

NOTES ON THE BIRDS OF THE STATES OF PERNAMBUCO
AND PARAIBA, BRAZIL

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IN their 'Birds of Lower Amazonia,' Griscom and Greenway (Bull. Mus. Comp. Zool., 88, 1941) refer to this region as a "neglected corner of Brazil," a statement borne out by the number of new forms and extensions of range in the small collection made by the author.¹ It is for this reason that the writer ventures to submit the following field notes and observations on birds encountered in the area.

The city of Recife, where the writer was located, is in the state of Pernambuco, on the coast, about eight degrees below the equator, and almost at the apex of the 'bulge' of northeastern Brazil. The rainy season in this region commences about March and lasts until the end of August. The climate is moderate throughout the year, but somewhat cooler during the rainy season. Mean temperature is 82 degrees Fahrenheit. The lowest recorded temperature is 52 degrees and the highest 103 degrees, but the normal variation is between 70 and 95 degrees.

This region offers a number of varied habitats within close proximity to one another. Of these, the ocean and beach are the least profitable for the bird observer. Pelagic species are rarely seen, and their appearances are almost exclusively confined to the months of April and May when occasional birds are blown in by storms. Frigate Birds, Brown Boobies and Brazilian Cormorants have been noted, as well as a petrel tentatively identified as the Trinidad Petrel (not included in the following list). Shore birds are fairly common on the beach in season.

Immediately behind the beach is a fringe of coconut palms, stretching inland for about half a mile. Most of this region is inhabited, and there is some cultivation, principally of mandioca. Certain tanagers, flycatchers, the bananaquit, hummingbirds, parrakeets and the house wren are most common in this section.

Several small rivers empty into the ocean in the vicinity of Recife, usually bordered by fairly extensive mangrove swamps. There are also a number of small fresh-water marshes. The latter particularly support an abundance of aquatic species, including rails, herons, kingfishers, ducks, gallinules, a grebe and numerous migrant shorebirds.

Further inland there is a large area of semi-open country, some of which is planted with mandioca and other crops. Seedeaters, fly-

¹ Two new forms described by Dr. J. T. Zimmer in the Proceedings of the Biological Society of Washington, 60: 99-106, 1947.

catchers, anis, guiras, tanagers and doves are the most conspicuous birds of this section. Isolated wooded patches are scattered about this semi-open country, usually on the tops of small hills. They support an entirely different type of bird life, including numerous small jungle flycatchers, honey-creepers, antbirds, manakins, tinamous and woodhewers. A number of trips have been made to a jungle area near the town of Goiana, about forty miles north of Recife. Such species as cotingas and araçaris were found primarily in this area.

The interior of the states of Pernambuco and Paraíba is usually arid, and is known as the Sertão. The terrain is frequently rocky and the flora consists largely of cactus and low brush with some dense high thickets and occasional light woods. This region supports a number of species not found on the coast, such as the *tico-tico* and the *seriema*. The most prevalent Sertão birds include Brazilian Cardinals, several species of doves, mockingbirds, orioles and the omnipresent vultures and caracaras.

Over a period of more than four years, the writer has spent approximately 450 hours in the field. At various times he has been accompanied by Lieutenant E. Pfeiffer (U. S. Marine Corps), Lieutenant Donald Alexander (U. S. Army), Captain Frank Connor (U. S. Army), Lieutenant George Cummings (Brazilian Air Force) and Mark Taylor (Rubber Development Corporation), whose able assistance has made this paper possible. Much welcome aid and encouragement has also been supplied by Dr. Herbert Friedmann, Curator of Birds at the U. S. National Museum, who has struggled with poorly worded descriptions and badly damaged specimens.

The following list is by no means complete for the region, as only those species observed and definitely identified by the writer are included. Data for the coastal region are fairly representative, although some species, such as *Trogon variegatus*, which are known to occur in this part of Brazil, have not been seen. Material on the interior is necessarily very incomplete, since it is based principally on occasional trips. The rhea, for example, is not uncommon in central Pernambuco, but I have never encountered it. Certain material has also been deleted from the paper because of lack of corroborative specimens.

TINAMIDAE. Tinamous.

Crypturellus soui albigularis (Brabourne and Chubb).—Fairly common in heavy jungle at Goiana. Also at São Caetano in high brush country about 100 miles inland.

Crypturellus parvirostris (Wagler).—One was shot in rolling grasslands at São Lorenzo, about fifteen miles west of Recife. The species was later found to be fairly common in this section.

Rhynchotus rufescens rufescens (Temminck).—Occasionally seen in open fields around Recife. Not uncommon in the grasslands at São Lorenzo, where it is usually hunted with dogs.

Nothura maculosa cearensis Naumburg.—One was collected near Campina Grande, Paraiba, at an elevation of about 2,000 feet. Half-grown birds were found near São Lorenzo on August 4, 1945.

COLYMBIDAE. Grebes.

Podilymbus podiceps antarcticus (Lesson).—Fairly common on fresh-water lakes throughout both states.

SULIDAE. Boobies

Sula leucogaster leucogaster (Boddaert).—Uncommon. Two were seen off the reef at Recife in March, 1943. Any other appearances of this conspicuous species could hardly have been overlooked.

PHALACROCORACIDAE. Cormorants

Phalacrocorax olivaceus olivaceus (Humboldt).—Not common. Several were seen about a mile offshore in March, 1943.

FREGATIDAE. Frigate Birds

Fregata magnificens rothschildi Mathews.—Frigate Birds, presumably of this species, were seen in April, 1943, and several times in May, 1944, always moving southward.

ARDEIDAE. Herons

Ardea cocoi Linnaeus.—Apparently rather uncommon near Recife. One was seen at a distance deep in a brackish marsh on October 15, 1944; another at close range in a mangrove swamp, December, 1945.

Butorides striatus striatus (Linnaeus).—Very common in both mangrove and fresh-water swamps. One was seen carrying nesting material on April 23, 1944. It was also observed at Patos, Paraiba, at a small lake about 160 miles inland, and at other interior lakes and ponds.

