

SMITHSONIAN MISCELLANEOUS COLLECTIONS
VOLUME 117, NUMBER 5

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COLORADO ISLAND, PANAMA
CANAL ZONE

BY
EUGENE EISENMANN



(PUBLICATION 4058)

CITY OF WASHINGTON
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The Lord Baltimore Press
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ANNOTATED LIST OF BIRDS OF BARRO COLORADO ISLAND, PANAMA CANAL ZONE

By EUGENE EISENMANN

Few localities in tropical America have been visited by so many naturalists as the biological station on Barro Colorado Island. Yet after nearly 30 years since the island was reserved for scientific purposes, even the inventory of its resident bird life is probably incomplete. A number of species collected in nearby parts of the Canal Zone still remain unrecorded, and almost every year students report one or two birds previously unknown from the island. This will surprise no one having field experience with the type of lofty tropical forest covering the island, where some woodland species are represented by few individuals, and others, though more numerous, are likely to be overlooked unless one is familiar with their notes.

In regard to the behavior and ecological relations—or, indeed, such fundamentals as breeding habits and season—of even most of the common species little is known and less has been published. Our ignorance applies to such species generally, not merely to their status on Barro Colorado Island. Thus the facilities of this very accessible area¹ afford students extraordinary opportunities for adding to our knowledge of tropical birds.

LOCATION AND ADMINISTRATION

Barro Colorado is the largest island in Gatún Lake, Panama Canal Zone, lying opposite the station of Frijoles on the Panama Railroad. Though situated on the Atlantic slope of the Continental Divide and less than 15 miles from the Caribbean Sea, it is only 20 miles from the Pacific. It was formed by the damming of the Chagres River for the Canal construction which converted the lowlands into Gatún Lake and the hilltops into islands. The ship channel through the Lake, in view of the laboratory, affords a fascinating contrast between the crisp modernity of ocean-going steamers and the wild, green islands and shores, against an ever-changing background of distant mountains, blue sky, and billowing clouds.

¹Frijoles station, where one gets the launch for the island, is only a short train ride from the cities of Colón and Panamá. At present, daily airplanes from Miami reach Panamá in 4½ hours.

Barro Colorado rises to a height of about 452 feet above the lake surface and 537 feet above sea level. Irregular in outline, with over 25 miles of shore line formed by many deeply indented bays and inlets, the island has a maximum diameter of about 3 miles and an area of some 3,609 acres, or 5.6 square miles. But its surface habitable for animal life is much greater than if it were level ground, for the whole is broken by numerous drainage ravines whose slopes are covered with luxuriant vegetation. Despite the well-kept trails, crossing the island on foot takes far more time and effort than the air-line diameter might suggest.

Barro Colorado Island, under its official title of Canal Zone Biological Area, is at present administered by the Smithsonian Institution. The island was set aside as a biological station on April 17, 1923, through the efforts of Thomas Barbour and of James Zetek, who from the start has served as resident manager. It was operated by the Institute for Research in Tropical America until 1940. Then, on July 2, 1940, Congress gave the area a permanent status, but World War II suspended normal activities. It was placed under the Smithsonian Institution by Presidential order on July 16, 1946. Since then visitors and students have again been welcomed and provided the means of becoming acquainted with the biological wealth of a humid tropical forest under comfortable and healthful conditions.

The station provides laboratory and library facilities, as well as the basic needs of food and lodging, in an environment of unusual beauty and interest. Well-marked trails crisscross the forest, and at various points on the periphery small houses are strategically located, so that the night may be spent in the more remote portions of the island.

Those wishing to visit Barro Colorado Island should communicate with the Secretary of the Smithsonian Institution, Washington 25, D. C., or with the Resident Manager, Canal Zone Biological Area, Drawer C, Balboa, C. Z.

ECOLOGICAL CONDITIONS

Barro Colorado Island is in the humid division of the Lower Tropical Zone, but there is a distinct dry season. The average annual rainfall (1925-1949) is about 107 inches, almost all of it between May and December; November is the wettest month. The four dry-season months, January, February, March, and April, all together supply on the average only about 7 inches (Zetek, 1950). The rainy season usually begins late in April and ends late in December. Even

in this season precipitation comes chiefly at night and in the afternoon. During the dry season, while rainfall may be less than 1 inch in some months, the high relative humidity (about 75 percent) suffices to keep the forest green, though in February and March some of the higher trees drop their leaves and produce masses of brilliant flowers. Daily temperatures range between 70° and 90° (average below 80°); variation is between night and day rather than between seasons (Zetek, 1948). During the dry season strong northeast trade winds blow; during the rainy season there is generally a pleasant breeze from the lake.

Except for a few acres of clearing, the island is entirely wooded. About half is mature forest; the remainder is in various stages of succession (Kenoyer, 1929).

For its size and relatively uniform environment Barro Colorado Island has a strikingly rich and varied flora and fauna. Standley (1933) lists 1,259 species of plants. Of vertebrates, other than birds, 56 species of mammals, 62 reptiles, 33 amphibians, and 22 fishes are reported (Zetek, 1951). The regularly resident larger mammals include monkeys (4 species), puma, ocelot, tayra, coati, kinkajou, deer (2 species), peccary (2 species), tapir, sloths (2 species), anteaters (2 species), and agouti (Enders, 1935).

In all, 306 species of birds are here listed as satisfactorily identified from the island; 52 are migrants from North America and 1 is probably a migrant from South America. The remainder are "resident" in the sense that they breed within the Republic of Panamá, though some of them, including certain water birds that one sees daily, definitely do not nest on Barro Colorado Island, and others merely appear occasionally from the mainland. Although direct breeding evidence (in the form of nests or fledglings) is presently available for fewer than 100 species, it is probable, on the basis of their year-round presence and known habits, that about 200 species breed more or less regularly on the island.² The population is by no means static. This can readily be noted around the clearing: from day to day one observes different species, and birds breeding there one year may be wholly absent the next at the very same period. Diurnal movements

² The number of species one may expect to see on a short visit is smaller, as conditions in the forest make many birds very elusive. For example, during a 2-week period in June and July (when there are no migrants), covering the laboratory clearing and perhaps a third of the trails, I ordinarily note between 120 and 125 species; over a hundred in or about the clearing. In fact, without leaving the clearing, on almost any day I can count (including birds heard) 55 to 65 species; but it takes a good deal of effort to raise a day's list beyond 75 at this season.

to and from the island, by such birds as the parrots, are very obvious. To what extent there are also seasonal movements by the "resident" birds is not known, but that they occur in some species seems likely.

Though essentially a humid neotropical forest environment, from the bird student's viewpoint the island habitats may conveniently be considered under four headings.

1. *The clearing*.—As here used this includes a narrow strip extending from the dock or entrance cove up the hillside to and around the laboratory buildings, and connecting with another narrow strip (sometimes called the plantation) running some 300 yards along the lake. This is largely a grassy area, interspersed with small trees (chiefly cultivated citrus) and banana plants. Crowding closely around the clearing a lofty forest rises sharply. About the clearing may be observed the greatest variety of birds. In fact, from there most of the species recorded on the island have at one time or another been seen or heard. A number of species requiring relatively open country, otherwise absent from the island, have become established or occasionally appear. The densely grown borders are favored by thicket inhabitants. The extensive "edge effect" exerts its well-known attractiveness. Best of all, the hillside location enables one to view the lake, the sky, the grassy slope, and the upper levels of the nearby forest. Many birds of the forest canopy are rarely noted except when flying across the clearing or moving in the adjacent treetops. Here, unlike the forest, bird activity is apparent throughout the day. Much smaller cleared areas are maintained at the summit of the island (where there is an observation tower) and at a few scattered points along the lake shore, but these are relatively insignificant, though they have attracted some birds absent from the forest.

2. *The mature or primary forest* covers about half the island, particularly the western portion. Though some exists near the laboratory, it is most impressive in the more level southwestern quarter. This forest is characterized by three arboreal strata, the upper canopy being between 75 and 100 feet, with scattered overtopping trees rising 125 feet or more (Allee, 1926b). There is relatively little undergrowth. Where best developed, the mature forest, with its dim filtered light and columnar structure, produces a cathedral solemnity. The constant hum of the cicadas soon fades into an unnoticed background, and the effect on a windless day is of silence—a silence interrupted at long intervals by the screeches of parrots or toucans, the roaring or chattering of monkeys, or the rapid passage of a mixed band of birds, perhaps accompanying a train of army ants. The mature forest seems to be preferred by most of the larger birds and mammals. The flowering and fruiting trees attract many smaller species, but it is

usually impossible to see, and often even to hear, such birds in the canopy. Except early in the morning, and to a less extent late in the afternoon, few birds are noticeable in the forest.

3. *The secondary forest* occupies the remainder of the island. It varies from areas that 25 years ago were clearings to forest well advanced toward maturity. The trees are lower and the canopy less closed than in the mature forest, so more light reaches the floor. As a result the undergrowth is thicker—in some places impenetrable without cutting. Epiphytes grow nearer the ground; ropelike, woody lianas and smaller vines are abundant. The secondary forest has a much wilder appearance than the mature forest, and more closely approximates the popular conception of a tropical jungle. Some birds are found only in the lighter woodland, others favor the denser tangles. But the correlation of neotropical birdlife to the forest succession remains largely an untilled field.

4. *The water borders.*—While these habitats vary, depending on exposure, maturity of the forest, and other factors, they have in common the favorable combination of standing water, abundant light, and large trees. The light encourages the growth of a green wall of vegetation down to the water's edge, providing haunts for thicket dwellers. In addition to birds for which the proximity of water is a requirement, this environment attracts a number of other species, particularly flycatchers, usually considered clearing birds. The most beautiful water borders are the margins of the esteros, narrow inlets (actually drowned stream valleys), deeply indenting the island, and best explored by cayuco, the native dug-out canoe. Along the quiet esteros aquatic plants grow luxuriantly, and the "edge effect" is apparent in the variety of birds. Extensive marshy vegetation is found only on the southwest margin of the island, where, protected from the waves raised by the trade winds and the wake of steamers, little grassy islets have formed around projecting tree stumps, thus affording homes for gallinules, rails, and jaçanas.

Gatún Lake itself, despite its richly forested shores, seems strangely unattractive to waterfowl. While masked ducks breed in its narrower reaches, none has ever been reported from the vicinity of Barro Colorado. Pied-billed grebes and anhingas occur, but the only swimming bird commonly seen is the ubiquitous cormorant.

ORNITHOLOGICAL WORK RELATING TO BARRO COLORADO ISLAND

In the first few years of the station's existence, careful collecting, chiefly by Dr. Frank M. Chapman and Dr. Josselyn Van Tyne, determined the basic avifauna. For many years now collecting of birds

has been prohibited, except in very special cases. Most additions to the bird list since 1928 have been based on sight observations.

In 1929 Dr. Chapman, in his first delightful book on Barro Colorado, "My Tropical Air Castle"—which every prospective visitor should read—listed some 200 species of birds personally recorded by him in the course of four dry seasons (late December to early April). In his equally enjoyable sequel, "Life in an Air Castle" (1938), published after 12 such seasons on the island, he appended a list of 251 species, including records by other observers. Dr. Chapman also wrote elaborate studies on the breeding habits of the manakin, *Manacus vitellinus* (1935), and of the oropéndola, *Zarhynchus wagleri* (1928).

It would serve no purpose to list all the bird students who have briefly visited Barro Colorado Island. Many of them are mentioned below among those who have contributed to the preparation of this list. The station has served to introduce students from all over the world to neotropical wildlife. Aside from Dr. Chapman, those ornithologists who have spent most time there are Dr. Alfred O. Gross, Dr. Alexander F. Skutch, and Dr. Josselyn Van Tyne. Dr. Gross has written several articles describing the nesting of various Barro Colorado birds (1927, 1929, 1930, 1950). Dr. Van Tyne published a monograph on the toucan, *Ramphastos brevicarinatus* (1929), and shorter accounts of breeding by other species (1926, 1929, 1950). Dr. Skutch, the most assiduous student of Middle American bird behavior, has published many papers containing life-history material obtained on Barro Colorado Island (1931-1951). Much of the Barro Colorado breeding data here given is derived from his observations.

Partly on the basis of studies on Barro Colorado, Mrs. Bertha B. Sturgis wrote the "Field Book of Birds of the Panama Canal Zone" (1928), which gives descriptions, with many illustrations, of most species known to occur in the Canal Zone. It is, I believe, the only pocket-sized descriptive bird book in English covering any part of the continental neotropics.

My own interest in Panamá bird life dates back to my childhood. I first visited Barro Colorado in 1937. Since then I have sojourned there for periods between June and September in 1938, 1945, 1948, 1949, 1950, and 1951. Though I have had dry-season experience in Panamá, all my stays on the island have been during the rainy season; thus my personal observations are somewhat complementary to the dry-season studies of Dr. Chapman.

In an effort to make the list as complete as present information permits, an appeal for Barro Colorado Island data was made through the

columns of the Auk, Condor, Wilson Bulletin, and Linnaean Newsletter, as well as by direct correspondence. The following supplied me with helpful information: Dr. A. A. Allen, Robert S. Arbib, Jr., Dr. F. Bourliere, Geoffrey Carleton, Dr. Nicholas E. Collias, G. W. Cottrell, Jr., Dr. David E. Davis, Miss Hazel Ellis, Mrs. Gladys Gordon Fry (including observations of her companions, Mrs. A. Edey, Mrs. M. Edey, Mrs. L. J. Francke, and Mrs. French), Thomas Gilliard, Dr. A. O. Gross, Dr. David Harrower, Mrs. Dorothy M. Hobson (including data of her companion Miss C. A. Moore), Thomas Imhof, Dr. Lawrence Kilham, Robert Laughlin, Dr. Frederick W. Loetscher, Jr., Philip Longenecker, Drs. Lorus J. and Margery Milne, Dr. Charles W. Quaintance, Dr. Robert T. Scholes, Dr. Alexander F. Skutch, Dr. Ken W. Stott, Jr., Dr. Josselyn Van Tyne, Jay A. Weber, and Dr. Alexander Wetmore.

Both published and unpublished data, including that contained in the species index on Barro Colorado Island, have been critically examined, bearing in mind the fact that several of the observers had had no prior experience with neotropical birds. Some doubtful reports have been omitted, in almost all cases with the approval of my correspondent.³ I have examined specimens in the collections of the American Museum of Natural History and on Barro Colorado Island, and Dr. Van Tyne and Dr. Gross kindly checked for me the species represented in their respective collections.

No one who has enjoyed the facilities of Barro Colorado can fail to acknowledge his gratitude to James Zetek, the resourceful and hospitable guardian of the island, but for whom there would be no biological station. In connection with the preparation of this paper I wish particularly to note the help of Dr. Gross, who originally urged me to this task, of Dr. Van Tyne, who generously provided me with much valuable data and criticism, and of Dr. Wetmore, who as Secretary of the Smithsonian Institution has had the island under his sympathetic supervision; all three read the manuscript and gave me excellent suggestions.

