olive. Bill long and straight, fairly wide at base and abruptly curved at tip



FIG. 74. *Onychorhynchus coronatus cristatus*

Female.—Length, 152 mm. (6.00 in.); tail, 63 mm. (2.50 in.). Similar to male but crest more orange.

The large and brilliant feathers of the crest can be laid down so that they are not at all

BROWN FLYCATCHER

conspicuous. The bird frequents the lower branches and undergrowth of heavy forest.

32. *Cnipodectes subbrunneus subbrunneus* (Sclater)

Brown Flycatcher

Sexes alike.—Length, 170 mm. (6.70 in.); tail, 82 mm. (3.20 in.). Above olive brown changing



FIG. 75. *Cnipodectes s. subbrunneus*
(Nat. Size)

to dark russet brown on upper tail coverts and tail; wing coverts tipped with buffy brown; wing quills edged with rather light brown; below pale grayish olive, shading to darker olive brown on the chest and to somewhat yellow on the middle of the abdomen.

A fairly long-tailed flycatcher of medium size, very brown coloration with a rather straight bill of moderate length and stoutness. A bird of

SULPHUR-RUMPED MYIOBIUS

Colombia and Western Ecuador, recorded from Lion Hill.

33. *Myiobius sulphureipygius aureatus* Bangs Sulphur-rumped Myiobius

Myiobius xanthopygius sulphureipygius RIDGWAY, Birds of N. and M. Amer., IV, p. 490, 1907; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 267.

Male.—Length, 121 mm. (4.75 in.); tail, 54 mm. (2.15 in.). Resembling the following



FIG. 76. *Myiobius sulphureipygius aureatus*
(Nat. Size)

species, *M. a. atricaudus*, but deeper and somewhat browner above, the rump also light sulphur yellow; chin and throat grayish yellow; chest and sides tawny; middle of breast and abdomen pale sulphur yellow.

Female.—About the same size as male, but usually without the yellow patch on the head.

Found chiefly in heavy forest.

BLACK-TAILED MYIOBIUS

34. *Myiobius atricaudus atricaudus* (Lawrence) Black-tailed Myiobius

Myiobius barbatus atricaudus RIDGWAY, Birds of N. and M. Amer., IV, p. 488, 1907; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 267.

Sexes alike.—Length, 118 mm. (4.65 in.); tail, 56 mm. (2.25 in.). Above olive green with a partly concealed yellow crown patch, the rump light sulphur yellow; no wing bars; tail black, its feathers broader than usual in flycatchers; chest and breast olive, shading to lighter and more grayish on throat and to light sulphur yellow on abdomen. Bill of moderate length, slightly curved with unusually long bristles about its base.

Common in all woodlands, particularly on the Pacific side. It has a habit of spreading its tail as it passes from branch to branch which, with its bright yellow rump, makes it readily seen and recognized.

35. *Myiophobus fasciatus furfurosus* (Thayer and Bangs) Bran-colored Flycatcher

Male.—Length, 109 mm. (4.30 in.); tail, 49 mm. (1.90 in.). Above dull cinnamon brown, the top of the head darker and with a concealed patch of yellow, passing to rufous towards hind-neck; wings dusky with two wide and conspicuous bands of brownish buff; tail dusky, slightly

FULVOUS-THROATED FLYCATCHER

tipped with yellowish white; under parts pale yellowish buff, the chest and sides shaded with dusky.

Female.—Resembles male. Slightly larger.

“Farfan. Jan. 23, 1916. . . . In thick shrubbery.” (Hallinan.) Jewel reports it from Gatun. “In second growth thickets and thick jungle.”

36. *Terenotriccus erythrurus fulvicularis* (Salvin and Godman)

Fulvous-throated Flycatcher

Sexes alike.—Length, 91 mm. (3.60 in.); tail, 38 mm. (1.50 in.). Head, neck and back grayish



FIG. 77. *Terenotriccus erythrurus fulvicularis*
(Nat. Size)

olive, the sides of the head paler, the forehead and eyelids tinged with cinnamon buff; outer surface of wings when closed, and tail, orange tawny; no wing bars; rump and under parts including under wing coverts tawny. Bill short, dark above, light below.

This little flycatcher flits about somewhat like a manakin, vibrating its tawny wings and tail.

GENUS EMPIDONAX

It frequents the second growth. Noted in undergrowth on high part of Barro Colorado Island on several occasions.

Genus *Empidonax*

The small plainly colored flycatchers of this genus are often exceedingly difficult to identify even when one has the specimen in hand. They much resemble those of the genera *Myiochanes* and *Rhynchocyclus* in appearance. They may be distinguished from the former genus by their stouter, broader-shouldered build, and by a habit of frequently twitching the tail up and down. They also habitually sit somewhat less upright, have a conspicuous eye-ring and their under parts are less deeply shaded with olive on the sides. From the species of *Rhynchocyclus*, the much smaller head and narrower, practically straight, bill of the present genus serves as a distinguishing character. In the north (the Canal Zone species are migrants), they each have characteristic song notes, but these are not likely to be heard in the Canal Zone where they will usually be found nearly or quite silent.

If a bird is identified as an *Empidonax*, its size (*E. virescens*, *E. t. traillii* and *E. traillii alnorum* are 10 mm. or more longer than the others), the size of the bill (*E. minimus* has a proportionately smaller bill than the others), and the color of the under parts, wing bars, etc., may give clues to the species (see descriptions), but in the case of immature specimens or those in poor plumage,

the small differences in color that exist are obscured.

37. *Empidonax flaviventris* (Baird)
Yellow-bellied Flycatcher

Sexes alike.—Length, 120 mm. (4.75 in.); tail, 51 mm. (2.00 in.). Dull olive green above; a ring of yellowish white around eye; two wing bars of pale yellow; below pale yellowish tinged with olive on chin and throat, the chest and sides of breast more olive, shading to pale but clearer yellow on rest of underparts.

A migrant from the eastern United States. Recorded from Lion Hill and Panama City. Those I have seen in the north were shy and silent, frequenting the lower branches of deep coniferous woods. Distinguishable from others of the genus by the uniform clear (not buffy) yellow of the under parts and its small size, and from species of *Rhynchocyclus* by its much smaller, straighter bill and smaller head.

38. *Empidonax virescens* (Vieillot)
Acadian Flycatcher

Sexes alike.—Length, 131 mm. (5.15 in.); tail, 58 mm. (2.30 in.). Above dark olive green with a rim of yellowish white around the eye and two wing bars of the same; below white tinged with yellowish olive on chest and with yellow on sides and abdomen.

TRAILL'S FLYCATCHER



FIG. 78. *Empidonax virescens*
(Nat. Size)

A migrant from the eastern United States. During the breeding season in the north it is recognized by its characteristic call, a constant *speet* uttered with a twitching of the tail. Recorded from Lion Hill. This bird is especially difficult to distinguish from *E. t. traillii* and *E. t. alnorum*, but is of a greener olive shade above, with yellower eye ring and wing bars. Unlike them it is not especially partial to the vicinity of water or damp places.

39. *Empidonax traillii traillii* (Audubon)

Traill's Flycatcher

Sexes alike.—Length, 132 mm. (5.20 in.); tail, 57 mm. (2.25 in.). Above brownish olive; a ring around the eye of dull whitish; wings with two distinct bands of pale buffy gray; chin and throat pure white; the rest of the under parts white tinged with pale yellow, rather heavily shaded with blue gray on sides and across breast

ALDER FLYCATCHER

A migrant from the western United States, where it frequents low bushes near water. It has a note of several syllables heard only in the breeding season. See remarks under *E. virescens*.

40. *Empidonax traillii alnorum* Brewster Alder Flycatcher

Sexes alike.—Length, 132 mm. (5.20 in.); tail, 57 mm. (2.25 in.). Similar to *E. t. traillii*, but upper parts not so brown.

A migrant from the eastern United States, where it replaces *E. t. traillii* and has very similar habits and calls. "Sabana de Panama; Saboga Island." (Ridgway.)

41. *Empidonax minimus* (Baird) Least Flycatcher

Sexes alike.—Length, 119 mm. (4.70 in.); tail, 53 mm. (2.10 in.). Above olive with a grayish shade; a dull white eye ring; two grayish white wing bands; under parts ashy white with no more than a slight tinge of yellow, washed with brownish gray on chest and sides of breast.

A migrant from the eastern United States, usually frequenting trees rather than bushes. Not partial to the vicinity of water. In the north during the nesting season, this flycatcher can be readily identified by its distinctive note *chebec*, accented on the last syllable, and it is

GENUS MYIOCHANES

often known by that name. Recorded from Lion Hill. It closely resembles *E. flaviventris* in size, but has the under parts much more nearly white and a smaller bill than either of them.

Genus Myiochanes

The Wood Pewees

These are small to medium sized fly-catchers of olive coloration above, with more or less distinct wing bars and pale white or yellowish shades below, the sides heavily washed with olive or grayish, confining the lighter color chiefly to the middle area of the lower parts.

Though much resembling such genera as *Rhynchocyclus* and *Empidonax* in plumage, they are of slenderer, more elongate build than those genera, and have rather long wings, which, when folded, give the body a rather high-shouldered appearance. They sit very upright and still except when they sally after insects, preferring tall trees regardless of whether these are in the forest or in inhabited places, choosing perches high up, but not in the extreme top, so that they are shaded by the upper branches. They do not have the habit common in *Empidonax* of frequently twitching the tail up and down.

42. *Myiochanes virens* (Linnæus)

Wood Pewee

Male.—Length, 143 mm. (5.65 in.); tail, 65 mm. (2.60 in.). Above dusky olive; an eye

WESTERN WOOD PEWEE

ring of whitish, two wing bars of grayish white; under parts from chin to tail coverts dull white or slightly yellowish, but this is much encroached on by the grayish olive sides of the chest and breast.

Female.—Length, 134 mm. (5.25 in.); tail, 61 mm. (2.10 in.). Similar to male but smaller.

A migrant from the eastern United States, ranging south to Peru in winter. It has been recorded from Taboga Island and Pacheca Island. Jewel reports a specimen from Gatun, November 3, 1911.

43. *Myiochanes richardsonii richardsonii* (Swainson)

Western Wood Pewee

Sexes alike.—Length, 141 mm. (5.55 in.); tail, 64 mm. (2.55 in.). Closely similar to *M. virens*, but grayer olive above and more extensively and heavily shaded olive grayish below.

A migrant from the western United States, ranging as far south as Ecuador in winter. Its habits are very similar to those of *M. virens*, and in appearance the two are practically indistinguishable.

44. *Myiochanes brachytarsus brachytarsus* (Sclater)

Short-legged Wood Pewee

Sexes alike.—Length, 133 mm. (5.20 in.); tail, 60 mm. (2.35 in.). Above olive, darkening to sooty brown on top of head; two wing bars of

CRESTED FLYCATCHER

grayish white; below shading from white to pale yellow, the sides of the chest and breast light grayish olive. Smaller and longer billed and yellower below than the two migratory species.

Although I never saw one singing, I think it must have been this pewee that I heard so

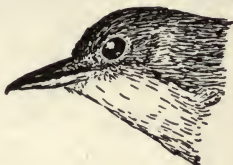


FIG. 79. *Myiochanes b. brachytarsus*
(Nat. Size)

constantly at Quarry Heights. The notes were *peeee weeee*, *pee wee wee wee wee*, the second note higher than the first, and the last five descending. The first two were delivered as if from a breast surcharged with emotion and the last five rather mournful and dreamy. It is a rather common and widely distributed bird in the Canal Zone, and is often to be seen or heard in the trees about habitations.

45. *Myiarchus crinitus* (Linnæus) Crested Flycatcher

Sexes alike.—Length, 196 mm. (7.70 in.); tail, 88 mm. (3.50 in.). Above plain olive, the feathers

PANAMA FLYCATCHER

of the top of the head somewhat elongated; sides of head gray; two wing bars of pale buffy olive, some reddish cinnamon on wings and tail; chin,

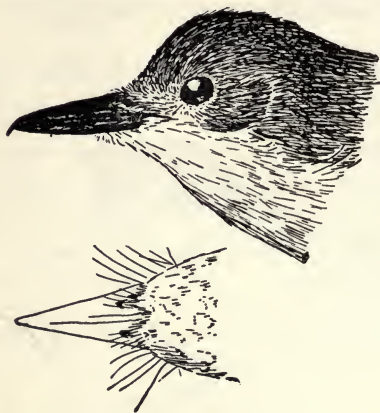


FIG. 80. *Myiarchus ferox panamensis*
(Nat. Size)

throat and chest pale gray changing rather abruptly to pale sulphur yellow on the rest of the under parts. Bill straight, fairly long and well hooked at tip.

A migrant. A large flycatcher of less stout build than the kingbirds. The reddish on its wings and rather long tail, is often quite noticeable. "Lion Hill, Colon; Saboga Island." (Ridgway.)

46. *Myiarchus ferox panamensis* (Lawrence) Panama Flycatcher

Sexes alike.—Length, 188 mm. (7.40 in.); tail, 88 mm. (3.50 in.). Back light olive, top of head

BLACK-CRESTED FLYCATCHER

more grayish, the middle feathers darker and elongated; hindneck and sides of neck and head, gray; tail dark grayish brown tipped with paler; chin, throat and chest pale gray, changing rather abruptly to pale yellow on the rest of under parts. No conspicuous light wing bars.

The commonest of the genus and a bird of rather subdued coloration (no rufous on wings and tail and no black cap) with a fairly long bill and tail, and a slightly crested head. It is of quiet habits, usually sitting rather low in the trees, often uttering a single lisping whistle. "Found in low bushes along the river bank and seashore." (Jewel.)

47. *Myiarchus tuberculifer brunneiceps* Lawrence

Black-crested Flycatcher

Myiarchus nigriceps RIDGWAY, Birds of N. and M. Amer., IV, p. 650, 1907; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 267.

Sexes alike.—Length, 145 mm. (5.70 in.): tail, 73 mm. (2.85 in.). Top of head sooty black; remaining upper parts dark greenish olive; sides of neck and ear coverts grayish black; wings and tail grayish brown; cheeks, chin, throat and chest ashy, the breast and abdomen becoming rather abruptly light yellow. No conspicuous wing bars. Bill rather long and straight.

Jewel records it from Gatun. A bird of moderately slender build with a fairly long tail, rather large head and long bill.

48. *Tyrannus tyrannus* (Linnæus)

Kingbird

Length, 186 mm. (7.30 in.); tail, 83 mm. (3.25 in.).

Male.—Above dark brownish gray, sooty on top of head, with a concealed crown patch of flame color, the crown feathers elongated; wing quills slightly edged with whitish; tail black with conspicuous white tips to all the feathers; below, including cheeks, white, the chest tinged with gray. No conspicuous wing bars.

Female.—Similar to male but crown patch smaller.

A migrant. Large, straggling flocks, apparently migrating northward in a leisurely manner, seen flying over and alighting on trees late in April, 1924. This bird is fond of perching on tree tops where its strongly contrasting dark back and white lower parts and the white tip to each tail feather (conspicuous as it flies out after insects) make it easy to recognize.

49. *Tyrannus melancholicus chloronotus*

Berlepsch

Lichtenstein's Kingbird

Tyrannus melancholicus satrapa RIDGWAY, Birds of N. and M. Amer., IV, p. 700, 1907; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 268.

Male.—Length, 221 mm. (8.70 in.); tail, 99 mm. (3.70 in.). Above mixed gray and olive

LICHTENSTEIN'S KINGBIRD

green, the top of the head and hindneck gray with a long, concealed crown patch of flame color; upper part of ear coverts dark gray, lower part of ear coverts and cheeks pale gray, still

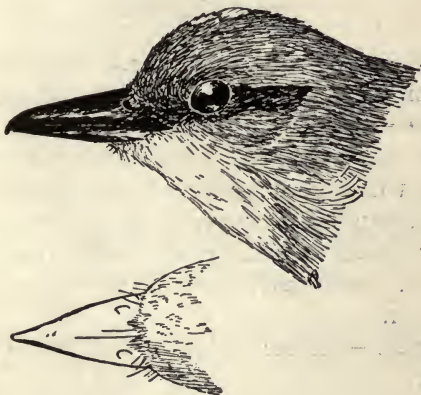


FIG. 81. *Tyrannus melancholicus chloronotus*
(Nat. Size)

paler on chin and throat, changing rather abruptly to yellowish olive on chest and shading to canary yellow on remainder of under parts. Bill rather long but not especially stout. No distinct wing bars.

Female.—Length, 203 mm. (8.00 in.); tail, 90 mm. (3.55 in.). Similar to male but crown patch smaller.

This kingbird is one of the largest of the Canal Zone flycatchers and one of the first birds the visitor will notice. It is extremely common and widely distributed, but prefers the neighborhood

of fresh or salt water. It usually perches on tree tops and has shrill bat-like, twittering calls.

50. *Tyrannus dominicensis* (Gmelin)

Gray Kingbird

Length, 207 mm. (8.20 in.); tail, 88 mm. (3.50 in.).

Male.—Gray above, the crown with a concealed orange patch, wings and tail grayish brown with whitish edging to wing quills but no definite wing bars; in front of eye and ear coverts dusky; cheeks and under parts white tinged with gray on chest and sides; under wing coverts yellowish.

Female.—Similar to male but crown patch smaller.

I saw a number of these flycatchers on different occasions along the Chagres River. One noted at Sosa Hill on April 11, 1926.

51. *Muscivora forficata* (Gmelin)

Scissor-tailed Flycatcher

Male.—Length, 337 mm. (13.40 in.); tail, 225 mm. (9.00 in.). Above light gray tinged with pinkish, paler on head, with a small concealed crown patch of flame color, and changing to brown on rump, and to black on upper tail coverts. Tail greatly elongated and deeply forked, black, with the outer feathers partly white tinged with pink; cheeks, chin, and throat

FORK-TAILED FLYCATCHER

white; chest and breast pale gray, the sides of the breast scarlet, the flanks salmon pink.

Female.—Length, 276 mm. (11.00 in.); tail, 158 mm. (6.20 in.). Similar to male but duller; tail shorter.

A migrant. I saw a male at Quarry Heights in November, 1921. It was sitting quietly on a large tree, its scarlet sides plainly visible in the light of the setting sun.