Florida caerulea (Linnaeus).—Fairly common in both fresh-water and mangrove swamps. One was seen at Patos, Paraiba.

Casmerodius albus egretta (Gmelin).—Common, principally in the mangrove swamps. A small flock was found at Patos, Paraiba.

Nycticorax nycticorax hoacili (Gmelin).—A roost of five birds was found on the wooded shore of a large pond 200 miles inland, near Pombal, Paraiba.

Ixobrychus exilis erythromelas (Vieillot).—Only seen twice, on both occasions in a fresh-water marsh close to Recife.

Botaurus pinnatus (Wagler).—Fairly common, and noted regularly in one large brackish swamp. Some of these occurrences, however, doubtless represent repeats.

ANATIDAE. Ducks

Dendrocygna viduata (Linnaeus).—Large flocks are to be seen in the brackish marshes from the middle of September to April. These flocks break up and the birds become more widespread during the rainy season. A nest containing eleven eggs in a fairly advanced stage of incubation was found at the edge of the swamp on September 17, 1944. These ducks were fairly common at Patos, Paraiba, on August 13, 1944.

Dendrocygna autumnalis discolor Sclater and Salvin.—Uncommon near the coast, but about 4,000 were seen at the lake at Candado in western Paraiba, October, 1945.

Sarkidiornis carunculata (Lichtenstein).—About 40 or 50 were seen among some thousands of tree ducks on a large artificial lake (Candado) in western Paraiba near Pombal.

Anas brasiliensis (Gmelin).—Common in both fresh and brackish marshes, usually in small flocks and normally not closely associated with other species.

Nomonyx dominicus (Linnaeus).—This species was found to be fairly common in a fresh-water swamp, heavily overgrown with weeds, at Campo Grande, about 40 miles west of Recife, in June, 1944.

CATHARTIDAE. American Vultures

Coragyps atratus foetens (Lichtenstein).—The Black Vulture is abundant and very tame. It is the principal scavenger in the city of Recife and throughout the coastal area, but is somewhat less common in the interior.

Cathartes aura ruficollis Spix.—Very common throughout the region, but somewhat less so than the Black Vulture, which, however, it outnumbered in the interior.

ACCIPITRIDAE. Hawks, Kites, etc.

Elanus leucurus leucurus (Vieillot).—Seen on four or five occasions, usually over semi-open country.

Harpagus bidentatus bidentatus (Latham).—One was shot in dense jungle at Goiana in October, 1945. Apparently not common.

Heterospizias meridionalis meridionalis (Latham).—Noted on several occasions in the interior in rolling country which was well watered.

Buteo magnirostris nattereri (Sclater and Salvin).—Common and widely distributed throughout the coastal area, but principally in the palm fringe near the ocean. Also fairly common in the Sertão. A nest was found in a *caju* tree about 15 feet above the ground. It contained one egg on January 1, 1947.

Asturina nitida nitida (Latham).—One of these hawks was observed on a number of occasions, always in the same high tree in thick jungle south of Recife.

Hypomorphnus urubitinga urubitinga (Gmelin).—Fairly common. Frequently seen soaring with the vultures, usually in the vicinity of water. It was reported by a reliable source to attack chickens. Also seen at Patos, Paraiba, in August, 1944.

FALCONIDAE. Falcons

Herpetotheres cachinnans queribundus Bangs and Penard.—One was seen in a sparsely wooded zone near Aguas Belas, in south-central Pernambuco, January, 1945.

Polyborus plancus brasiliensis (Gmelin).—A widely distributed species, common in the palm fringe and somewhat less so in the interior.

Gampsonyx swainsonii swainsonii Vigors.—A small sluggish hawk. Apparently not common. It was seen on two occasions sitting on telegraph poles near the air field at Recife.

Falco sparverius eidos Peters.—Fairly common throughout the interior and noted even in the most arid sections. Also occasional in grasslands near the coast.

RALLIDAE. Rails

Rallus longirostris crassirostris Lawrence.—Five of these large rails were found in a small section of grassy marsh on January 16, 1944. In view of their readiness to take wing instead of skulking when approached, it is considered possible that the birds might be migrants. They were noted again in the same marsh on January 21, 1945.

Porzana albicollis albicollis (Vieillot).—Easily the commonest species of rail in the region. A female taken in August, 1943, had in the ovary two eggs complete except for shells. One was noted with a downy chick on March 25, 1945.

Porzana flaviventer flaviventer (Boddaert).—Seen occasionally in fresh-water marshes.

Laterallus melanophaius melanophaius (Vieillot).—Found on three occasions, twice in a small fresh-water marsh and the other time along a stream bank. A female with ovaries fairly well developed was taken on December 5, 1943.

Gallinula chloropus galeata (Lichtenstein).—Fairly common in fresh and brackish swamps about Recife, but noted more often in the interior. One small chick was found on October 13, 1943. Downy chicks a day or two old were noted at Patos, Paraiba, on August 13, 1944.

Porphyryla martinica (Linnaeus).—Fairly common at Campo Grande on June 25, 1944. A number were seen in fresh-water marshes near Recife on August 20, 1944. This species has not been observed near Recife during the dry season.

CARIAMIDAE. Seriemas

Cariama cristata (Linnaeus).—This species is confined to the arid interior, where it is not uncommon or particularly wary. Seen frequently along the road in western Pernambuco.

JACANIDAE. Jaçanas

Jacana spinosa jacana (Linnaeus).—Very common in all swamp and marshy sections in the Recife area. Full-grown immature birds were noted on March 26, 1944. Fairly common at Patos, Paraiba.

CHARADRIIDAE. Plovers

Belonopterus chilensis cayennensis (Gmelin).—Fairly common near Recife in both fresh and salt-water swamps, but only noted during the dry season. Also common in the Sertão, where every pond, however small, seems to have at least one pair.

Squatarola squatarola (Linnaeus).—Two birds in winter plumage were found on a sand spit on May 21, 1944. These birds are fairly common winter residents. The earliest fall record is September 9, 1945.