THE ANNOTATED LIST

In this list species are marked with an asterisk when actual specimens taken on Barro Colorado Island are known. In view of the policy against collecting on the island, the absence of such specimens has little

³ In a few instances the footnotes refer to certain reports by competent observers of species whose reported presence, while unlikely or subject to possible misidentification, seems worth mentioning.

significance; actually of the 306 species here listed all (except *Phaeo-progne tapera*) have been collected within nearby parts of Panamá, and almost all within the Canal Zone.

Technical names.—The nomenclature followed is basically that of Griscom's Panamá checklist (1935), with modifications suggested by more recent studies of Hellmayr, Friedmann, Peters, Wetmore, and Zimmer.

English names.—These are intended to be comprehensive names applicable to the species as a whole—not merely to the Canal Zone subspecies—and thus sometimes differ from names that have been used for the local race.⁴

Unfortunately no published list of English species names exists for Middle American birds, as the older authorities generally provided only subspecies names, which usually did not indicate conspecific relationship.⁵ Until some committee acts, the individual writer or student is forced to make his own selection.

For migrants from the area of the A. O. U. Check-list of North American Birds the species names here used are those so far adopted by the A. O. U. Committee.

For tropical species the literature was examined to find a name appropriate to each species (not misleading as to any of its races or confusing with the name of other species), and, if possible, with some associative or recognition value. Hence names suggestive of some character of the appearance, behavior, habitat, or general distribution of the species were favored, and patronymics and lesser geographic designations were avoided (see Eisenmann and Poor, 1946). Preference was given to appropriate names used for the species or one of its subspecies in Ridgway's Birds of North and Middle America or in Hellmayr's Catalogue of Birds of the Americas; and when a choice existed among the names of several subspecies, that of the nominate

⁴ To facilitate reference, where a name selected is materially different from that used in the Sturgis Field Book (1928), that name is indicated in parentheses.

⁵ This practice (often criticized) not only obscured relationships but uselessly multiplied the number of disparate names to be memorized. It has been particularly burdensome in the neotropics, where most species are divided into many local and intergrading subspecies, so that there is frequently uncertainty as to the subspecific status of the local population. The amateur, for whom English names are primarily intended, often has no name available unless he pretends to make a subspecific discrimination that cannot possibly be made in the field. The use of appropriate comprehensive names avoids these difficulties, facilitates recognition throughout the range, and can aid in identification.

subspecies was favored. Resort was also had to the writings of others.⁶ Effort was made to avoid novelty, although some names were modified to prevent confusion or misleading effect.

Status.—Status and habitat on Barro Colorado Island are indicated where known, but our information is still very tentative and incomplete. In the case of migrants, the spotty Barro Colorado data have been supplemented with migration dates from Panamá, derived from published records, from labels on specimens in the American Museum, and from sight records of my own or of a few other observers.

Notes.—The descriptions of calls and song are not intended as a complete account of the notes of any species. They are given primarily as an aid to identification, in the full realization that verbal interpretations tend to be extremely personal. In a few instances I include interpretations by other writers.

Breeding.—All breeding dates from Barro Colorado reported to me have been summarized. Since this information is meager, I have added supplemental data (also very incomplete) of nesting dates elsewhere in the Canal Zone and nearby parts of Panamá. On the information presently available it can be said that, while there are birds nesting on Barro Colorado at all times of the year, the greatest number seem to breed between March and June. The breeding periods of Central American birds are still inadequately known, but helpful accounts have been prepared by Harrower (1936a) and Skutch (1950a).

Descriptions.—Certain species recorded from Barro Colorado Island are not described in the Sturgis Field Book (1928). For the convenience of visitors I have supplied a brief diagnosis of such birds, other than migrants from North America.

Order TINAMIFORMES: Tinamous

Family TINAMIDAE: Tinamous

**Tinamus major castaneiceps*: Great Tinamou (Chestnut-headed).

Common in the forest; heard daily from the clearing at dusk and dawn, occasionally at other times. *Notes*: A sad, flutelike whistle of two long-drawn, tremulous notes, the second beginning slightly higher but sliding down; sometimes the first note is repeated once or twice before the second is given; sometimes the 2-noted phrase is twice uttered. *Breeding*: February 26, 1934, 8 young just able to fly

⁶ Particularly Sutton's Mexican Birds (1951), the recent Distributional Check-list of the Birds of Mexico (Friedmann et al., 1950), and publications of Beebe, Gould, and Skutch.

(Davis) ; February 28, 1938, 2 eggs (Gilliard) ; April 28, 1926, 6 eggs (Van Tyne) ; June 21, 1951, 4 eggs (Milne, Eisenmann) ; June 26, 1927, 4 eggs (Van Tyne) ; June 30, 1948, 2 downy young (Eisenmann).

**Crypturellus soui panamensis*: Little Tinamou (Pileated).

Status uncertain ; formerly not uncommon near the laboratory ; not seen in recent years, though reported calling, by Wetmore, on April 24, 1947, April 5, 1948. Prefers second growth and forest edge. *Notes*: A series of tremulous, ascending whistles, increasing in volume and rapidity, then usually dying away suddenly with a few falling notes. Most often heard early in the morning or late in the afternoon. *Breeding*: March 16, 1926, 2 eggs (Van Tyne) ; July 13, 1927, 2 eggs, hatched July 29, 1927 (Gross and Van Tyne) ; August 4, 1925, 2 eggs (Gross).

Order COLYMBIFORMES: Grebes

Family COLYMBIDAE: Grebes

**Podilymbus podiceps antarcticus*: Pied-billed Grebe.

Male in breeding condition collected August 5, 1927 (Van Tyne) ; others seen March 8, April 14, and June 3, 1927 (Van Tyne).⁷

Order PELECANIFORMES: Totipalmate Swimmers

Family PELECANIDAE: Pelicans

**Pelecanus occidentalis carolinensis*: Brown Pelican.

Small groups fly daily over the lake on their way across the isthmus. They nest on islands in the Gulf of Panamá.⁸

Family PHALACROCORACIDAE: Cormorants

**Phalacrocorax olivaceus olivaceus*: Olivaceous Cormorant (Brazilian).

Very common on the lake, especially on projecting tree trunks.

⁷ The least grebe (*Colymbus dominicus*) occurs, and probably breeds, on Gatún Lake, but has never been reported from Barro Colorado Island.

⁸ Four blue-faced boobies (*Sula dactylatra*) are reported by Mrs. G. G. Fry flying together over the Lake on February 14, 1940, "within easy identification distance." As no storm had occurred, this is very surprising, for the species, though often noted off Colón Harbor, is distinctly pelagic.

Family ANHINGIDAE: Anhingas

**Anhinga anhinga leucogaster*: Anhinga.

Not common; occasionally seen in the laboratory cove and the narrow esteros.

Family FREGATIDAE: Frigatebirds

Fregata magnificens rothschildi: Magnificent Frigatebird.

Small groups fly daily over the lake on their way across the isthmus. They nest on islands in the Gulf of Panamá.

Order CICONIIFORMES: Herons, Storks, Ibises, and Allies

Family ARDEIDAE: Herons

Ardea herodias: Great Blue Heron.

Individuals occur at all seasons, including May, June, July, and August (Van Tyne, Eisenmann, Loetscher, Longenecker, Stott). Wetmore believes that some of these are migrant individuals of the northern great blue heron and that some may be of another subspecies.

Casmerodius albus egretta: Common Egret (American).

Casual on the island. Seen March 11, 1946, February 22, 1948, April 5, 1948, February 28, 1951 (Wetmore).

**Hydranassa tricolor ruficollis*: Tricolored Heron (Louisiana).

Individuals infrequently noted (Chapman). Female collected October 30, 1927 (Gross).

**Florida caerulea*: Little Blue Heron.

Individuals seen throughout the year along the lake shore; the heron most frequently noted in the laboratory cove; most birds are immature.

Leucophoyx thula thula: Snowy Egret.

February 27, 1940 (Mrs. A. Edey and Mrs. M. Edey). The rarity here of this common Canal Zone species is probably caused by the absence of mud flats.

**Butorides virescens*: Green Heron.

Birds of the genus *Butorides* are the most numerous of the family on the island. Almost all students have reported seeing green herons. Wetmore writes: "Two forms of this species undoubtedly occur, one

resident and one migrant, but field records are confused owing to the fact that the two differ only in size. The northern *virescens* winters in the Canal Zone (specimens identified from near Gatún and Tabernilla); the smaller race *maculatus*, presumably resident, is also found (specimens seen from near Gatún). Birds, supposedly *maculatus*, have been reported breeding on the Island by Chapman and others: March 24, 3 eggs (Gilliard); April 28, 1935, 2 eggs (Skutch). Additional breeding specimens are needed to determine the true composition of the resident population."

**Butorides striatus patens*: Striated Heron.

Common along the wooded lake margins.⁹ Van Tyne (1950) attributes to this form all breeding birds of this genus collected by him on the island. *Breeding*: April 11, 1927, male taken in full breeding condition; July 28, 1925, nest, 2 eggs; August 11, 1925, 2 half-grown young (Van Tyne).

Agamia agami: Agami or Chestnut-bellied Heron.

Estero west of Salud Point, May 10, 1935 (Skutch). A fairly large (length, 32 inches) slender heron. Adult is bottle green above with lavender crown and back plumes, and largely maroon and chestnut below. Immature is dark brown above with slaty crown, tail, and wing tips, and has creamy-buff underparts with dusky streaks on the sides.

Nycticorax nycticorax hoactli: Black-crowned Night Heron.

Occasional (Chapman). Breeds in Canal Zone, March 21 (Hallinan).

Tigrisoma mexicana: Bare-throated Tiger-heron (Cabanis's).

"Observed rarely. No specimens" (Chapman).¹⁰

⁹ Some individuals approach *B. virescens* in being quite brownish-necked. As to this Wetmore says: "Adults are never deep chestnut on the neck like *B. virescens*, but show various shadings of lighter brown toward the purely gray-necked *B. s. striatus*, which is found in eastern Panamá. Immature birds may be separated in the field with difficulty from *B. v. maculatus*."

¹⁰ The common tiger-heron (*T. l. lineatum*), which has a feathered throat and the adults of which have the head and neck chestnut, may be expected to occur.

Ixobrychus exilis: Least Bittern.

Infrequently seen in marshy islets on southwestern shore (Chapman). The northern *exilis* may occur in winter; the South American *erythromelas* may breed; both have been collected in the Canal Zone.

Family CICONIIDAE: Storks

Mycteria americana: Wood Ibis.

One seen flying over the island on February 12, 1940 (Mrs. Fry, Mrs. Francke, and Mrs. Teague).¹¹

Order FALCONIFORMES: Birds of Prey

Family CATHARTIDAE: Vultures

**Sarcoramphus papa*: King Vulture.

Not common, but seen from time to time, often flying over the clearing. Rarely more than one individual, but four soaring together February 8, 1950 (Wetmore), and September 18, 1951 (Bourliere).

**Coragyps atratus*: Black Vulture.

One or two individuals generally can be seen daily.

**Cathartes aura aura*: Turkey Vulture.

Four to eight individuals generally can be seen daily. Large flocks of migrating birds, apparently one of the northern forms, have been noted: February 25-April 5 (Chapman, Cottrell).

Family ACCIPITRIDAE: Hawks

**Elanoides forficatus yetapa*: Swallow-tailed Kite.

Not uncommon; from time to time small groups are seen flying over the clearing. A flock of 20 noted June 30, 1949 (Eisenmann).

**Leptodon cayanensis*: Gray-headed Kite.

Adult female collected, perched on a forest trail, August 18, 1927 (Van Tyne). Fairly large (length, 18-24 inches), bill very hooked.

¹¹ Eight all-dark unidentified ibises, apparently of the family Threskiornithidae, were seen flying over by Mrs. Fry February 9, 1940. While the green ibis (*Mesembrinibis cayennensis*), a bottle-green bird with greenish bill and legs, is the only all-dark ibis so far taken in the Canal Zone, two or three other such species may possibly occur.

Adults: Above blackish with a contrasting slaty-gray head; underparts white, sometimes tinged with pearl gray, tail with two or three whitish bands. *Immatures*: Similar, but head mainly white with black crown, a creamy white collar, and white underparts. There are also melanistic phases with blackish head and streaking below.

**Chondrohierax uncinatus uncinatus*: Hook-billed Kite (Red-collared Hawk).

Occasionally noted near the edge of the clearing. Collected May 18, 1926 (Van Tyne); seen July 10, 11, 1950 (Eisenmann).

**Harpagus bidentatus fasciatus*: Double-toothed Kite.

Occasionally seen at the edge of the clearing and in the forest. Rather small (length, 14 inches). *Adults*: Above (including sides of head) slaty; below largely chestnut, breast and abdomen usually barred with white, the bars often edged with gray. *Immatures*: Above brown; below yellowish white, throat and chest sparsely streaked with dusky, belly and flanks barred with brown. *Notes*: A high shrill *pee-yip*, also *pseeyp*, *pseeyp*. *Breeding*: Nest high in *Bombacopsis* tree at clearing edge, June 29, 1951; egg taken by toucan July 4 (Laughlin, Eisenmann).

**Ictinia plumbea*: Plumbeous Kite.

Uncommon. Collected April 9 (male, breeding condition), April 22 (female), 1926 (Van Tyne). Seen April 25, 1926 (pair), three flying over the forest August 17, 1927 (Van Tyne); February 25, 1950 (Kilham); March 19, 1950 (Cottrell).

**Buteo platypterus platypterus*: Broad-winged Hawk.

Winter visitant. A flight of over 250 hawks, some definitely this species,¹² noted March 21, 1933 (Carleton). Late date April 6, 1950 (Wetmore).

Buteo magnirostris petulans: Roadside or Insect Hawk (Large-billed).

Occasional around the clearing; the common open-country hawk over much of Panamá. Collected at Frijoles (Gilliard).

**Leucopternis albicollis costaricensis*: White Hawk (Ghiesbrecht's).

One or two birds generally frequent the forest edge near the laboratory, and often perch in the open, permitting close approach.

¹² Swainson's hawk (*B. swainsoni*) migrates in large flocks over the Canal Zone, but has not yet been reported from the island.

Leucopternis semiplumbea: Semiplumbeous Hawk.

"Not common" (Chapman). Rather small (length, 15 inches). *Adults*: Above lead gray; below white, usually with a few fine throat streaks; wings black, tail black with one white band. *Immatures*: Similar, but more streaked below and tail with two white bands.

Hypomorphnus urubitinga ridgwayi: Greater Black Hawk, or Urubitinga.

One seen March 8, 1949 (Wetmore). Resembles the next species but is larger and heavier (length, 26 inches) with decidedly longer legs. *Adults*: Differ also in having pure white upper tail coverts, thighs distinctly barred with white, and slaty preocular facial skin contrasting with yellow cere. *Immatures*: Also like those of next species, but head more buffy with less blackish streaking and throat generally unstreaked buffy.

Buteogallus anthracinus: Common Black Hawk or Crab Hawk.

Adult seen April 6, 1948 (Wetmore). Commonest in the coastal areas of Panamá.

**Morphnus guianensis*: Common Crested Eagle.

Collected March 30, 1936 (R. J. Niedrach and A. C. Rogers). Very large (length, 32-37 inches), with pointed crest. *Adults*: Above slaty with lighter tipping to crest; below chiefly white, more or less barred on breast and belly with rufous or brown, chest gray to brown. *Immatures*: Above ashy white with brown marbling, head (except dusky tips to crest) and entire underparts white; tail dusky with irregular lighter bands. Melanistic examples also occur.