52. *Muscivora tyrannus* (Linnæus) Fork-tailed Flycatcher

Male.—Length, 366 mm. (14.50 in.); tail, 265 mm. (10.50 in.). Top and sides of head, and hindneck black, with a very large concealed



FIG. 82. *Muscivora tyrannus*

FAMILY PIPRIDÆ

crown patch of yellow, remainder of upper parts light gray, darker on rump and shading to black on upper tail coverts; tail (deeply forked and very long) black with narrow white edgings on the long, outer feathers; cheeks and under parts white.

Female.—Length, 294 mm. (11.75 in.); tail, 202 mm. (8.00 in.). Similar to male but tail shorter.

Common in the winter and early spring months in open places, sometimes in large straggling flocks, not infrequently seen perching on telegraph poles along the roads and in Panama city, even in the Cathedral Plaza. It is usually quite silent but conspicuous from its graceful flight and motions and extremely elongated and forked tail.

50. Family PIPRIDÆ

The Manakins

The manakins are a family of birds very closely related to the flycatchers (*Tyrannidæ*) and the cotingas (*Cotingidæ*) in structure, but differing much from them in appearance and habits. They are stout, with a short bill and short tail, and frequent low jungle and undergrowth. The males are very active and noisy, and generally very brightly and handsomely colored; the females are much quieter in plumage and demeanor. The family is confined to tropical America, where they are among the most

RED-HEADED MANAKIN

attractive and interesting members of the bird fauna.

Key to the Adult Male Manakins

- a. General color black, head with blue or red.
 - b. Head with blue.....*Pipra velutina minuscula*
 - bb. Head with red.
 - c. Crown red with a flattened crest; back and shoulders pale bluish.....*Chiroxiphia lanceolata*
 - cc. Whole head and neck excepting chin and throat red, no crest; chin and thighs yellow.....
.....*Pipra mentalis ignifera*
- aa. General colors orange yellow, olive and black. Wing coverts with yellow edgings, a collar across hindneck, chest, sides of neck and throat, orange yellow; rump and remaining under parts olive green.....
.....*Manacus v. vitellinus*

1. *Pipra mentalis ignifera* Bangs Red-headed Manakin

Length, 96 mm. (3.80 in.); tail, 26 mm. (1.00 in.).

Male.—General color velvety black with a brilliant flame colored head and neck, not including chin and throat; plumage of chin and thighs yellow. Bill small, slender, moderately curved at tip, and pale colored.

Female.—Dull olive green, paler and tinged with pale yellow below. Bill like that of male; legs flesh colored.

The young male is often recognizable by having scarlet feathers scattered among the olive green ones of head and neck.

VELVETY MANAKIN

These little manakins frequent the undergrowth of the jungles. I first saw them on Barro Colorado Island. Though not so noisy as Gould's manakin (*Manacus v. vitellinus*), the males make similar characteristic snapping sounds, restlessly flitting through the undergrowth. The females are less active and often quietly approach and silently inspect the visitor from some nearby branch.

2. *Pipra velutina minuscula* Todd Velvety Manakin

Length, 88 mm. (3.50 in.); tail, 26 mm. (1.00 in.).

Male.—Very small. Velvety black with an oval patch of bright cobalt blue on crown. Bill black above, light colored below.

Female.—Upperparts and chest parrot green; chin and throat grayish, breast greenish, remaining underparts yellowish olive. Bill same as in male.

“Gatun. A bird of the forest.” (Jewel.)

3. *Chiroxiphia lanceolata* Sclater Sharp-tailed Manakin

Chiroprion lanceolata RIDGWAY, Birds of N. and M. Amer., IV, p. 737, 1907; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 268.

Length 127 mm. (5.00 in.); tail 49 mm. (2.00 in.).



Above—GOULD'S MANAKIN. MALE (left), FEMALE (right).

Manacus v. vitellinus.

Below—RED-HEADED MANAKIN. MALE (right), FEMALE (left).

Pipra mentalis ignifera.

SHARP-TAILED MANAKIN

Male.—Velvety black, a flattened crest of stiff, narrow, elongated, bright crimson feathers covering crown to middle of forehead, the back and shoulders grayish azure blue, the rump tinged with olive slate. Legs and feet orange. Middle tail feathers noticeably longer than the others and pointed.

Female.—Above olive green, crown with red feathers, rarely a patch; under parts paler. Feet and legs as in male.

Young male—Similar to female, red on head as in adult male.

Velvety black, with their red caps and blue mantles, these manakins are rarely beautiful. They are of less active and nervous temperament than the Gould's and Yellow-thighed Manakins, and frequent dry thickets and low jungle, usually in twos or in small groups. They are abundant near the Pacific Coast of the Isthmus, for instance in the woods and low jungle on the Panama City side of the Juan Franco race track and around Patillo Point. During the spring and summer months, I have seen them there many times and heard them calling continuously to each other with liquid whistling notes of two or three syllables;—a questioning call of two notes followed by an answering one of three, having a tone faintly suggesting that of the bluebird of the Eastern United States, varied with tremulos and an occasional catlike call.

4. *Manacus vitellinus vitellinus* (Gould)
Gould's Manakin

Male.—Length 103 mm. (4.00 in.); tail 29 mm. (1.10 in.). Head, back, shoulders and tail black, rump olive green, wings yellow and black; a collar across hindneck, sides of neck, chest and whole throat, bright orange-yellow; rest of under parts light olive green. Bill black; feet and legs reddish orange.

Female.—Olive green, lighter below. Feet and legs as in male.

Fairly common and the noisiest of the manakins. Their loud snapping and cracking sounds seem witchlike until located as emanating from these little birds, rapidly darting from branch to branch. The sound is incredibly loud and startling to come from such a small creature. As in the Yellow-thighed Manakin, the females are of quieter disposition and equally inquisitive regarding visitors to their haunts. They can sometimes be distinguished from the females of *Pipra mentalis ignifera*, by the bright colored legs.

51. Family COTINGIDÆ

The Cotingas

A large family of South and Central American birds of the group *Tyranni*, closely related to the flycatchers (*Tyrannidæ*) and connected with them by several intermediate genera which may be placed in either family.

FAMILY COTINGIDÆ

The cotingas are also closely related to the manakins. A varied assemblage of species ranging from very small ones to birds the size of a jay are comprised in the family, which includes some very remarkable tropical birds, such as the Umbrella bird, Bell bird and Cock-of-the-rock. The typical cotingas are forest birds, some of them with very beautiful plumage, that frequent the tops of the tallest trees in pairs or small groups and are usually of very restless disposition. Most of them have characteristic and sometimes very beautiful notes. Unlike their relatives, the flycatchers, they feed on the fruits of forest trees to a large extent. This is one of the most interesting families to the bird student, but one difficult to become familiar with, on account of the forest haunts, wariness and rarity of many of the species.

Key to the Cotingas

- a. With spots or streaks.
 - b. Plumage brown, the feathers tipped with whitish or buff forming scale-like spots.....
.....*Cotinga nattereri*, female
 - bb. Olive above, with rump yellow; below yellow with olive streaks (resembling flycatcher).....
.....*Attila brasiliensis sclateri*, sexes similar
- aa. Neither spotted nor streaked.
 - b Plumage bright blue with black throat and a purple patch on abdomen.....*Cotinga nattereri*, male
 - bb. With no blue in plumage.
 - c. Large and heavy birds, plumage uniform black.
 - d. Throat with wine colored patch.....
.....*Querula purpurata*, male

COSTA RICAN TITYRA

- dd. Throat without colored patch.....
.....*Querula purpurata*, female
- cc. Smaller (sometimes very small), plumage not uniform black.
- d. Plumage rufous or tawny.
 - e. Small, length not over 141 mm. (5.55 in.); rufous above, under parts tawny buff.....
Pachyrhamphus cinnamomcus, sexes similar
 - ee. Medium and large; under parts tawny.
 - f. Medium, length about 196 mm. (7.75 in.).
.....*Lipaugus h. holerythus*, sexes alike
 - ff. Larger, length about 242 mm. (9.50 in.)..
.....*Lathria unirufa*, sexes alike
- dd. Plumage not extensively rufous or tawny.
 - e. Small, olive above, pale yellow below.....
Pachyrhamphus polychropterus cinereiventris, female
 - ee. Plumage largely gray (or brownish gray in female) and black.
 - f. Larger, length about 178 mm. (7.00 in.); head, wings and tail partly black.
 - g. Base of bill and bare skin about eyes bright red.....*Tityra semifasciata costaricensis*, sexes similar
 - gg. No red on head or bill.....
Erator albitorques fraseri, sexes similar, (female with patch of chestnut on side of head.)
 - ff. Smaller, length not over 150 mm. (5.80 in.); top of head and back black, rump and under parts slate gray.....*Pachyrhamphus polychropterus cinereiventris*, male

1. *Tityra semifasciata costaricensis* Ridgway Costa Rican Tityra

Length 195 mm. (7.70 in.); tail 69 mm. (2.70 in.).

COSTA RICAN TITYRA

Male.—Forehead, around eye and patch below eye, and chin, black; general color above pale bluish gray, almost white on back of head



FIG. 83. *Tityra semifasciata costaricensis*
(Male, Nat. Size)

and cheeks and deeper on back, scapulars and lesser wing coverts; the remainder of the wings black; tail pale gray with terminal third abruptly black and tipped with grayish white; under parts pale bluish gray, fading to white on throat. Bare skin around and in front of eye and basal half of bill, red; terminal portion of bill black. Feet gray.

Female.—Drab gray above, deepening to sooty on top of head and cheeks, shading to smoke gray on hindneck, rump and upper tail-coverts; wings same as in male but gray more brownish; under parts pale gray, fading to white on throat. Bill and bare skin same as in male.

“Found along the shores of the lake and river.” (Jewel). Noted in tall trees on the shore of Barro Colorado Island, April 4, 1924 and April

9, 1926. In his List of the Birds of Costa Rica Carriker says, "Its native name of 'Pajaro chancho' is given on account of the resemblance of the note of the birds to the grunting of a pig."

2. *Erator albitorques fraseri* (Kaup)

Fraser's Erator

Erator albitorques RIDGWAY, Birds of N. and M. Amer., IV, p. 863, 1907; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 269.

Male.—Length 182 mm. (7.15 in.); tail 64 mm. (2.55 in.). Forehead, crown and region in front of eye black, rest of head including cheeks and nape white, the remainder of the upper parts pearl gray; terminal half of tail abruptly black; wings gray and black; under parts pure white passing to pale gray on breast and sides. Bill black, bluish gray below.

Female.—Length about that of male. A frontal patch of white to pale chestnut; rest of top of head black shading into grayish brown, finely spotted with black on nape and hindneck, the sides of head chestnut brown; the remainder of upper parts grayish brown; tail brownish and dull black; wings gray and black; under parts white passing to brownish gray on chest and sides. Bill same as in male.

This species differs from the preceding, *Tityus semifasciata costaricensis*, in lacking the bare red skin around the eyes and the red on the bill. In

the female of this species the sides of the head are chestnut brown.

Seen on Barro Colorado Island in trees near Gatun Lake April 4, 1924; April 2, 1926.

3. *Pachyrhamphus polychropterus cinereiventris* (Sclater)

Gray-bellied Becard

Male.—Length 134 mm. (5.25 in.); tail 54 mm. (2.15 in.). Black above, the rump gray, the feathers of top of head and nape, tipped with glossy steel blue; wings black with two conspicuous white bands, the scapulars so margined with white as to form two white stripes along back; tail black tipped with white; sides of head and neck and under parts, lead gray, paler on abdomen and under tail coverts. Bill blue-gray tipped with black.

Female.—About same size as male. Above dull grayish olive, the back and rump tinged with cinnamon; wings dusky, variously margined and tipped with yellowish buff and dull whitish; tail brown and olive tipped with tawny buff; under parts light olive and pale yellow, clearer on abdomen; under wing coverts pale yellow. Bill same as in male.

“Gatun” (Jewel). “They frequent trees along streams, open woodland, and scattered trees in pastures. They are usually seen in small flocks, although single birds or pairs are not infrequently encountered” (Carriker).

4. *Pachyrhamphus cinnamomeus* Lawrence
Cinnamon Becard

Male.—Length 141 mm. (5.50 in.); tail 58 mm. (2.30 in.). Rufous tawny above, darker on top of head; a stripe of pale buff from bill to above eye; underneath tawny buff, paler on chin and upper throat. Bill black above, blue-gray below.

Female.—Similar to male in size and color.

“Gatun. Found in the forest” (Jewel). They are birds of the heavy forest and frequent the tops of the trees.

5. *Lathria unirufa* (Sclater)
Panama Lathria

Lathria unirufa clara RIDGWAY, Birds of N. and M. Amer., IV, p. 823, 1907; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 269.

Sexes alike.—Length 242 mm. (9.50 in.); tail 107 mm. (4.20 in.). Above bright cinnamon brown; underneath orange tawny, the chest darker and duller.

A large cotinga, bill broad at its base. Carriker says of this species, “It has the very curious habit of calling out suddenly and loudly two or three times at the report of a gun, or when suddenly disturbed by any cause.” He notes that this species and *Lipaugus h. holerythrus* are confined

to the heavy forest and are very solitary in their habits, sitting motionless for long periods.

6. *Lipaugus holerythrus holerythrus*
Sclater and Salvin
Rufous Lipaugus

Sexes alike.—Length 196 mm. (7.75 in.); tail 90 mm. (3.50 in.). Above cinnamon brown; wings darker brown and russet; under parts tawny.

Resembling *Lathria unirufa* in coloring but considerably smaller. "Lion Hill" (Ridgway).

7. *Attila brasiliensis sclateri* Lawrence
Sclater's Attila

Attila citreopygus citreopygus RIDGWAY, Birds of N. and M. Amer., IV, p. 863, 1907; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 269.

Male.—Length 171 mm. (6.75 in.); tail 72 mm. (2.80 in.). Top of head olive streaked with black, a line of pale olive yellow and dusky streaks over the eyes, the back and scapulars olive green tinged with chestnut, the rump and upper tail coverts chrome yellow; wings brown with two indistinct bars of light buffy brown; tail cinnamon brown shading into grayish brown on the end; throat and chest pale lemon-yellow, streaked with dusky, fading to white and faintly streaked



FIG. 84. *Attila brasiliensis sclateri*
(Nat. Size)

on breast and abdomen. Bill narrow and black, paler at base.

Female.—Resembling male in color and about the same size; tail shorter.

“Cruces Trail near Coroza1” (Hallinan). “A dull stupid bird, perching high up in the forest” (Jewel).

8. *Cotinga nattereri* (Boissoneau)
Natterer's Cotinga “Gorrion azul”

Male.—Length 189 mm. (7.50 in.); tail 69 mm. (2.70 in.). Bright rich cobalt blue above and below, changing to greenish turquoise or purplish in certain lights; a black ring around the eye, a black line on forehead next to the bill; wings and tail largely black; throat and upper chest blackish purple, a mauve purple patch on middle of lower breast and abdomen.

Female and Young Male.—Hair—brown above and below, the feathers tipped with whitish buff

PURPLE-THROATED FRUIT CROW

and cinnamon buff; tail brown tipped with cinnamon buff; wings brown and cinnamon buff.

The male is a rarely beautiful bird, unusual in coloring, and cannot be mistaken, though not easy to become familiar with, as like most of the other large cotingas, this species frequents the tops of tall forest trees in pairs or small groups and is of restless and rather wary habits. One adult male and a flock of several female or immature individuals noted by Van Name near Barro Colorado Biological Station in April, 1924.

9. *Querula purpurata* (Müller) Purple-throated Fruit Crow

Male.—Length about 272 mm. (10.70 in.); tail about 116 mm. (4.55 in.). Black with a conspicuous patch of glossy, crimson, maroon, elongated, stiff feathers on chin and throat. Bill silvery gray.

Female.—Length 249 mm. (9.95 in.); tail 109 mm. (4.30 in.). Plumage entirely black. Bill same as in male.

A beautiful bird, about the size of our American Blue Jay but stouter and heavier, resembling in its actions a small crow. An inhabitant of the forest where it frequents the tallest trees in pairs or small flocks. Though decidedly wild, I have induced a male and female to approach by imitating their loud, somewhat harsh, interrogatory call of two notes.

Suborder Oscines (Song Birds)

The remaining families of Passeriformes or Perching Birds all belong to this suborder, collectively called the Song Birds. Having the most complex and effective system of muscles attached to the cartilages of their vocal organs, they are in consequence best equipped as songsters. It must, however, be admitted, that many birds of other groups sing very well, and that many of the Oscines, the crows and the familiar English sparrow for instance, produce only harsh sounds. Nevertheless they cannot blame this on any failure of nature to provide them with the means.

52. Family HIRUNDINIDÆ

The Swallows

The swallows are a widely distributed family, recognizable among all the other perching birds by their long wings and remarkable powers of flight. They keep on the wing much of the time, ranging back and forth over the country at a low or moderate height, catching on the wing the small insects that form their food. Their feet are small, the tail generally more or less notched at the end (sometimes deeply forked), the bill short but wide at the base so that the mouth, when opened, is large, and the plumage often with a metallic gloss on the upper parts.

They are gregarious and sociable in habits,



Photographs by Mr. F. L. Jaques.

SUBMERGED FOREST IN GATUN LAKE.

and their graceful flight, cheerful conversational notes (though few of them have much of a song), and insect destroying habits make them welcome about human habitations, many of them nesting about buildings or in bird houses placed for them.

Swallows are not likely to be mistaken for, or confused with, any other birds except the swifts. The latter, however, have narrower, usually more or less curved, wings and a characteristic manner of flight that the bird student will soon learn to distinguish.

Key to the Swallows

- A. Tail noticeably elongate and deeply forked. Back steel blue, throat and chest rufous. *Hirundo erythrogaster*
- AA. Tail not elongated; notched, or slightly, but not deeply, forked.
 - a. Upper parts (including rump) of uniform or nearly uniform color.
 - b. Back sooty black, blue black or steel blue.
 - c. Very small, length 102 mm. (4.00 in.). General color sooty black, slightly lighter below *Neochelidon tibialis*
 - cc. Size large, length 165 mm. (6.50 in.), back steel blue or blue black (more sooty) in young; under parts grayish brown shading to white on abdomen. *Progne c. chalybea*
 - bb. Upper parts grayish brown. Lower parts white with a broad grayish brown band across chest. *Riparia riparia*
 - aa. Rump noticeably different in color from rest of upper parts.
 - b. Rump white or whitish.
 - c. Rump conspicuously white. Rest of back steel blue in adults, drab gray in young. Lower parts white. *Iridoprocne albilinea*

BANK SWALLOW

- cc. Rump dull white, general color grayish brown, reddish buff on throat.....
.....*Stelgidopteryx ruficollis uropygialis*
- bb. Rump cinnamon buff. Back mostly gray to blue black, throat fawn color, chest grayish brown.....*Petrochelidon lunifrons tachina*

1. *Riparia riparia* (Linnæus)

Bank Swallow

Sexes alike.—Length 119 mm. (4.70 in.); tail 50 mm. (2.00 in.). Above grayish brown, crown darker, rump very slightly paler; under parts including cheeks white, a broad band of grayish brown crossing chest and extending down sides.