Charadrius hiaticula semipalmatus Bonaparte.—Flocks of 50 to 100 migrant shorebirds, including this and the preceding species, as well as Sanderlings, are often to be seen on the beaches in March and April. Exact fall dates are not available for this species, which appears to be somewhat less common than *C. wilsonia*.

Charadrius collaris Vieillot.—This resident species is fairly common throughout the year, being found in the same areas as those frequented by the migrants and also further inland. A specimen taken on June 29, 1945, was approaching breeding condition. One was taken in August, 1944, at Patos, Paraiba, about 160 miles inland.

Charadrius wilsonia wilsonia Ord.—Noted in mixed flocks from September 23, 1945, throughout the winter. The latest spring date was supplied by a specimen collected on May 21, 1944. Compared

with North American specimens this bird is nearest to typical *wilsonia*, but has the white frontal band narrower but not so narrow as in *beldingi*. Further material should be of interest.

SCOLOPACIDAE. Sandpipers

Numenius phaeopus hudsonicus Latham.—A fairly common species in the tide-water mangrove swamps throughout the winter, but it is very shy. The earliest fall date is September 23, 1945.

Tringa flavipes (Gmelin).—Fairly common. Noted from November 14 through April 15 in brackish and fresh-water marshes.

Tringa melanoleuca (Gmelin).—Three were shot out of a flock in a mangrove swamp close to the ocean on January 2, 1944. Lesser Yellow-legs and dowitchers were also present in the immediate vicinity.

Tringa solitaria cinnamomea (Brewster).—Common from early November to the middle of April, principally in fresh-water marshes. One collected April 16, 1944, was in breeding plumage. This species was very common along a small stream in the arid interior near São Caetano on February 26, 1946.

Actitis macularia (Linnaeus).—One was shot along the bank of the Paraiba River near João Pessoa on October 11, 1943. Others were noted in January and February.

Arenaria interpres morinella (Linnaeus).—Two small groups of three and four birds, respectively, were noted in a tide-water mangrove swamp on September 23, 1945. A flock of about 20 birds was seen close to the Pernambuco-Alagoas border on October 11, 1946.

Limnodromus griseus griseus (Gmelin).—Three birds were collected on January 2, 1944, out of a flock which also contained Lesser Yellow-legs. They were found in a swampy lake, surrounded by mangroves, close to the ocean.

Capella paraguaiae paraguaiae (Vieillot).—Common throughout the year in both salt and fresh-water swamps. A female in breeding condition was shot June 4, 1945.

Capella undulata gigantea (Temminck).—Uncommon. Only two birds were seen—one collected July 16, 1943, and the other September 15, 1943, both in a small fresh-water marsh close to the Recife airfield. Local hunters confirm that this species is seen very infrequently.

Crocethia alba (Pallas).—Common along the ocean beaches during migration, particularly in April. The latest spring record is May 21, 1944, and the earliest fall appearance, August 25, 1944. Frequently found in flocks with Semipalmated and Wilson's Plovers.

Ereunetes pusillus (Linnaeus).—One was shot and four others were seen along the coast close to the Pernambuco-Alagoas border on Octo-

ber 11, 1946. An injured bird was found on the beach at Recife, December 18, 1946.

Erolia minutilla (Vieillot).—Common in brackish marshes from late September through the middle of March.

LARIDAE. Gulls and Terns

Sterna hirundo hirundo Linnaeus.—One was collected out of a flock of 64 migrant terns, most of which were referable to this species. The flock appeared on October 8, 1944, and remained for several days fishing off the reef near Recife.

Sterna superciliaris Vieillot.—One was seen hovering over a small lake between Patos and Soledade in central Paraiba on October 18, 1945.

Thalasseus sandvicensis acuflavida (Cabot).—A few terns in the above-mentioned flock were identified by sight as being of this species.

COLUMBIDAE. Pigeons

Zenaida auriculata noronha (Chubb).—Several small flocks were observed at Patos, Paraiba, in the high Sertão on August 13, 1944. Very common on the Pernambuco-Paraiba border about 150 miles inland in October, 1945. Local sources state that enormous flocks of this dove are present in the Sertão during August and September.

Scardafella squammata squammata (Lesson).—Common in the palm fringe, although less so than *passerina*. A nest with two young was found in a palm tree on May 21, 1944. This species is abundant throughout the dry interior.

Columbigallina passerina griseola Spix.—Very common in the palm fringe and abundant in open fields. Also common in parts of the interior. Nests were found, usually on the ground, throughout the dry season, from the middle of September until the end of April. One was discovered on August 4, 1945, during the rainy season, containing two eggs. The nests were constructed of dried grass, and, though rather untidy, were better made than is usual in this genus. All but one were found on the ground. The exception was rather crudely built with dried reeds, and was in a crotch of a fallen branch about a foot above the water in a marsh. In no instance did the number of eggs exceed two. A nest located on November 2, 1943, contained one egg and one young bird, evidently very recently hatched. It was 1½ inches long and sparsely covered with buff-colored down.

Columbigallina talpacoti talpacoti (Temminck).—This handsome species is fairly common, usually noted in open fields along the coast.

Leptotila verreauxi approximans (Cory).—A male with testes enlarged was collected at Patos, Paraíba, in August, 1944. Not very common at São Caetano in high brush country, February, 1946. This species was also found to be fairly common in a narrow stretch of high brush country near the ocean in the vicinity of Recife.

PSITTACIDAE. Parrots

Aratinga jandaya (Gmelin).—These striking parakeets were fairly common in the palm fringe, usually in small flocks containing a dozen birds or less.

Aratinga cactorum caixana Spix.—Found only in the arid interior, where it is very common from Rio Branco (130 miles inland), Pernambuco, westward. Usually in groups of two to eight birds.

Aratinga aurea aurea (Gmelin).—Common in semi-open country where there are sufficient trees to act as cover. Occasionally occurs in large flocks. Neither this nor *Aratinga jandaya* were noted in the Sertão.