**Morphnus taeniatus*: Banded Crested Eagle.

One seen in the forest February 8, 1950 (Wetmore). This rare bird may be a color phase of the preceding species (Lehmann, 1943; Hellmayr and Conover, 1949). It differs in having a blackish chest, with the breast and belly broadly barred black and white.

Harpia harpyja: Harpy Eagle.

Seen 1924 (Barbour), January 8, 1947 (Quaintance), June 22, 1950 (Stott).

Spizastur melanoleucus: Black-and-white Eagle-hawk.

"Rare" (Chapman). Large (length, 21-25 inches), crested, tarsus feathered to the toes. *Adults*: Head, neck, and underparts white, crest

and nape with a few black markings; rest of upper parts blackish, wings and tail barred with paler. *Immatures*: Similar, but dark areas more brownish and wing coverts narrowly tipped with whitish.

**Spizaëtus ornatus vicarius*: Ornate or Crested Eagle-hawk.

Collected August 17, 1927 (Van Tyne); seen soaring over an opening on Pearson trail February 8, 1950 (Wetmore). Large (length, 24-49 inches), conspicuously crested. *Adults*: Above blackish; ear coverts and sides of neck and chest tawny rufous; a broad black mustache mark below eye; rest of underparts white, belly barred with black. *Immatures*: Above browner, entire head and neck buffy white, rest of underparts white, with a few black spots and black barring on sides.

Spizaëtus tyrannus serus: Black or Tyrant Eagle-hawk.

Seen perched in forest at edge of clearing June 28, 1949 (Eisenmann, Gross). Large (length, 26-30 inches), conspicuously crested. *Adults*: Black, with some white on crown; white barring on thighs, under wings coverts, under tail coverts, and tail. *Immatures*: Above dark brown, nape and crest white with black tips, wings barred and spotted with black and white; below largely blackish, with white on center of throat and chest and on flanks, chest streaked with brown.

Circus cyaneus hudsonius: Marsh Hawk.

Regular winter visitant (Chapman).

Geranospiza nigra nigra: Blackish Crane-hawk or Frog-hawk.

Several sight records around the clearing: February 13, 1940 (Mrs. A. Edey, Mrs. M. Edey, Mrs. H. Scherman), January 8, 1945 (Allen), July 19, 1945, July 2, 1949 (Eisenmann).

Family PANDIONIDAE: Ospreys

Pandion haliaëtus carolinensis: Osprey.

Regular winter visitant. Though not a breeder, individuals are seen in Panamá throughout the year.

Family FALCONIDAE: Falcons

**Micrastur ruficollis interstes*: Barred Forest-falcon (Cassin's Barred Hawk).

Adult female collected May 1, 1926, in forest on Barbour-Lathrop trail (Van Tyne). "Not uncommon" (Chapman). A forest species.

**Micrastur semitorquatus naso*: Collared or Pied Forest-falcon (Black-and-white Hawk).

Collected February 2, 1926 (Chapman and Potter). Occasionally seen in the forest below the canopy. March 11, 1946 (Wetmore). *Notes*: A series of deliberate laughing notes, *hah, hah, hah*, or a lower *cuh, cuh, cuh*. *Breeding*: July 20, 1949, two fully grown young sitting in a tree (Loetscher).

**Daptrius americanus guatemalensis*: Red-throated Caracara.

Fairly common in the forest, wandering about in small bands, which will approach an intruder with noisy protests. *Notes*: A loud, raucous *ca-ca-ca, cá-o*, sometimes *cá-ak, ca-cá-o*.

Falco peregrinus anatum: Peregrine Falcon (Duck Hawk).

Uncommon migrant and winter visitant: February 12, 1937 (Gilliard); November 8, 1944 (Allen).

**Falco albigularis albigularis*: Bat Falcon.

A pair or two probably reside on the island, for one or two birds can often be seen flying over the clearing or along the lake shore. *Notes*: *kee-kee-kee-kee*. *Breeding*: In Panamá near the Canal Zone a pair seen feeding a full-grown juvenal, June 26, 1949 (Eisenmann).

Order GALLIFORMES: Gallinaceous Birds

Family CRACIDAE: Curassows and Guans

**Crax rubra rubra*: Great Curassow (Great Panama).

Recorded only by Van Tyne: collected male (of two seen) on April 18, 1927; male seen June 25, 1925, and on three occasions in the spring of 1926. All were found "in the big forest, one not far behind the Laboratory, the others up towards the center of the island."

**Penelope purpurascens aequatorialis*: Crested Guan.

Common in the forest, occasional in the clearing. Usually found in small bands in the trees, calling loudly. *Notes*: A somewhat variable metallic yelping, *quenk, quenk, quenk*, or *keelp, keelp, keelp*. In January before sunrise drumming is reported by Chapman.

**Ortalis garrula cinereiceps*: Chestnut-winged Chachalaca (Gray-headed).

Fairly common in the lighter growth, especially near the lake shore; occasional around the clearing. *Notes*: A loud, repeated *chack, chack, chack*.

Family PERDICIDAE: Partridges and Quails

Odontophorus gujanensis marmoratus: Marbled Wood-quail.

Formerly occurred in undergrowth at edge of the clearing; not reported in recent years. *Notes*: A repeated, very rapid, ringing, musical call syllabized as *corcorovado, corcorovado, corcorovado* (Chapman) or *burst the bubble, burst the bubble, burst the bubble* (Skutch).

Order GRUIFORMES: Cranes, Rails, and Allies

Family RALLIDAE: Rails

**Aramides cajanea cajanea*: Gray-necked Wood-rail (Cayenne).

Not common; frequents damp woodland. *Notes*: Pairs duet, usually at night "resembling an aged couple singing in shaky, quavering voices" (Chapman), a "loud series of short gurgling laughs" (Aldrich), or *killi, killi, killi* followed by *cow, cow, cow* (Young).

**Laterallus albigularis albigularis*: White-throated Crake.

"Common in grassy shores and islands" of the southwestern part (Chapman). *Notes*: "A short but loud, groaning snore" (Chapman).

**Porphyryula martinica*: Purple Gallinule.

Pairs well distributed where small marshy areas occur along the bays and estero margins. *Notes*: A variety of clucking, cackling, and guttural sounds, as well as a snapping of the bill (Gross and Van Tyne, 1929). *Breeding*: March 14, 1929, 2 young about a week old (Chapman); May 15, 1935, nest, 5 eggs near Salud Point (Skutch); July 13, 1925, nest, 4 eggs near laboratory cove, hatched August 2-3 (Gross and Van Tyne); November 5, 1927, young in natal down near Frijoles, and many juvenals about 3 months old seen or collected October and early November 1927 (Gross and Van Tyne).

Family HELIORNITHIDAE: Sun-grebes

**Heliornis fulica*: Sun-grebe (American Finfoot).

Local and uncommon; all reports are from the coves and esteros of Gigante Bay on the south side of the island. Collected August 18, 1927 (Van Tyne) and November 6, 1927 (Gross). Seen March 15, 1933 (Carleton); January 3, 1937, cove near Drayton house (Skutch); March 9, 1949, cove at end of Shannon trail (Wetmore); July 8, 1950, cove near Drayton house (Eisenmann, Dr. and Mrs. F. Ryan).

Family EURYPYGIDAE: Sun-bitterns

**Eurypyga helias major*: Sun-bittern.

Rare; collected March 15, 1926, in a creek bed deep in the forest on Shannon trail (Van Tyne); "seen on the lake and along small forest streams tributary to it" (Sturgis).

Order CHARADRIIFORMES: Shorebirds, Gulls, Auks

Family JACANIDAE: Jaçanas

**Jacana jacana hypomelaena*: Wattled Jaçana (Black).

Fairly common in aquatic vegetation, especially on the southwest margin of the island. *Breeding*: March 24, 1937, four young about a day old (Gilliard).

Family SCOLOPACIDAE: Snipes and Sandpipers

**Actitis macularia*: Spotted Sandpiper.

Regular migrant and winter visitant. Late date: May 12, 1926 (collected Van Tyne). There are Canal Zone records for every month except June, and in Panamá from July 25 to May 23.

Family LARIDAE: Gulls and Terns

Larus atricilla: Laughing Gull.

Common migrant and winter visitant on the lake; occasional at other times. Collected on May 17, 1926, at Frijoles (Van Tyne). Several seen June 22, 27 and July 3, 1951 (Eisenmann). Many immature birds can regularly be found in Panamá waters throughout the year.

Larus pipixcan: Franklin's Gull.

One seen July 3, 1951, with the preceding species, on the lake between Barro Colorado Island and Frijoles. Primarily a migrant in Panamá, but immatures sometimes linger over the summer, as noted repeatedly in June-July 1951.

Sterna hirundo: Common Tern.

Seen July 1, 1950, and June 25 and July 3, 1951 (Eisenmann). Individuals, apparently immature, can regularly be found in Panamá waters even in June and July. Jewel collected a male from a flock and a lone immature female on Gatún Lake on December 3, 1911, and June 9, 1912, respectively (Stone, 1918).

**Thalasseus maximus maximus*: Royal Tern.

Regular migrant and winter visitant over the lake. Collected May 28, 1927, seen July 19 and 23, 1927, August 16, 1927 (Van Tyne), and June 25, 1951 (Eisenmann). Many immature birds regularly occur in Panamá waters throughout the year.

Thalasseus sandvicensis acufavidus: Sandwich Tern (Cabot's).

November 7, 1944, seen over lake (Allen).

**Chlidonias niger surinamensis*: Black Tern.

Regular migrant, occasional in summer: collected November 12, 1927 (Gross). Seen November 29, 1945 (R. C. Murphy), June 28, 1949, six birds (Eisenmann, Gross), July 10, 13, 1949 (Loetscher). Considerable numbers in nonbreeding plumage remain in Panamá Bay during the summer.

Order COLUMBIFORMES: Pigeonlike Birds

Family COLUMBIDAE: Pigeons

**Columba speciosa*: Scaled Pigeon.

"Not uncommon" (Chapman). Collected by Van Tyne. An arboreal species of lighter forest and edge.

**Columba cayennensis pallidicrissa*: Pale-vented Pigeon.

Fairly common arboreal species of the lighter woodland, especially along the lake shore. *Notes*: A mournful *kúk-tu-coóoo*.

**Columba nigrirostris*: Short-billed Pigeon.

Fairly common arboreal forest species. *Notes*: A "melodious 'Je t'adore'" (Chapman); to my ear, *ho, cu-cu-coóoo*.

Columbigallina minuta claeodes: Plain-breasted Ground-dove.

March 24, 1950, one seen in the clearing (Cottrell). An open-country bird.

Columbigallina talpacoti rufipennis: Ruddy Ground-dove.

Occasionally occurs in the clearing (Weber, Skutch). Common in the more open parts of the Canal Zone and Panamá.

**Claravis pretiosa pretiosa*: Blue Ground-dove.

A pair may usually be found at the edge of the clearing, and occasionally elsewhere in the lighter woods. Primarily a thicket bird, both terrestrial and arboreal. *Breeding*: Nests with eggs found in the Canal Zone in August (Arbib), and female about to lay in April (Stone, 1918).

Leptotila verreauxi verreauxi: White-tipped Dove (Verreaux's).

A pair or two can be found in or around the clearing, and occasionally in other fairly open areas. Favors thickets and small trees in open country, but feeds chiefly on the ground. *Notes*: A soft, inquiring *hoó-oo* or *hoo-hoo, hoo-oo*. *Breeding*: March 1947 (Quaintance); June 30, 1950, incubating (Eisenmann); July 1949 (Gross); August 5, 1942, two eggs (Mrs. Hobson); nests with eggs September 18, 1925, October 8, 1927 (Gross).

**Leptotila cassinii cassinii*: Gray-chested Dove (Cassin's).

Well distributed throughout the forest, occasionally seen at the edge of the clearing. Frequents the ground and lower growth. The gray head contrasting with the brown nape and back help to distinguish this species from the preceding. *Breeding*: February-April 1935 (Skutch); April 12, 1937 (Gilliard); July 30, 1934 (Arbib). In the Canal Zone also May and September (Stone, 1918).

Geotrygon montana: Ruddy Quail-dove.

Not uncommon on the ground in the forest. *Notes*: "A soft deep *coo*" (Skutch); to my ear a low humming *mmmm*, repeated after a half-second pause.

Order PSITTACIFORMES: Parrots

Family PSITTACIDAE: Parrots

**Brotogeris jugularis jugularis*: Orange-chinned or Tovi Parakeet.

Common; gathering in substantial flocks in the clearing after the breeding season, particularly late in the afternoon. More than 100 birds gathered in one tree every evening in September 1938, then flew off to the mainland to roost for the night. *Notes*: A high screeching chatter. *Breeding*: January-May (Van Tyne).

**Pionus menstruus*: Blue-headed Parrot.

Common in the forest; seen daily in the clearing, usually flying over, but sometimes perching. Distinguished in flight from the *Amazona* parrots by higher-pitched calls and deeper, freer wing strokes; the short wing strokes of the *Amazona* group suggest the flight of ducks. *Notes*: A harsh, high *keéweenk, keéweenk, keéweenk*. *Breeding*: April 12, 1937, young in nest (Gilliard); April 6, 1950, in stub in the water (Wetmore).

Amazona autumnalis salvini: Red-lored Parrot (Salvin's).

Common in the forest; seen daily flying over the clearing, particularly morning and afternoon. *Notes*: Harsh screeches syllabized as *chikák, chikák, oorák, oorák, ooérk* (Chapman).

Amazona ochrocephala panamensis: Yellow-headed Parrot (Panama).

Rare or casual; a bird of the lighter Pacific woodlands. Reported by Sturgis; also July 16, 1945, 2 perched at the edge of the clearing (Eisenmann); March 17, 1950, 3 or 4 on Barbour trail (Cottrell).

**Amazona farinosa inornata*: Mealy Parrot (Plain-colored).

Common in the forest; pairs seen daily flying over the clearing. *Notes*: Louder, but less raucous than those of the preceding, rendered as *stop it, stop it, quick quick quick* and *yelp, yelp, yelp, cha-cha-cha* (Chapman).

Order CUCULIFORMES: Cuckoolike Birds

Family CUCULIDAE: Cuckoos

Coccyzus americanus: Yellow-billed Cuckoo.

Migrant seen April 30, 1951 (Collias). Recorded in Panamá September 30–November 19.

**Piaya cayana thermophila*: Squirrel Cuckoo.

Individuals are well distributed where there is forest edge or high thickets. *Notes*: A dry *chick-kaw*; a loud *trrt-trrt-trrt-trrt*; a ringing, almost whistled *whep*, repeated five to eight times; a strongly accented *kyékerah* or *wípperah*; also *piscátaqua piscátaqua* (Chapman); also a sharp *peek* and a lower *chirr* (Mrs. Hobson). *Breeding*: Nest in mango tree beside the kitchen, May 1935 (Skutch).

Crotophaga major: Greater Ani.