Young.—Similar to adults, many of the feathers more or less margined with pale cinnamon or whitish.

A migrant, easily distinguishable from the dull colored *Stelgidopteryx* by the grayish brown band across the white under parts. Nests in holes in sand or clay banks.

2. *Iridoprocne albilinea* (Lawrence)

Mangrove Swallow

Sexes alike.—Length 115 mm. (4.50 in.); tail 42 mm. (1.65 in.). Above, excepting rump and including sides of neck and ear coverts, glossy greenish steel blue; rump white; a white line on each side of forehead; cheeks and under parts white.

Young.—Drab gray above, otherwise similar to adults.

Fairly common and widely distributed, especially in the vicinity of water.

3. *Hirundo erythrogaster* Boddaert
Barn Swallow

Male.—Length 168 mm. (6.60 in.); tail 76 mm. (3.00 in.). Forehead chestnut, remaining upper parts glossy steel blue; a conspicuous white spot on the inner web of outer tail feathers; cheeks, chin, throat and chest rufous chestnut, remaining under parts paler. Tail noticeably elongate and forked for about a third of its length.

Female.—Length 155 mm. (6.10 in.); tail 76 mm. (3.00 in.). Resembling male but slightly smaller.

Young.—Duller in color.

A common migrant, can be recognized by the long deeply forked tail and by the bright coloring below. Flight low, very swift and erratic. A flock seen flying over the ocean near the island of Galera in the Pearl Island group, March 14, 1924.

4. *Neochelidon tibialis* (Cassin)
White-thighed Swallow

Sexes alike.—Length 102 mm. (4.00 in.); tail 41 mm. (1.60 in.). Sooty black above becoming slightly grayer on rump, wings and tail;

below plain sooty grayish brown, the thighs white.

This little swallow is easily mistaken for a swift from its small size, long wings and sooty coloration, though distinguished by its longer tail. Seen repeatedly in the vicinity of Patillo Point, Panama, in April, 1926.

5. *Progne chalybea chalybea* (Gmelin)
 Gray-breasted Martin

Length 165 mm. (6.50 in.); tail 65 mm. (2.60 in.).

Male.—Glossy dark steel blue above; sides of head and neck, chest and sides grayish brown; paler on chin and throat, and shading to white on remaining under parts.

Female.—Resembling male but duller.

Young.—Duller than adults, with the back more sooty, the young male in the second year exactly like the female.

Common everywhere in the Canal Zone, nesting about the eaves and roofs of buildings. A favorite roost, where enormous numbers of them gather toward evening, is on some telephone wires near the water front, not far from the President's Palace, Panama City.

6. *Petrochelidon lunifrons tachina* Oberholser
 Lesser Cliff Swallow

Sexes alike.—Length 119 mm. (4.70 in.); tail 47 mm. (1.85 in.). Forehead dull cinnamon

white that color extending along the sides of the glossy blue black crown, back and scapulars sooty gray washed with blue black; rump cinnamon buff; sides of head, chin and throat fawn color or dull cinnamon; chest grayish brown fading to white on remaining under parts, a blue black patch on base of throat.

Young.—Duller in color.

A rare migrant. The pale cinnamon buff rump, contrasting with the dark back, is quite conspicuous when seen flying low enough to see the upper parts.

7. *Stelgidopteryx ruficollis uropygialis*
(Lawrence)

Panama Rough-winged Swallow

Sexes alike.—Length 118 mm. (4.65 in.); tail 49 mm. (1.95 in.). General color grayish brown, sooty on head, shading to dull whitish on rump; wings and tail sooty; under parts paler, the chin and throat reddish buff; abdomen tinged with straw color, the under tail coverts tipped with black.

Young.—Similar to adults.

Quite a common species in the Canal Zone, recognizable by its grayish brown back and whitish, but not pure white, rump. It prefers the vicinity of water, and may often be seen flying over the Lake.

53. Family SYLVIIDÆ

The European Warblers, Kinglets, Gnatcatchers
and Their Allies

This is a varied assemblage of birds, mostly of small, in many cases very small, size, closely related to the thrush family, in which many of its members have often been included. It is best represented in the Old World where its typical members may be said to take the place of the *Mniotiltidæ* in America. Among its few American members are the Gnatcatchers, represented in the Canal Zone. These are very small, active, arboreal, insectivorous birds of slender, delicate build, with a rather long tail, which strongly suggest diminutive mocking birds in their actions and appearance.

1. *Polioptila superciliaris superciliaris*

Lawrence

Lawrence's Gnatcatcher

Length: Male 99 mm. (3.90 in.); tail 40 mm. (1.60 in.). Female 93 mm. (3.60 in.); tail 39 mm. (1.55 in.).

Male.—Dark blue gray above, the top of the head and hindneck black, that color extending to sides of neck; tail black with white on outer feathers; eyelids and a streak over ear coverts, sides of face and under parts, white, heavily washed with blue gray on the chest, breast and sides.



FIG. 85. *Polioptila s. superciliaris*
(Nat. Size)

Female.—Similar to male but with less black on head and the gray of upper parts duller.

Jewel says it is found in the second growth. Its very small size, slender build and comparatively long tail enable it to be easily recognized among the other small birds of the region. It is active and nervous in its movements, climbing around after the manner of a warbler, in tree tops as well as in undergrowth.

2. *Microbates cinereiventris semitorquatus*
(Lawrence)

Half-collared Antwren

Sexes alike.—Length 98 mm. (3.80 in.); tail 27 mm. (1.10 in.). Dark brown above, the sides of the head tawny buff, this color extending to sides of neck, the front of the cheeks white; chin and throat white bordered on each side by a broken streak of black, the remaining under parts gray, passing to olive on flanks, the upper chest broadly streaked with black.

LONG-BILLED ANTWREN

“Lion Hill” (Ridgway). This bird has a superficial resemblance to the antwrens, among which it was formerly placed.

3. *Ramphocænus rufiventris rufiventris* (Bonaparte) Long-billed Antwren

Sexes alike.—Length: 117 mm. (4.60 in.); tail 41 mm. (1.60 in.). Above brownish gray, the



FIG. 86. *Ramphocænus r. rufiventris*
(Nat. Size)

head and hindneck dull rufous; tail dusky, its outer feathers with graduated white tips; below grayish tinged and washed with tawny; throat white, indistinctly spotted with black. Bill remarkably long and practically straight, horn color, paler below.

Rather common in the jungles of the Pacific slope. Seen in the second growth at Patillo Point and in the jungle near the Bull Ring and race track. Its long, rather light colored bill at once distinguishes it among the other small insectivorous birds. It climbs around like a warbler in an active manner, preferring the lower and well shaded branches to those of the tree tops. This little bird was for a long time

incorrectly placed in the antbird family, but is a true song bird.

54. Family TROGLODYTIDÆ

The Wrens

The wrens are a large and widely distributed family of insectivorous birds especially well represented in tropical America. Though allied to the mocking birds and thrashers, they are with some exceptions of rather small (sometimes very small) size, with a rather slender, often somewhat curved bill and more or less barred or streaked plumage in which browns of various shades, buff, and gray prevail. They are easily recognized by their stout, compact body and by the tail, which is generally short and often held tilted nearly upright, and by their nervous, excitable disposition. They frequent chiefly low thickets and shrubbery, and have a variety of scolding calls as well as a song that is loud for such small birds, usually cheerful, and very beautiful in some species.

Key to the Wrens

- a. Large, length about 181 mm. (7.10 in.); top of head and hindneck white; tail very long.....
.....*Heleodytes albobrunneus*
- aa. Smaller, length not over 145 mm. (5.70 in.); tail short or of medium length.
 - b. Tail short.
 - c. Sides of the head, throat and chest bright chestnut; upper and remaining under parts dark brown, the breast tinged with gray.....
.....*Leucolepis lawrencei*

FAMILY TROGLODYTIDÆ

- cc. Sides of the head, throat and chest not bright chestnut.
- d. Sides of head and neck black conspicuously streaked with white; sometimes a few white spots on wing coverts; under parts mainly white. *Henicorhina p. prosthaleuca*
- dd. General color dark brown, paler and barred with dusky below; tail excessively short. *Microcerculus philomela lusciniæ*
- bb. Tail medium.
- c. Very small, length about 111 mm. (4.30 in.); general color grayish brown; wings, tail and under tail coverts barred with dusky. *Troglodytes musculus inquietus*
- cc. Larger, length not under 124 mm. (4.90 in.).
- d. Throat black spotted with white; breast and abdomen tawny rufous; under tail coverts white barred with dusky. *Pheugopedius hyperythrus*
- dd. Throat white or whitish.
- e. Throat white, or throat and chest white in striking contrast to color of remaining under parts.
- f. Throat and chest pure white; remaining under parts abruptly black with narrow indistinct white bars on abdomen and under tail coverts. *Pheugopedius fasciato-ventris albigularis*
- ff. Throat pure white; top of head and hind-neck black; remaining under parts abruptly chestnut. *Thryophilus c. castaneus*
- ee. Throat white, remaining under parts whitish or passing to tawny buff; a conspicuous white line over eye and ear coverts; a streak of brown in continuation of eye.
- f. Remaining under parts shading to tawny buff; above pale dull brown, the wings and tail distinctly barred with black. *Thryophilus g. galbraithi*
- ff. Remaining under parts mainly whitish.

WHITE-HEADED CACTUS WREN

- g. Larger, length about 142 mm. (5.60 in.); above chestnut; sides of head white conspicuously streaked and under tail coverts barred with dark brown.
.....*Thryophilus rufalbus castanonotus*
- gg. Smaller, length about 126 mm. (5.00 in.); above grayish brown; under tail coverts plain tawny buff.
.....*Thryophilus modestus elutus*

1. *Heleodytes albobrunneus* Lawrence White-headed Cactus Wren

Length 180 mm. (7.10 in.); tail 77 mm. (3.00 in.).

Male.—Head, neck, and under parts white; upper parts sooty brown.

Female.—Similar to male, but top of head streaked and tinged with pale grayish brown.

A large rather long-tailed wren inhabiting chiefly land of a more arid character than that which prevails in the Canal Zone.

2. *Thryophilus castaneus castaneus* (Lawrence) Bay Wren

Sexes alike.—Length 135 mm. (5.30 in.); tail 53 mm. (2.10 in.). Top of head, nape and sides of neck black, back and rump bright chestnut; tail black barred with chestnut; wings barred black and chestnut; a narrow white line above the eye; cheeks white streaked with dusky, bordered below by a black line which

merges with the black sides of the neck; chin and upper throat white changing into tawny chestnut on remainder of under parts, which are more or less distinctly barred with dusky.

Young.—Similar to adults.

“Found in heavy undergrowth in damp jungle thickets. Song loud and ringing” (Jewel).

3. *Thryophilus rufalbus castanonotus*
 Ridgway
 Chestnut-backed Wren

Sexes alike.—Length 142 mm. (5.60 in.); tail 51 mm. (2.00 in.). Above light chestnut; wings and tail barred with dusky; a narrow distinct line of white over eye with a dusky streak above it; cheeks and sides of neck white streaked with dusky brown; under parts white more or less streaked with dusky, the breast and abdomen sometimes immaculate.

Young.—Similar to adults.

This wren is not uncommon and is widely distributed, although it is so shy and secretive in its habits that it is not often seen. Once heard, never to be forgotten is its song. As one passes along the trail or road, from the almost impenetrable depths of vine-covered thicket, one hears its liquid and thrilling notes, usually ending in a sharp ascending whistle. It also has a melodious song somewhat resembling a subdued bugle call. One of these wrens inhabited the undergrowth on the side of Ancon Hill for three years.

4. *Thryophilus galbraithi galbraithi*
(Lawrence)
Galbraith's Wren

Sexes alike.—Length: Male, 129 mm. (5.10 in.); tail 44 mm. (1.70 in.). Female, 122 mm. (4.80 in.); tail 42 mm. (1.65 in.). Above plain rich brown shading to russet on rump; wings and tail russet, the wings finely, and the tail more coarsely, barred with black; a narrow stripe of white above the eye, a narrow stripe of dusky in continuation of the eye; sides of head, the chin and upper throat white, the sides of the head sometimes indistinctly streaked with dusky; lower throat, chest and breast buff deepening to tawny buff on abdomen.

Young.—Similar to adults.

Less common than the following species, *Thryophilus modestus elutus*, but somewhat more brightly colored and distinguishable also by its smaller size. Jewel says it is found in thickets.

5. *Thryophilus modestus elutus* Bangs
Panama Wren

Sexes alike.—Length 129 mm. (5.10 in.); tail 48 mm. (2.00 in.). Top of head and hind-neck brownish gray, the remainder of the upper parts olive brown passing into russet on rump; tail russet barred with dusky; a narrow but conspicuous stripe of white over, and a dusky streak in continuation of, eye; cheeks, chin,



FIG. 87. *Thryophilus modestus elutus*

throat, chest, breast and abdomen white, the abdomen more or less tinged with buff.

Young.—Similar to adults.

Very common, especially so in the semi-arid and brushy regions of the Pacific side of the Isthmus; recognizable among the larger wrens of the Canal Zone by its rather dull colors. Its song is loud and varied, consisting of trills and high pitched whistles, some of them suggesting in their tone the notes of the Water Thrushes (*Seiurus*); one of its common ones is a phrase of four loud whistled notes, repeated several times in close succession.

6. *Pheugopedius fasciato-ventris albigularis*
(Sclater)

Panama Black-billed Wren

Length 147 mm. (5.80 in.); tail 54 mm. (2.10 in.).

Male.—Above plain chestnut brown; top of head and forehead darker, tail black barred with light brown; wings indistinctly barred with dusky; a line of white streaks above eye; sides of face, excepting cheeks, dusky; cheeks, chin, throat and chest very pure white, contrasting with the breast and rest of under parts, which are very abruptly black or dusky gray, the latter narrowly barred with whitish. Bill black, bluish gray below.

Female.—Brownish gray replaces the black below.

Young.—Similar to female.

I saw and heard this wren in the swampy jungle near Fort Sherman in the spring of 1924, and at Barro Colorado Island, April 3, 1926. It has surprisingly loud, oriole-like whistles. It is difficult to believe that so small a bird could emit such a volume of sound. Its black breast contrasting with the pure white throat and chest make it easy to recognize, even if its notes are not heard.

7. *Pheugopedius hyperythrus*
(Salvin and Godman)
Tawny-bellied Wren

Sexes alike.—Length 124 mm. (4.90 in.); tail 48 mm. (2.00 in.). Above brown, the forehead and crown deep russet; tail grayish brown broadly barred with black; line of black above line of white over eye; cheeks, chin, and

throat black, streaked and spotted with white; chest and breast bright orange tawny; rest of under parts duller, under tail coverts brownish white barred with dusky.

A species inhabiting scrub jungle on the Pacific slope. Found by Hallinan in the jungle in the valley of the Rio Algarrobo. It is not difficult to identify because of the conspicuous marking over the eye, the black, white-spotted throat, and the orange tawny breast.

8. *Troglodytes musculus inquietus* (Baird)
Panama House Wren

Sexes alike.—Length 111 mm. (4.30 in.); tail 38 mm. (1.50 in.). Above grayish brown, finely barred with dusky on rump and upper tail coverts; wings and tail barred with dusky; an indistinct stripe of buff over eye; under parts, including cheeks, mostly white, the chest pale brownish buff deepening to clay color on flanks and barred with dusky, the under tail coverts broadly barred with dusky.

Young.—Similar to adults.

Very common everywhere near habitations, often nesting under the eaves or elsewhere about buildings, so that it is sure to be noticed by the visitor to Panama. It has a loud, cheerful song resembling that of the common House Wren, *Troglodytes aëdon aëdon*, in the United States.

9. *Henicorhina p. prosteleuca* (Sclater)
Sclater's Wood Wren

Henicorhina prosteleuca pittieri STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 272.

Sexes alike.—Length 100 mm. (4.00 in.); tail 25 mm. (1.00 in.). Top of head brown; sides of head and neck velvety black variously



FIG. 88. *Henicorhina p. prosteleuca*
(Nat. Size)

streaked with white; tail russet barred with black; wings barred black and chestnut brown, the feathers of the blackish greater coverts tipped with a small white spot; a narrow stripe of white over the eye; throat, chest, middle of breast and abdomen white; sides of breast gray; flanks and under tail coverts tawny. Bill black.

A small, very short-tailed, rather brightly colored wren, inhabiting the underbrush of thick jungle and well shaded forest. It has a two-syllabled inquiring call of agreeable tone and a rather high-pitched, clear, whistled song of which there are several variations. *Tuee hewhew* repeated several times is one of the common

phrases. Recorded by Jewel from Gatun. "In a thicket in the jungle." (Hallinan.)

10. *Microcerculus philomela luscinia* Salvin
Panama Nightingale Wren

Microcerculus luscinia RIDGWAY, Birds of N. and M. Amer., III, p. 669, 1904; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 272.

Sexes similar.—Length 108 mm. (4.20 in.); tail, male, 25 mm. (1.00 in.). Deep vandyke brown above; throat grayish white; sides of head and under parts brownish gray deepening into deep vandyke brown on under tail coverts.

Young Female.—Similar to adults.

A rare species. "Isthmus of Panama from Panama Railroad to Chiriqui" (Ridgway).

11. *Leucolepis phæocephalus lawrencei*
(Sclater)

Lawrence's Musician Wren

Leucolepis lawrencii, RIDGWAY, Birds of N. and M. Amer., III, p. 673, 1904; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 272.

Length about 136 mm. (5.35 in.); tail 31 mm. (1.20 in.).

Male.—Mostly sepia brown above and below, the wings and tail finely barred with black, the chin, throat, chest and sides of neck, bright chestnut rufous. Bare bluish green skin around

the eye. Bill black, proportionately large and long.