Forpus passerinus vividus (Ridgway).—This small parrotlet is fairly common in the semi-open country and somewhat less so in the palm fringe. It is always in flocks except during the breeding season. It was seen a number of times in the interior.

Amazona aestiva aestiva (Linnaeus).—Observed on four or five occasions in wooded areas in the interior, principally near the São Francisco River in southern Pernambuco.

CUCULIDAE. Cuckoos

Piaya cayana pallescens (Cabanis and Heine).—Fairly common in brushy sections; also observed infrequently in jungle.

Crotophaga ani Linnaeus.—A very common bird throughout the coastal zone. It is found in all types of terrain except jungle, but appears to prefer open fields and semi-marshy sections. Not uncommon in the interior. Half-grown young were noted near Recife on July 16, 1944, still being fed by the parents.

Guira guira (Gmelin).—Only slightly less common than the ani, and requires the same type of terrain, although it shows more preference for brushy sections. The flocks are very sedentary, sometimes remaining for months in one field.

TYTONIDAE. Barn Owls

Tyto alba tuidara (J. E. Gray).—Two young about 16 days old were found in the belfry of an old church near the Recife airfield on August 26, 1945.

CAPRIMULGIDAE. Goatsuckers

Chordeiles pusillus pusillus Gould.—A large percentage of the night-hawks observed in this region are apparently of this species. Specimens were collected on several occasions, including one at Patos, Paraíba, in August, 1944.

Podager nacunda nacunda (Vieillot).—Definitely identified several times. One was shot out of a large scattered group in a marshy section in open savannah country about 40 miles west of Recife.

Hydropsalis braziliana braziliana (Gmelin).—Only identified once, when one bird was shot out of fifteen or twenty present on the airfield on September 11, 1943.

CYPSELIDAE. Swifts

Chaetura andrei meridionalis Hellmayr.—Swifts are not common in this region. The only specimen collected was referable to this species.

TROCHILIDAE. Hummingbirds

Glaucis hirsuta hirsuta (Gmelin).—Fairly common but irregularly distributed in jungles near Recife. Not noted at Goiana.

Phaethornis ruber ruber (Linnaeus).—Found only in jungle where it is very common and exceedingly vocal. Mating display was observed in June, 1944, and 1945. This display consisted solely of the male darting back and forth very rapidly a few inches over the female.

Eupetomena macroura simoni Hellmayr.—Fairly common in the palm fringe and in semi-open country; not uncommon at São Caetano.

Melanotrochilus fuscus (Vieillot).—Rather uncommon. Several were seen at Escada (40 miles south of Recife) drinking from a waterfall in a low jungle section on November 25, 1944. Another was observed in jungle near Recife on January 27, 1945.

Chrysolampis mosquitus (Linnaeus).—This brilliantly colored hummer is rather uncommon. It was noted in brushy sections and occasionally in jungle.

Polytmus guainumbi thaumantias (Linnaeus).—Seen on only four occasions, always in marshy areas.

Amazilia fimbriata nigricauda (Elliot).—Common in the palm fringe, in brushy country, and even in the parks of Recife; occasional in jungle. Also common in the São Caetano region. One was observed feeding young on October 1, 1945.

ALCEDINIDAE. Kingfishers

Ceryle torquata torquata (Linnaeus).—Seen on an average of about eight times a year, usually in the larger swamps—possibly often the

same birds. One was noted fishing on a reef about a half mile from shore in February, 1946.

Chloroceryle amazona amazona (Latham).—Fairly common in the mangrove swamps and somewhat less so in fresh-water marshes and along streams. Also seen in the interior.

Chloroceryle americana americana (Gmelin).—Fairly common in fresh-water marshes, and on lakes and ponds in the interior.

GALBULIDAE. Jacamars

Galbula rufoviridis rufoviridis Cabanis.—Fairly common in jungle and occasional in trees about cultivated areas.

BUCCONIDAE. Puffbirds

Nystalus maculatus maculatus (Gmelin).—Common in trees in semi-open and brushy sections, frequently close to human habitations. Often noted on telegraph wires. It was rather common in parts of the interior.

Chelidoptera tenebrosa brasiliensis (Sclater).—A pair of these puffbirds lived close to a stream on the road to João Pessoa, about 30 miles north of Recife. They were feeding full-grown young on March 19, 1944. Apparently quite rare as none were observed elsewhere.

RAMPHASTIDAE. Toucans

Pteroglossus aracari aracari (Linnaeus).—Found only in heavy jungle in the vicinity of Goiana, about 40 miles north of Recife. Although infrequently seen, their cry, which is much like an axe hitting a tree, but with a slightly more metallic ring, was often heard. Two specimens were collected on December 26, 1943.

Pteroglossus inscriptus inscriptus Swainson.—Only noted on one occasion, when a male was taken on October 1, 1944, in medium second-growth jungle close to Recife.

PICIDAE. Woodpeckers

Chrysoptilus melanochloros juae Cory.—Common, but almost entirely confined to the palm fringe. One was shot in north-central Pernambuco on October 16, 1945.

Veniliornis passerinus taenionotus (Reichenbach).—Fairly common in the jungle and occasional in the interior.

Picumnus exilis pernambucensis Zimmer.—Not common. Seen twice near Recife, once at the edge of the jungle and once in second-growth thickets near the ocean. One specimen was collected.

DENDROCOLAPTIDAE. Woodhewers

Lepidocolaptes fuscus atlanticus (Cory).—Found exclusively in heavy jungle near the coast where it is not uncommon. A male in breeding condition was shot November 12, 1944, and several other specimens were collected.

Sittasomus griseicapillus reiseri Hellmayr.—Common in the jungle. A male with enlarged testes was collected July 9, 1944. Easily the commonest woodhewer in this region.

FURNARIIDAE. Ovenbirds, Spine-tails, etc.

Furnarius figulus figulus (Lichtenstein).—Common in all marshy sections. Nests were noted in April and May. A nest containing three eggs was examined May 28, 1944. The species was also noted in the interior.

