

NOTES ON SOME PANAMA CANAL ZONE BIRDS WITH  
SPECIAL REFERENCE TO THEIR FOOD.

BY THOMAS HALLINAN.

OBSERVATIONS were made on the occurrence and the food, nesting and general habits of 440 collected specimens, including 159 species.

The specimens have been deposited in the American Museum of Natural History, in New York City, and the identifications were made by Mr. W. deW. Miller who has remarkable ability as a taxonomist.

The scientific permit to collect these birds was issued by Governor George W. Goethals. His administration, by enforcing the existing laws, on the Panama Canal Zone, provided protection to the birds and it has made this territory as desirable to the avifauna as some of the remote, uninhabited regions on the Isthmus.

In the field work I had extensive aid from several men whose resourcefulness and persistency added largely to the observations and their names, following, I subscribe with pleasure.—Mr. Elliott F. Brown, Balboa, Canal Zone; Mr. Albert Horle, Cristobal, Canal Zone; Mr. Ernest Peterkin, United States Navy; Mr. P. T. Sealey, New York City; Mr. Ezekiel Arnott Smith, Hartford, Conn.; and Mr. Joseph W. Smith, Sisson, Calif.

The following list locates the stations, mentioned in this paper, with reference to the Panama Canal:—

Ancon Hill.—Near the Pacific entrance of the Canal.

Balboa.—Near the Pacific entrance of the Canal.

Casa Largo.—About 10 miles northeast of the junction of the Chagres River and the Canal, on the Atlantic Slope.

Corozal.—Near the Pacific entrance of the Canal.

Culebra-Arraijan Trail.—Running about 6 miles south, on the Pacific Slope, from Culebra on the Continental Divide.

Darien Radio Station.—On the Canal, about 22 miles from the Atlantic entrance, on the Atlantic Slope.

Farfan.—Near the Pacific entrance of the Canal.

Gatun.—On the Canal, about 7 miles from the Atlantic entrance, on the Atlantic Slope.

Gamboa.—On the Canal, about 25 miles from the Atlantic entrance, on the Atlantic Slope.

Gorgona.—On the Canal, about 22 miles from the Atlantic entrance, on the Atlantic Slope.

Juan Diaz.—About 14 miles east of the Pacific entrance of the Canal, on the Pacific Slope.

Juan Mina.—On the Chagres River about 6 miles northeast of the junction of the Chagres River and the Canal.

La Boca.—Near the Pacific entrance of the Canal.

Las Cascadas.—On the Canal, about 27 miles from the Atlantic entrance, on the Atlantic Slope.

Las Guacas.—On the Chagres River about 4 miles northeast of the junction of the Chagres River and the Canal.

Mindi.—On the Canal, about 5 miles from the Atlantic entrance.

Naos Island.—Near the Pacific entrance of the Canal.

New Culebra.—On the Canal, about 30 miles from the Atlantic entrance, on the Continental Divide.

Old Panama.—About 5 miles east of the Pacific entrance of the Canal, on Panama Bay.

Palo Seco.—Near the Pacific entrance of the Canal.

Rio Algarrobo.—A small stream about 7 miles northeast of the Pacific entrance of the Canal, flowing into Panama Bay.

Rio Caimitillo.—A small stream flowing into Miraflores Lake about 7 miles from the Pacific entrance.

Rio Chilibre.—A small stream flowing into the Chagres River, about 6 miles northeast of its junction with the Canal.

Rio Juan Diaz.—A small stream, about 14 miles east of the Pacific entrance of the Canal, flowing into Panama Bay.

Rio Velazquez.—A small stream, about 4 miles west of the Pacific entrance of the Canal, flowing into the Canal.

Rio Venado.—A small stream, about 5 miles west of the Pacific entrance of the Canal, flowing into Panama Bay.

Sosa Hill.—Near the Pacific entrance of the Canal.

Taboguillo Island.—Near the Pacific entrance of the Canal.