Local; small groups are spottily distributed in shrubbery along the lake edge of various esteros. In July 1950 I noted three groups on the south shore in different esteros of Gigante Bay and three on the north shore at coves between Fuertes Estero and Salud Point. *Notes*: Most characteristic is a bubbling *prrrr* or *brrrr*, resembling the sound produced by expelling air forcibly from between tightly closed lips; also a lighter *whirrrr*; and a very different, almost mammal-like growl *grrrra* or *grrrr*.

**Crotophaga ani*: Smooth-billed Ani.

A small group, which has on occasion included as many as 11 birds, can usually be found in the lower part of the clearing or on Slothia Island; rarely elsewhere along the shore; 2 seen northwest of Armour trail-end, June 25, 1951. *Notes*: Most characteristic is a whining *oooo-eeek* or *oooo-eeelk*. *Breeding*: January and February (Chapman, Gilliard); February-May 1935, repeated nestings, all destroyed (Skutch); June 1929 (Skutch).

Tapera naevia excellens: Striped Cuckoo.

Occasional in the clearing; a bird of open-country thickets. *Notes*: Melancholy, long-drawn whistles. One phrase is of two notes, the second note a half tone higher; another phrase is of five or six notes, the next to the last highest and longest. *Breeding*: Said to be parasitic.

**Dromococcyx phasianellus rufigularis*: Pheasant Cuckoo.

Rare; collected March 13, 1926 (Van Tyne); seen (Chapman). A bird of thick undergrowth.

**Neomorphus geoffroyi salvini*: Rufous-vented Ground-cuckoo (Salvin's).

Collected by Chapman and Potter January 7, 1926; seen at the beginning of Barbour-Lathrop trail, March 22, 1935 (Skutch). A terrestrial bird of forest undergrowth.

Order STRIGIFORMES: Owls

Family STRIGIDAE: Owls¹³

Otus choliba luctisonus: Choliba Screech Owl.

Occurs about the clearing; a bird of open woods, clearings, and gardens. "Not common" (Chapman); April 23, 1947 (Wetmore); February 1950 (Killham). *Notes*: A short series of quick purring or bubbling notes ending in a higher catlike whine.¹⁴

Lophotrix cristata stricklandi: Crested Owl (Strickland's).

Two sight reports: Armour trail, January 18, 1929 (Robert S. Woods); near laboratory, July 10, 1948 (Longenecker).

**Pulsatrix perspicillata chapmani*: Spectacled Owl.

Seen from time to time near the laboratory. *Notes*: A. A. Allen attributes to this species a series of low hoots, of almost machine-gun rapidity, of which he made a sound recording. Chapman (1929) thought that a very different, deep, deliberate *woof-woof-woof*, often heard before dawn, might be uttered by this species. Neither Allen nor Chapman saw the bird when it was calling.

**Ciccaba virgata virgata*: Mottled Wood-Owl (Cassin's Barred Owl).

"One specimen; status unknown" (Chapman). A forest owl.

Order CAPRIMULGIFORMES: Goatsuckers and Allies

Family CAPRIMULGIDAE: Goatsuckers

**Chordeiles acutipennis micromeris*: Lesser Nighthawk (Texas).

Immature female collected October 30, 1927 (Gross), one of a number of migrants, large flocks having been noted from late September on (Gross, 1930a). This specimen, now in the American Museum of Natural History (wing, 173 mm., tail, 95.3 mm.), is identified by Wetmore as *micromeris*, the Central American race. Other races, including *texensis* of southwestern United States, must also occur in migration. On September 14, 1938, I saw a flock of nighthawks, but as the birds were not calling and were flying high, and

¹³ The status of the island owls is very uncertain owing to lack of knowledge of their voices.

¹⁴ The vermiculated screech owl (*Otus guatemalae vermiculatus*), which differs in lacking both the distinct dark facial rim and the herringbone pattern below, may also occur, for it has been collected at Frijoles.

the common nighthawk (*C. minor*) also migrates over the Canal Zone, the species could not be determined.

**Nyctidromus albicollis intercedens*: Pauraque.

Often heard and occasionally seen around the clearing. *Notes*: A hoarse whistled *cor-weéee-oo* or *por-weéeeer*; also a *bup-bup-bup* or *hip-hip-hip* on a single tone. *Breeding*: March 1935 in laboratory clearing, April 30, 1935, on Slothia Island (Skutch).

**Caprimulgus carolinensis*: Chuck-will's-widow.

Migrant; one found dead November 1931 on steps leading to laboratory (in Barro Colorado Island collection).

Family NYCTIBIIDAE: Potoos

Nyctibius grandis: Great Potoo.

"Rare" (Chapman). A little-known nocturnal woodland species. *Notes*: Reported as *oorrr* and *oorrroo* in Surinam (Haverschmidt, 1948).

Nyctibius griseus panamensis: Common Potoo (Panama).

"Not uncommon" (Chapman). A nocturnal woodland species. *Notes*: A melancholy series of loud, rich, long-drawn wailing notes (usually six), going down scale (Chapman).

Order APODIFORMES: Swifts and Hummingbirds

Family APODIDAE:¹⁵ Swifts

Panyptila cayennensis: Swallow-tailed Swift.

Occasional over the clearing: September 12-16, 1938, 2 to 5 birds daily (Eisenmann); April 6, 1949 (Wetmore); July 23, 1950 (Eisenmann); June 23, 1951 (Scholes, Eisenmann). *Breeding*: Found nesting in the Canal Zone in July on Ancón Hospital piazza and Pedro Miguel locks (Greenway, 1934). A velvety-black, fork-tailed swift, with white throat, nape, and sides of rump.

¹⁵ Swifts of the genus *Chaetura* are often seen over the clearing, but no specimens have been taken. Chapman (1938) apparently assumed them to be *C. chapmani*. As five species of *Chaetura* have been collected in or near the Canal Zone (Rogers, 1939) and their separation in the field is very difficult, sight identifications seem unreliable—at least until more is known regarding their local status.

Family TROCHILIDAE: Hummingbirds

Glaucis hirsuta affinis: Rufous-breasted Hermit (Lesser Hairy).

Not uncommon, especially in wild plantain (*Heliconia*) thickets and around banana plants. *Breeding*: In the Canal Zone nests found in April and May (Stone, 1918).

Threnetes ruckeri ventosus: Band-tailed Barbed-throat (Rucker's Hermit).

Occasionally noted around *Heliconia* and banana plants.

Phaethornis guy coruscus: Green Hermit (Bangs's).

Not uncommon, in damp woods and *Heliconia* thickets.

**Phaethornis superciliosus*¹⁶ *cassini*: Long-tailed Hermit (Nicaraguan).

Fairly common; in damp woods and *Heliconia* thickets. *Breeding*: Nests at tip of palm leaf; August 5, 1925, 2 eggs (Gross), June 24, 1951, 2 eggs, 1 hatched June 26 (Milne, Eisenmann). In the Canal Zone, nest with eggs in May (Stone, 1918).

**Phaethornis longuemareus saturatus*: Little Hermit (Dusky).

Occasional in the clearing, not uncommon in the forest; always but a few feet above the ground.

Florisuga mellivora mellivora: White-necked Jacobin (Jacobian Hummingbird).

Common about the flowering shrubs of the clearing. *Breeding*: January 10, 1937, nest with eggs (Gilliard).

Anthracothorax nigricollis nigricollis: Black-throated Mango.

Not uncommon around the clearing. *Breeding*: December, January, February, and March (Chapman, Skutch, Allen).

Lophornis delattrei lessoni: Rufous-crested Coquette (De Lattre's).

Females seen near the laboratory June 30, 1948, and June 28-July 5, 1949 (Eisenmann).

¹⁶ Zimmer (1950) considers *P. malaris*, not *P. superciliosus*, to be the nominate race of the wide-ranging species which includes the Middle American forms.

Chlorostilbon canivetii assimilis: Fork-tailed Emerald (Allied).

“Not common” (Chapman). A bird partial to gardens, clearings, and the more open country of the Pacific slope. *Breeding*: In the Canal Zone, nests found in January and November (Sturgis).

**Thalurania furcata venusta*: Common Wood-nymph (Colombian).

Common around the clearing and in the forest. *Breeding*: March 2, March 25, 1935, nests in the forest (Skutch).

**Damophila julie panamensis*: Violet-bellied Hummingbird (Panama).

One of the most common hummingbirds around the flowering shrubs of the clearing, at least during June-September. Chapman regarded it as “not common” during the dry season.

Lepidopyga coeruleogularis coeruleogularis: Sapphire-throated Hummingbird (Duchassain's).

Occasional around the laboratory. A common species in more open country.

Hylocharis eliciae: Blue-throated Goldentail (Elicia's).

Males seen at the laboratory July 5, 1948, July 2, 1949, June-July 1950 (Eisenmann).

**Amazilia amabilis costaricensis*: Blue-chested Hummingbird (Lovely).

Male collected March 12, 1926 (Van Tyne).

Amazilia edward edward: White-bellied Hummingbird (Wilson's).

Males seen at the laboratory July, 2, 6, 1948, and July 4, 6, 1950 (Eisenmann). Generally a bird of more open country.

**Amazilia tzacatl tzacatl*: Rufous-tailed Hummingbird (Rieffer's).

The most common hummingbird around the clearing. *Breeding*: December 1930 (Skutch); July 10, 1950, collecting nesting material (Eisenmann). In the Canal Zone, nests found in April and May (Stone, 1918).

**Chalybura buffonii micans*: White-vented Plumeleteer (Buffon's).

Occasional around the laboratory.

**Heliothryx barroti*: Purple-capped Fairy (Barrot's).

Common in flowering trees around the clearing. *Breeding*: April 1924, nest attached to side of vertical hanging liana (Sturgis).

Heliomaster longirostris longirostris: Long-billed Starthroat.

Male seen January 27, 1951, near the laboratory (Collias). Primarily an open-country species.

Order TROGONIFORMES: Trogons

Family TROGONIDAE: Trogons

**Trogon massena hoffmanni*: Slaty-tailed Trogon (Massena).

Common in the forest, often seen in the clearing. *Notes*: A loud *cah, cah, cah*, interminably repeated at the rate of about two a second. *Breeding*: In old termite nests March-June (Chapman, Gilliard); July 13, 1927, nest with young (Gross).

Trogon melanurus macroura: Black-tailed Trogon (Large-tailed).

Very few records. "Rather rare" (Chapman); woods near laboratory March, April, 1935 (Skutch).

**Trogon rufus tenellus*: Black-throated Trogon (Graceful).

Common in the forest; often seen at the edge of the clearing. *Notes*: *cow*, repeated three or four times, with a pause between notes, which come at the rate of about one a second; also a sharp, repeated *chirr*. *Breeding*: In low decaying stumps; April 1935, 2 nests (Skutch); April 20, 1951, 2 eggs (Collias); June 18, 1951, 2 eggs (Milne), 1 young had hatched June 21 (Milne, Eisenmann).

Trogon violaceus concinnus: Violaceous Trogon (Gartered).

Common in the lighter forest; often seen at the edge of the clearing. *Notes*: A rather soft *cow*, repeated at a steady pace of about two a second, 10 to 15 times. *Breeding*: February 25, 1950, 2 eggs in cavity near top of 6-foot stump (Kilham); April 1936, building in termite nest (Chapman); June-July 1950, building in termite nest (Eisenmann).

**Trogon viridis chionurus*: White-tailed Trogon.

Common in the lighter forest; often seen in the clearing. *Notes*: A rather soft *coo*, repeated at first slowly but accelerating into a roll,

which sometimes ends with a few slower notes; occasionally a bird will vary the usual call with a simple *kuh, kuh, kuh, kuh*. *Breeding*: March 11, 1947, in termite nest (Wetmore); April, building in termite nest (Chapman); June 27, 1950, feeding young in termite nest (Stott, Eisenmann).

Order CORACIIFORMES: Kingfishers, Motmots, and Allies

Family ALCEDINIDAE: Kingfishers

**Megaceryle torquata torquata*: Ringed Kingfisher.

Common along the lake shore.

Megaceryle alcyon alcyon: Belted Kingfisher.

Common winter visitant.

**Chloroceryle americana isthmica*: Green Kingfisher.

Most common kingfisher. *Notes*: A clicking *trit-trit-trit*.

Chloroceryle inda: Green-and-rufous Kingfisher.

Seen April 17, 1942, between Frijoles and Barro Colorado Island (Imhof).

**Chloroceryle amazona mexicana*: Amazon Kingfisher.

Fairly common along the lake shore.

Chloroceryle aenea aenea: Pygmy Kingfisher (Least Green).

Occasionally seen in the narrower bays and inlets: near dock July 21, 1945 (Eisenmann); estero near Drayton house August 22, 1948 (Longenecker); at mouth of stream east of Armour trail-end, April 6, 1951 (Collias).

Family MOMOTIDAE: Motmots

**Electron platyrhynchum minor*: Broad-billed Motmot.

Fairly common in the forest; often heard from the laboratory in the early morning. *Notes*: A single loud and resonant, but somewhat nasal *cwa* or *cah*, repeated with pauses of 2 to 3 seconds; occasionally run together as *cah-cah-cah*.

**Baryphthengus ruficapillus semirufus*: Rufous Motmot.

Common in the forest; heard several times daily from the laboratory, particularly in the early morning. *Notes*: The basic phrase is a

mellow, rhythmic *hoó-too-too* or *hó-hoo-hoo*, with the accent on the first syllable, often repeated, and echoed by other individuals. A common call sounds like *hoórro*. The hooting may be varied in pitch or time, and is frequently accelerated into a roll.

Momotus momota conexus: Blue-crowned Motmot (Small-billed).

“Occasional; irregular” (Chapman). A bird of more open woodland, collected at Frijoles (Gilliard).

Family BUCCONIDAE: Puffbirds

**Notharcus macrorhynchus hyperrhynchus*: White-necked Puffbird (Dyson’s).

Not uncommon in the lighter forest.

**Notharcus pectoralis*: Black-breasted Puffbird.

Not uncommon in the forest. *Breeding*: April 1935, in termite nest (Skutch).

Notharcus tectus subtectus: Pied Puffbird.

Not uncommon in the forest near the laboratory.

**Malacoptila panamensis panamensis*: White-whiskered Puffbird (Panama *Malacoptila*).

Fairly common in the lighter forest, perching low. *Breeding*: In the Canal Zone stub-tailed fledgling seen August 19, 1933 (Arbib).

Monasa morphoeus fidelis: White-fronted Nunbird (Goldman’s).

At least two seen April 6, 1950, on Wheeler trail (Wetmore).

Nonnula frontalis frontalis: Gray-cheeked Nunlet (Panama).

Seen in the forest September 7, 1935, off Drayton trail (D. W. Lamm); seen in the forest, June 23, 1950, on Wheeler trail between Barbour-Lathrop and Snyder-Molino trails (Stott).

Order PICIFORMES: Woodpeckers, Barbets, Toucans, and Allies

Family CAPITONIDAE: Barbets

Capito maculicoronatus maculicoronatus: Spotted-crowned Barbet.

Reported seen once in the forest (Sturgis).

Family RAMPHASTIDAE: Toucans

**Pteroglossus torquatus torquatus*: Collared Araçari.

Common in the forest; seen almost daily around the clearing. *Notes*: A high sneezy *ksiyik*, *ksiyik* (Skutch writes it *pītit*, *pītit*); occasionally a soft nasal groan *ang-uh*; a staccato *penk* (Skutch). *Breeding*: In natural hollow of a high horizontal branch, which was first used as a sleeping hole by a group of six; incubation began late March 1935; eggs hatched about April 11; 3 young emerged May 24, 26, 27 (Skutch).