Synallaxis frontalis frontalis Pelzeln.—Not uncommon in heavy jungle. One was taken in brushy country at the edge of the Sertão.

Certhiaxis cinnamomea cearensis (Cory).—One was shot at São Caetano on October 15, 1945.

Pseudoseisura cristata (Spix).—A common and conspicuous species in the Sertão, usually found in pairs. Their bulky nests are a regular feature of the landscape in the interior.

Automolus leucophthalmus lammi Zimmer.—Specimens were collected in thick jungle at Dois Irmaos Park, Recife, on February 18 and August 12, 1945. Not seen on any other occasion.

Xenops minutus (genibarbis?) Illiger.—Collected on three or four occasions, always in heavy jungle. Two males shot on November 12, 1944, were in breeding condition. Probably more common than these records indicate as it is very inconspicuous.

FORMICARIIDAE. Ant-thrushes

Taraba major stagurus (Lichtenstein).—Not common along the coast. A female was collected in a brushy section just south of Recife. Several males were noted in high bush country at São Caetano, where it is apparently more common.

Thamnophilus dobiatus capistratus Lesson.—Apparently uncommon near the coast. An immature male was shot in dense undergrowth in a jungle section near Recife. Fairly common at São Caetano.

Thamnophilus palliatus palliatus (Lichtenstein).—Apparently not common here. Observed twice at the edge of the jungle near Recife.

Thamnophilus punctatus pelzelni Hellmayr.—A male was taken on July 2, 1944, in low growth at the edge of the jungle south of Recife. Others were noted later in another jungle section near the city.

Myromotherula axillaris luctuosa Pelzeln.—A common species in the jungle where it is normally found in lower growth. Sometimes present in mixed feeding flocks with *Xenops* and other insectivorous birds.

Myrmorchilus strigilatus strigilatus (Wied).—A ground-haunting ant-bird which was almost certainly of this species was fairly common in the dense brush at São Caetano. Several specimens were examined. It was not found along the coast.

Formicivora grisea grisea (Boddaert).—Rather common. Usually encountered in the jungle, but occasional along the coast in thick brush. It was taken also at São Caetano.

Pyriglena leuconota pernambucensis Zimmer.—Common in the thick jungle at Goiana, but only taken once in jungle sections south of Recife. A ground species.

CONOPOPHAGIDAE. Gnat-eaters

Conopophaga lineata (Wied).—Four fully-grown immature birds were found in the jungle near Recife on April 30, 1944. Several others were taken later in dense jungle, but this gnat-eater is not common.

COTINGIDAE. Chatterers

Xipholena atro-purpurea (Wied).—Several specimens were collected in thick jungle at Goiana. This species is confined to large jungle areas. Pinto (*Catalogo das Aves do Brasil*) was of the opinion that this cotinga was extinct in the northeast.

PIPRIDAE. Manakins

Pipra erythrocephala rubrocapilla Temminck.—Fairly common in low dense jungle.

Chiroxiphia pareola pareola (Linnaeus).—Common in low jungle at Goiana and fairly common in similar areas south of Recife. Courtship dancing by this species was observed for about half an hour on January 22, 1945. Four males and one female were present, but two of the males were merely onlookers. The other two used a small horizontal branch about two feet above the ground. They perched parallel to one another, and first one and then the other would jump about a foot in the air, beating his wings violently and uttering a purring note. Frequently they would jump over one another. When the female, which was silent throughout, alighted on a branch close by, they usually deserted their perch and demonstrated on each side of her. When she retreated they returned to the original branch. Finally she alighted on the perch and both faced her and danced violently. This occurred several times until one male finally left (not visibly driven off)

and the female remained on the branch, posturing and hopping a little, while the male danced excitedly about her. Three or four times he darted to a twig about six feet away but returned immediately. They finally copulated twice in close succession, after which he flew off, but she remained for about a minute longer. All birds then deserted the area, but a male returned shortly thereafter and began calling.

Manacus manacus gutturosus (Desmarest).—Common in all jungle sections. Mating display was observed in early October.

TYRANNIDAE. Tyrant Flycatchers

Fluvicola pica albiventer (Spix).—This flycatcher is unknown on the coast but is common in the interior, where it is found side by side with *climazura* and apparently replaces *leucocephala*. Noted at São Caetano but no nearer to the littoral. At São Caetano it was outnumbered about five to one by *climazura*. Whereas *climazura* runs along the ground seeking its food, *albiventer* is inclined to perch on a twig close to the water and catch flies in the air.

Fluvicola climazura climazura (Vieillot).—This ground flycatcher is the commonest bird about the streets and parks of Recife. It is also very common throughout the coastal zone, and moderately so in the interior. It is particularly partial to localities where there is water, and is confined to such sections in the Sertão. A nest containing almost grown young was found on October 24, 1943. Another nest in process of construction was found in a swamp on April 23, 1944, and a nest with one egg on January 20, 1946. Nests were noted at heights varying from twelve to three and one-half feet above the ground, and were always in the vicinity of water, usually at the end of a limb with the entrance facing outward. They are covered at the top, and are normally constructed of dried grass with some cotton near the entrance, and are lined with feathers.

Arundinicola leucocephala (Linnaeus).—Very common in marshy sections but apparently confined to the coast. A nest containing two eggs was found on November 14, 1943. Numerous nests were under construction during the latter part of April, 1944, and a nest visited May 28, 1944, contained three eggs. The nests are to be found in bushes in the swamps, usually not over four feet above the ground. No attempt is made to conceal them, and they are invariably very conspicuous. The nests are very well made, and are roofed, with the entrance at the side. They measure about four inches high, and about three wide, and are constructed principally of dried grass. The chamber is thickly lined with soft substances, usually some type of down.

Muscivora tyrannus tyrannus (Linnaeus).—Although the Fork-tailed Flycatcher is common farther north, it is rare in Pernambuco and Paraiba. One was seen January 13, 1946, at Goiana and another at Recife, February 23, 1946, both in brushy areas. These birds are believed to be migrants.