Tiger Hill.—On the Canal, about 14 miles from the Atlantic entrance, on the Atlantic Slope.

Tortola Island.—Near the Pacific entrance of the Canal.

Venado Island.—Near the Pacific entrance of the Canal.

**Larus atricilla.** LAUGHING GULL.—La Boca, Mar. 21, 1915. Two males. Flying over the water. This species was common in this locality. Its flight was not fast and at times large numbers could be seen resting on the water in close formation.

**Sterna maxima.** ROYAL TERN.—Palo Seco, Mar. 27, 1915. One male and one female. On the wing over the water about  $\frac{1}{2}$  mile from shore. Scales and bones of small fish in stomach. There were several flying swiftly over a large area, diving at intervals into the water from heights of 40 feet or more. When the female was shot the male hovered around and came close to the water, several times, where the bird was floating.

**Puffinus tenuirostris.** SLENDER-BILLED SHEARWATER.—Naos Island, June 8, 1915. Male. Picked up on the water. There were several floating on the water in the vicinity apparently exhausted. When the bird was placed on a cake of ice it revived and became active. This observation extends the known range of this species, southward, into Central America.

**Oceanodroma melania.** BLACK PETREL.—Palo Seco, Mar. 24, 1915. Two males. Flying over the water about  $\frac{1}{2}$  mile from shore. Particles of sea weed and a soft mass of marine forms in stomach. They were on the wing at dusk and one was seen flying in the darkness preceding a storm. Sometimes they rested on the water and sometimes they suspended themselves with a wing motion and paddled with their feet just on the surface. They flew singly over a wide area with graceful glides, rapidly moving near the surface, and at times several would congregate at one spot where they had found food. This observation extends the known range of this species, southward, into Central America.

**Sula nebouxii.** BLUE-FOOTED BOOBY.—(a) Tortola Island, Mar. 27, 1915. Male. On the wing  $\frac{1}{2}$  mile off shore. (b) Taboguillo Island, Sept. 12, 1915. Female. Resting in trees on a rocky islet off shore. It was roosting with White-bellied Boobies.

**Sula leucogastra.** WHITE-BELLIED BOOBY.—(a) Taboguillo Island, Sept. 12, 1915. Three females. Resting in trees on a rocky islet off shore. One specimen had a fish, 14 inches long and 2 inches in diameter, with the head partly digested and the tail sticking out of its bill. The birds are excellent fliers, divers, and swimmers. (b) Taboguillo Island, Dec. 5, 1915. Female. In a flock flying over the water. (c) Taboguillo Island, Dec. 5, 1915. Female. Shot after leaving nest on a rocky, wooded islet, about  $\frac{1}{4}$  mile off shore. The nest was on a rock shelf among the cacti and shrubbery. It was made of sticks, dried leaves and a few feathers, flat on the rock. Two white eggs, covered with chalky deposit. There were about 20 nests in the vicinity. The birds could be approached to within a few feet, while on the nests, but would show great agitation, and if disturbed they would return quickly. All the nests had two eggs, except one, and that had a single egg.

**Anhinga anhinga.** AMERICAN DARTER.—On the Rio Chilibre, Jan. 16, 1916. Male. Grass tops and seeds in stomach.

**Phalacrocorax vigua.** BRAZILIAN CORMORANT.—(a) Old Panama, Feb. 21, 1915. Two males. Flying along the shore. In the intestines were worms, about 1 inch long and .03 inch in diameter. This species is common along the shore and on the islands of Panama Bay. On Changarmi Island, near the Pacific entrance of the Canal, they roosted at night in great numbers. (b) Farfan, Aug. 22, 1915. Resting on a Mangrove tree in a swamp. Fragments of fish in stomach.