Female.—Similar to male, including bill, but lighter brown above and paler below.

Young.—Similar to adults.

“A bird of the jungle” (Jewel). Recorded from Lion Hill and Chepo. Dr. Chapman tells me it has a song of two penetrating whistles, the first low, the second high.

55. Family MIMIDÆ

The Mockingbirds, Thrashers and Catbirds

This is a rather small, exclusively American family whose members are structurally closely allied to the wrens, generally resembling them in the shape of the bill, in the brown, gray and buff colors that prevail in their plumage and in their habit of skulking in bushes and thickets, but they are very much larger and more thrush-like in size and build, and usually have a fairly long (sometimes conspicuously long) tail. The family includes many very fine songsters.

1. *Dumetella carolinensis* (Linnæus)

Catbird

Length 198 mm. (7.80 in.); tail 94 mm. (3.80 in.)

Male.—Top of head and tail black; rest of plumage slate gray; under tail coverts chestnut.

Female.—Similar to male.

A winter visitant, well known in North America. It frequents dense thickets. There are several records for this species in the Canal Zone. An individual was seen on Taboga in March, 1926, in a brushy pasture.

56. Family TURDIDÆ

The Thrushes

This is a large and very widely distributed family of song birds, upon whose limits and exact definition ornithologists are by no means agreed, though this does not affect the Panama species, which are all typical examples of the group.

These are above the average size of song birds, with a rather weak bill adapted for a varied diet of worms, fruit and insects, and are of a somewhat slender build with rather long legs whose horny covering is continuous instead of being divided into plates or scales. The thrushes are generally considered to include the very finest of bird musicians, having songs consisting of phrases of soft, often beautifully modulated, musical notes.

1. *Turdus grayi casius* (Bonaparte)

Bonaparte's Thrush

Planesticus grayi casius RIDGWAY, Birds of N. and M. Amer., IV, p. 120, 1907; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 272.

Sexes alike.—Length 221 mm. (8.70 in.); tail 97 mm. (3.80 in.). Above brownish olive;

OLIVE-BACKED THRUSH



FIG. 89. *Turdus grayi casius*
(Nat. Size)

chin and throat pale buff streaked with olive; remainder of under parts brownish buff. Bill greenish yellow; feet pale yellow.

Very like our American Robin in every respect barring color. Exceedingly common in all parts of the Zone. The first nests of the year I found in February. Its call notes are somewhat like those of the American Robin, but its song is much sweeter and more musical, varying in the different phases of the breeding season from wooing, to reassuring notes during the period of incubation, and to a pæan of triumph after the young are hatched.

2. *Hylocichla ustulata swainsoni* (Cabanis) Olive-backed Thrush

Sexes alike.—Length 163 mm. (6.40 in.); tail 68 mm. (2.70 in.). Above olive, region in

front of, and ring around, the eye pale buff; chin, throat and chest pale buff shading to white on the abdomen, the sides of the throat, and chest with streaks of wedge-shaped spots of blackish and the breast with spots of light olive brown; sides light brownish gray.

A migrant, shy and retiring, preferring deeply shaded woods and undergrowth. It has a short call note like "whit," which is easily imitated and which it will usually answer.

57. Family VIREONIDÆ

The Vireos

The vireos are insectivorous song birds having the bill moderately long and rather straight, usually with a slight hook at the tip. Their coloration is generally rather plain; olive and gray shades above, and whitish or pale yellow on the under parts, prevailing. They average larger than the warblers, but resemble them in the way they climb about the branches of trees and bushes to feed, though their motions are more deliberate. Their song varies, but consists more commonly of short, disconnected phrases sometimes repeated so persistently as to become tiresome.

The Pachysylvias are small vireos with a noticeably large head, large bill and short tail.

YELLOW-GREEN VIREO

1. *Vireosylva flavoviridis flavoviridis* Cassin Yellow-green Vireo

Sexes alike.—Length 138 mm. (5.45 in.); tail 53 mm. (2.10 in.). Top of head and hind-neck gray; rest of upper parts olive green; an indistinct line of light gray above the eye; chin, throat, middle of chest, breast and abdomen white; sides and under tail coverts yellow. No wing bars. Iris red.

One of the commonest and most widely distributed birds in the Canal Zone. Its song, which differs more in tone than character from that of *V. olivacea* of the United States, is often to be heard from the shade trees about habitations. The brief phrases of which it consists, are slighter, sharper pitched and less musical than those of its northern relative.

2. *Vireosylva olivacea* (Linnæus) Red-eyed Vireo

Sexes alike.—Length 135 mm. (5.30 in.); tail 54 mm. (2.15 in.). Crown slate gray bordered by black; below that a conspicuous white line extending from the bill above and behind eye; rest of the upper parts olive green; under parts grayish white; no wing bars. Iris red. Bill fairly slender, slightly curved at tip.

A migrant. Much like *Vireosylva f. flavoviridis* in appearance, habits and notes, but

with a more conspicuous line over the eye and no yellow tinge on the under parts.

3. *Lanivireo flavifrons* (Vieillot)

Yellow-throated Vireo

Sexes alike.—Length 126 mm. (4.95 in.); tail 49 mm. (2.00 in.). Bright olive green above changing to gray on rump and upper tail coverts; a yellow ring around eye extending to almost meet that of opposite side on forehead; two distinct white wing bars; chin, chest, and breast bright yellow, changing to grayish white on abdomen.

A migrant.

4. *Pachysylvia decurtata* (Bonaparte)

Gray-headed Pachysylvia

Sexes alike.—Length 96 mm. (3.80 in.); tail 36 mm. (1.40 in.). Head and hindneck gray, the rest of the upper parts yellowish olive green; eye-ring dull white; chin and throat ashy white; middle of chest and breast and abdomen white; sides light olive yellow. No wing bars.

The smallest and shortest-tailed of the Canal Zone vireos and one of the common and widely distributed birds, frequenting the brush and undergrowth as well as the tallest trees of the forest.

5. *Pachysylvia aurantiifrons aurantiifrons*
(Lawrence)

Lawrence's Pachysylvia

Sexes alike.—Length about 105 mm. (4.15 in.); tail about 43 mm. (1.70 in.). Above yellowish olive green, becoming decidedly brown on crown and hindneck, and shading to golden brown on forehead; eyelids and throat whitish deepening into pale yellow on rest of under parts. No wing bars.

In the Zone, found in clearings and jungle, chiefly in the heavy forest of the Caribbean slope. "Pedro Miguel in wild banana jungle." (Jewel.) "In shrubbery in the valley of the Rio Velasquez." (Hallinan.)

6. *Pachysylvia viridiflava* (Lawrence)

Yellow-green Pachysylvia

Sexes alike.—Length 111 mm. (4.40 in.); tail 49 mm. (1.90 in.). Above dull yellowish olive slightly tinged with brownish on head; no wing bars; no trace of a line over the eye. Chin light ashy, becoming grayer on throat and shading to rather dull yellow on the rest of the under parts. Bill and feet pinkish; iris pale yellow.

A common bird in shrubbery and bushy localities, as those near Bella Vista and Patillo Point. "Corozal in shrubbery." (Hallinan.)

“Mt. Hope.” (Jewel.) Its song is characteristic and somewhat mournful, a series of rather high-pitched whistled notes. It responds readily to an imitation of these notes, coming near but always remaining concealed in vines or bushes.

58. Family MNIOTILTIDÆ

The American Warblers

These small insectivorous birds, an exclusively American family, get their name not from their warbling, for their song is in most cases a high-pitched, often rather weak and lisping strain, but from a superficial resemblance in size and habits to the European warblers, which are small birds allied to the thrush family and which do, in many cases, have a warbling song.

The *Mniotiltidæ* are closely related to the tanagers, but are mostly of decidedly small size, delicate build, and with a small, slender, tapering, very slightly curved bill adapted for dealing with very small insects only, and, in many cases, have very handsome coloration when in breeding plumage, though extremely brilliant colors are rare and metallic colors never occur. Variation in plumage with sex, age and season are often considerable. The typical warblers search for their food among the smaller branches and twigs of trees and bushes, and their characteristic active way of climbing about and hopping and fluttering from one branch to another, as well as the small, weak bill, generally makes it easy to distinguish them from the other

birds of the Canal Zone, such as antwrens, honeycreepers, etc., of similar size.

The waterthrushes (genus *Seiurus*), also included in this family, are different in appearance and habits, being more terrestrial, frequenting low undergrowth and walking or running on the ground, often with a teetering motion.

I. *Mniotilta varia* (Linnæus)

Black and White Warbler

Length 115 mm. (4.50 in.); tail 47 mm. (1.85 in.).

Male.—Crown black, a white stripe through the middle and one over each eye; remaining upper parts striped black and white; tail black, inner webs of outer tail feathers with white patches at the tip; two white wing bars; below striped black and white, the middle of the abdomen white. In fall plumage less striped on throat and breast.

Female.—Similar to male but slightly tinged with brownish above; cheeks pale grayish; less streaked below, and sides washed with brownish. In fall plumage more washed with brownish.

Young male.—Similar to adult female but more streaked below.

A black and white bird with no yellow in plumage, which creeps about the trunks and limbs of trees. A winter visitant.

PROTHONOTARY WARBLER

2. *Protonotaria citrea* (Boddaert)

Prothonotary Warbler

Length 122 mm. (4.80 in.); tail 47 mm. (1.85 in.).

Male.—Head, neck (including throat) and remaining under parts rich orange yellow, paler on abdomen and changing to white on under tail coverts; back yellowish green; rump gray; wings and tail gray; the inner webs of all but the middle pair of tail feathers margined with white excepting at the tip. No wing bars.

Female.—Similar to male but the yellow of plumage paler.

Young.—Similar to but duller than adults.

A rather uncommon migrant seen in the shrubbery at Quarry Heights in January, 1924; one at Patillo Point in April, 1926,—and one on the island of San José in Panama Bay in March, 1926.

3. *Vermivora chrysoptera* (Linnæus)

Golden-winged Warbler

Helminthophila chrysoptera RIDGWAY, Birds of N. and M. Amer., II, p. 448, 1902.

Length 108 mm. (4.20 in.); tail 46 mm. (1.80 in.).

Male.—Crown yellow bordered by a white line above the eye; back greenish gray; wings gray with conspicuous yellow patch; three outer tail feathers with white areas near tip; a black

patch from bill through eye and ear coverts, bordered below by a broad white stripe; throat black; remaining under parts grayish, white through the middle. No streaks.

Female.—Similar to male, the yellow crown more greenish, the black markings replaced by gray.

Young.—Similar to adults.

A rare migrant frequenting damp low growths. The yellow wing patch forms a distinguishing character in both sexes.

4. *Dendroica æstiva æstiva* (Gmelin)
Yellow Warbler

Length 110 mm. (4.30 in.); tail 43 mm. (1.70 in.).

Male. Spring.—Above yellowish olive green, yellower on crown; tail dusky olive with yellow areas on inner webs; under parts including sides of head and neck bright yellow, streaked with chestnut on chest, sides and flanks.

Male in fall, female and young.—More olive above; duller yellow below, with few chestnut streaks or more often none at all.

A bird of strikingly yellow coloration and so numerous during the migrations that it can hardly fail to attract notice. Common in open woods and shrubbery in a great variety of situations.

5. *Dendroica erithachorides* Baird
Panama Yellow Warbler

Length. Male.—115 mm. (4.50 in.); tail 49 mm. (2.00 in.).

Male.—Whole head bright chestnut; remaining upper parts yellowish olive green; two yellow wing bars; tail with some yellow; remaining under parts rich yellow, the breast with streaks of chestnut confluent with the chestnut of throat.

Female and immature males.—Practically indistinguishable from those of the Yellow Warbler *Dendroica e. aestiva*.

A native warbler common in mangrove swamps and bushes in vicinity of the seashore.

6. *Dendroica coronata* (Linnæus)
Myrtle Warbler

Length 130 mm. (5.10 in.); tail 56 mm. (2.20 in.).

Male. Spring.—Bluish gray above, streaked with black, a conspicuous yellow patch on the middle of the crown, on rump and on sides of breast; a white line over eye and one along lower eyelid; two white wing bars; outer tail feathers with white areas near the tip; cheeks black; throat and remaining under parts white; the chest, breast and sides heavily marked with black.

Male. Fall.—Quite different; mostly brownish gray above and less distinctly streaked, the yellow patches on crown and sides less conspicuous. Lightly streaked below.

Female.—Similar to male in fall.

Young.—With still browner tints prevailing. Yellow patches on sides much duller and smaller, sometimes almost wanting, but yellow rump always conspicuous in any plumage.

A rare winter visitant. Of more terrestrial habits than most of the *Dendroicæ*, but often seen also in tall trees.

7. *Dendroica magnolia* (Wilson)

Magnolia Warbler

Dendroica maculosa RIDGWAY, Birds of N. and M. Amer., II, 532, 1902.

Length 112 mm. (4.40 in.); tail 48 mm. (1.90 in.).

Male. Spring.—Top of head and nape (extending behind ear coverts) bluish gray; a white elongated patch over and extending behind upper eyelid, a white mark on lower eyelid; forehead, cheeks, and back black; rump bright lemon yellow; tail black with square white patches on webs of quills forming an incomplete white band across its middle; wings black edged with gray and with a conspicuous white wing patch; under parts bright yellow, heavily streaked with black, the streaks con-

verging to form a patch of black at the base of the yellow throat; under tail coverts white.

Male. Fall.—Back more or less streaked with olive; under parts less heavily streaked; two white wing bars.

Female.—Similar to male, plumage duller; the black more or less replaced with olive, especially in fall.

Young.—Much plainer, but yellow rump and white tail patches as in adult. Above mostly olive, head markings indistinct or wanting; mostly plain yellow below or indistinctly streaked on the sides only.

A migrant, apparently not common.

8. *Dendroica cærulea* (Wilson)

Cerulean Warbler

Dendroica rara RIDGWAY, Birds of N. and M. Amer., II, p. 570, 1902.

Length 108 mm. (4.20 in.); tail 43 mm. (1.70 in.).

Male.—Back and crown almost sky blue, the back with blackish streaks; eyelids and line over the eye white; wing and tail feathers blackish edged with bluish; two white bars on the wings and white marking on webs of the wing and tail quills; below white, a band of small grayish black streaks across the breast and others along the sides.

Female.—Dull greenish olive above with a grayish blue shade, greener on the crown; eye-

lids, line over the eye and entire under parts whitish washed with greenish yellow; wings and tail dusky with whitish markings as in male.

Young male.—Similar to female, but purer white below, and often with evident dark streaks on the back.

A rare migrant from the eastern United States; to be looked for in April and October.

9. *Dendroica pensylvanica* (Linnæus)
Chestnut-sided Warbler

Length 113 mm. (4.45 in.); tail 48 mm. (1.90 in.).

Male. Spring.—Crown yellow, forehead white, remaining upper parts greenish yellow striped with black; a streak of dusky over eye, and covering back of head and nape, confluent in front of eye with a streak of dusky under cheeks; cheeks and ear coverts white; two conspicuous yellowish white wing bars; tail black with white on outer feathers near tip; under parts white, a broad chestnut stripe on sides and flanks. Fall.—Not distinctly striped above; whole side of head gray with white eye ring.

Female. Spring.—Like male but duller black; stripes on sides of head less conspicuous, a narrower stripe of chestnut on sides. Fall.—Still less chestnut or none at all on sides.

BAY-BREASTED WARBLER

Young male.—Similar to adult male but little or no chestnut on sides; none in fall.

A common migrant. Hallinan took one in 1915 at New Culebra, "In a cocoa plantation."

10. *Dendroica castanea* (Wilson)

Bay-breasted Warbler

Length 122 mm. (4.80 in.); tail 52 mm. (2.05 in.)

Male. Spring.—Crown chestnut, the forehead and sides of head including ear coverts black; a buffy patch on sides of neck; remaining upper parts buffy gray, the back streaked with black; two white wing bars and white patches at ends of outer tail feathers; throat, chest and sides chestnut; remaining under parts buffy white. Fall.—Above olive green somewhat streaked with black; under parts whitish; sides with some chestnut.

Female.—Similar to male but less brightly colored.

Young.—Upper parts bright olive green indistinctly streaked with black; wings and tail as in adults; under parts white tinged with buff, deeper on sides.

A migrant. Recorded by Jewel from Gatun in November and by Hallinan from New Culebra in November. One seen at Barro Colorado Island in April.

PLATE XIX.



Photograph by Mr. F. L. Jaques.
A POINT ALONG THE SHORE OF BARRO COLORADO ISLAND.

BLACKBURNIAN WARBLER

11. *Dendroica fusca* (Müller)

Blackburnian Warbler

Dendroica blackburniæ RIDGWAY, Birds of N. and M. Amer., II, p. 574, 1902.

Length 114 mm. (4.50 in.); tail 47 mm. (1.85 in.)

Male. Spring.—Whole head and nape black with an oval patch of orange on middle of crown, a broad orange stripe over eye joining an orange patch on sides of neck and an orange line below the nape; remaining upper parts black streaked with whitish; wing coverts tipped with white, forming a conspicuous white wing patch; some white on outer tail feathers, but tips black; throat and chest bright orange; remaining under parts yellowish white, the sides and flanks streaked with black.

Fall.—Similar but orange of plumage much paler; more olive above and with two white wing bars.

Female.—Similar to male in fall but duller in coloration in spring and still duller in fall, the orange of chest often merely yellow.

Young male.—Similar to female in fall.

A rare migrant of decided and brilliant coloring.

12. *Dendroica virens* (Gmelin)

Black-throated Green Warbler

Length 112 mm. (4.40 in.); tail 47 mm. (1.90 in.).

OVENBIRD

Male. Spring.—Above bright olive green, forehead, line over eye, and cheeks yellow; a dusky streak through the eye, ear coverts more or less dusky; white areas on outer tail feathers; two conspicuous white wing bars; throat and chest black; remaining under parts yellowish white, the sides heavily streaked with black.

Female.—Similar to male but black of throat and chest mixed with yellowish.

Male in fall and young.—Similar to females but less black on throat and chest if any at all; sides less distinctly streaked.

A migrant. Aside from the black throat, the bright olive upper parts, yellow sides to the head and white wing bars form characteristic features.

13. *Seiurus aurocapillus* (Linnæus)

Ovenbird

Length 132 mm. (5.20 in.); tail 52 mm. (2.05 in.)