**Ramphastos sulfuratus brevicarinatus*: Keel-billed Toucan (Short-keeled).

Very common in the forest; seen daily around the clearing. *Notes*: A dry, grunting or grinding *werrk*, *werrk*, *werrk*. The song is described by Van Tyne as beginning with a hoarse low *crr*, *crr*, *crr*, changing to *cra*, *cra*, *cra*, and finally settling to a shrill repeated *cree*, *cree*, *cree*. *Breeding*: In natural cavities of large trees, eggs laid in March and April (Van Tyne).

**Ramphastos swainsonii*: Chestnut-mandibled Toucan (Swainson's).

Common in the forest; seen almost daily around the clearing. *Notes*: A loud, somewhat gull-like, yelping *kee-you*, *tedick-tedick-tedick*; sometimes *kee-you*, *tedick*.

Family PICIDAE: Woodpeckers

Celeus loricatus mentalis: Cinnamon Woodpecker (Fraser's).

Occasionally seen in the forest (Chapman, Skutch, Stott).

**Centurus rubricapillus rubricapillus*: Red-crowned Woodpecker (Wagler's).

Occasional in the clearing. A very common bird in more open country. *Notes*: *churr*, *churr*; also *wicka*, *wicka*.

**Centurus pucherani pucherani*: Black-cheeked Woodpecker (Pucheran's).

Very common around the clearing. *Notes*: *cherrr*; also a higher *chírrirree*, *chírrirree*. *Breeding*: December-June (Chapman, Eisenmann).

**Dryocopus lineatus nupcrus*: Lineated Woodpecker (Panama Pileated).

Common in the forest; often seen at the edge of the clearing.
Notes: A loud flickerlike *wicka-wicka-wicka*.

**Phloeocastes melanoleucos malherbii*: Crimson-crested Woodpecker (Malherbe's).

Fairly common in the forest; often seen at the edge of the clearing.
Notes: A loud metallic *cheerrr*. *Breeding*: December-February; young left nest about February 20, 1925 (Chapman).

Order PASSERIFORMES: Perching Birds

Family DENDROCOLAPTIDAE: Woodcreepers¹⁷

Dendrocolaptes certhia nigriorstris: Barred Woodcreeper.

Uncommon; seen December 24, 1934, in forest on Wheeler trail (Davis); November 21, 1939 (Skutch); March 11, 1951 (two birds) between Miller trail 2-4 (Collias); July 1, 1951, at northwest edge of clearing (Eisenmann).

**Xiphorhynchus guttatus nanus*: Buff-throated Woodcreeper (Lawrence's).

Common in the lighter woodland and forest edge. *Notes*: A series of loud whistles, rising slightly in pitch and then dropping and slowing down (Sturgis); a slurred *cheer*, a *choe* (Skutch). *Breeding*: April 14, 1936, in partly covered box (Chapman); May 1935 in hole in papaya tree (Skutch).

**Xiphorhynchus lachrymosus lachrymosus*: Black-striped Woodcreeper.

Not uncommon forest species; occasionally seen at the edge of the clearing.

Campylorhynchus trochilirostris brevipennis: Red-billed Sickbill (Venezuelan).

Seen August 17, 1935, on Snyder-Molino trail (D. W. Lamm).

¹⁷ This name, used by Chapman and Sutton, is adopted in place of the misleading "woodhewer" of Sturgis and other authors.

Chapman (1938) lists *Dendroplex picus "panamensis"* (= *extimus*?) as "Not common." As this species has not been reported by any other observer, and in Panamá seems to be restricted to a narrow coastal strip along the Pacific, some error is probable.

**Glyphorynchus spirurus sublestus*: Wedgebill.

Not uncommon in the forest. *Notes*: *chif, chif*. *Breeding*: July 12, 1949, nest in natural cavity, two fully-fledged young (Gross, Loetscher).

**Dendrocincla fuliginosa ridgwayi*: Brown Woodcreeper (*Dendrocincla*).

Common in the forest. *Notes*: A loud squeaky *sweeach* or *scheeah*.

Family FURNARIIDAE: Ovenbirds and Allies

**Automolus ochrolaenus pallidigularis*: Buff-throated Automolus (Pale-throated).

A forest species of shrubbery and lower growth. *Breeding*: March 23, 1926, nest with two young in a clay bank (Van Tyne).

**Xenops minutus ridgwayi*: Plain Xenops (Mexican).

Fairly common in the forest, generally feeds like titmouse among outer branches of smaller trees and higher shrubs. *Notes*: *tseet-tseet*; a high *cheep-cheep-cheep-cheep-cheep*.

**Sclerurus guatemalensis guatemalensis*: Scaly-throated Leafscraper (*Guatemalan Sclerurus*).

Uncommon terrestrial forest species. *Breeding*: March 30, 1935, with one nestling in burrow on stream bank near laboratory (Skutch).¹⁸

Family FORMICARIIDAE: Antbirds

**Cymbilaimus lineatus fasciatus*: Fasciated Antshrike.

A pair or two can generally be found at the north edge of the clearing in the shrubbery or low trees. A bird of thickets in humid areas. *Notes*: An easily imitated series of whistles, all on one note, uttered at the rate of about two a second, and continuously repeated for 8 to 10 seconds, *cü, cü, cü, cü, cü* or *cwee, cwee, cwee*, etc. The alarm note is a nasal *wañurk*.

¹⁸ The tawny-throated leafscraper (Mexican sclerurus)—*Sclerurus mexicanus andinus*—is included in Chapman's 1929 (but not in his 1938) list. In his later list, *S. guatemalensis* (omitted from the first list) is the only member of the genus mentioned; hence the original listing was probably an error.

Thamnophilus doliatus nigricristatus: White-barred Antshrike (Black-crested).

Occasional in the thickets around the clearing. Common in more open country. Collected at Frijoles (Van Tyne). *Notes*: A rapid whistled hooting, ending in a higher, more emphatic note *hu-hu-hu-hu-hu-hu-hu-hu-hu-zweng*, rather similar to the analogous call of the next species; a very harsh guttural *garrrr* or *ahrrrr*; a catlike whine. *Breeding*: In the Canal Zone, fresh eggs July 17, August 12 (Harrower, Arbib).

**Thamnophilus punctatus atrinucha*: Slaty Antshrike.

Most common antbird; a forest species. *Notes*: A rapid whistled hooting, sometimes at a steady pace, but often accelerating into a roll, ending in a nasal note, *hu-hu-hu-hu-hu-hu-hu-hu-hu-hu-wenk*; a nasal *wenk* or *wank*, given alone; a note starting as a nasal and ending in a growl, *ang-grrrrrr*, or *wang-grrrrrr*; a nasal, whining *ñaaah*; a harsh *gr-gr-gr-gr-gr-gr*. *Breeding*: Occupied nests December 22, 1930, January 7, 1937, February 14, 1935, March 17, 1935 (Skutch); March 26, 1950 (Cottrell); May 7, 1935 (Skutch); July 4, 1949, July 6, 1950 (Eisenmann); July 5, 1947, July 30, 1947 (Mrs. Hobson); July 13, 1949 (Gross); July 20, 1948 (Longenecker). All the July nests contained eggs.

**Dysithamnus puncticeps puncticeps*: Spotted-crowned Antwreos.

Not uncommon. A forest bird of low trees and shrubbery. *Breeding*: Nests with two eggs, July 9, July 11, 1925, July 1949 (Gross); food carried to nest near Shannon trail 1, April 22, 1951 (Collias).

Myrmotherula brachyura ignota: Pygmy Antwren.

Seen July 28, 1934 (Arbib).

Myrmotherula surinamensis pacifica: Streaked Antwren (Surinam).

Not common. A bird of the lower forest trees. *Breeding*: In the Canal Zone, nest with eggs found July 13 (Stone, 1918).

**Myrmotherula fulviventris fulviventris*: Fulvous-bellied Antwren (Lawrence's).

Very common in the more open part of the forest, frequenting low trees and undergrowth. *Notes*: A squeaky *queek, queek*; a somewhat sweeter *tseep, tseep*; a rapid, continued series of chirps, *syip-*

syip-syip-syip; a series of high whistles going upscale, *pü-peh-pey-pih-piy-pee-pyee*. *Breeding*: Nests with eggs, January 14, 1931, March 29, 1935 (Skutch); October 20, 1944 (Allen).

**Myrmotherula axillaris albigula*: White-flanked Antwren (Black).

Very common in the forest, frequenting the lower branches of smaller trees and the higher shrubbery, often in company with other birds. *Notes*: A high piping on a descending scale, *pee-a, peh-a, pü-a*; sometimes only *peé-a, pü-a*; also *pee-pep-pip*; also *pip-pip* or *tit-tit*; also *psst, psst*; also a dry *trrrr* or *trtrtrtr*; a sharp *whoit*; also a sweet *cheep, cheep*. *Breeding*: April 3, 1935, full clutch; April 16, 1935, very young nestling; May 7, 1935, eggs (Skutch).

**Microrhopias quixensis virgata*: Dotted-winged Antwren (Panama).

Common in the more open parts of the forest, frequenting the lower branches of smaller trees and the higher shrubbery. *Notes*: *wit-wit* or *tit-tit*; also a higher *cheet, cheet*; a very dry *thrrrr*; a very high chick-like *cheep, cheep, cheep*, varied by a *keeya* resembling a note of *Myiozetetes*. *Breeding*: Nest building, February 22, 1935 (Skutch).

**Cercomacra tyrannina rufiventris*: Dusky Antbird (Tyrannine).

Common in thickets and undergrowth of forest openings and edge. *Notes*: A song of five to eight whistled notes, going upscale but not smoothly, with pauses after the first two notes, the remainder given very rapidly and rising in pitch, *pü, pü, pi-pi-pi*, or *pü, peh, pipipi-peepee*. A call, *teé-oo, teé-oo*. *Breeding*: Nest, April 29, 1935 (Skutch).

Myrmeciza longipes panamensis: White-bellied Antbird.

Not uncommon, in second-growth woodland, usually on the ground. *Notes*: A "loud rail-like whinny" (Chapman).

**Myrmeciza exsul exsul*: Chestnut-backed Antbird (Sclater's).

Common in the forest and forest edge; frequents thickets, keeping low, but is not terrestrial. *Notes*: A loud, emphatic, easily imitated whistle, *deh, deé-a*, or *deh, deh, deé-a*, which Chapman paraphrases as "Come here" and "Come right here." Also a clucking *quick-ick*, and a nasal, catlike *nyaah*. *Breeding*: Nests with eggs, July 13, 1927, July 25 and August 5, 1925 (Gross).

**Formicarius analis panamensis*: Black-faced Antthrush (Panama).

Common terrestrial forest species; much more often seen than heard. *Notes*: A phrase of three (occasionally four) deliberate plaintive whistles, the first longer and about a half tone higher than the succeeding notes, which are on the same pitch. The bird will decoy to an imitation of this call. The alarm note is "a sharp, clear, somewhat explosive *tleet*, sometimes repeated in a continuous sequence" (Skutch). *Breeding*: Nest with one egg in tree stump, May 19, 1929 (Cleaves).

**Gymnopithys leucaspis bicolor*: Bicolored Antbird.

Fairly common in the forest, on or near the ground; often with army ants. *Notes*: A low, rather whining *chirrrrr*. *Breeding*: Nest with eggs, April 15, 1927 (Van Tyne, 1944).

**Hylophylax naevioides naevioides*: Spotted Antbird.

Common in forest undergrowth, generally off the ground, usually with army ants. *Notes*: Most characteristic is a rather soft, deliberate, oft-repeated *teé-de, téé-de, teé-de, téé-de, teé-de*, gradually slowing in time and slightly descending in pitch. Also a sharp, whistled *supeé, pee, pee, pipipipi*, the last group of notes very fast; also a low *chirrr* or *tsirrr*. Skutch mentions as additional alarm notes a high sharp *psip* and a short soft *peep*. *Breeding*: Nests with eggs, April 18, May 7, May 16, 1935 (Skutch), July 16, 1925, July 1949 (Gross); June 24, 1951, hatched July 2 (Milne, Laughlin, Eisenmann).

**Phaenostictus mcleannani mcleannani*: Ocellated Antthrush (McLeannan's).

Not uncommon in the forest; a terrestrial species most often seen with army ants. *Notes*: A soft, very fast series of 5 to 8 whistles, slightly upscale, *puhpüpehpeypihpee*; a sharp *wheerrr* or *cheerrr*. *Breeding*: July 10, 1950, adults feeding stub-tailed fledgling (Eisenmann).

Grallaria perspicillata perspicillata: Streak-chested Antpitta (Lawrence's).

Fairly common terrestrial forest species; more heard than seen; frequently heard from the laboratory. *Notes*: A series of clear, melancholy whistles, at first rising a little in pitch, then falling off in three descending couplets, *deh, dee, dee, dee, dee, dee, deé-eh, déh-oh, dóh-a*. The notes preceding the couplets vary in number, but the

couplets are almost always three. There is usually a few minutes' pause before repetition of the song; by imitation of it the bird can be decoyed into view.

Family COTINGIDAE: Cotingas

Cotinga nattererii: Blue Cotinga (Natterer's).

A tree-top forest species; probably not uncommon, but infrequently seen; occasionally noted in the tall trees at the edge of the clearing. *Breeding*: February-March, 1927, 1928 (Chapman).

**Attila spadiceus sclateri*: Polymorphic Attila (Sclater's).

An arboreal bird of the lighter woodland, often perching fairly low. *Notes*: A "measured, emphatic *beat-it, beat-it, beat-it, no-ó-w,*" also a sharp twitter in flight (Chapman).

**Laniocera rufescens rufescens*: Speckled Mourner.

"Rare" (Chapman). Adult female collected March 3, 1926 (Van Tyne). A little-known forest species. Resembles the next species in size (length, 7.8 inches) and color, being rufous above and tawny below; but differs in having the wing coverts dusky, speckled with a rufous; a tuft of yellow feathers on the sides of the breast (usually concealed), and very indistinct barring on the chest.

**Rhytipterna holerythra holerythra*: Rufous Mourner (Rufous Lipaugus).

"Not common" (Chapman). Collected April 25, 1926 (Van Tyne). An arboreal forest species.

**Lipaugus unirufus castaneotinctus*: Rufous Piha (Panama Lathria).

Rather common arboreal forest species. *Notes*: A very loud, emphatic, whistled *chu-weé-oo*, repeated from time to time. Chapman describes it as a "staccato, explosive *see-you I-see-you*, a long sweeping silvery whistle."

Pachyramphus cinnamomeus cinnamomeus: Cinnamon Becard.

An infrequently noted arboreal forest species.

Pachyramphus polychopterus cinereiventris: Black-backed Becard (Gray-bellied).

"Infrequent" (Chapman). An arboreal bird of open woodland clearings. *Breeding*: In the Canal Zone, nest with eggs found June 18 (Stone, 1918).

Tityra semifasciata costaricensis: Masked Tityra (Costa Rican).