**Fregata aquila.** FRIGATE BIRD.—(a) Taboguillo Island, Dec. 5, 1915. Two males. The birds carried Hippoboscidae. Balboa, May 18, 1916. Flying over the water. Female. A fish, 14 inches long, in stomach. When dynamiting was done under the water these birds learned to come quickly, by the score, to get the stunned and floating fish. (b) Taboguillo Island, Dec. 5, 1915. Flying over the water.

**Querquedula discors.** BLUE-WINGED TEAL.—Gamboa, Oct. 15, 1915. Female. On Gatun Lake. Grass tops and seeds in stomach.

**Ajaja ajaja.** ROSEATE SPOONBILL.—(a) At the mouth of the Rio Juan Diaz, Oct. 17, 1915. A small Periwinkle shell in stomach. In a flock of six, on a dead tree, in a point of woods running out into the tidal mud flats. Female. (b) At the mouth of the Rio Juan Diaz, Nov. 7, 1915. Male. Eight Periwinkle shells,  $\frac{1}{8}$  inch long, in stomach. On a tree overhanging the tidal mud flats. There were a few others feeding on the mud flats.

**Guara alba.** WHITE IBIS.—(a) At the mouth of the Rio Juan Diaz, Oct. 3, 1915. Male. Fish scales in stomach. In a small flock in the Mangrove trees in a tidal swamp. (b) At the mouth of the Rio Juan Diaz, Nov. 7, 1915. Male. Small bivalves and fragments of crabs in stomach. On the tidal mud flats. There was a flock of more than one hundred feeding on the mud flats, in this locality. (c) Taboguillo Island, Dec. 5, 1915. Male. Cockroaches,  $2\frac{1}{2}$  inches long, in stomach. On a wooded, rocky islet, about  $\frac{1}{4}$  mile from shore.

**Florida caerulea.** LITTLE BLUE HERON.—(a) Gatun, Aug. 30, 1908. In a swamp. Gatun, Mar. 21, 1909. Two Crawfish, 3 inches long, in stomach. On a sandbar in a stream. (b) Corozal, Mar. 12, 1915. Female. In a Mangrove swamp. (c) Corozal, Mar. 12, 1915. Female. Small Coleoptera in stomach. In a Mangrove swamp. (d) On the Rio Venado, Mar. 27, 1915. Male. Shrimps,  $1\frac{1}{2}$  inches long, and crab legs, 2 inches long, in stomach. In a Mangrove tree. (e) Farfan, May 2, 1915. Female. Two crabs, with bodies,  $\frac{3}{4}$  inch in diameter, and legs,  $1\frac{1}{2}$  inches long, were in the neck. In a Mangrove swamp. (f) Darien Radio Station, Dec. 12, 1915. Male. Grass seeds, Locustidae and other Orthoptera in stomach. On the floating islands of grass and Water Lettuce. (g) Balboa, Dec. 25, 1915. Male. Small crabs in stomach. On the mud banks of a tidal stream. (h) On the Rio Chilibre, Jan. 1, 1916. Two males. Locustidae

and other Orthoptera and large Spiders in the stomachs. There were about 12 in a scattered flock but they are usually seen singly.

**Butorides virescens.** LITTLE GREEN HERON.—(a) Corozal, Nov. 12, 1915. Female. In the mud in a Mangrove swamp. (b) On the Rio Juan Diaz, Oct. 10, 1915. Female. (c) Corozal, May 6, 1916. Two males. In a Mangrove swamp. (d) Balboa, May 13, 1916. Shot after flying from nest in a Mangrove swamp. The nest was built on a shrub, about 8 feet above the water. It was made of dried twigs, well woven, but with no lining. Three eggs pale bluish-green. A similar nest nearby had two fledglings and one egg.