Sexes similar.—Center of top of head orange tawny bordered by a black line on each side; remaining upper parts brownish olive green; a distinct whitish eye ring; under parts white streaked with dusky on breast and sides.

A shy migrant found on or near the ground in well shaded woods and dense thickets. It, and the two following species of the same genus, walk or run instead of hopping and nest on or near the ground.

14. *Seiurus noveboracensis noveboracensis*
(Gmelin)

Northern Water Thrush

Length 133 mm. (5.20 in.); tail 50 mm. (2.00 in.).

Sexes alike.—Similar to *S. motacilla*, the line over eye buffy; under parts pale sulphur yellow, everywhere, including throat, streaked with blackish.

A fairly common migrant similar in habits to *S. motacilla* but frequently found in shady woods removed from water.

15. *Seiurus motacilla* (Vieillot)

Louisiana Water Thrush

Length 135 mm. (5.30 in.); tail 51 mm. (2.00 in.).

Sexes alike.—Above entirely plain olive brown, a conspicuous white line from nostril over eye and ear coverts; under parts white tinged with buff and heavily streaked with dusky except on throat and middle of abdomen.

A common migrant found along the shores of inland waters and the sea. Seen on the Pearl Islands in March. Very shy, usually giving a sharp note of alarm as it takes flight.

16. *Oporornis formosus* (Wilson)

Kentucky Warbler

Length 124 mm. (4.90 in.) tail 49 mm. (2.00 in.).

MOURNING WARBLER

Male.—Crown black, becoming grayish on back of head and separated by a yellow line (which curves around the eye behind) from a broad black stripe extending from the base of the bill down the side of the neck; remaining upper parts olive green; under parts bright yellow shaded with olive on the sides. No wing bars; no white on tail.

Female and young.—Similar but duller colored, the black replaced by obscure dusky or wanting entirely.

A migrant; Jewel reports one from Gatun.

17. *Oporornis philadelphia* (Wilson)

Mourning Warbler

Length, 121 mm. (4.75 in.); tail, 48 mm. (1.90 in.).

Male.—Head and neck slate gray, the throat mixed with black, becoming entirely black on chest, in abrupt contrast to the canary yellow of remaining underparts; remaining upper parts, wings and tail olive green. No white eye ring.

Female.—Similar to male but head and chest smoky gray without any black, throat paler; an indistinct grayish eye ring.

Young.—Similar to female, but throat more or less yellow, some dusky on chest, a grayish or whitish eye ring.

A migrant; Jewel reports it from Gatun. It frequents low bushes, preferring the vicinity of water.

18. *Wilsonia citrina* (Boddaert)

Hooded Warbler

Wilsonia mitrata RIDGWAY, Birds of N. and M. Amer., II, p. 705, 1902.

Length, 125 mm. (4.90 in.); tail, 56 mm. (2.20 in.).

Male.—Forehead, front of crown, cheeks and ear coverts bright yellow, the remainder of head including throat and sides of neck, black; remaining upperparts, wings and tail olive green, the three outer tail feathers with inner webs mostly white; remainder of underparts yellow, abruptly outlined on the chest by the rounded lower edge of the black throat.

Female and young.—Similar to male but duller, the hood more dusky and incomplete, the throat yellow, sometimes with a fairly dusky collar crossing upper chest.

A rare winter visitant; the male unmistakable from its distinctive marking.

19. *Wilsonia canadensis* (Linnæus)

Canadian Warbler

Length, 123 mm. (4.80 in.); tail, 54 mm. (2.15 in.).

Male.—Above gray, the crown spotted with black, the forehead black; a line of yellow from nostrils to, and encircling, eye forming an eye ring; region in front of, immediately below eye and an elongate patch behind eye, black; under-

parts clear yellow except for the white under tail coverts and a necklace of short black streaks or spots crossing lower part of throat.

Female.—Similar to male but duller, no black on forehead, no black on sides of head, the black necklace less distinct.

Young.—Similar to adult female; the young female entirely clear yellow below, except for the white under tail coverts.

A migrant reported from Gatun by Jewel. One found dead near Bella Vista, April, 1924.

20. *Setophaga ruticilla* (Linnæus)

Redstart

Length, 120 mm. (4.70 in.); tail, 55 mm. (2.15 in.).

Male.—Head, neck, chest, sides of breast and upper parts black, the tail black with a large salmon orange patch each side of middle pair of feathers; the wings are crossed by a broad band of orange at the base of the quills; a large patch of salmon orange on sides of breast and flanks; remaining under parts white.

Female.—Very different. The orange markings replaced by yellow; head grayish; remaining upper parts white tinged with yellow on breast and abdomen; the wing band more restricted.

Young.—Resemble female.

A common migrant; the male very brilliant and striking in coloration. It is even more

active in its movements than most of the other warblers and the large orange or yellow tail patches are very conspicuous in any plumage, especially as it has the habit of widely spreading its tail as it flits from one branch to another.

21. *Basileuterus rufifrons mesochrysus*
(Sclater)
Sclater's Warbler

Length, 110 mm. (4.30 in.); tail, 50 mm. (2.00 in.).

Sexes alike.—Top of head, and including ear coverts, chestnut with an indistinct lighter center



FIG. 90. *Basileuterus rufifrons mesochrysus*
(Nat. Size)

stripe and a white streak over eye extending along sides of nape; hindneck and sides of neck gray; remaining upper parts dull olive green; a dark grayish streak through eye; under parts yellow.

A native species, fairly common in damp thickets especially in the vicinity of water. Seen at Gatun, below the dam, and at Patillo Point. Several taken by Hallinan.

22. *Basileuterus fulvicauda veraguensis*
(Sharpe)

Buff-rumped Warbler

Basileuterus semicervinus veraguensis RIDGWAY, Birds of N. and M. Amer., II, p. 756, 1902; STONE, Proc. Phila., Acad. Nat. Sci., 1918, p. 274.

Length, 121 mm. (4.75 in.); tail, 50 mm. (2.00 in.).

Sexes alike.—Top of head and hindneck dark grayish brown; remaining upper parts dark olive, the rump and upper tail coverts and tail basally buff; under parts light buff, paler on throat and abdomen, the chest sometimes barred with dull olive.

A native species. "Frequents river banks and overhanging tree roots. Flits its wings like a Kinglet (*Regulus*), flashing its bright rump. Has a beautiful, clear, ringing song, somewhat like the Ovenbird (*Seiurus aurocapillus*), but more striking because the crescendo rises higher. The bird also walks like an Ovenbird and feeds along the water's edge like a Water Thrush (*S. noveboracensis*)." (Jewel.)

59. Family MOTACILLIDÆ

The Pipits and Wagtails

A group of small or rather small birds usually of slender build, with a weak slender bill and long or rather long tail. They are of terrestrial habits and walk or run on the

ground instead of hopping. The pipits comprise species with streaked, sparrowlike plumage that frequent open places and except in the breeding season are often found in flocks. Though their voices are not loud, some of them are good songsters, giving their song while hovering in the air like larks. The family is more characteristic of temperate than of tropical regions and is better represented in the Old World than in America.

1. *Anthus parvus* Lawrence
Panama Pipit

Sexes alike.—Length, 111 mm. (4.40 in.); tail, 43 mm. (1.70 in.). Streaked above, wood brown

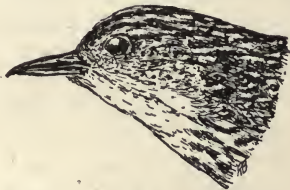


FIG. 91. *Anthus parvus*
(Nat. Size)

and dusky prevailing; pale buff below distinctly striped with brown on chest and sides; tail blackish, with outer feathers white and conspicuous in flight.

A small, slender-billed bird with streaked, sparrow-like plumage, and vacillating flight, which walks and runs on the ground in open places. I have seen it on the Panama golf links and elsewhere in the sabanas.

60. Family FRINGILLIDÆ

The Finches

A very large family, nearly world wide in distribution, closely related to the tanagers, characterized by a short, stout, conical bill, adapted especially for a diet of hard seeds, though insects, grubs and fruits, etc., also constitute much of the food of some species. The family includes species from the size of a thrush down to some very minute forms, and comprises the sparrows, buntings, linnets, grosbeaks, seedeaters, etc. They are mostly birds of more or less heavy, compact build, and most of them are less arboreal than the tanagers, seeking much of their food on the ground. Many of the sparrows and buntings frequent open grassy plains, and rarely alight on trees. Their plumage is very variable, the sparrows usually having streaked plumage and plain colors, but some of the buntings, grosbeaks and others are brilliantly colored. The family contains many fine songsters.

1. *Zamelodia ludoviciana* (Linnæus)

Rose-breasted Grosbeak

Male.—Length, 176 mm. (6.90 in.); tail, 73 mm. (3.90 in.). Summer plumage: Head, throat, upper breast, back, wings, and tail black, with two white wing bands; outer tail feathers tipped with white on the inner webs; rump feathers white tipped with black; middle of

PANAMA BLUE GROSBEAK

breast and under wing coverts bright rose red; rest of under parts white. Winter plumage: Back and head browner, streaked with black; throat rose; chest tinged with rose and with remainder of under parts more or less streaked with dusky. Bill white.

Female.—About the same size. Black of male replaced with dusky; rump brown; under parts buffy streaked with dusky; under wing coverts orange; white line over eye. Bill same as in male.

Immature male.—Similar to female but more heavily streaked, under wing coverts reddish instead of orange.

A migrant and winter visitor from North America. Fairly common in spring (April) when it is very nearly in summer plumage. Frequents woods and large trees. "Call a sharp steely *peek peek*." (Chapman.)

2. *Cyanocompsa cyanoides cyanoides* (Lafresnaye)

Panama Blue Grosbeak

Cyanocompsa concreta cyanescens RIDGWAY, Birds of N. and M. Amer., I, p. 597, 1901; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 275.

Length, 153 mm. (6.00 in.); tail, 66 mm. (2.55 in.).

Male.—Decidedly bluish black; forehead bluer; wings and tail black. Bill large and swollen, bluish horn color.

LESSER RICE GROSBEAK



FIG. 92. *Cyanocompsa c. cyanooides*
(Nat. Size)

Female.—Vandyke brown; wings and tail dusky. Bill same as in male.

Immature male. Similar to female.

Not uncommon. Noted on the edge of the jungle near Corozal, also at Barro Colorado Island in undergrowth of jungle. Call note a metallic *clink*, sometimes two-syllabled.

3. *Oryzoborus funereus* Sclater Lesser Rice Grosbeak

Length, 112 mm. (4.50 in.); tail, 49 mm. (2.00 in.).

Male.—Black except for a spot of white on wing, sometimes entirely concealed; under wing coverts white. Bill bluish horn color, very large and thick proportionately.

Female.—Light brown above, more olive on top of head; rump red brown; under parts light tawny cinnamon, darker across the chest. More

MINUTE SEEDEATER



FIG. 93. *Oryzoborus funereus*
(Nat. Size)

deeply colored in autumn and winter. Bill like that of male.

Immature male.—Similar to female.

Not uncommon. Noted in a swamp near Fort Randolph. Fort Lorenzo. "Associates with *Sporophila aurita*." (Jewel.) "Gatun." (Hallinan.) Richmond says its song "is very like that of the Indigo Bunting (*Passerina cyanea*) but is not nearly so loud and clear. At times . . . it seeks a perch in the top of a tree from which to deliver its song."

4. *Sporophila minuta centralis* Bangs and Penard Minute Seedeater

Sporophila minuta minuta RIDGWAY, Birds of N. and M. Amer., I, p. 567, 1901; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 275.

Length, about 97 mm. (3.85 in.); tail, about 40 mm. (1.55 in.).

Male.—Above, excepting rump, olive, olive gray or brownish olive; rump and cheeks and

MEXICAN GRASSQUIT

band across the chest, black, the white feathers basally black forming a somewhat mottled appearance. In black phase:—Black, including



FIG. 94. *Sporophila aurita*
(Nat. Size)

throat; a white patch on either side of neck; abdomen mostly white.

Female.—Similar in size. Olive, paler below; abdomen buffy or pale orange.

Common everywhere in open country in high grass and shrubs. May be seen in great numbers along the sides of the Gamboa road toward the end of the dry season. Often to be seen in the park in front of the Tivoli Hotel.

7. *Tiaris olivacea pusilla* (Swainson)

Mexican Grassquit

Length, 97 mm. (3.85 in.); tail, 38 mm. (1.50 in.).

Male.—General color grayish olive; forehead, crown, sides of head and neck, lower throat, chest and upper breast, black; chin, upper throat and line from bill over eye, bright yellow.

Female.—Similar to male, the black markings less distinct or lacking, the yellow markings paler and less distinct.

BLUE-BLACK GRASSQUIT



FIG. 95. *Tiaris olivacea pusilla*
(Nat. Size)

Young.—Duller than female in coloration, lacking the yellow markings, the throat in the young male dull whitish.

Common in grass and thickets; sometimes seen in flocks. Usual call a sharp *tzzp*.

8. *Volatinia jacarini splendens* (Vieillot) Blue-black Grassquit

Male.—Length, 100 mm. (3.95 in.); tail, 41 mm. (1.60 in.). Glossy blue black with a

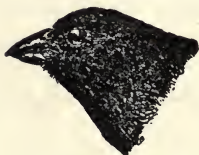


FIG. 96. *Volatinia jacarini splendens*
(Nat. Size)

concealed white patch above and in front of junction of wing and body.

Female.—About the same size as male. Olive brownish above; brownish buffy below, the chest streaked with dusky.

Young.—Very similar to adult female but with

SLATE-COLORED GROSBEAK

some brownish buff or dull tawny edgings to the wings.

Common in open places. Often to be seen with *Sporophila aurita* on the sides of the Gamboa road. Hallinan writes of a male in Balboa, "This bird would perch on a twig and after short intervals would jump vertically about a foot and alight again in the same place, uttering a few short notes during the jump." I observed this performance on several occasions at Quarry Heights.

9. *Pitylus grossus saturatus* Todd Slate-colored Grosbeak

Pitylus grossus RIDGWAY, Birds of N. and M. Amer., I, p. 652, 1901; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 276.

Length, 184 mm. (7.20 in.); tail, 82 mm. (3.20 in.).

Male.—General color bluish slate, sides of head, chin and throat, and chest black, middle portion of chin and throat and also the under wing coverts white. Bill salmon pink.

Female.—Differs in having no black on head or chest and is a paler and less slaty gray below. Bill as in male.

Seen repeatedly in second growth jungles on Barro Colorado Island in April, 1926. "Gatun. Found in clearing in the forest." (Jewel.) "The call note is similar to that of the Cardinal, *Cardinalis cardinalis*" (Richmond).

PANAMA BUFF-THROATED SALTATOR

10. *Saltator intermedius* (Lawrence) Panama Buff-throated Saltator

Saltator magnoides intermedius RIDGWAY, Birds of N. and M. Amer., I, p. 665, 1901; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 276.

Sexes alike.—Length, 195 mm. (7.70 in.); tail, 92 mm. (3.60 in.). Top of head and cheeks gray, a narrow stripe of white above eye, remaining upper parts yellowish olive green; sides of chin and throat and band across chest (sometimes absent) black, enclosing a buff throat patch, this fading to white on chin; under tail coverts yellow buff, rest of under parts grayish. Bill black.

Widely distributed and common. I saw it several times near the Gamboa road in the brush.

11. *Saltator striatipectus isthmicus* (Sclater) Panama Streaked Saltator

Saltator albicollis isthmicus RIDGWAY, Birds of N. and M. Amer., I, p. 669, 1901; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 276.

Sexes alike.—Length, 177 mm. (6.95 in.); tail, 82 mm. (3.20 in.). Olive green above, tinged with grayish on top and sides of head and neck and passing to light grayish brown on rump; an indistinct line of dull whitish from bill to whitish eyebrow; the sides of the throat olive, the remainder of the under parts dull whitish

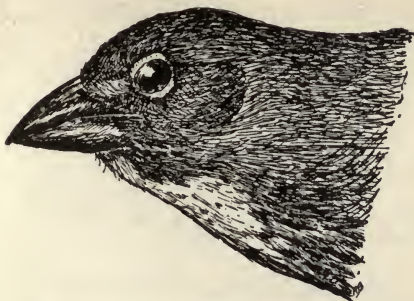


FIG. 97. *Saltator striatipectis isthmicus*
(Nat. Size)

changing to buffy and somewhat streaked with dusky grayish on under tail coverts. Bill black.

Smallest of the three species of saltators recorded in the Zone. Exceedingly common in undergrowth and trees and often seen about habitations. Its unmistakable notes are constantly heard from February through July; a plaintive *wheu wheu wheeeuh* (the last note drawn out and very characteristic in tone), varied at times with a series of unmusical *chows* following the two initial notes. By imitating these calls, the bird can be induced to approach very near, its answers growing more curious and insistent.

12. *Saltator atriceps lacertosus* Bangs
Panama Black-headed Saltator

Male.—Length, 244 mm. (9.75 in.); tail, 116 mm. (4.55 in.). Resembling *S. intermedius*

but conspicuously larger, the black extends to cover head and is sharply defined at the hind-neck; gray line beginning over bill, extending and becoming white over the eye; throat patch white; undertail coverts orangetawny. Bill black.

Female.—Length, 231 mm. (9.20 in.); tail, 109 mm. (4.30 in.). Like male in plumage.

Young.—Similar to adults.

A larger saltator much less common than the related species, *Saltator intermedius*, usually found in the brush. I saw a male and female with their young just out of the nest, in bushes near the Gamboa road; both were calling with sharp metallic, smacking notes.

13. *Astragalinus psaltria columbianus*
(Lafresnaye)

Central American Goldfinch

Astragalinus psaltria croceus RIDGWAY, Birds of N. and M. Amer., I, p. 118, 1901; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 276.

Male.—Length, 100 mm. (4.95 in.); tail, 38 mm. (50 in.). Top of head and upper tail coverts black; wings black and white; rest of upper parts olive green; underneath rich lemon yellow.

Female.—About the same size as and resembling male. No black on top of head but sometimes dusky streaks; wings dusky and white; below light olive yellow.

“In the valley of the Rio Algarrobo, July 4, 1915. In the jungle.” (Hallinan.)

14. *Spiza americana* (Gmelin)

Dickcissel

Length 146 mm. (5.80 in.); tail 55 mm. (2.20 in.).