Common arboreal species, especially at the edge of forest clearings. *Notes*: A dry *quert, quert*. *Breeding*: May 28, 1935, nest with eggs in natural tree cavity (Skutch); June 29, 1948, feeding young in woodpecker hole (Eisenmann); June 28, 1951, feeding young (Ellis).

**Erador inquisitor fraserii*: Black-crowned Erador or Tityra (Fraser's).

Not uncommon arboreal forest species; occasional at the edge of the clearing. *Notes*: Like those of the preceding species, but "drier and less 'grunty'" (Skutch).

**Querula purpurata*: Purple-throated Fruit-crow.

Very common, noisy, arboreal, forest species, wandering about in small bands; frequently heard from the laboratory. *Notes*: A variety of loud, often liquid or tremulous cawing calls, *kweé-a-wuh, kweé-a-wuh; kwoo, kwoo; kwék-kwék-oo; cherkáw, cherkáw; kwek-kwek*. *Breeding*: Pair noted building nest at northwestern edge of clearing June 28, 1951; incubation apparently begun July 14 (Ellis, Eisenmann).

Family PIPRIDAE: Manakins

**Pipra mentalis minor*: Red-capped or Yellow-thighed Manakin.

Common in the lower levels of the lighter forest. *Notes*: *sick, seeeeeeeeee*, the second note very high, thin, and rising in pitch; also a *tsick* or *seck*, or *psit*, which Skutch writes is sometimes repeated. The male likewise produces a snap and whirring, doubtless with its wings. *Breeding*: Nests with eggs, 3 in March (earliest March 10), 2 in April, 1 May 7 (Skutch); July 8, 1947; young left July 29 (Mrs. Hobson); July 7, 1950 (Mrs. F. Ryan, Eisenmann).

**Manacus vitellinus vitellinus*: Golden-collared Manakin (Gould's).

Common in the lighter second-growth woodland, particularly near the lake shore, keeping low. *Notes*: Vocal notes are a whistled *peé-you*, and a softer *chee-póó* or *chee-woóoo*. Other sounds, probably made by the wings, are a loud snap, reminiscent of stones struck together; a reedy whir; a ripping sound like the tearing of cloth; and a less loud snip (Chapman 1935; Arbib). *Breeding*: Nests with eggs February 27-August 1 (Skutch, Van Tyne); July 22, 1925, July 25, 1925 (Gross). In the Canal Zone, off the island, nests with eggs have been found in March, April, May, June, and August (Stone, 1918, Harrower, Arbib).

Chiroxiphia lanceolata: Lance-tailed Manakin (Sharp-tailed).

Female seen March 11, 1946, at Fred Miller trail 15 (Wetmore). A bird of scrub and second-growth thickets, common on the Pacific slope of Panamá. *Notes*: The basic note is a mellow, but rather hollow, *doh*, with a bell-like quality, which is repeated alone, or rapidly reiterated *do-do-do-do-do*, or accelerated into a musical roll *drrrrrrrrr*, or varied into *dówee*, *dówee-oh*, and *deé-o*. Another more elaborate phrase goes *whit*, *coo-coó*, *do-do-do-do-do-whit*, and still another, with a somewhat oriole quality, *do-do-dee-do-deh*. There is also a very different nasal *whang*. *Breeding*: In the Canal Zone and vicinity, nests with eggs have been found on August 11 and September 13 (Hallinan).

Schiffornis turdinus panamensis: Thrushlike Manakin.

"Rare" (Chapman). A forest bird of the undergrowth. Rather large (length, 6.5 inches) for a manakin. Above plain brown; below cinnamon on throat and chest, pale olive on breast and flanks, fading to yellowish on abdomen. Immature birds are more uniformly cinnamon below, paler on throat, and grayish on abdomen.

Family TYRANNIDAE: Tyrant Flycatchers

**Tyrannus tyrannus*: Eastern Kingbird.

Common migrant; sometimes noted in numbers; March 22, 1927, 30 seen (Chapman); collected April 21, 27, 1926, seen April 12, April 17, 1927 (Van Tyne). May 6, 1935, at least 100 (Skutch); September 14-16, 1938, 6 to 8 together (Eisenmann). Recorded in Panamá March-May and August-October.

**Tyrannus melancholicus chloronotus*: Tropical Kingbird (Lichtenstein's).

Common in the clearing and along the lake shore. *Notes*: A rapid twittering *piririri*, sometimes *piriri*, also *feet-feet-feet*. *Breeding*: Nests February-June (Chapman, Skutch).

Tyrannus dominicensis dominicensis: Gray Kingbird.

Seen February 1940 (Davis). Migrant and winter visitant in Panamá November-April.

**Legatus leucophaeus leucophaeus*: Piratic Flycatcher (Striped).

Pairs occur around clearings and lake shore, and elsewhere in breeding colonies of victim species. *Notes*: A monotonously repeated

wee-yeé? pírirírec; often the *wee-yeé?* is given alone. *Breeding*: Seizes newly built closed nests of other species that are harried until they desert. Appropriating and apparently using nests in oropéndola colony February-April (Chapman, Sturgis); appropriating *Myiozetetes* nests in late March (Chapman).

**Myiodynastes maculatus difficilis*: Streaked Flycatcher (Noble).

One or two pairs frequent the laboratory clearing and others occur along the lake shore. *Notes*: A loud heavy *chup* or *check*; also *ééchup*; also *chupeé* or *chupeét*; also, by the male, *chup*, *weéarooweép*, the latter phrase given after a slight pause and of such different, rather musical though squeaky quality that it seems as if made by another bird. *Breeding*: Builds nests in tree holes, roof corners, boxes, and other natural or artificial crannies and hollows. Late December 1925, woodpecker hole (Chapman); March 17, 1950, incubating (Cottrell); April 6, 1950, angle of roof, April 24, 1947, angle of roof (Wetmore); April 1935, bird box, May 1935, woodpecker hole (Skutch); June 29, 1948, feeding young in woodpecker hole, June 27, 1950, incubating in angle of roof, young fed July 7 (Eisenmann); July 1, 1947, feeding young in angle of roof (Mrs. Hobson); July 7-10, 1949, eggs laid, young hatched July 25, in angle of roof (Gross).

**Megarhynchus pitangua mexicanus*: Boat-billed Flycatcher.

A pair can generally be found in the laboratory clearing and others are well distributed along the lake shore. *Notes*: A harsh, rattling *keerrrrrik-keé* several times repeated; also *krrrrreek*. *Breeding*: June 27, 1925, nest with large young (Van Tyne); July 15, 1947, feeding young outside nest (Mrs. Hobson); June 28-July 3, 1951, incubating (Eisenmann). In the Canal Zone young have been found in the nest June 2 (Stone, 1918).

**Myiozetetes cayanensis harterti*: Rusty-margined Flycatcher (Cayenne).

A pair or two can often be found in the laboratory clearing; others are frequent along the lake shore and are also occasionally seen in the treetops in the forest. *Notes*: A rather high *fee-ee*; also *feéee-you*. *Breeding*: January-May (Chapman, Skutch). In Panama City found incubating in early July (Eisenmann).

**Myiozetetes similis columbianus*: Vermilion-crowned or Social Flycatcher (Colombian).

A couple of pairs can usually be found in the clearing and birds are common along the lake. *Notes*: The common call is a loud, harsh

keé-you or *kreeé-you*, also a longer *keé-you*, *kee-kee-kee-kee-kee*. *Breeding*: February-June (Chapman, Skutch, Van Tyne), with egg-laying chiefly March-May.

Myiozetetes granadensis granadensis: Gray-capped Flycatcher.

Occasional along the lake shore. *Notes*: A heavy *chip*; a loud, harsh *kree-you*. *Breeding*: In the Canal Zone, nests with eggs have been found in April and May (Hallinan).

**Pitangus lictor panamensis*: Lesser Kiskadee (Lictor Flycatcher).

Not uncommon in the coves of Gigante Bay and around the mouth of Fuertes Estero. *Notes*: Buzzy and squeaky, *dzai*; also *dzwey*, and *dzee*; also an excited *dzai-dey-dzáy-dah* repeated over and over; also *dzey-ee-dey*. *Breeding*: In the Canal Zone, female with egg July 9 (Stone, 1918).

**Myiarchus crinitus*: Great-crested Flycatcher.

Migrant and winter visitant. Collected March 19, 1927, and May 3, 1926 (Van Tyne). Recorded in Panamá from October 6-May 3.

**Myiarchus ferox panamensis*: Short-crested Flycatcher (Panama).

Fairly common in the clearing and in the lighter woodland, usually sitting rather low. *Notes*: A rather soft, whistled *whee*; also a whistled *whee-hee-hee-hee-hee-hee-hee-hee*.

**Myiarchus tuberculifer brunneiceps*: Dusky-capped Flycatcher (Black-crested).

Fairly common at the edge of the clearing and in the lighter woodland. *Notes*: A loud, throaty, whistled *wheeeew*, with a bit of *r* in it; also a whistled *wheeeep*, suggesting the great crested flycatcher.

**Contopus virens*: Eastern Wood Pewee.

Migrant. Collected April 23, 1926, April 29, 1927, and May 14, 1927 (Van Tyne). Seen and heard calling February 9, 10, 1940, at edge of clearing (Mrs. Fry and party). In Panamá this species has been taken April 17-May 14 and September 8-November 8. Birds of this genus were noted by the writer in September 1938. As both *C. virens* and the western *C. richardsonii* migrate through the Canal Zone, sight identifications of silent birds are unreliable. The difficulty is further increased by the possible occurrence of the tropical pewee (*Contopus cinereus brachytarsus*), which is a common Canal Zone resident.

Empidonax flaviventris: Yellow-bellied Flycatcher.

Seen October 17, 1944 (Allen). A winter visitant, recorded in Panamá September 8-April 14.

**Empidonax virescens*: Acadian Flycatcher.

Collected February 19, 1927 (Chapman). A winter visitant, recorded in Panamá October 16-April 7.

Empidonax traillii: Traill's Flycatcher.

"Winter visitant; no specimens" (Chapman). Both the eastern and western forms of this species appear to winter in (and at least regularly migrate through) Panamá; records for *traillii*: August 21-May 13; for *brewsteri*: September 17-May 9.¹⁹

**Terenotriccus erythrurus fulvicularis*: Ruddy-tailed Flycatcher (Fulvous-throated).

Not uncommon in the forest. *Notes*: A thin *tseeé-oo-tee*. *Breeding*: March 1935, two nests with eggs; May 18, 1935, nest with nestlings (Skutch).

**Myiobius sulphureipygius aureatus*: Sulphur-rumped Flycatcher (Myiobius).

Not uncommon along woodland streams. *Breeding*: Nests hung over stream at the rear of the clearing, March and April 1935 (Skutch).

**Myiobius atricaudus atricaudus*: Black-tailed Flycatcher (Myiobius).

Fairly common along streams and the lake shore. *Breeding*: Nests hung low over water; nests with eggs June 28, July 8, July 9, July 10, August 9, 1925 (Gross).

**Onychorhynchus mexicanus fraterculus*: Northern Royal Flycatcher (Colombian).

Uncommon woodland bird, favoring the vicinity of water. *Breeding*: Nesting over stream February-March, 1935 (Skutch).

**Platyrinchus coronatus superciliaris*: Golden-crowned Spadebill (Lawrence's).

Occasionally noted in the forest, sitting in low trees or shrubs.

¹⁹ The least flycatcher (*E. minimus*) has been taken at least once in the Canal Zone.

**Cnipodectes subbrunneus panamensis*: Brownish Flycatcher.

Occasionally noted in the forest. *Breeding*: April 5, 1935, seen building nest (Skutch).

Tolmomyias sulphureus flavo-olivaceus: Sulphury Flycatcher (Yellow-olive).

Seen May 22, 1933 (Carleton). A bird of light woodland and forest edge. *Breeding*: In the Canal Zone, nest with young found May 28 (Stone, 1918).

Tolmomyias assimilis flavotectus: Yellow-margined Flycatcher.

Uncommon in the forest. *Breeding*: April 6, 1948, building nest (Wetmore).

**Rhynchocyclus olivaceus bardus*: Olivaceous Flatbill (Equinoctial Flycatcher).

Not uncommon in second-growth woodland and forest edge. *Breeding*: April 13, 1937, young about four days old in nest (Gilliard). Four sleeping nests found in February and March, 1935 (Skutch).

Todirostrum cinereum finitimum: Common Tody-flycatcher (Northern).

Occasional in the clearing; a bird of open areas with scattered trees and thickets. *Notes*: A short *srrrr*; a sharp *chip*. *Breeding*: April 1937 (Chapman); 2 eggs, May 2, 1935 (Skutch); nest with 2 eggs, hatched July 10 (Eisenmann).

Todirostrum sylvia schistaceiceps: Slate-headed Tody-flycatcher.

"Not common" (Chapman). A bird of low shrubbery in clearings and open country.

**Oncostoma olivaceum*: Southern Bentbill (Lawrence's Bent-billed Flycatcher).

Not uncommon in thickets in the lighter forest. *Breeding*: Nests, April 1937 (Chapman); two eggs, May 2, 1935 (Skutch). In the Canal Zone, nest with eggs, August 7 (Harrower).

Capsiempis flaveola semiflava: Yellow Flycatcher.

Pair seen in the clearing November 1935 (Skutch). A shrub bird of open country.

**Elaenia flavogaster pallididorsalis*: Yellow-bellied Elaenia (Northern).

Male collected April 21, 1927, on Slothia Island in the laboratory cove (Van Tyne). A very common bird of open country and clearings. *Notes*: A loud, harsh *krreéup*, *weekrreéup*; sometimes only *krreéup* or *krreep*; also *wrrree*. *Breeding*: In the Canal Zone, occupied nests found March 31 (Hallinan); July 21 (Harrower); but mostly in April-June (Harrower; Stone, 1918; Eisenmann).

Elaenia chiriquensis chiriquensis: Lesser Elaenia (Lawrence's).

Occasional in the clearing; an open-country bird. *Notes*: A *wheeee* or *feeee*, sometimes slightly trilled *freeee*; also *féé-oo*; also a buzzy *peb-zü*. *Breeding*: In the Canal Zone and nearby Panamá, June 18, juvenals being fed by adults; June 24, nest with young a few days old (Eisenmann); July 17, nest with incubation apparently going on (Arbib); July 30, nest with young (Imhof).

Sublegatus arenarum atrirostris: Scrub Flycatcher (Smooth).

"Not uncommon" (Chapman). A bird of scrubby country; common on the Pacific slope of Panamá. *Breeding*: In the Canal Zone in April (Imhof).

Camptostoma obsoletum flaviventre: Southern Beardless Flycatcher (Yellow-bellied Camptostoma).

Occasionally noted in the clearing; a bird of open-country thickets and second growth. *Breeding*: March 7, 1949, feeding full-grown young near laboratory (Wetmore).

Tyranniscus vilissimus parvus: Paltry Tyrannulet (Lesser Paltry Flycatcher).

Common around the edge of the clearing and observed at various places on the lake shore and in the forest. *Notes*: *pee-ee-yíp* or *chee-yíp*, frequently uttered. Not listed by Chapman and not collected, but noted in recent years by all experienced observers.

Tyrannulus elatus panamensis: Yellow-crowned Tyrannulet.