**Nycticorax nycticorax naevius.** BLACK-CROWNED NIGHT HERON.—(a) Corozal, Dec. 25, 1915. Male. In a swamp. They were numerous and roosted in the same trees with the Yellow-crowned Night Herons and the Boat-billed Herons. (b) Corozal, Mar. 10, 1915. Male. In a flock of about 15 in a Mangrove swamp. The birds perched on the trees in the swamp and waded in the mud in the tidal streams. (c) On San Jose Rock, near Naos Island, Mar. 21, 1915 there were about 20 nests, apparently of this species. The nests were built from 4 to 25 feet from the ground among the thorn, trees, Cacti, and vines, on the rocky slope of the island. Some of the nests had fledgling birds.

**Nyctanassa violacea.** YELLOW-CROWNED NIGHT HERON.—(a) Taboguillo Island, Aug. 15, 1915. Female. Near the water on a rocky shore. There were several small flocks of from 2 to 12 seen on the islands of Panama Bay. (b) At the mouth of the Rio Juan Diaz, Oct. 3, 1915. Male. In a flock of 50 or more resting in the Mangrove trees in a tidal swamp. (c) On the Rio Juan Diaz, Oct. 10, 1915. Female. Fragments of a crab, with a body  $1\frac{1}{2}$  inches in diameter, in stomach.

**Cochlearius zeledoni.** BOAT-BILLED HERON.—(a) Corozal, Mar. 12, 1915. Male. In a Mangrove swamp. (b) Corozal, Dec. 25, 1915. Female. In a Mangrove swamp. There were a number of these birds and they roosted in the same trees with the Black-crowned Night Herons and the Yellow-crowned Night Herons. (c) Balboa, May 6, 1916. Male. In a flock of eight in a Mangrove swamp. (d) Corozal, Mar. 10, 1915. Male. In a Mangrove swamp. There were several in the trees and they squaked like small pups barking. A number of young birds climbed about the limbs and flew short distances and when approached they loudly snapped their bills. There were seven nests built, about 10 feet high, near the ends of the branches of the Mangrove trees. One nest, with a young bird perched on it, had eight 2-inch, partly decomposed fish on the edge. In the shallow water under the nest was one white egg.

**Ionornis martinica.** PURPLE GALLINULE.—Las Guacas, Nov. 28, 1915. Three males. Grass seeds and grass tops in stomach. Resting on Plantain leaves in a plantation.

**Ereunetes mauri.** WESTERN SANDPIPER.—At the mouth of the Rio Juan Diaz, Oct. 3, 1915. Sick bird picked up on the tidal mud flats.

Immense numbers, running into tens of thousands, were feeding on the mud flats. They were very tame and could be approached to within a few feet.

**Symphemia semipalmata.** WILET.—(a) At the mouth of the Rio Juan Diaz, Oct. 10, 1915. Male. Fragments of small crabs in stomach. On the tidal mud under the trees. (b) At the mouth of the Rio Juan Diaz, Oct. 17, 1915. Two males. Fragments of crabs in stomach. There were about 40 of this species on the tidal mud flats.

**Bartramia longicauda.** BARTRAMIAN SANDPIPER.—La Boca, Oct. 26, 1915. Male. One Periwinkle shell,  $\frac{1}{4}$  inch long, in stomach. In a big clearing, about  $\frac{1}{2}$  mile from the shore.

**Actitis macularia.** SPOTTED SANDPIPER.—Old Panama, Feb. 21, 1915. Fragments of small crabs in stomach. Running among the rocks near the shore. There were a number of these birds along the tide beach and they sought their food singly, occasionally two would be together, and within a mile there would be 20 or more scattered among the rocks on the sand beach.

**Numenius hudsonicus.** HUDSONIAN CURLEW.—(a) On the Rio Juan Diaz, Oct. 10, 1915. Two females. On the mud banks under the trees. Small crabs in stomach. They were quite numerous in this locality. (b) At the mouth of the Rio Juan Diaz, Oct. 17, 1915. Two females. Fragments of crabs in stomach. On the tidal mud flats. There were several small flocks along the shore between Balboa and the Rio Juan Diaz. (c) At the mouth of the Rio Juan Diaz, Nov. 7, 1915. One male and one female. On the low branches of trees after the tide had covered the mudflats.