Tyrannus melancholicus despotes (Lichtenstein).—Abundant in brushy and semi-open localities where it is frequently noted on telegraph wires. It is present even in the driest parts of the Sertão, but is much less common in the interior.

Empidonomus varius varius (Vieillot).—Occasional in semi-open and brushy country, usually in small flocks.

Megarhynchus pitangua pitangua (Linnaeus).—Seen on several occasions in the jungle at Goiana. It is immediately distinguishable from the preceding species by its note.

Myiozetetes similis pallidiventris Pinto.—Common in semi-open country and marshy sections. A nest discovered on February 27, 1944, had just been completed. Another, containing four eggs, was found on April 23, 1943.

Pitangus sulphuratus maximiliani (Cabanis and Heine).—This large, noisy flycatcher is found most commonly in the palm fringe and somewhat less frequently in semi-open areas, and was observed at Patos, Paraiba, and in other parts of the interior. It was also noted on the reef about 100 yards offshore, feeding on marine life. Nests containing eggs have been found during March and April. Four eggs appear to comprise a normal clutch. A typical nest, found March 7 in a *caju* tree was close to the end of a limb, about fifteen feet above the ground. The entrance was on the side away from the trunk. It was ten inches in diameter, and was composed of twigs, dead vines, and a few pieces of paper. It contained two eggs and two freshly hatched young.

Cnemotriccus fuscatus bimaculatus (Lafresnaye and d'Orbigny).—Uncommon. My only record is of a female with ovaries slightly enlarged which was shot in dense jungle just south of Recife on February 4, 1945.

Myiobius atricaudus snethlagei Hellmayr.—Not very common. Noted once at Goiana and several times south of Recife, always in fairly heavy jungle.

Myiophobus fasciatus flammiceps (Temminck).—Noted on several occasions in an overgrown pasture. An immature bird was taken in low jungle on October 1, 1944.

Hirundinea bellicosa bellicosa (Vieillot).—One was shot and several were seen at Triunfo, Pernambuco, about 150 miles inland and close to the Paraiba border at an altitude of about 4,000 feet.

Platyrinchus mystaceus mystaceus Vieillot.—Rare. Several were seen and one was collected in jungle undergrowth at Dois Irmãos Park, Recife, on June 10, 1945.

Tolmomyias flaviventris flaviventris (Wied).—A small, olive-backed flycatcher. Common in the jungle. A male shot on October 22, 1944, was in breeding condition.

Todirostrum cinereum cearae Cory.—A common species in semi-open country, where it shows a strong affinity for *caju* trees. A nest under construction was noted about thirty feet above the ground on April 30, 1944. The species was found also in the high bush country at São Caetano.

Euscarthmornis margaritaceiventris wuchereri (Sclater and Salvin).—This tiny flycatcher was only noted in dense thickets along the coast, where, owing to its excessive shyness, it may be more common than my records indicate. Specimens were secured on October 29, 1944, and May 27, 1945.

Euscarthmornis zosterops naumburgae Zimmer.—A common jungle species, very sedentary in its habits. A male with testes enlarged was collected November 12, 1944. A flycatcher apparently of this species was shot at Custodia (central Pernambuco) in October, 1945.

Elaenia cristata Pelzeln.—Common in brushy country along the coast.

Myiopagis viridicata viridicata (Vieillot).—A fairly common, sedentary jungle species. A male with testes enlarged was collected on November 12, 1944.

HIRUNDINIDAE. Swallows

Progne chalybea domestica (Vieillot).—Fairly common about Recife, where the birds frequently roost on the tops of the city buildings. Common in all towns in the interior. This species was noted gathering nesting material at Equador, Rio Grande do Norte (in the Sertão), on February 13, 1944.

Phaeoprogne tapera tapera (Linnaeus).—Common about the city, in the palm fringe and in semi-open country. Also noted at Patos, Paraiba.

Stelgidopteryx ruficollis ruficollis (Vieillot).—Only encountered once when a flock was found and one specimen collected in the jungle at Goiana on June 3, 1944. The birds were all perched in a large dead tree.

Hirundo rustica erythrogaster Boddaert.—The Barn Swallow is a common winter resident, usually in the vicinity of marshes. The first arrivals appear about the middle of September, and the flocks begin to

gather for their northward migration about the middle of February. The latest recorded spring date is March 19, 1944.

Iridoprocne albiventer (Boddaert).—Common about the swamps and rivers. One pair nested in the eaves of the barracks at the airfield in September, 1944. Also noted at Patos, Paraiba.

CORVIDAE. Crows and Jays

Cyanocorax cyanopogon (Wied).—These handsome jays are confined to the interior where they are usually found in small bands. They are fairly common in the lower foothills near Flores, Pernambuco, close to the Paraiba border, and were also noted at a lower elevation between Patos and Pombal in Paraiba. They are very noisy, uttering a flute-like, rather musical note resembling one of their vernacular names, *pion-pion*.

TROGLODYTIDAE. Wrens

Thryothorus longirostris bahiae (Hellmayr).—Fairly common in thick brush at São Caetano.

Thryothorus genibarbis genibarbis Swainson.—Common in the jungle, where, although rarely seen, its loud, liquid notes are often heard.

Troglodytes musculus musculus Naumann.—This familiar species is fairly common in the vicinity of houses and along the palm fringe. Also observed in the Sertão. One was feeding young still in the nest at São Lorenzo, March 3, 1946.

MIMIDAE. Mockingbirds

Mimus gilvus antelius Oberholser.—Confined to the littoral, where it is relatively common in the scrub just back of the beach.

Mimus saturninus frater Hellmayr.—This mockingbird is abundant in the dry interior, usually in small flocks.

Donacobius atricapillus atricapillus (Linnaeus).—Fairly common in the marshy sections south of Recife, provided there is sufficient brush to afford adequate cover.

TURDIDAE. Thrushes

Turdus leucomelas albiventer Spix.—One specimen collected in the jungle near Recife was of this species. Thrushes are frequently heard in deep jungle, and this bird may be fairly common.