Male.—Head, hindneck and sides of neck pale gray, the forehead tinged with yellow; back grayish brown streaked with black; rump light grayish; wings and tail dusky, the former varied with cinnamon rufous and pale buffy grayish; a line over eye and one on each side of throat yellow; chin white; a black throat patch; breast yellow passing to white on abdomen.

Female.—Resembling male but duller; head browner and usually streaked with dusky; with less yellow on the breast and no black patch on the throat.

Young, in first winter.—Similar to female, but everywhere tinged with pale clay color or dull buffy.

A migrant.

15. *Arremonops striaticeps striaticeps*

(Lafresnaye)

Lafresnaye's Sparrow

Arremonops conirostris conirostris RIDGWAY, Birds of N. and M. Amer., II, p. 453, 1901; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 276.

Sexes alike.—Length 161 mm. (6.30 in.); tail 69 mm. (2.70 in.). Head gray with two broad, lateral stripes of brownish black, a triangular spot in front of, and a line in continuation of, eye

ORANGE-BILLED SPARROW

black, the remainder of upper parts olive green; edge of wing canary yellow; chin and throat dull



FIG. 98. *Arremonops s. striaticeps*
(Nat. Size)

white; chest and breast grayish, fading to white on abdomen. Bill black, lighter below.

Young.—No description available.

A common and characteristic bird of the Zone. Frequents clearings and low bushes, including the vicinity of habitations; often seen on the ground. Its call, which is frequently heard in the spring months, consists of a repetition of the same short note, beginning slowly and increasing in rapidity until it very nearly merges into a continuous sound. It is one of the most characteristic bird calls of the Canal Zone.

16. *Arremon aurantirostris aurantirostris*
Lafresnaye
Orange-billed Sparrow

Male.—Length 155 mm. (6.10 in.); tail 67 mm. (2.65 in.). Somewhat resembles *Arremonops s. striaticeps* but bill is conspicuously orange red,

head including sides and chin black except for a middle stripe of gray and a narrow stripe of



FIG. 99. *Arremon a. aurantiistrois*
(Nat. Size)

gray (changing to white in the middle), over eye; upper parts olive green and dusky; edge of wing bright yellow; throat, breast and abdomen white, a broad, conspicuous black band across chest.

Female.—Length 145 mm. (5.70 in.); tail 62 mm. (2.45 in.). Like male in coloration.

Young.—Uniform sooty olive, paler on throat and abdomen.

Much less common and familiar than the last species. I saw this sparrow (which is easily identified by the conspicuous coloration of head and bill) on the edge of the jungle along the Gamboa road and also about a mile from France Field.

61. Family CÆREBIDÆ

The Honeycreepers

The Honeycreepers are found only in the forested regions of tropical America including

MEXICAN BANANAQUIT

the West Indies. They are small song birds with a usually long, slender, more or less curved bill and a tongue brushy at the tip, adapted to extracting nectar and small insects from flowers, on which they feed, as well as on ripe fruit, hovering or clinging to flower or twig in the process.

The males are often brilliantly colored, but the females are always plain. They are considered to be related to both the tanagers and the American warblers, though seemingly more closely to the *Meliphagidæ* or Honey-eaters of Australasia.

1. *Cœreba mexicana mexicana* (Sclater)

Mexican Bananaquit

Sexes alike.—Length 90 mm. (3.55 in.); tail 32 mm. (1.25 in.). Top and sides of head, excepting cheeks, sooty, rest of upper parts, excepting rump, grayish olive; rump yellowish olive; a stripe of white from bill over eye; wings with a more or less concealed white spot; cheeks, chin and throat ashy gray; rest of under parts yellow, olive tinged. Bill black, deeply curved and sharply pointed.

Found in clearings of the heavy forest. "In thickets and second growth." (Jewel.)

2. *Dacnis cayana ultramarina* (Lawrence)

Ultramarine Dacnis

Length 112 mm. (4.40 in.); tail 43 mm. (1.70 in.).

BLUE HONEYCREEPER

Male.—A streak through the eye and the whole back black; chin and throat grayish black washed with blue; wings and tail black, the wings tipped and edged with bright blue; remaining plumage ultramarine blue (greenish blue seen away from the light). Feet and legs brownish horn color.

Female.—Yellowish grass green, head and lesser wing coverts greenish blue and streaked; paler below with throat blue gray. Feet and legs as in male.

Found in the trees about habitations as well as in the jungle. It is not uncommon to see these decorative little birds in captivity.

3. *Cyanerpes cyaneus cyaneus* (Linnæus) Blue Honeycreeper

Length 115. mm. (4.50 in.); tail 36 mm. (1.40 in.).

Male.—Streak from bill through eye, hind-neck, back, wings, and tail black; crown tur-



FIG. 100. *Cyanerpes c. cyaneus*
(Nat. Size)

quoise blue; rest of plumage bright sapphire blue; part of under wing coverts yellow. Feet and legs red.

NORTHERN GREEN HONEYCREEPER

Female.—Olive green above; under parts paler and brighter green, the throat and middle of the abdomen whitish; the chest indistinctly streaked. Feet and legs reddish.

These little birds frequent shrubbery and second growth. The males, of beautiful sapphire and turquoise blue plumage, are captured in great numbers for sale in the markets, and none of the native birds of Panama furnish stronger evidence of the abuses and inexcusable cruelty of the cage bird traffic, and the need of its regulation and restriction. I have seen large cages full of them in a deplorable condition, many dead on the bottom and others thrown on the floor of the stalls.

4. *Chlorophanes spiza arguta* Bangs and Barbour Northern Green Honeycreeper

Chlorophanes spiza guatemalensis RIDGWAY, Birds of N. and M. Amer., II, p. 383, 1902; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 277.

Length 130 mm. (5.10 in.); tail 48 mm. (1.90 in.).

Male.—Top of head, cheeks and chin black; remainder of plumage bright glossy green.

Female.—Glossy yellowish green, paler below.

A bird of the forest where it may be seen in the taller trees, but found in more open situations

also. Noted at Barro Colorado Island. Of quieter, less active habits than most smaller members of the family. "Feeds largely on ripe bananas. Has loud clear shrill call of two syllables like *twee-twee*, which can be heard a long distance. Mixes with other honey creepers quite freely. Iris, burnt sienna; lower mandible Naples yellow" (Richmond).

62. Family TANGARIDÆ

The Tanagers

The tanagers are a large family confined to America, and most of them to its tropical portions, where they constitute a conspicuous part of the bird fauna. They are closely allied to the Fringillidæ, and although typical tanagers are easily distinguished from typical finches, there are intermediate forms which might be placed in either family.

The typical tanagers have a bill more adapted for feeding on fruits and insects than on hard seeds. Though stout at the base and ending in a sharp point as in the finches, it is less conical, usually slenderer, slightly longer and with its upper outline more arched or curved. The tanagers are all of arboreal habits and range in size much as do the finches. The Canal Zone species include forms from the size of a rather small grosbeak down to that of a small sparrow. Many of them are brilliantly, or at least conspicuously, colored; a few are good singers.

FAMILY TANGARIDÆ

Key to the Tanagers

- a. Size small, not over 125 mm. (4.90 in.), often much smaller.
 - b. Plumage black with conspicuous white spot on shoulder.....
.....*Tachyphonus luctuosus panamensis*, male
 - bb. Plumage not predominately black.
 - c. With yellow or yellowish on under parts.
 - d. Upper parts steel blue.
 - e. Under parts wholly yellow; crown yellow....
.....*Tanagra crassirostris*, male
 - ee. Under parts not wholly yellow, the chin and throat steel blue.
 - f. Remaining under parts yellow; crown yellow (no white on tail).....
.....*Tanagra luteicapilla*, male
 - ff. Remaining under parts not wholly yellow.
 - g. Lower abdomen and under tail coverts orange tawny; front of crown yellow, the yellow feathers tipped with dusky
.....*Tanagra fulvicrissa*, male
 - gg. Lower abdomen and under tail coverts white; front of crown yellow, the feathers not tipped with dusky.....
.....*Tanagra minuta humilis*, male
 - dd. Upper parts olive green.
 - e. Under parts wholly yellowish.
 - f. Larger, length 103 mm. (4.00 in.)
.....*Tanagra crassirostris*, female
 - ff. Smaller, length 93 mm. (3.75 in.), (no white on tail).....
.....*Tanagra luteicapilla*, female
 - ee. Under parts not wholly yellowish.
 - f. Larger, length 120 mm. (4.80 in.); throat buffy white; remaining under parts yellowish (sides of head gray, eyelids dull white).....
.....*Tachyphonus luctuosus panamensis*, female

FAMILY TANGARIDÆ

- ff. Smaller, length 92 mm. (3.60 in.) or less.
 - g. Throat gray, lower abdomen and under tail coverts white.
 *Tanagra minuta humilis*, female
 - gg. Throat yellowish, under tail coverts orange tawny (forehead russet brown, the olive green of upper parts glossed with metallic bluish green).
 *Tanagra fulvicrissa*, female
- cc. With no yellow or yellowish on under parts.
 - d. Under parts mainly gray or mainly grass green.
 - e. Under parts mainly gray; abdomen white; upper parts gray; wings and tail dusky, the lesser wing coverts bright blue (not conspicuous).
 . . *Tangara inornata languens*, sexes similar
 - ee. Under parts mainly grass green; abdomen turquoise blue; upper parts grass green; head (excepting throat) henna; hindneck saffron yellow.
 *Tangara lavinia*, sexes similar
 - dd. Under parts neither gray nor grass green.
 - e. Plumage variegated with black, blue and white, with the crown, hindneck and sides of neck golden-buff.
Tangara larvata centralis, (adult, both sexes)
 - ee. Upper parts light bluish green; dull white below. . . . *Tangara larvata centralis*, (young)
- aa. Larger, length 153 mm. (6.00 in.) or more.
 - b. Wings and tail bright blue, rest of plumage gray.
 *Thraupis cana diaconus* (both sexes)
 - bb. No blue in plumage.
 - c. Plumage in part or chiefly some shade of red or rufous.
 - d. Rufous above, tawny below.
 *Tachyphonus rufus*, female
 - dd. Plumage in part bright red, rose or blood red.
 - e. General color dull rose or pinkish red.
 *Piranga r. rubra*, male
 - ee. Plumage in part black or very dark brown or dusky.

FAMILY TANGARIDÆ

- f. Wings and tail black.
 - g. Bright scarlet except black wings and tail.....*Piranga erythromelas*
(male in summer)
 - gg. Crimson maroon, breast and rump blood red, abdomen as well as wings and tail black.....
.....*Ramphocelus dimidiatus isthmicus*
(both sexes, female much duller)
- ff. Very dark brown tinged with red or dark slate above.
 - g. Very dark brown tinged with red above; under parts grayish brown shading to vermilion on throat.....
.....*Phænicothraupis fuscicauda*, male
 - gg. Dark slate above; under parts mainly rose red.....
.....*Rhodinocichla rosea eximia*, male
- cc. No red in plumage.
 - d. Rump bright yellow in conspicuous contrast to rest of body.
 - e. Rest of plumage jet black.....
.....*Ramphocelus icteronotus*, male
 - ee. Rest of plumage chiefly olive.....
.....*Ramphocelus icteronotus*, female
- dd. Rump not contrastingly yellow.
 - e. Plumage jet black (with trace of white on forepart of wing).....
.....*Tachyphonus rufus*, male
 - ee. Upper parts dusky, dark grayish brown or olive.
 - f. Upper parts dark (dusky olive or dark grayish brown).
 - g. Dusky olive (very dark) above, grayer below, shading to yellow or orange on throat.....
.....*Phænicothraupis fuscicauda*, female
 - gg. Dark grayish brown above.
 - h. Forehead and sides of face black; throat whitish; breast yellowish green.....
.....*Mitrospingus c. cassini*, sexes alike

YELLOW-CROWNED EUPHONIA

- hh. Under parts mainly tawny.
Rhodinocichla rosea eximia, female
- ff. Upper parts predominatingly olive.
- g. Wings and tail black or largely so.
- h. Under parts dark olive like back.
.*Thraupis palmarum atripennis*,
sexes alike
- hh. Under parts greenish yellow, lighter
than back.
Piranga erythromelas, male in winter
- gg. Wings and tail not in contrast to rest of
upper parts.
- h. Head and neck abruptly gray, below
yellow.
.*Eucometis cristata*, sexes alike
- hh. Head and neck not in contrast to olive
of back.
- i. Under parts greenish yellow.
.*Piranga erythromelas*, female
- ii. Under parts yellower, without green-
ish shade.
.*Piranga r. rubra*, female

1. *Tanagra luteicapilla* (Cabanis) Yellow-crowned Euphonia

Euphonia luteicapilla RIDGWAY, Birds of N. and M.
Amer. II, p. 20. 1901.

Length 93 mm. (3.75 in.); tail 30 mm. (1.25 in.).

Male.—Crown and forehead yellow, remaining upper parts and sides of head, the throat and upper chest steel blue; some white on wings but none on tail; remaining lower parts bright yellow.

Female.—Female and young olive green above; under parts yellowish.

WHITE-VENTED EUPHONIA

Rare. Recorded from Paraiso Station, Panama Railroad.

2. *Tanagra minuta humilis* (Cabanis)

White-vented Euphonia

Euphonia minuta humilis RIDGWAY, Birds of N. and M. Amer. II, p. 23, 1902.

Length 92 mm. (3.60 in.); tail 30 mm. (1.15 in.).

Male.—Resembles the male of the following species, *E. fulvicrissa*, but forehead is deeper yellow with no dusky on tips of feathers; lower abdomen and under tail coverts white. Some white on wings and tail.

Female.—Above yellowish olive green, more yellowish and minutely spotted with dusky on forehead; throat pale gray; chin and chest olive yellowish deepening to gamboge on breast; abdomen white; under tail coverts brownish gray.

“Guatemala to Isthmus of Panama.” Ridgway. Recorded from Panama Railroad.

3. *Tanagra fulvicrissa* (Sclater)

Fulvous-vented Euphonia

Euphonia fulvicrissa RIDGWAY, Birds of N. and M. Amer. II, p. 18, 1901.

Length 86 mm. (3.40 in.); tail 26 mm. (1.10 in.).

THICK-BILLED EUPHONIA

Male.—Forehead and front of crown lemon yellow, the feathers tipped with dusky; rest of upper parts, including sides of head, glossy steel blue; chin and throat steel blue; remainder of under parts yellow deepening to orange on middle of abdomen and under tail coverts; some white on wings and tail.

Female.—Forehead deep russet brown; rest of upper parts olive green, tinged with metallic bluish green on head, wings, and back; under parts yellowish olive green, mixed with orange and tawny on abdomen.

The smallest of the Canal Zone tanagers. Recorded from Lion Hill and San Pablo stations on the Panama Railroad.

4. *Tanagra crassirostris* (Sclater) Thick-billed Euphonia

Euphonia crassirostris RIDGWAY, Birds of N. and M. Amer. II, p. 28, 1901.

Length 103 mm. (4.00 in.); tail 35 mm. (1.40 in.).

Male.—Forehead and greater part of crown yellow; sides of head, upper parts and tail glossy steel blue; some white on wings and tail; lower parts bright yellow. No black on throat. Bill short and thick.

Female.—Olive green above; under parts yellowish.

The commonest of the small tanagers or Euphonias, called "Pico gordo" by the Pana-

PLAIN-COLORED TANAGER



FIG. 101. *Tanagra crassirostris*
(Nat. Size)

manians. The male is often trapped and caged on account of its sweet and somewhat canary-like song. "Gatun, Mindi, Toro Point and Mount Hope. Seen frequently in second growth and in trees in open ground." (Jewel.)

5. *Tangara inornata languens* Bangs and Barbour Plain-colored Tanager

Calospiza inornata RIDGWAY, Birds of N. and M. Amer. II, p. 51, 1902; *Tangara inornata*, STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 278.

Sexes similar.—Length 118 mm. (4.60 in.); tail 44 mm. (1.70 in.). Above plain slate gray; wings and tail dusky, a more or less concealed spot of cerulean blue on upper wing coverts; lower parts dull light gray, the middle of the breast and abdomen white. Bill grayish, black at tip.

A tanager resembling at a distance a small sparrow, since the blue patch on the wing coverts is inconspicuous. Not very common. "New Culebra on an open trail." (Hallinan.) "Gatun. Found on the edge of the jungle." (Jewel.)

6. *Tangara larvata centralis* Berlepsch
Mrs. Wilson's Tanager

Calospiza larvata fanny RIDGWAY, Birds of N. and M. Amer., II, p. 49, 1902; *Tangara larvata fanny*, STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 277.

Sexes similar.—Length 118 mm. (4.65 in.); tail 46 mm. (1.80 in.). Mostly light (turquoise) blue and black above; black and white below with a conspicuous buff patch on hindneck merging into a band of golden buff on throat, the sides of the breast and abdomen mixed with turquoise blue. Bill black.

Young.—Head, neck and rump malachite green; under parts dull white; back and scapulars dusky grayish green.

A beautiful little tanager, fairly common and often seen in inhabited places where there is a growth of trees. "Usually seen on the edge of the jungle." (Jewel.)

7. *Tangara lavinia* (Cassin)
Lavinia's Tanager

Calospiza lavinia RIDGWAY, Birds of N. and M. Amer., II, p. 46, 1902.

Length 120 mm. (4.70 in.); tail 45 mm. (1.80 in.).

Male.—Top of head and cheeks bright henna, rest of upper parts bright grass green, the feathers of hindneck and upper back tipped

with saffron yellow; wings tinged with rusty and margined with rufous; lower parts green, with turquoise blue on chin and most of abdomen.

Female.—Similar but duller.

Rare. "Nicaragua to Isthmus of Panama."
(Ridgway.) "New Culebra, on an open trail."
(Hallinan.)

8. *Thraupis cana diaconus* Ridgway and Nutting Blue Tanager. Azulejo

Tanagra cana RIDGWAY, Birds of N. and M. Amer., II, p. 55, 1902; *Thraupis c. cana* STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 278.

Length 153 mm. (6.00 in.); tail 64 mm. (2.50 in.).

Male.—Pale bluish gray, darker and bluer on back and rump; wings and tail bright light blue. Bill black, blue gray below.

Female.—Similar but paler.

Immature.—Colors still duller.

A medium sized tanager. This and the next species, both common in trees near habitations and in the squares of Panama City, are among the first birds the visitor to the isthmus is likely to notice. Usually seen in pairs. They call to each other in single squeaky notes. Their song is also thin and squeaky, the phrasing not unlike one of the songs of the Redstart, *Setophaga ruticilla*.