Common in the small trees of the clearing, and noted at various places on the lake shore and at Fuertes House. *Notes*: A clear, frequently given whistle, *deé-ee*, *deéa*. *Breeding*: July 3, 1950, adults feeding a stub-tailed juvenal (Eisenmann). Not listed by Chapman and not collected, but noted in recent years by most visitors.

Microtriccus brunneicapillus brunneicapillus: Brown-capped Tyrannulet.

Fairly common in the clearing. *Notes*: A high, piping whistle usually of five notes, descending in pitch, *pee-pih-pey-peh-pü*, and uttered so fast that the whole phrase lasts only about a second; also a single high, clear *peep*. Not listed by Chapman and not collected. I have regularly noted it around the laboratory on my many visits in June, July, and August.

**Pipromorpha oleaginea parca*: Ochre-bellied Flycatcher (Bang's Pipromorpha).

Rather common woodland species, particularly in low trees of hillsides and ravines. *Breeding*: March 2, 1926, 2 nests with eggs hanging against large tree on Wheeler trail, eggs of one nest hatched March 25, 1926; July 12, 1925, 2 nests hanging against cut-bank of Lutz Stream, eggs of one nest hatched July 15, 1925 (Van Tyne); November 23, 1939, nest (Skutch). In the Canal Zone, nest with 3 eggs, May 14 (Stone, 1918).

Family HIRUNDINIDAE: Swallows

**Iridoprocne albilinea*: Mangrove Swallow.

Common, flying low over the lake. *Breeding*: Probably nests in holes in partly submerged tree trunks of the drowned forest.

Riparia riparia riparia: Bank Swallow.

Migrant; four seen April 17, 1942, with migrating barn swallows (Imhof). Reported in the Canal Zone February 22–April 17, August 26–November 30.

Stelgidopteryx ruficollis uropygialis: Rough-winged Swallow (Panama).

Fairly common, flying over the lake, sometimes over the clearing. The northern race *serripennis* has been taken in winter in the Canal Zone.

**Hirundo rustica erythrogaster*: Barn Swallow.

Common migrant; March 23 (Chapman)–May 17 (Van Tyne); occasional in winter, December 30, 1934 (Davis). Migration in the Canal Zone is chiefly from March to May and August to October.

**Progne chalybea chalybea*: Gray-breasted Martin.

Very common, flying over the lake and the clearing and often perching on trees along the shore. *Breeding*: April 6, 1950 (Wetmore); May 20, 1935 (Skutch); July 2, 1951, nestling at nest near Slothia Island (Laughlin); all three nests in tin-can channel markers.

Phaeoprogne tapera: Brown-chested Martin.

July 4, 1949, three recognized flying over the laboratory were later studied at close range, perched on a tree near the lake with the preceding species (Eisenmann), and were shown to Dr. A. O. Gross. At least 12 were noted perched on wires at Frijoles in July 3, 1951 (Eisenmann). Though never previously reported from Panamá, this South American species was regularly seen by me about the city of Panamá and in the Canal Zone during late June and July, 1949 and 1951, often perched on wires in numbers up to about 100. The race of southern South America (*fusca*) is known to be migratory. This species, though very much larger (length, 6.5 inches), closely resembles the bank swallow in color and pattern. The birds seen had noticeable speckling below the brown breastband, thus suggesting the southern *fusca*.

Family CORVIDAE: Jays, Crows, and Allies

**Cyanocorax affinis zeledoni*: Black-chested Jay (Talamanca).

Small groups are occasionally noted in the forest. *Notes*: A loud metallic *chung, chung*; also a harsh *wahk*; also a rapid, dry, and loud *chikidik*; also a loud *kityiyiying*.

Family TROGLODYTIDAE: Wrens

**Thryothorus castaneus castaneus*: Bay Wren.

"Rare" (Chapman). Collected March 22, 1926 (Van Tyne). A bird of thickets in most woodland and along stream edges. *Breeding*: In the Canal Zone, nest with egg found July 28 (Stone, 1918).

Thryothorus leucotis galbraithii: Buff-breasted Wren (Galbraith's).

Occasional in thickets around the clearing. A common species (collected at Frijoles) of moist thickets, in fairly open areas and the edge of clearings.²⁰

²⁰ The plain wren (*T. modestus clutus*), common in larger clearings, may be expected to occur. It lacks the sharp black wing barring and is less buffy on the breast.

Thryothorus fasciato-ventris albigularis: Black-bellied Wren.

Occasional in the thickets at the edge of the clearing.

**Troglodytes musculus inquietus*: Southern House Wren (Panama).

A pair generally can be found around the laboratory and sometimes at one of the houses along the shore of the island. *Notes*: Most of them sufficiently resemble those of the northern *T. aedon* to be readily recognized. *Breeding*: Egg dates, early January through August (Chapman, Van Tyne, Skutch, Eisenmann).

**Henicorhina leucosticta pittieri*: White-breasted Wood Wren (Sclater's).

Uncommon; collected by Van Tyne (who identifies it as this race) and also by Chapman. A bird of forest undergrowth and fallen treetop tangles.

**Cyphorhinus phaeocephalus lawrencii*: Song Wren (Lawrence's Musician).

Fairly common in the forest in thickets, occasional at the edge of the clearing. *Notes*: Call, a guttural *cúttá, cúttá, cúttá*. Song, a variety of whistles usually intermixed with *cutta* notes, *per-cutta wheet, per-cutta whoot, per-cutta wheet, per-cutta whoot; per-cutta-cuttle wheet whoot; per-cutta whoot whoot* (Harrower). Two sleeping nests with four or five occupants February-March 1935 (Skutch).

**Microcerculus philomela philomela*: Nightingale Wren.

A little-known forest species. Collected March 23, 1926 (Van Tyne). Seen December 30, 1930 (Chapman, Skutch). May 14-23, 1933, a total of six found singing in various parts of the island (Carleton).

Family MIMIDAE: Mockingbirds and Thrashers

Dumetella carolinensis: Catbird.

"Rare winter visitant" (Chapman). Recorded from Panamá October 24-April 23.

Family TURDIDAE: Thrushes

**Turdus grayi casius*: Clay-colored Robin (Bonaparte's).

A pair or two can generally be found in the clearing. *Notes*: Its song and most of its calls are much like those of the American robin

(*T. migratorius*), but it has a distinctive, whining call, often interminably repeated, sounding like *chee-weé-va* or *kee-éé-wuh*, sometimes *wáyewoo*. *Breeding*: Egg dates in the Canal Zone and adjacent Panamá range from February-August (Hallinan, Harrower, Eisenmann; Stone, 1918).

Hylocichla mustelina: Wood Thrush.

Rare winter visitant; seen December 29, 1926 (Chapman), March 21, 1935 (Skutch).

**Hylocichla ustulata swainsonii*: Swainson's Thrush (Olive-backed).

Migrant. Collected April 17, 1927 (Van Tyne), seen April 4, 5, 6, 1935 (Skutch), April 17, 1942 (Imhof), October 14, 1944 (Allen). Fairly common migrant through Panamá October 7-November 9 and March 17-May 1.

Family SYLVIIDAE: Warblers, Gnatcatchers, and their Allies

**Polioptila plumbea bilineata*: Tropical Gnatcatcher (Lawrence's).

Not common; a bird of light second-growth and scrubby areas. *Notes*: A thin nasal *tzeet, tzeet*; a nasal twang.

**Ramphocaenus melanurus rufiventris*: Long-billed Gnatwren (Antwren).

Fairly common in thickets in the lighter woods. *Breeding*: In Panama City, nest with two newly hatched young, July 15, 1950 (Eisenmann).

Family CYCLARHIDAE: Pepper-shrikes

Cyclarhis gujanensis: Rufous-browed Pepper-shrike.

Seen singing March 9-10, 1950, near the laboratory (Wetmore). Previously unreported from the Canal Zone, and known in Panamá only from open woodland and scrub on the Pacific slope. Length, 5.6 inches. Above olive-green, with brownish cap, rufous superciliaries, gray sides of head; below largely yellow, fading to white on abdomen.

Family VIREOLANIIDAE: Shrike-vireos

**Smaragdolanus pulchellus viridiceps*: Green Shrike-vireo.

A forest bird of the treetops, very hard to see, but probably not uncommon. *Notes*: Whistles a monotonous "one-two three", all on the same note, with a tireless persistence" (Chapman). Length, 5.3

inches. Entirely brilliant green, with a yellow throat and blue hind-neck.

Family VIREONIDAE: Vireos

Vireo flavifrons: Yellow-throated Vireo.

Seen March 12, 1935 (Skutch). Uncommon winter visitant in Panamá, November 3-March 12.

Vireo olivaceus: Red-eyed Vireo.

"Migrant" (Chapman). A common migrant and occasional winter visitant in Panamá, August 14-May 1, but chiefly seen in September and October, March and April.

Vireo flavoviridis flavoviridis: Yellow-green Vireo.

Very common in the treetops in the forest and at the edge of the clearing. Panamá-breeding birds are sometimes separated under the name *insulanus*. *Notes*: Calls are like those of *V. olivaceus*; song is also similar, but the phrases are shorter, drier, and more monotonous, and the utterance is less continuous. *Breeding*: In the Canal Zone, March 26 (Imhof).

**Hylophilus decurtatus pusillus*: Gray-headed Greenlet (*Pachysylvia*).

Not uncommon in the lighter woods, generally moving in small groups among the lower trees; sometimes seen at the edge of the clearing. *Notes*: A rapid, emphatic, whistled *cheetsacheét*, repeated at intervals of about 5 seconds; sometimes the note sounds more like *itsachéyit*. *Breeding*: In the Canal Zone, young collected June 25 (Stone, 1918).

Family COEREBIDAE: Honeycreepers

**Coereba flaveola columbiana*: Bananaquit.

Common in the clearing among the smaller trees and flowering shrubs. *Notes*: A buzzy, high, unmusical *zizi-zizi-zizi-zizi-ziz*, sometimes accelerating to *zizizizi*. *Breeding*: Nests, January 20, 1935, February-April 1935 (Skutch); August 30, 1947 (Eisenmann); November 20, 1939 (building), December 29, 1930 (Skutch). Old nests are often used for sleeping, and sleeping nests are also built.

**Dacnis cayana ultramarina*: Blue Dacnis (*Ultramarine*).

Common in and around the clearing and trees of the lake shore. *Notes*: *tseet*. *Breeding*: Two juvenals being fed July 28, 1947 (C. A. Moore).

Dacnis venusta venusta: Scarlet-thighed Dacnis.

Seen February 8, 1951, 2 males and 2 females at Fuertes House (Collias); June 26, 27, 1951, male and female at south edge of laboratory clearing (Eisenmann). A species rarely recorded in the Canal Zone. Length, 4.75 inches. *Male*: Turquoise blue above, including sides of head; black forehead, wings, tail, and underparts; thighs scarlet. *Female*: Olive above; bluish-green sides of head and neck; buffy underparts; thighs tinged with red.

**Cyanerpes cyaneus carncipes*: Blue Honeycreeper.

Usually very common in and around the clearing—at least in June and July; 20 individuals (mostly adult males) on June 27, 1951, in one tree; not noted in August 1945, September 1938 (Eisenmann), or in October 1943 (Allen). *Notes*: *st*, *st* or *tsst*, *tsst*; also *zee*. *Breeding*: Feeding juvenal, April 6, 1937 (Gilliard).

Cyanerpes lucidus isthmicus: Shining Honeycreeper.

July 1, 2, 3, 6, 11, 1950, 1 to 3 individuals of both sexes seen at close range in and around the clearing (Eisenmann); March 17, 1951, pair (Scholes). Length, 4 inches. *Male*: General color deep blue, becoming azure on the crown; black throat, wings, and tail; legs bright yellow. *Female*: Greenish above, becoming grayish-blue on the head; underparts whitish, the chest streaked with blue, the sides with greenish; legs greenish.

**Chlorophanes spiza arguta*: Green Honeycreeper.

Common in and around the clearing, particularly in the tall trees. *Notes*: *pst*, *pst*; also a short nasal grunt *uhr*, given by the male. *Breeding*: July 7, 1950, female gathering nesting material (Eisenmann).

Family PARULIDAE: Wood Warblers

Mniotilta varia: Black-and-white Warbler.

Fairly common winter visitant; late date, March 18, 1933 (Carleton). Recorded in Panamá August 24–March 26.

**Protonotaria citrea*: Prothonotary Warbler.

Fairly common winter visitant, especially along the lake shore; November 24, 1939 (Skutch)—March 14, 1933 (Carleton). Recorded in Panamá August 1–March 14.

Helmitheros vermivorus: Worm-eating Warbler.

Seen February 26, 1935 (Skutch). A winter visitant recorded in Panamá December 15–March 16.

Vermivora chrysoptera: Golden-winged Warbler.

Winter visitant (Chapman); September 19, 1951 (Bourliere). Recorded in Panamá October 24–April 16.

Vermivora peregrina: Tennessee Warbler.

Fairly common migrant and winter visitant; October 23, 1944 (Allen)–March 24, 1950 (Cottrell). Recorded in Panamá October 17–April 1.

**Dendroica petechia aestiva*: Yellow Warbler.

Common winter visitant. Collected April 17, 1927, May 4, 1926 (Van Tyne). Seen September 12, 1938 (Eisenmann)–April 23, 1935. Recorded in Panamá August 17–May 4. Barro Colorado sight records may not all be this subspecies, but they relate to the northern birds treated until recently as the species *D. aestiva*.

**Dendroica pensylvanica*: Chestnut-sided Warbler.

Common winter visitant, October 25, 1944 (Allen)–April 15, 1935 (Skutch). Recorded in Panamá September 22–April 15.

Dendroica fusca: Blackburnian Warbler.

Seen March 20, 1950 (Cottrell). Recorded in Panamá as migrant September 27–November 17, March 5–April 28.

**Dendroica castanea*: Bay-breasted Warbler.

Fairly common migrant and winter visitant, October 22, 1944 (Allen)–April 5, 1927 (Van Tyne). Recorded in Panamá October 22–April 27.²¹

²¹ The blackpoll warbler (*Dendroica striata*) is the subject of two sight reports, which are remarkable as this species migrates through the West Indies and has apparently never been recorded in Central America. Dr. A. A. Allen writes that November 6, 1944, he observed one "close enough so that I had no trouble seeing the light-colored legs and white under tail coverts." Mrs. G. G. Fry writes that on February 8 and 9, 1940, she heard a song, which she recognized as that of this species, and that one of the members of her party, Mrs. L. J. Francke, saw the bird and said it was a male in spring plumage.

Seiurus aurocapillus: Ovenbird.

Winter visitant. Reported singing February 19, 20, 1940 (Mrs. Fry). Late date, March 18, 1933 (Carleton). Recorded in Panamá November 26–April 15.

**Seiurus noveboracensis notabilis*: Small-billed Waterthrush (Northern).

Common winter visitant along forest streams and lake shore. Six specimens taken by Van Tyne March 11, 1926–May 4, 1926, April 17, 1927, are identified by him as this race. Other forms probably occur. Seen October 25, 1944 (Allen)–May 4, 1926 (Van Tyne). Recorded in Panamá September 18–May 4.