Turdus rufiventris juensis (Cory).—Much shyer than the American Robin, which it strongly resembles. Usually found in medium jungle, but not uncommon wherever large deciduous trees are available for cover. Seen occasionally in parks in the city. Several were noted at Patos, October, 1945.

SYLVIIDAE. Warblers, Gnatcatchers, etc.

Polioptila plumbea atricapilla (Swainson).—One pair was found in an overgrown pasture near Recife. Not common in the coastal zone, but a typical and abundant species in the Sertão.

Ramphocaenus melanurus melanurus Vieillot.—One was collected out of the treetops in dense jungle at Goiana on March 19, 1944.

MOTACILLIDAE. Pipits

Anthus lutescens lutescens Pucheran.—Common in suitable open and somewhat marshy habitats. Often seen on the field at the airport.

CYCLARHIDAE. Pepper-shrikes

Cyclarhis gujanensis cearensis Baird.—A very common species, but it usually sticks close to dense foliage, and would often be missed except for its constant and distinctive singing. Also noted in the interior at Patos and São Caetano.

VIREONIDAE. Vireos

Vireo virescens chivi (Vieillot).—A male with testes greatly enlarged was taken on April 2, 1944, and another specimen collected in jungle on October 8, 1944. Vireos are fairly common in the jungle, but usually escape notice except during mating season when the song is much in evidence.

Hylophilus poicilotis amaurocephalus (Nordmann).—This species was common in the high brush country at São Caetano, about 100 miles inland, in April, 1946. They were usually found in small groups and frequented low bushes.

COEREBIDAE. Honey-creepers

Coereba luteola chloropyga (Cabanis).—Abundant, particularly in the palm fringe, but also found in jungle. Common in the city parks. Apparently rather rare at São Caetano. Nesting takes place throughout the dry season in the coastal zone, but is particularly noticeable in March and April. However, one nest with three young was noted on November 2, 1946. It has been observed that this species frequently builds in close proximity to hornets' nests. The nests are usually not more than ten feet above the ground, and are often in *caju* trees, but are sometimes in the eaves of houses. They are constructed of twigs, and usually lined with palm fiber. On April 7, 1944, nest building operations were observed for several hours. Apparently only one bird was working, although another, probably the male, was heard singing

at frequent intervals near by. On one occasion, six trips were made to the nest in seven minutes, and later seven trips in 13 minutes. The bird was lining the nest, and remained within for periods usually not exceeding five seconds, but did not emerge for 27 seconds in one case. There were intervals up to half an hour when no work was done on the nest.

Dacnis cayana paraguayensis Chubb.—Fairly common in second-growth as well as in the jungle tree tops. Occasional in the palm fringe.

Cyanerpes cyaneus cyaneus (Linnaeus).—Moderately common, usually high up in jungle trees, but sometimes found in lightly wooded sections.

Chlorophanes spiza axillaris Zimmer.—Apparently rare. One sight record is from a jungle near Amaraji, about 60 miles southwest of Recife on February 23, 1946.

PARULIDAE. Wood Warblers

Parula pitiayumi pitiayumi (Vieillot).—A singing male was collected in thick brush at São Caetano.

Basileuterus flaveolus (Baird).—This ground-haunting warbler is common in the jungle. A female simulating a broken wing was noted on November 12, 1944, and a male with testes enlarged was shot the same day. This species is absolutely fearless and will approach within a few feet if the observer remains motionless.

Geothlypis aequinoctialis (velata?) (Vieillot).—Rare. A male was shot on August 29, 1943, in a low bush at the edge of a swamp near the airport. No others were seen in spite of extensive swamp work.

ICTERIDAE. Troupials, Hangnests

Cacicus cela cela (Linnaeus).—A very common species in the palm fringe. Nesting colonies were found in the palms from the middle of November to the middle of January. Also common about *caju* trees a little farther inland.

Molothrus bonariensis bonariensis (Gmelin).—Flocks of this cowbird are not uncommon in open pasture land near Recife. Also noted in the interior of Paraiba between João Pessoa and Campina Grande.

Molothrus rufo-axillaris Cassin.—Three Screaming Cowbirds were noted in a flock of about 40 *bonariensis* in a pasture near Recife on October 22, 1944, and one of them, a female, was collected. Dr. Friedmann, in a letter to the writer regarding this bird, stated that "this constitutes a very remarkable extension of range. This species was not known previously north of extreme southeastern Brazil. In

view of the fact that farther south this species is parasitic almost exclusively on *Molothrus badius*, it is of interest to find that its range extends northward to include that of *M. b. fringillarius*." It is not yet known, however, whether it parasitizes the latter form in eastern Brazil.

Molothrus badius fringillarius (Spix).—A specimen was obtained from a flock of about 20 birds in brush country 40 miles southwest of Recife on June 18, 1944.

Icterus cayanensis tibialis Swainson.—This common species is found almost exclusively in the palm fringe. Several were seen in a small wood between Patos and Pombal in western Paraiba.

Icterus jamacaii (Gmelin).—One was seen in a large tree at the edge of a pasture close to Recife. This species, although rare near the coast, is a fairly common and conspicuous bird in the arid interior.

Agelaius ruficapillus frontalis Vieillot.—A colony of these blackbirds consisting of about 30 individuals was present throughout the year in a small fresh-water marsh near Recife. The first eggs were found on April 23, 1944. Nests containing eggs and newly hatched young, and birds just out of the nest, were noted on May 28. The nests were attached to reeds, and were only about one and a half feet above the water. They were made of rushes, bound together and lined with rootlets. A clutch usually consisted of three eggs.

Gnorimopsar chopi sulcirostris (Spix).—One of these grackles was observed in medium heavy woods about 25 miles north of the São Francisco river in south-central Pernambuco. Apparently not found in the littoral.

Leistes militaris superciliaris (Bonaparte).—Common, usually in flocks in open fields, savannahs and damp meadows. Also observed at Patos and São Caetano.