9. *Thraupis palmarum atripennis* Todd
Black-winged Palm Tanager

Tanagra palmarum melanoptera RIDGWAY, Birds of N. and M. Amer., II, p. 58, 1902; *Thraupis palmarum melanoptera* STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 278.

Male.—Length 167 mm. (6.55 in.); tail 72 mm. (2.85 in.). General color dark olive green glossed with purplish, greener on the forehead; lighter and tinged with yellowish underneath; tail and terminal two thirds of wings conspicuously blackish tinged with purplish.

Female.—Similar to male in size and color.

Common and widely distributed. Frequents palm trees, often those about habitations, and the parks in the cities. Song and call notes resembling those of the preceding species, *T. cana diaconus*.

10. *Ramphocelus icteronotus* Bonaparte
Yellow-rumped Tanager

Length 165 mm. (6.50 in.); tail 73 mm. (2.85 in.).

Male.—Velvety black, the lower back, rump, and upper tail coverts abruptly rich lemon yellow. Bill pale blue with dark tip.

Female.—Top of head, hindneck, neck, upper back and scapulars dusky olive; lower back, rump, and upper tail coverts clear yellow;

wings, and tail dusky; below yellow, brighter on breast.

Young male.—Resembles female. Older individuals variously intermediate in plumage.

Less common than the "Sangre de Toro," though of similar habits. Noted in the spring of 1924 on the edge of the jungle near Fort Sherman, and near Fort Randolph, and not far from the road to Gamboa.

11. *Ramphocelus dimidiatus isthmicus*
Ridgway

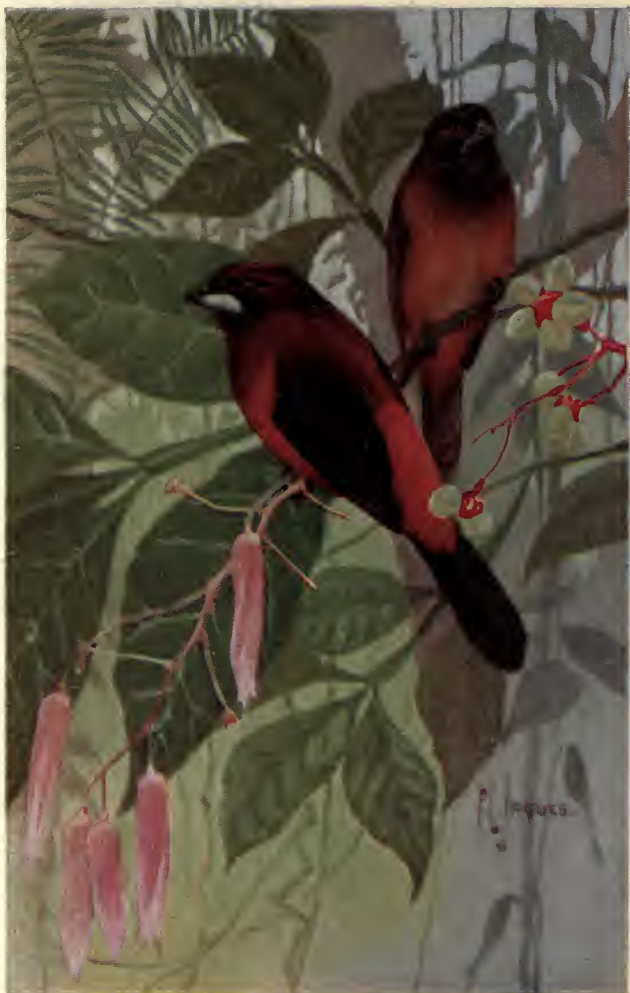
Panama Crimson-backed Tanager. "Sangre de Toro"

Length 161 mm. (6.30 in.); tail 73 mm. (2.85 in.).

Male.—Head, neck, upper back, upper chest and scapulars velvety crimson maroon; lower back, rump, upper tail coverts, and breast blood red; wings and tail black; abdomen brownish black. Bill black above, partly silver below.

Female.—Much duller, head and back brown-er; breast and rump more brick red. Bill dusky.

One of the common and conspicuous tanagers; a species of medium size for the family. Usually seen about the edge of the jungle, and also along the roads and about habitations. Common call harsh *w-ā-ā-h*, *w-ā-ā-h*.



CRIMSON-BACKED TANAGER.

Ramphocelus dimidiatus isthmicus.

12. *Piranga rubra rubra* (Linnæus)
Summer Tanager

Length 172 mm. (6.80 in.); tail 71 mm. (2.80 in.).

Male.—Rose red, wings dusky, margined with red; under parts brighter.

Female.—Yellowish olive green, lower parts lighter and yellower.

A winter visitor from the southern United States; often seen in the shade trees around houses, common in spring (April). I noted a male at Quarry Heights during the midwinter months for three successive years; one at Patillo Point in March, 1926.

13. *Piranga erythromelas* (Vieillot)
Scarlet Tanager

Length 164 mm. (6.45 in.); tail 68 mm. (2.60 in.).

Male.—In summer, scarlet, wings and tail black; in winter, similar to the female but wings and tail black.

Female.—Olive green above; wings and tail dusky; lower parts dull greenish yellow.

A winter visitor from North America; apparently not common. In winter plumage in the Zone.

14. *Phœnicothraupis fuscicauda* Cabanis
Dusky-tailed Ant Tanager

Length 189 mm. (7.40 in.); tail 87 mm. (3.40 in.).

Male.—Chocolate brown above and grayer brown below, tinged with red, especially on the rump and under parts, passing into vermilion on the throat, a vermilion patch on crown. Bill black; feet pinkish.

Female.—Dusky olive above and more grayish below, passing into yellow or orange on throat.

A medium sized tanager of rather slender build and not at all timid habits. Its ordinary call note is a sharp noise like the tearing of cloth. It frequents thickets and the undergrowth of the jungle; often found in pairs. On Barro Colorado Island in April, 1926, I heard for the first time its lovely warbling song.

15. *Tachyphonus rufus* (Boddaert)
Boddaert's Tanager

Length 173 mm. (6.80 in.); tail 79 mm. (3.05 in.).

Male.—Black with under wing coverts white, showing only in flight. Bill bluish.

Female.—Rufous chestnut above; under parts plain cinnamon tawny. Bill same as in male.

Found in second growth about the edge of the jungle and along the roads. Rather common; usually seen in pairs.

16. *Tachyphonus luctuosus panamensis* Todd
 White-shouldered Tanager

Tachyphonus luctuosus RIDGWAY, Birds of N. and M. Amer., II, p. 132, 1902; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 279.

Length 120 mm. (4.80 in.); tail 53 mm. (2.00 in.).

Male.—Black with a conspicuous white shoulder spot. Bill black, blue on the side.

Female.—Yellowish olive green, darker on the crown; under parts yellow shading into light olive green, the throat dull buffy whitish. Bill same as in male.

A small and fairly common species. Found on the edge of the jungle at Fort Randolph, Gatun, and elsewhere, often in groups of a few individuals. Noted at Barro Colorado Island in April, 1926.

17. *Eucometis cristata* (Du Bus)
 Gray-crested Tanager

Sexes alike.—Length 171 mm. (6.70 in.); tail 78 mm. (3.00 in.). Whole head and neck gray, the head slightly crested, rest of upper parts yellowish olive green; remaining under parts saffron yellow.

A rather common bird of the jungle, noticed below the dam at Gatun, at Barro Colorado Island, and at Patillo Point and elsewhere in that vicinity.

18. *Mitrospingus cassini cassini* (Lawrence)
Cassin's Tanager

Sexes alike.—Length 170 mm. (6.70 in.); tail 74 mm. (2.90 in.). General color above dark grayish brown except for a yellowish green triangular patch on the crown; forehead and sides of face grayish black; throat gray; breast bright yellowish green deepening on abdomen, sides and flanks; under tail coverts russet.

Young.—Duller, no patch on crown.

A rare species ranging from Costa Rica to Ecuador. Recorded from Lion Hill Station.

19. *Rhodinocichla rosea eximia* Ridgway
Panama Thrush Tanager

Male.—Length 195 mm. (7.70 in.); tail 86 mm. (3.35 in.). Dark slate above, including the sides of head and neck; a rose red stripe from sides of forehead broader in front of eye and



FIG. 102. *Rhodinocichla rosea eximia*
(Nat. Size)



Photograph by Dr. Alfred O. Gross.

DEEP FOREST ON BARRO COLORADO ISLAND.

FAMILY ICTERIDÆ

merging into a white line over the eye; most of under parts rose red. Bill blue gray, dusky at base.

Female.—Length 185 mm. (7.30 in.); tail 80 mm. (3.10 in.). Browner above; rose red of male replaced by tawny.

Immature male.—Similar to female; tawny more or less tinged with red.

A rather stout and rather short-tailed bird above the medium size for a tanager. It is not a typical tanager, as its name "Thrush Tanager" indicates, and there has been some disagreement as to what family it belongs in. This is one of the most beautiful of the Panama birds, and though fairly common and widely distributed, is more easily heard than seen, on account of the dense character of the thickets and second-growth jungle it frequents. The male has a surprisingly loud and sweet whistle of notes of different pitches, also a low call of an unhurried repetition of a single note. He often sits for some time in one place, whistling at intervals, but well concealed by the dense foliage.

63. Family ICTERIDÆ

The American Orioles, Grackles and their Allies

This exclusively American family includes a fairly large and varied assemblage of birds, most of which have more or less striking

coloration, in the males at least; black alone, or black varied with yellow, orange, red or white prevailing. They are generally larger in size and have a more elongated bill than the finches, to which, however, they are closely related. The group includes arboreal forms as the orioles and oropendulas, which are noteworthy for their elaborately woven pendant nests, and others that are more or less completely terrestrial, as the grackles and meadow larks. Their notes are loud, very varied and often musical, some being fine songsters, and their habits are more or less gregarious, certain of them in the breeding season as well as at other times. Some of the largest of the song birds are members of this family, several of the oropendulas being exceeded in size only by the crows and ravens. The Old World orioles constitute a different family (*Oriolidæ*).

1. *Zarhynchus wagleri wagleri* (Gray)

Wagler's Oropendula

Length. Male.—350 mm. (13.70 in.); tail 132 mm. (5.20 in.). Female.—268 mm. (10.60 in.); tail 102 mm. (4.00 in.).

Male.—Head, neck, upper chest, flanks, rump and lower abdomen dark chestnut brown, the crown and slender crest feathers darker; back, scapulars, wings, lower chest and breast, glossy black; tail yellow, the middle feathers black. Bill pale greenish white, swollen at the base,



WAGLER'S OROPENDOLA. MALE (left), FEMALE (right).

Zarhynchus w. wagleri.

forming a conspicuous broad rounded frontal shield.

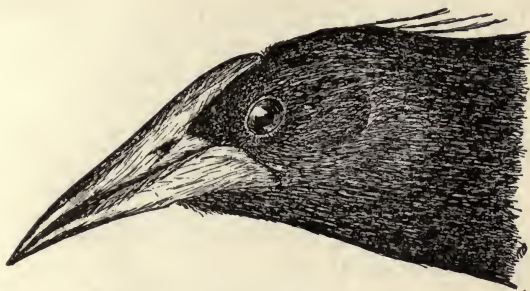


FIG. 103. *Zarhynchus w. wagleri*

Female.—Similar to male but much smaller. Bill darker.

Young.—Similar to adults.

This is the common oropendula in the Canal Zone. It breeds in colonies and suspends its long hanging nests from the branches of some large tree, distributing them in different parts of the tree and usually selecting one containing a wasp's nest to insure greater safety. Few of the Canal Zone birds have such loud, arresting notes, consisting of sounds like the plunking of huge drops of water, and liquid whistles. It also makes a crashing sound which is suggestive of the cutting of dry brush with a machete. When nesting, the males remove to roost at night in trees at some distance from their nests, in which, however, the females spend the night.

2. *Gymnostinops montezuma* (Lesson)*Montezuma Oropendula*

Length. Male.—About 491 mm. (19.30 in.); tail about 197 mm. (7.80 in.). Female.—About 381 mm. (15.00 in.); tail about 152 mm. (6.00 in.).

Male.—Head, neck, and upper chest black; tail yellow, the middle pair of tail feathers brownish black; remainder of plumage purplish chestnut. Bill elongate-conical, extended to form a frontal shield; basally black, orange terminally. Bare skin below eye and on forehead pinkish.

Female.—Similar to male but much smaller.

Young.—Similar to adults.

Recorded from Lion Hill. Its habits resemble those of the preceding species, *Zarhynchus w. wagleri*. "The flight is slow and labored, recalls that of a crow; . . . the ordinary note is frequently uttered but like the song of this species is most difficult to describe. The song is a gurgling sound rapidly ascending the scale, and simultaneously with it another note is uttered resembling the shrill squeaking of a hinge or wagon wheel which is in need of attention. . . . When about to deliver its notes it makes a profound bow bringing the head below the level of its perch, at the same time raising the tail to a vertical position. While singing the bird gradually resumes its normal position." (Richmond.)

3. *Ostinops decumanus* (Pallas)

Crested Oropendula

Length 433 mm. (17.00 in.); tail 202 mm. (8.00 in.).

Male.—Black with rump purplish chestnut, and tail yellow with middle pair of tail feathers black. Bill pale greenish yellow with a narrow but prominent frontal shield. Iris blue.

Female.—Similar to male but much smaller.

Young.—Similar to adults.

Recorded from Lion Hill.

4. *Cacicus vitellinus* Lawrence

Lawrence's Cacique

Length. Male.—276 mm. (10.85 in.); tail 112 mm. (4.40 in.). Female.—234 mm. (9.20 in.); tail 92 mm. (3.60 in.).

Male.—Plumage black, the lower back, rump, upper and under tail coverts and a small patch on wing, bright yellow. Bill light lemon yellow; iris light blue.

Female.—Similar but smaller.

This species resembles *Zarhynchus w. wagleri* in habits and in many of its notes, though it was not heard to make the crashing sound and deep liquid notes. It was found nesting in the same tree with that species up the Chilibri River in January, 1923 and 1924. In such cases its nests, which are shorter and smaller, are usually grouped near together.

5. *Cacicus microrhynchus* (Sclater and Salvin)
Small-billed Cacique

Length. Male.—220 mm. (8.65 in.); tail 91 mm. (3.60 in.). Female.—195 mm. (7.70 in.); tail 80 mm. (3.15 in.).

Male.—Plumage black with a large triangular patch of flame red on rump. Bill pale greenish yellow; iris pale blue; feet black.

Female.—Similar but smaller, the flame-colored patch on rump smaller.

Apparently very rare in the Canal Zone. Carriker says of this species in Costa Rica, "They are usually found in the forest, although at times frequenting scattered trees in pastures, the edges of the forest and banana plantations. They have a weak, rather musical note, which is often uttered as the birds in small bands are feeding or flying about among the trees."

6. *Amblycercus holosericeus centralis* Todd
Prevost's Cacique

Amblycercus holosericeus RIDGWAY, Birds of N. and M. Amer., II, p. 194, 1902; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 280.

Length. Male.—225 mm. (8.90 in.); tail 100 mm. (3.95 in.). Female.—207 mm. (8.10 in.); tail 93 mm. (3.70 in.).

Male.—Entire plumage black. Bill light greenish yellow. Iris light yellow.

Female.—Similar but smaller.



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swollen above and extending into a frontal shield. Bill and feet black. Iris yellow.



FIG. 105. *Cassidix oryzivora mexicana*

Female.—Similar to male but smaller and duller.

These are large, black, semi-terrestrial Icteridæ with the maxilla swollen and rounded, extending into a flat frontal shield. Somewhat terrestrial in habits. Not common. Jewel reports a female from Gatun. "Shot from a tree top; was alone."

8. *Dolichonyx oryzivorus* (Linnæus)

Bobolink

Length 160 mm. (6.30 in.); tail 63 mm. (2.45 in.).

Male.—Breeding plumage.—Top and sides of head and under parts black; hindneck buff; scapulars, rump and upper tail coverts white tinged with gray, upper back black streaked with

buff, the lower back grayish white; wings and tail mostly black, the feathers of the tail with pointed tips. Bill black.

Female.—Light olive buff above with a black stripe streaked with buff along each side of the top of the head; back and rump striped with black; a narrow stripe of black in continuation of eye; under parts including sides of head and neck light olive yellowish, the sides and flanks streaked with dusky. Bill brown.

Male in fall and winter plumage and young.—Similar to female.

A migrant, rare in Panama. Frequents open fields and marshes.

9. *Leistes militaris* (Linnæus)

Red-breasted Blackbird

Length 169 mm. (6.65 in.); tail 56 mm. (2.20 in.).

Male.—Breeding plumage.—Black, the chest, breast and upper abdomen rich vermilion red. Bill black.

After breeding season.—Buffy grayish edgings to black plumage; tail barred with brownish gray.

Female.—Blackish above streaked with buff; a broad buffy streak above the eye and a black streak in continuation of eye; under parts mostly brownish buff, the breast and abdomen tinged with pinkish red; edge of wing pinkish red.

Young.—Somewhat like the adult female but chest and sides streaked with dusky.

A species of terrestrial and gregarious habits found in open fields and sabanas. Quite common between Juan Diaz and Panama near the road to old Panama; in April, 1924, several noted, the males in breeding plumage. They look not unlike small dark meadowlarks with a red instead of a yellow breast.

10. *Sturnella magna paralius* Bangs
Panama Meadowlark

Sturnella magna inexpectata (part) RIDGWAY, Birds of N. and M. Amer., II, p. 364, 1902.

Length 198 mm. (7.80 in.); tail 65 mm. (2.50 in.).

Male.—Brown above streaked with black, buff, and whitish; top of head with a median buffy streak, also a buffy streak above and behind, and a dark streak in continuation of eye, below that sides of head dull, grayish white; throat and breast bright yellow shading to buffy brown on sides and abdomen which are streaked with dark brown; a large black crescent on breast; outer tail feathers largely white.

Female.—Similar but paler.

A bird of the sabanas, not common in the Canal Zone. One heard and seen near Gamboa in May, 1924. Its song is a short phrase of clear sweet whistles of varying pitches, resembling that of the eastern North American meadowlark, *Sturnella m. magna*.