**Squatarola squatarola.** BLACK-BELLIED PLOVER.—At the mouth of the Rio Venado, Mar. 27, 1915. In a flock, of about 15, scattered over the rocks and sand beach.

**Charadrius semipalmatus.** SEMPALMATED PLOVER.—(a) At the mouth of the Rio Venado, Mar. 27, 1915. Two females. In a flock, of about 10 birds, walking and feeding in the mud near the water. They sought food in close formation and flew, rapidly, short distances in close formation. (b) At the mouth of the Rio Juan Diaz, Oct. 17, 1915. Male. Feeding on the mud flats. They were in company with Western Sandpipers but were not near so numerous.

**Pagolla wilsonia.** WILSON'S PLOVER.—Near Panama City, Aug. 11, 1907. On the shore.

**Arenaria interpres.** TURNSTONE.—(a) San Jose Rock, near Naos Island, Mar. 21, 1915. In a flock, of about 20, coming to rest on the rock. (b) Venado Island, Mar. 24, 1915. Two males. Fragments of shells of small bivalves in stomach. In a flock of about 15 birds. There were two flocks, with a total of about 25 birds, on Venado and Cocovi Islands. They flew in close formation and when at rest, after short flights, they sought food in close formation.

**Jacana nigra.** BLACK JACANA.—(a) On the Rio Chilibre, Jan. 1, 1916. Three females. Small seeds in stomach. On floating vegetation. (b) Darien

Radio Station, Dec. 12, 1915. Female. Vegetable matter and 1/16 inch, white pebbles in stomach. Feeding on the floating islands of grass and Water Lettuce on Gatun Lake. Two well formed eggs in the ovaries. This species is found in small flocks and they run rapidly on the floating grass and Water Lettuce and are very conspicuous on the wing. (c) Darien Radio Station, Dec. 12, 1915. One male and one female. Grass tops and grass seeds in stomach. Feeding on the floating grass and Water Lettuce on Gatun Lake.

**Crypturus soui panamensis.** PILEATED TINAMOU.—Sosa Hill, May 25, 1914. Small seeds, some sprouted, in stomach. In the thick jungle. It ran rapidly on the ground, with occasional short flights.

**Columba speciosa.** SPLENDID PIGEON.—In the valley of the Rio Velazquez, Feb. 13, 1916. One male and one female. Berries in crop. On very high trees.

**Chaemapelia minuta elaeodes.** PLAIN-BREASTED GROUND DOVE.—(a) Gatun, May 26, 1909. Grass seeds in crop. Shot after leaving the nest. The nest was built, about 5 feet from the ground, in a thorn shrub, growing in high rank grass. It was made loosely of twigs with growing grass woven with them. Two eggs, glossy white but not highly polished. One measured 1.08 by .64 inches. (b) Mindi, July 11, 1915. Male. Grass seeds in stomach. Perched on a tree. (c) Cruces Trail, near Corozal, Sept. 5, 1915. Male. Grass seeds in crop. This species is numerous and they are found in small flocks on the ground and in the low shrubbery. They have a soft, pleasing call. (d) Cruces Trail, near Corozal, Sept. 19, 1915. Female. Grass seeds in crop. (e) Corozal, May 21, 1916. Two females. Grass and sedge seeds in stomach.

**Chaemapelia rufipennis rufipennis.** RUDDY GROUND DOVE.—(a) Gatun, April 11, 1909. Shot while leaving the nest. The nest was in a crotch of a tree about 12 feet from the ground. It was made loosely of twigs, bits of grass, and leaves. Two eggs, glossy white and highly polished, .88 by .68 and .88 by .67 inches. The bird could be closely approached while on the nest. (b) Gatun, April 29, 1909. Small grass seeds in stomach. Shot while leaving nest. The nest was on a hanging vine, about 10 feet from the ground, somewhat in the open. It was loosely built of small twigs, bits of bark, and grass. Two eggs, one measured .94 by .67 inches.