**Seiurus motacilla*: Louisiana Waterthrush.

Collected March 12, 1926 (Van Tyne). Recorded in Panamá August 24–March 18.

Oporornis formosus: Kentucky Warbler.

Uncommon winter visitant. Late date, March 28, 1935 (Skutch). Recorded in Panamá September 8–March 28.

Oporornis philadelphia: Mourning Warbler.

Uncommon winter visitant (Chapman, Skutch). Recorded in Panamá September 24–April 14.²²

Wilsonia citrina: Hooded Warbler.

Male seen September 24, 1951 (Bourliere). Rare migrant and winter visitant in Panamá.

Wilsonia canadensis: Canada Warbler.

Migrant, September 24, 1951 (Bourliere); October 20, 1944 (Allen); March 25, 1950 (Cottrell); April 16, 20, 1935 (Skutch). Recorded in Panamá September 21–October 20, March 25–May 19; sometimes winters.

Setophaga ruticilla: American Redstart.

Winter visitant, January 18, 1931 (Skutch), February 1940 (Mrs. Fry). Recorded in Panamá August 17–April 28.

²² The yellowthroat (*Geothlypis trichas*) is mentioned in Chapman's 1929 (but not in his 1938) list. As the only reported Panamá specimen is a migrant collected in western Chiriquí, the later omission may have been intentional.

**Basileuterus delatrii mesochrysus*: Chestnut-capped Warbler (Sclater's).

Collected June 18, July 27, 1927 (Van Tyne). According to Chapman, "not uncommon along clearing borders," but I have not seen it on any of my visits. It favors second-growth thickets and scrub. *Notes*: Calls include a simple *chit*, a *zeep-zeep* or *dzit-dzit*; song is a rather rapid, dry, chattering *chit-cha-chup-cha-chuwéep*, with variations. *Breeding*: In Panamá near the Canal Zone, juvenal being fed June 25 (Eisenmann).

Family ICTERIDAE: Blackbirds, Troupials, and Allies

**Zarhynchus wagleri ridgwayi*: Chestnut-headed Oropéndola (Wagler's).

Small bands are frequently seen around the clearing and in the forest; location of breeding colonies not presently known. *Notes*: A slashing, liquid croak, *grwáckoo*, *grwáckoo*, *grwak*, *grwak*; often *grwáckoo* alone; also a series of gurgling notes like the sound of dripping water, *plup*, *plup*, *plup*, *plúp-loo-úpoo*; also *plup* alone. *Breeding*: In the former colony near the laboratory nest-building regularly began the first or second week of January, egg laying began in late January and continued to April, and by the end of June the young had left (Chapman); June 27, 1925, a few young still in nest (Gross).

**Cacicus cela vitellinus*: Yellow-rumped Cacique (Lawrence's).

A local colonial nester, favoring trees with open surroundings or towering above their neighbors. *Breeding*: A colony of 16 nests attached to a bush growing on a dead trunk in water of the estero west of Salud Point, April–May 1935, destroyed by a snake (Skutch).

Amblycercus holosericeus holosericeus: Yellow-billed Cacique (Prevost's).

Seen February 19, 1940, at edge of the clearing (Mrs. Fry). A common thicket bird in more open country. *Notes*: The male utters mellow whistles, answered by the female with a long dry *churr* (Skutch). *Breeding*: Not colonial, nest with eggs in the Canal Zone, April 24 (Hallinan).

Psomocolax oryzivorus violens: Giant Cowbird (Colombian Rice Grackle).

Frequents breeding colonies of *Zarhynchus* and *Cacicus*, in whose nests it lays its egg. After the breeding season it gathers in flocks, feeding in fields and often attending cattle.

Icterus galbula: Baltimore Oriole.

Winter visitant, February 11, 1929 (Chapman); February 8, 1940, male and female (Mrs. Fry); March 24, 1950 (Cottrell). Recorded in Panamá October 2–April 20.

Icterus spurius: Orchard Oriole.

Winter visitant, February 19, 1937 (Chapman); February 22, 1948 (Wetmore); March 20, 1950, male and female (Cottrell). Recorded in Panamá August 2–March 20.

Icterus mesomelas salvini: Yellow-tailed Oriole (Salvin's).

Infrequently noted near the laboratory. April 17, 1942 (Imhof); March 12, 1946, March 8 and May 3, 1949 (Wetmore).

Icterus chrysater giraudii: Yellow-backed Oriole (Giraud's).

Common in and around the clearing and often along the lake shore. *Notes*: Song is a rather hesitant, disconnected series of 6 to 14 loud, clear whistles, moving irregularly up and down scale, and ending in an inconclusive manner. Another common call goes *teéa, cheep-cheep-cheep tee*, the first and last notes whistled, the middle ones nasal; often the last note is suppressed.

Family THRAUPIDAE: Tanagers

**Tanagra fulvicrissa*: Fulvous-vented Euphonia.

Regular in small groups, feeding on mistletoe berries.

Tanagra laniirostris crassirostris: Thick-billed Euphonia.

"Not common" (Chapman). In the clearing, April 1935 (Skutch).

**Tangara inornata languens*: Plain-colored Tanager.

Very common in small groups around the clearing. *Notes*: When feeding, a low *tst tst tst*; when flying off, *tsrrr*. *Breeding*: Nests found in mango and lime trees near the laboratory, April and May 1935 (Skutch). In Canal Zone, fledgling being fed, August 17 (Harrower, Arbib).

Tangara lavinia lavinia: Rufous-winged Tanager (Lavinia's).

Seen July 22, 1933 in the clearing (Arbib). A little-known forest species.²³

²³ The rather similar green tanager, *T. gyrola deleticia* (not mentioned by Sturgis), has also been recorded in the Canal Zone; it lacks the rufous wings and has a blue rump.

Tangara larvata franciscae: Golden-masked Tanager (Mrs. Wilson's).

Rather common in small groups around the clearing. *Breeding*: Nests found in orange and avocado trees near the laboratory, February–May, 1937 (Skutch); collecting nesting material, July 13, 1947 (Mrs. Hobson).

**Thraupis episcopus diaconus*: Blue-gray Tanager (Blue).

Very common in the clearing, and found in other open situations. *Notes*: Song is a fast, sibilant, twittering *tsu tsu tseéwee tsu-tseéwee tsu-tseéwee tseéwee tseéwee*, with variations. Calls are *chup*; also *chueép*; also *seeee*. *Breeding*: Nests, January (Chapman), May 10, 1935 (Skutch); building nest, July 4, 1948 (Longenecker, Eisenmann). In the Canal Zone, nests with eggs, April 13 and May 6 (Hallinan); in Panamá City, feeding young in nest, June 23 (Eisenmann).

**Thraupis palmarum atripennis*: Palm Tanager.

Very common in the clearing. *Notes*: Song somewhat like that of the preceding species, but with a distinct "r" sound: *súsuri súsuri, sree sree sree, súsuri súsuri súsuri*, with variations. Calls are *see-ee* with a rising or questioning inflection, and *see-you* with a falling inflection. *Breeding*: In natural and artificial crannies, late in January 1926 (Chapman); February 28, 1935, in coco palm (Skutch); June 1, 1935, young hatched, nest in cranny in top of dead trunk (Skutch).

**Ramphocelus dimidiatus isthmicus*: Crimson-backed Tanager.

Irregular, but sometimes fairly common in the clearing. A bird of thickets and small trees in open country. *Breeding*: February and April, 1935; second nest destroyed and same pair raised another brood in May (Skutch). In the Canal Zone, nests with eggs found March 3 (Stone 1918), May 10 and 24 (Hallinan), June 11 (Stone, 1918).

Ramphocelus icteronotus: Yellow-rumped Tanager.

Irregular, but sometimes not uncommon around the edge of the clearing. A bird of thickets at the edge of humid forest. *Breeding*: In the Canal Zone, nests with eggs found April 30 and May 14 (Stone, 1918).

**Piranga rubra rubra*: Summer Tanager.

Regular winter visitant, November 1939 (Skutch)–March 24, 1933 (Carleton), and March 24, 1950 (Cottrell). Recorded in Panamá September 3–April 16.

**Piranga olivacea*: Scarlet Tanager.

Male collected April 5, 1936 (Niedrach). In Panamá an uncommon migrant recorded March 25–April 5.

**Habia fuscicauda erythrolaema*: Dusky-tailed Ant-tanager.

Not uncommon in thickets in the forest. *Notes*: Song is a beautiful flutelike warble. Call is a harsh wrenlike scold. *Breeding*: In the Canal Zone, nest with eggs found May 14 (Stone, 1918). Some authorities consider this form a race of the red-throated ant-tanager, *H. gutturalis*.

Tachyphonus rufus: White-lined Tanager (Boddaert's).

Irregular about the clearing; a bird of thickets at the edge of woodland. *Breeding*: In the Canal Zone, nest with eggs found May 7 (Stone, 1918).

**Tachyphonus luctuosus panamensis*: White-shouldered Tanager.

Not uncommon in the clearing and in lighter woods; a bird of forest edge. *Notes*: *tsip*, *tsip*.

Heterospingus rubrifrons: Sulphur-rumped Tanager.

Seen (4 birds) November 20, 1939, in the tree-tops in the forest near the tower (Skutch). A little-known species. *Male*: Above sooty-slate with yellow rump; below slate-gray, tinged with yellow on abdomen, with white patch on each side of breast; white under wing coverts. *Female*: Duller and less yellow on abdomen. Length, 6 inches. Considered by Hellmayr a "hen-feathered" race of *H. xanthopygius*.

**Eucometis penicillata cristata*: Gray-headed Tanager (Gray-crested).

Fairly common in light woodland and occasional at the edge of the clearing. A bird of shrubbery and low trees. *Notes*: *chewp*, *chewp*; also a sharp *chip*. *Breeding*: March 29, 1935 (Skutch); July 1, 1948, nest with one egg being incubated at Snyder-Molino trail O, hatched July 11 (Longenecker, Eisenmann).

**Rhodinocichla rosea eximia*: Rose-breasted Thrush-tanager (Panama).

One at border of clearing winter of 1936–1937; found dead February 17, 1937 (Chapman, Weber). A bird of dense thickets, most common on the Pacific slope. *Notes*: A rich, very loud, rather hollow,

whistled *chó-ho*, repeated over and over, and sometimes varied to *cheéa-wo*, *cho-wéy*.

Family FRINGILLIDAE: Finches, Grosbeaks, and Allies

**Saltator maximus intermedius*: Buff-throated Saltator.

Occasional in thickets around the clearing. *Breeding*: Carrying nesting material April 15, 1935; nest with nestling in lime tree May 9, 1935 (Skutch). In the Canal Zone, nests with eggs found April 1 (Hallinan) and April 30 (Stone, 1918).

**Saltator albicollis isthmicus*: Streaked Saltator.

Occasional in the thickets around the clearing; common in open country. *Notes*: A loud, whistled *ché-oo, ché-oo, ché-oo, chéééé-oo*; or *choo, ché-oo, ché-oo, chéééé-oo*, varied at times to *chip-chéé-up, chip-chéé-up, chup-chéé-oo*; also a sharp *tseek*. *Breeding*: In the Canal Zone, nests with eggs found April 7, May 10 (Hallinan), August 10 (Harrower).

**Pitylus grossus saturatus*: Slate-colored Grosbeak.

Common in the forest, particularly near the clearing; more often heard than seen. *Notes*: A variety of high, whistled phrases, *witchee-weéoo, chééoo*; also *wee-ee, witchoo chééoo cheer*; also *hoó-ee, weéoo-wihoo-wéyoo*. Call is a metallic *chip*.

**Cyanocompsa cyanoides cyanoides*: Blue-black Grosbeak (Panama Blue).

Common in thickets at the edge of the clearing and in the lighter woodland. *Notes*: Song a series of loud, clear, deliberate whistles *do-do, deh, dee, deh, do*, often followed by a soft, irregular twitter; sometimes there are only five whistled notes, corresponding very well with the solmization "do do re mi re." Also uttered is a sharp scolding *kee-eyy*. *Breeding*: Nest with eggs, July 1947 (C. A. Moore). In the Canal Zone, nest with two fresh eggs, July 27, 1933 (Harrower).

Spiza americana: Dickcissel.

Seen twice in winter (Chapman). In Panamá a winter visitant, numerous locally on migration, September 11–May 10, one specimen June 16.

**Sporophila aurita aurita*: Variable Seedeater (Hicks's).

Very common in the clearing. *Notes*: A sweet, rapid, twittering, somewhat canarylike *tsíwee tsíwee tsíwee, chee chee chee, twee-twee-twee-twee, chirr chirr chirr chirr* with variations, the *chirrs* often omitted. Call is a sweet questioning *chíwee* or *tsíwee*; also *cheep*. *Breeding*: Nests with fresh eggs, June, July, August, September (Gross, Eisenmann); young left nest as early as June 26, 1951 (Laughlin, Eisenmann), and there were young in the nests as late as second week of October 1927 (Gross). In the Canal Zone, nests with eggs found as early as last week of May, but eggs are laid chiefly June–August (*vide* Gross).

Sporophila nigricollis nigricollis: Yellow-bellied Seedeater.

One seen in the clearing March 19, 1933 (Carleton). A common open-country species, often noted at Frijoles. *Notes*: Song is sweet, but ends usually with two buzzy phrases, *seéwee-seéwee-seéwee-seéwee soósoo, bzeéwee-bzeéwee*; another song is *zeéoo, zcéoo, bzü, bzü*; a third is *wit-seéoo, tsitseéoo, tsee*. *Breeding*: In the Canal Zone and Panama City, nests with eggs, July 13 (Harrower, Arbib), July 17 (Eisenmann).

**Volatinia jacarina splendens*: Blue-black Grassquit.

Adult male collected April 27, 1927 (Van Tyne). On the mainland an abundant bird of grassy areas. *Notes*: An explosive *bzeé-eeep* given by the male as it jumps a foot in the air, often repeating the performance every 10 to 15 seconds for a half-hour or more. *Breeding*: In the Canal Zone and nearby Panamá, occupied nests, July 2 (eggs) (Stone, 1918); July 6 (2 eggs) hatched July 7, July 13 (3 young), July 14 (1 young and 1 egg) (Eisenmann).

Oryzoborus funereus: Thick-billed Seed-finch (Rice Grosbeak).

Occasional in the clearing. An open-country species. *Notes*: Song is a sweet warble, given from the top of a small tree or other elevation. *Breeding*: In the Canal Zone, nest with eggs found April 11 (Hallinan).

Arremonops conirostris striaticeps: Green-backed Sparrow (Lafresnaye's).

Occasional in thickets of the clearing; a bird of more open country. *Notes*: Song, a loud, clear note, repeated at first slowly then gradually faster and faster, *cho, cho, cho, cho cho cho cho-cho-chochocho*.

Calls, *whit-cho*; also a whistled *whit* or *white* (like the *white* in the bob-white call); also *whup*; also *cheéoo*, *cheéoo*; also *chep-chep-chep*.
Breeding: July 10, 1950, juvenal with adult (Eisenmann). In the Canal Zone and Panama City, nests with eggs, April 18, June 2, June 11 (Stone, 1918), July 16 (Harrower, Arbib); nests with young, June 20, July 17 (Eisenmann, I. R. Eisenmann, Jr).

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