BALTIMORE ORIOLE

11. *Icterus galbula* (Linnæus) Baltimore Oriole

Male.—Length 181 mm. (7.10 in.); tail 76 mm. (3.00 in.). Whole head, neck, throat and upper back black, extending down to middle of chest; lower back, rump, lesser wing coverts and remaining under parts rich orange, wings black with a band of white and white edgings to outer margins of quills; middle and basal part of tail black, remaining part orange.

Female.—Length 166 mm. (6.55 in.); tail 69 mm. (2.65 in.). Above brownish orange, brighter and unmarked on the rump and spotted with black on head and neck; wings dusky with two white wing bands, the quills edged with gray; under parts dull orange yellow.

Young.—Similar to female, duller yellow replacing the orange yellow.

A common winter visitor distinguishable from the native species by its deeper orange color, small size and the white on the wings. Often seen in spring about Ancon.

12. *Icterus spurius* (Linnæus) Orchard Oriole

Length 156 mm. (6.15 in.); tail 68 mm. (2.70 in.).

Male.—Head, neck, middle of upper chest, upper back and scapulars, black; lower back, rump, lesser wing coverts and remaining under

GIRAUD'S ORIOLE

parts chestnut. In autumn, with buffy edgings to some of the black feathers; the chestnut plumage also dulled by buffy or yellowish edgings.

Female.—Above grayish olive green; wings dusky with two whitish bands and light olive grayish edgings; under parts dull yellow.

Young.—Similar to adult female, the young male in the second year has throat black.

A winter visitant, observed about Ancon and Panama in spring, but less common than *Icterus galbula*.

13. *Icterus giraudi* Cassin Giraud's Oriole

Sexes alike.—Length.—Male.—210 mm. (8.25 in.); tail 99 mm. (3.90 in.). Female.—188 mm.



FIG. 106. *Icterus giraudi*
(Nat. Size)

(7.40 in.); tail 88 mm. (3.45 in.). Forehead and sides of head excepting ear coverts, chin, throat and upper chest (excepting sides) black; remainder of plumage orange yellow; wings and



Photograph by Dr. Alfred O. Gross.

BIOLOGICAL STATION ON BARRO COLORADO ISLAND SHOWING THE VIRGIN TROPICAL FOREST.

tail black. In winter the orange plumage is duller and tinged with olive above.

Young.—First plumage mostly deep yellow tinged with olive above; wings black with light edgings; tail black. Later plumage similar to adults but duller.

Much less common than the following species *I. mesomelas salvini* and distinguishable from it in having no black on the back, no yellow on the wings or tail, and the yellow parts of the plumage of a deeper shade inclining toward orange.

14. *Icterus mesomelas salvini* (Cassin)
Salvin's Oriole

Sexes alike.—Length.—Male.—228 mm. (9.00 in.); tail 108 mm. (4.25 in.). Female.—212



FIG. 107. *Icterus mesomelas salvini*

mm. (8.35 in.); tail 105 mm. (4.10 in.). Front half of cheeks, in front of eyes, and eyelids, throat, upper chest (excepting sides), back,

scapulars, and wing quills (these with some yellow and white edgings) and middle tail feathers, black; remaining plumage *including wing coverts* and greater part of outer tail feathers (presenting a yellow under tail surface) lemon yellow.

Young.—The yellow in plumage of adults replaced by yellowish olive green and olive; wing quills dusky with some dull yellow edgings; the middle tail feathers dusky olive.

This is the commonest of the orioles (and is often seen in trees along the roadsides). The lighter yellow of its coloring and the conspicuous yellow wing coverts serve to distinguish it from *I. giraudi* which has the wings practically black. Its song consists of varied combinations of loud, sweet, whistled notes of different pitches. "The bird is something of a ventriloquist, at times beginning its song in a low tone as if far away, and gradually leading up to its full volume, when one discovers the bird close at hand instead of far away in the plantation, as at first supposed." (Richmond.)

15. *Megaquiscalus major assimilis* (Sclater)
Great-tailed Grackle

Megaquiscalus major macrourus RIDGWAY, Birds of N. and M. Amer., II, p. 238, 1902; STONE, Proc. Phila. Acad. Nat. Sci., 1918, p. 280.

Male.—Length about 422 mm. (16.70 in.); tail about 217 mm. (8.60 in.). Plumage black

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glossed with violet and steel blue. Bill and legs black.

Female.—Length 322 mm. (12.70 in.); tail 148 mm. (5.80 in.). Upper parts sooty brown, under parts grayish brown more buffy on chin and throat. Smaller and with a proportionately shorter tail than male. Bill and legs black.

A species widely distributed and common except in dense forest or jungle, and one of the most familiar and fearless birds of the Canal Zone. It is partial to the sea shore and may be seen on the most isolated rocks of the bay as well as on the lawns and in the gardens of the towns and cities, where its conspicuous size, long tail, glossy plumage and graceful and dignified carriage make the male one of the most striking and attractive birds of the inhabited parts of the region, and one which even the casual visitor can hardly fail to notice. It has a variety of notes and calls, the most characteristic being a long drawn out, whistled screech ascending with a questioning inflection.

64. Family CORVIDÆ

The Crows, Jays and Magpies

The structure of the vocal organs, as well as their other characters, show that the members of this family must be included among the song birds, though their notes are for the most part harsh, often little varied and without musical character. They

TALAMANCA JAY

comprise (in the crows and ravens) the largest members of the song bird group, the usually entirely black coloration of these large members of the family being in strong contrast to the strikingly variegated and often bright colors of many of the jays. The single Panamanian species of the family is a typical representative of the latter group.

1. *Cyanocorax affinis zeledoni* Ridgway Talamanca Jay

Length.—Male.—354 mm. (13.90 in.); tail 163 mm. (6.60 in.). Female.—319 mm. (12.50 in.); tail 149 mm. (5.90 in.).

Sexes alike.—Forehead, crown, neck (except hindneck) and chest black; a patch above and one below eye and a streak from corner of mouth through cheek bright blue; head posterior to crown, and upper hindneck duller purplish blue, remainder of hindneck, back and rump heliotrope shading into more purplish on wings and tail, the tail broadly tipped with cream; under parts deep cream.

Found in the forest along the rivers in small flocks. I bought one in the market in Panama City in 1921 and kept it for some time. It had an interminable loud, monotonous call, *chow chow, chow chow*, etc., which nearly drove us out of the house, also a very harsh metallic note like pulling a chain through a hole in a tin can. By the latter call I located several in the forest not far from Fort Sherman.

MIGRANTS AND WINTER VISITANTS

W.V.	Sora Rail	<i>Porzana carolina</i>
M.	Pink-footed Shearwater	<i>Puffinus creatopus</i>
M.	Sooty Shearwater	<i>Puffinus griseus</i>
M.	Slender-billed Shearwater	<i>Puffinus tenuirostris</i>
M.	Least Petrel	<i>Halocyptena microsoma</i>
M.	Black Petrel	<i>Oceanodroma melania</i>
M.	Wilson's Petrel	<i>Oceanites oceanicus</i>
W.V.	Ruddy Turnstone	<i>Arenaria interpres morinella</i>
W.V.	Black-bellied Plover	<i>Squatarola squatarola</i>
W.V.	Wilson's Plover	<i>Pagolla wilsonia beldingi</i>
W.V.	Killdeer	<i>Oxyechus v. vociferus</i>
W.V.	Semipalmated Plover	<i>Charadrius semipalmatus</i>
W.V.	Hudsonian Curlew	<i>Numenius hudsonicus</i>
W.V.	Dowitcher	<i>Macrorhamphus g. griseus</i>
W.V.	Willet	<i>Catoptrophorus semipalmatus</i>
W.V.	Greater Yellowlegs	<i>Totanus melanoleucus</i>
W.V.	Lesser Yellowlegs	<i>Totanus flavipes</i>
W.V.	Solitary Sandpiper	<i>Tringa s. solitaria</i>
W.V.	Spotted Sandpiper	<i>Actitis macularia</i>
M.	Upland Plover	<i>Bartramia longicauda</i>
W.V.	Semipalmated Sandpiper	<i>Ereunetes pusillus</i>
W.V.	Western Sandpiper	<i>Ereunetes mauri</i>
M.	Buff-breasted Sandpiper	<i>Tryngites subruficollis</i>
W.V.	Least Sandpiper	<i>Pisobia minutilla</i>
M.	Pectoral Sandpiper	<i>Pisobia maculata</i>
M.	White-rumped Sandpiper	<i>Pisobia fuscicollis</i>
W.V.	Wilson's Snipe	<i>Gallinago delicata</i>
W.V.	Great Blue Heron	<i>Ardea h. herodias</i>
W.V.	American Bittern	<i>Botaurus lentiginosus</i>
W.V.	Mallard	<i>Anas platyrhynchos</i>

MIGRANTS AND WINTER VISITANTS

W.V.	Baldpate, American Widgeon	<i>Mareca americana</i>
W.V.	Blue-winged Teal	<i>Querquedula discors</i>
W.V.	Cinnamon Teal	<i>Querquedula cyanoptera</i>
W.V.	Pintail	<i>Dafila acuta tzitzihoa</i>
W.V.	Lesser Scaup Duck	<i>Marila affinis</i>
M.	Black Tern	<i>Hydrochelidon nigra surinamensis</i>
M.	Franklin's Gull	<i>Larus franklini</i>
W.V.	Marsh Hawk	<i>Circus hudsonius</i>
W.V. and M.	Broad-winged Hawk	<i>Buteo p. platypterus</i>
W.V.	Duck Hawk	<i>Falco peregrinus anatum</i>
W.V.	Pigeon Hawk	<i>Falco columbarius</i>
W.V.	Sparrow Hawk	<i>Cerchneis sparverius</i>
W.V.	Osprey	<i>Pandion haliaetus</i>
W.V.	Belted Kingfisher	<i>Megaceryle a. alcyon</i>
M.	Night Hawk	<i>Chordeiles v. virginianus</i>
W.V.	Texas Night Hawk	<i>Chordeiles acutipennis texensis</i>
M.	Yellow-billed Cuckoo	<i>Coccyzus a. americanus</i>
W.V.	Yellow-bellied Flycatcher	<i>Empidonax flaviventris</i>
M.	Acadian Flycatcher	<i>Empidonax virescens</i>
M.	Traill's Flycatcher	<i>Empidonax t. traillii</i>
M.	Alder Flycatcher	<i>Empidonax traillii alnorum</i>
W.V.	Least Flycatcher	<i>Empidonax minimus</i>
M.	Wood Pewee	<i>Myiochanes virens</i>
M.	Western Wood Pewee	<i>Myiochanes r. richardsoni</i>
W.V.	Crested Flycatcher	<i>Myiarchus crinitus</i>
M.	Kingbird	<i>Tyrannus tyrannus</i>
W.V.	Scissor-tailed Flycatcher	<i>Muscivora forficata</i>
M.	Bank Swallow	<i>Riparia riparia</i>
W.V. and M.	Barn Swallow	<i>Hirundo erythrogaster</i>
W.V.	Catbird	<i>Dumetella carolinensis</i>
M.	Olive-backed Thrush	<i>Hylocichla ustulata swainsonii</i>

MIGRANTS AND WINTER VISITANTS

W.V. Red-eyed Vireo	<i>Vireosylva olivacea</i>
W.V. Yellow-throated Vireo	<i>Lanivireo flavifrons</i>
W.V. Black and White Warbler	<i>Mniotilta varia</i>
W.V. Prothonotary Warbler	<i>Protonotaria citrea</i>
W.V. Golden-winged Warbler	<i>Vermivora chrysoptera</i>
W.V. Yellow Warbler	<i>Dendroica a. æstiva</i>
W.V. Myrtle Warbler	<i>Dendroica coronata</i>
W.V. Magnolia Warbler	<i>Dendroica magnolia</i>
M. Cerulean Warbler	<i>Dendroica cærulea</i>
M. Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>
W.V. and M. Bay-breasted Warbler	<i>Dendroica castanea</i>
M. Blackburnian Warbler	<i>Dendroica fusca</i>
W.V. Black-throated Green Warbler	<i>Dendroica virens</i>
W.V. Ovenbird	<i>Seiurus aurocapillus</i>
W.V. Northern Water Thrush	<i>Seiurus n. noveboracensis</i>
W.V. Louisiana Water Thrush	<i>Seiurus motacilla</i>
W.V. Kentucky Warbler	<i>Oporornis formosus</i>
W.V. Mourning Warbler	<i>Oporornis philadelphia</i>
W.V. Hooded Warbler	<i>Wilsonia citrina</i>
M. Canadian Warbler	<i>Wilsonia canadensis</i>
W.V. Redstart	<i>Setophaga ruticilla</i>
W.V. Rose-breasted Grosbeak	<i>Zamelodia ludoviciana</i>
W.V. Dickcissel	<i>Spiza americana</i>
W.V. Summer Tanager	<i>Piranga r. rubra</i>
M. Scarlet Tanager	<i>Piranga erythromelas</i>
M. Bobolink	<i>Dolichonyx oryzivorus</i>
W.V. Baltimore Oriole	<i>Icterus galbula</i>
W.V. Orchard Oriole	<i>Icterus spurius</i>



LOCALITIES MENTIONED IN TEXT

Amador.—Artillery Post at Pacific entrance of the Canal.

Ancon.—Canal Zone town adjacent to Panama City.

Ancon Hill.—Hill overlooking Balboa, Ancon and Panama City.

Balboa.—Canal Zone town at the entrance of the Canal, on the Pacific side.

Balboa Heights.—Overlooking Balboa.

Barro Colorado Island.—Largest island in Gatun Lake, $1\frac{1}{2}$ miles west of Frijoles.

"Bull Ring."—Near Bella Vista, on main highway eastward from Panama City.

Chamé.—Small island about 4 miles southwest of Taboga.

Chepillo.—Island in Panama Bay, off the mouth of the Rio Chepo.

Clayton, Fort.—Military Post on railroad and highway, about 3 miles north of Balboa.

Corozal.—Military Post on railroad and highway, about $1\frac{1}{2}$ miles north of Balboa.

Cruces Trail.—Old Royal Road from Cruces, on the Rio Chagres, to Panama; it lies east of the Canal, its general direction parallel to the latter, the distance therefrom varying from

LOCALITIES MENTIONED IN TEXT

1 to 4 miles. It passes about 1 mile east of Corozal and Clayton.

Darien Bay.—Mouth of the Rio Tuyra.

Farfan.—Near the Pacific entrance of the Canal.

Fortified Islands.—Islands at Pacific entrance of the Canal.

Fort Randolph.—Atlantic Defenses, east of the Canal Entrance.

Fort San Lorenzo.—Old spanish fort at the mouth of the Chagres River.

Fort Sherman.—Atlantic Defenses, west of the Canal Entrance.

France Field.—Air Field, east of Fort Randolph.

Frijoles.—Station on railroad, between Gamboa and Gatun.

Galera.—One of the Pearl Islands.

Gamboa.—Town on railroad where latter crosses the Rio Chagres.

Gatun.—Town on the Canal, about 7 miles from the Atlantic entrance.

Gatun Dam.—Opposite Gatun, extending west from the lock.

Gulf of Panama.—Large body of water south of Panama City and extending between head lands to the Pacific ocean, comprising the smaller bays along the Coast.

Juan Diaz.—Small town about 14 miles east of Panama.

“Juan Franco Race Track.”—On main highway eastward from Panama City.



Courtesy American Museum of Natural History.

BARRO COLORADO ISLAND HABITAT GROUP.

Mindi.—Town on the Canal about 5 miles from the Atlantic entrance to the Canal.

Monkey-cap Palm Grove.—Near Fort Sherman.

Monte Lirio.—Town on the railroad about 8 miles south of Gatun.

Naos.—One of the fortified islands at the Pacific entrance of the Canal.

Old French Canal.—Abandoned waterway between Colon harbor and Gatun Dam.

Old Panama.—Ruins of original city on coast, 5 miles east of Panama.

Otoque.—Island about 20 miles off the Pacific entrance of the Canal, in Gulf of Panama.

Panama City.—Capital of the Republic of Panama, on the Pacific Coast, adjacent to the Canal Zone.

Pacheca.—One of the Pearl Islands.

Patillo Point.—Point in Panama Bay, 2 miles east of Panama City.

Pearl Islands.—Group of islands in the Gulf of Panama.

Pedro Gonzales.—One of the Pearl Islands.

Pedro Miguel.—Town at the Pedro Miguel lock.

Quarry Heights.—Military Headquarters overlooking Balboa.

Rio Algarrobo.—Stream about 7 miles northeast of the Pacific entrance of the Canal, flowing into the Bay of Panama.

LOCALITIES MENTIONED IN TEXT

Rio Bayano.—Another name for the Rio Chepo.

Rio Chagres.—River of central plain, expanding into Gatun Lake at Gamboa, contracting again at the “Spillway” and flowing into the Atlantic Ocean.

Rio Chepo.—River flowing into the Gulf of Panama, thirty miles east of Panama City.

Rio Chilibri.—Stream flowing into the Rio Chagres about 6 miles northeast of its junction with the Canal.

Rio Chilibrillo.—Small tributary of the Rio Chilibri.

Rio Juan Diaz.—Small stream about 14 miles east of Panama City, flowing into Panama Bay.

Rio Tuyra.—River flowing into San Miguel Bay.

Rio Velasquez.—Small stream 4 miles west of the Pacific entrance of the Canal, flowing into the Canal.

Rio Venado.—Small stream about 5 miles west of the Pacific entrance of the Canal, flowing into Panama Bay.

San José.—One of the Pearl Islands.

San Miguel Bay.—About 100 miles east of Panama City.

Sosa Hill.—Near Pacific entrance of the Canal.

Tabernilla.—Near Barro Colorado Island.

Taboga.—Island about 10 miles off Pacific entrance of the Canal.

Taboguilla.—Island about 10 miles off Pacific entrance of the Canal and east of Taboga.

Tiger Hill.—On the Canal about 14 miles from the Atlantic entrance.

Venado.—Island near the Pacific entrance of the Canal.

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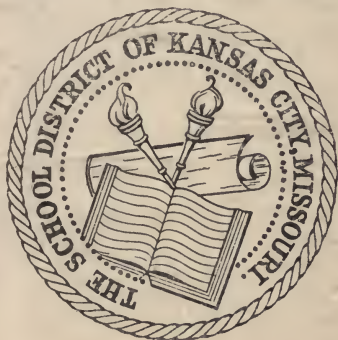
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