**Claravis pretiosa.** BLUE GROUND DOVE.—In the valley of the Rio Algarrobo, July 4, 1915. Male. Seeds like Cucumber in stomach. In a clearing.

**Leptotila cassini.** CASSIN'S DOVE.—(a) Gatun, Feb. 11, 1909. Fine gravel, millet and sedge seeds, and small white berries in crop. Walking about, beneath the shrubbery, on a creek bank. (b) Gatun, May 4, 1909. Millet seeds and small berries in crop. Shot on the edge of the nest. The nest was about 6 feet from the ground on a limb of a shrub, in high grass, and partly supported by vines. It was loosely made of twigs which were woven in with the growing grass tops. There was one hatched chick and

one, glossy white, egg, 1.19 by .86 inches. A similar nest at Gatun, Sept. 3, 1908, very probably the same species, was on a shrub, about 6 feet from the ground. It was made of twigs, laid loosely on some interlaced branches and the egg could be seen through the bottom of the nest. The egg was glossy white, 1.10 by .83 inches.

**Leptotila verreauxi verreauxi.** VERREAUX'S DOVE.—(a) Sosa Hill, May 26, 1914. Male. About 40 seeds,  $\frac{1}{4}$  by  $\frac{1}{4}$  by  $\frac{1}{8}$  inches, were in the stomach and crop. (b) Farfan, Aug. 22, 1915. One male and one female. Buds, from a  $\frac{1}{4}$  to  $\frac{1}{2}$  inch in diameter, and seeds in stomach. In Cacti and shrubbery. (c) Cruces Trail, near Corozal, Sept. 5, 1915. Female. Grass seeds in crop. There was a Dipterous larva in the flesh, under the left wing, and another in the flesh of the abdomen. They had fed on the head and left larva skins and putrid flesh. When the bird was put on ice the larvae pupated and died soon after. (d) Gorgona, Feb. 20, 1916. Female. In sparse shrubbery.

**Cathartes aura.** TURKEY VULTURE.—Farfan, Jan. 9, 1916. Two males and one female. On a tree near the shore. There were several roosting in the nearby trees and when the skinned bodies of the birds, that were shot, were thrown on the beach, the others ate them up. The species is very common on the Isthmus and they roost in great numbers on Ancon Hill, overlooking the City of Panama.

**Leptodon palliatus.** CAYENNE KITE.—Gatun, Mar. 28, 1909. In the early morning, in a tree overhanging a stream.

**Asturina nitida.** SHINING BUZZARD HAWK.—Mindi, Jan. 28, 1909. Frog, 2 inches long, in the neck. On the wing over a swamp.

**Buteo brachyurus.** SHORT-TAILED BUZZARD.—Gatun, Feb. 11, 1909. Fragments of a small bird in stomach. Shot on a limb of a dead tree, about 75 feet high, over a creek bottom, while eating two 14-inch Ground Lizards (*Ameiva ameiva praesignis*).

**Buteo platypterus.** BROAD-WINGED HAWK.—(a) Gatun, Feb. 19, 1909. Acridiidae in stomach. In a clearing. (b) New Culebra, Nov. 25, 1915. Male. (c) In the valley of the Rio Chilibre, Jan. 1, 1916. Female. Small Iguana in stomach. The bird carried Hippoboscidae.

**Rupornis ruficauda.** HAWK.—Culebra-Arraijan Trail, Nov. 26, 1914. In a tree in the jungle. The head and tail of a 15-inch Ground Lizard (*Ameiva ameiva praesignis*) were partly swallowed. The bird carried Hippoboscidae.

**Urubitinga anthracina.** MEXICAN BLACK HAWK.—(a) At the mouth of the Rio Juan Diaz, Oct. 3, 1915. Female. Vertebrae of small mammal in stomach. In a Cocoa Palm. (b) At the mouth of the Rio Juan Diaz, Oct. 10, 1915. Two immature females and one adult male. Crab fragments in stomachs. On high sparse-leaved trees. (c) Ancon, Jan. 16, 1916. Male. In a tree.