THRAUPIDAE. Tanagers

Tanagra violacea aurantiicollis (Bertoni).—A jungle species which is fairly common. It is almost always associated in mixed flocks with other small tanagers and honey-creepers.

Tanagrella velia cyanomelaena (Wied).—Rare. One was shot out of a flock of honey-creepers in heavy jungle at Goiana on March 19, 1944.

Tangara fastuosa (Lesson).—This handsome little species is not very common about Recife. It was found under the same conditions as *Tanagra violacea*.

Tangara cyanocephalus corallina (Berlepsch).—Occasional in brushy country, although it is believed to be more common than my records indicate. A female observed on June 20, 1943, was feeding several

almost full-grown young. Also noted in jungle at Amaraji, about 60 miles southwest of Recife.

Tangara cayana flava (Gmelin).—A very common species which is found almost exclusively in brushy sections.

Thraupis sayaca sayaca (Linnaeus).—This is the only species of the family normally found in the parks in the center of the city. It is frequently present in brushy areas close to the coast, and seems to show a preference for the vicinity of human habitations. One was collected at São Caetano.

Thraupis palmarum palmarum (Wied).—A fairly common species in the palm fringe. One was shot in medium jungle. Two fully fledged young were found in a nest in a palm tree in December, 1945.

Ramphocelus bresilius bresilius (Linnaeus).—This striking tanager is not uncommon in low marshy jungle.

Habia rubica bahiae Hellmayr.—One was shot at Dois Irmãos Park, Recife, in heavy jungle, June 10, 1945. Dr. John T. Zimmer, in a letter to Dr. Herbert Friedmann, dated April 17, 1947, made the following comments regarding this specimen. "I cannot match it exactly in our series. It is a young male and from its black bill and large size must be referred to *bahiae* unless it belongs to an unknown new form. It has never been recorded from the neighborhood of Recife or anywhere north of Bahia so there is nothing on record to give a clue. I should not be surprised if it were simply the Bahian subspecies from a new northern locality."

Tachyphonus rufus (Boddaert).—Very common in brushy and cultivated sections but only occasional in low jungle. Also found at São Caetano.

Tachyphonus cristatus brunneus (Spix).—A relatively common bird in the dense jungle at Goiana, where it is usually found in lower growth. It was not observed elsewhere.

Thlypopsis sordida sordida (Lafresnaye and d'Orbigny).—This species is fairly common in brushy country and somewhat rarer in low jungle.

Schistochlamys melanopsis olivina (Sclater).—Rather common in bush sections, where it shows a definite tendency to frequent the semi-arid slopes which other birds appear to shun.

FRINGILLIDAE. Finches, Buntings, etc.

Saltator maximus maximus (P. L. S. Müller).—Rather common in all jungle sections and occasional in semi-open country.

Caryothraustes canadensis frontalis (Hellmayr).—This bird has been found on only one occasion when a specimen was collected in lower growth in a dense jungle section at Goiana.

Paroaria dominicana (Linnaeus).—The Brazilian Cardinal is very common near Recife in the brush and in semi-open pasture land, somewhat less so in the palm fringe. This bird is abundant in the dry Sertão, and is the most conspicuous species there with the exception of the ground doves.

Cyanocompsa cyanea cyanea (Linnaeus).—Not a common species. Usually noted in brushy regions between the coastal belt and the Sertão. It was taken at São Caetano.

Spermophila albogularis (Spix).—This seedeater was noted at São Lorenzo and was common in flocks at São Caetano.

Spermophila leucoptera cinereola (Temminck).—Fairly common in brushy country. Also found in savannah and on sugar-cane plantations.

Spermophila nigricollis nigricollis (Vieillot).—A common species in overgrown pastures and cultivated areas. A nest with three eggs was found in a small pine tree close to the beach in March, 1946.

Spermophila lineola (Linnaeus).—A specimen was collected in a bushy section about 15 miles south of Recife on April 2, 1944. Four or five individuals were noted in a bushy marsh on February 4, 1945. Large numbers of these birds appear in the local pet store about this time of year, and it is considered possible that the species is migratory.

Spermophila bouvreuil bouvreuil (P. L. S. Müller).—A very common species in semi-open country. Large flocks gather to feed in the reed beds during the dry season.

Oryzoborus angolensis angolensis (Linnaeus).—This little finch is fairly common in second-growth jungle and thick brushy sections, but it often escapes notice. During the breeding season, in early December, singing males can be heard throughout all suitable areas.

Volatinia jacarina jacarina (Linnaeus).—Fairly common in open fields. A few were noted at São Caetano.

Spinus yarrelli (Gmelin).—A pair was seen in a cultivated section close to the city, and a male about 50 miles south of Recife. Also noted at São Caetano.

Sicalis flaveola brasiliensis (Gmelin).—Abundant in overgrown pastures and cultivated areas about Recife, and common in the city parks. Also common in the Sertão. It is very popular locally as a cage bird.

Coryphospingus pileatus pileatus (Wied).—Not found along the coast, but very common in small flocks throughout the Sertão.

Arremon taciturnis taciturnis (Hermann).—Not common. A shy ground-haunting sparrow found only in the undergrowth in thick jungle.

Myiospiza humeralis humeralis (Bosc).—This rather inconspicuous species is usually found in grassy sections at the edge of marshes and in damp meadows. Two nests containing two eggs each were found on the ground in the latter type of situation on April 18 and October 15, 1944. The nests were in little clumps of grass, were constructed of dried grasses, and measured six by seven centimeters across.

Zonotrichia capensis malutina (Lichtenstein).—This familiar Brazilian sparrow is absent from the coastal regions but is very common at São Caetano. It was noted also in western Paraiba.

Emberizoides herbicola herbicola (Vieillot).—A common species which is found exclusively in marshy sections. Two nests were found on September 17, 1944, one containing two eggs, and the other two young about six days old. The nests were fairly well woven and made of dried grasses. They were securely tied to thick tussocks of dried grasses and were about a foot above the ground.

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