**Cerchneis sparveria.** SPARROW HAWK.—(a) Gatun, Feb. 10, 1909. Small Spiders and small Acridiidae in stomach. In a big clearing in the

late afternoon. (b) La Boca, Feb. 22, 1915. Acridiidae in stomach. In a tree in a clearing. (c) New Culebra, Oct. 23, 1915. Female. Acridiidae and fragments of an Iguana, 12 inches long, in stomach. On an electric transmission line. (d) New Culebra, Oct. 23, 1915. Female. Acridiidae, Iguana, 5 inches long, and two Ground Lizards (*Ameiva ameiva praesignis*), 4 inches long, in stomach.

***Cerchneis sparveria phaloena.*** SPARROW HAWK.—New Culebra, Nov. 25, 1915. Female. Acridiidae in stomach. On an electric transmission line.

***Pandion haliaëtus carolinensis.*** FISH HAWK.—Farfan, Dec. 19, 1915. Male. On a high tree near the shore.

***Tyto perlata guatemalae.*** CENTRAL AMERICAN BARN OWL.—Old Panama, Aug. 11, 1907. In the ruins of the Merced Convent Tower.

***Otus choliba.*** CHOLIBA SCREECH OWL.—(a) On the slope of Ancon Hill, Jan. 29, 1916. Female. Shrub seeds in stomach. Perched in dense vegetation, at noon. (b) Sosa Hill, May 23, 1916. Female. A large number of red, leaf-cutting Ants in stomach. In dense shrubbery at mid-day. (c) On the Culebra-Arraijan Trail, Jan. 1, 1915. Female. Orthoptera and Odonata in stomach. On the nest in mid-afternoon. The nest was in the top of a dead and decayed stump of a palm, about 9 feet high and about one foot in diameter. It was made of the fiber from the stump. There were several eggs in the ovaries of the bird and three white eggs in the nest. They measured 1.32 by 1.12, 1.39 by 1.19 and 1.39 by 1.21 inches.

***Rhinoptynx clamator.*** STRIPED HORNED OWL.—(a) Balboa, Feb. 26, 1915. Male. Small feathers in stomach. Perched on a pole in a clearing at the fall of dusk. (b) Balboa, Sept. 3, 1915. Perched on a dead tree, in a clearing, at dusk. This bird, for several evenings at dusk, flew out of the jungle on Sosa Hill and rested on a dead tree.

***Ciccaba nigrolineata nigrolineata.*** BLACK-AND-WHITE OWL.—(a) Gatun, Feb. 11, 1909. By the roadside, on a dead tree, at dusk. (b) Tiger Hill, Feb. 20, 1909. Spotted at night, with a light, in a dense jungle. The lucidium tapetum in this bird's eyes reflects the light strongly in the dark. It had a cat-like call.

***Brotogeris jugularis.*** MULLER'S PARRAKEET.—(a) Gatun, Aug. 30, 1908. On a tree in a clearing. (b) Gatun, Feb. 11, 1909. About 75 feet high, on a sparse-leaved tree, in a clearing. (c) Farfan, Mar. 26, 1915. Male. About 20 soft white fruit seeds, about  $\frac{1}{4}$  inch in diameter, in stomach. In a sparse-leaved tree over the jungle. This species is very common on the Isthmus and they fly in flocks, of from 5 to 50, with a noisy chatter while in flight. (d) Farfan, May 23, 1915. Female. Green vegetable matter in stomach. On a high, sparse-leaved tree in a clearing. (e) Gorgona, Feb. 20, 1916. Male. Fruit fragments in stomach. On a sparse-leaved tree in a clearing.

***Eucinetus haematotis coccin collaris.*** RED-NECKLACED PARROT.—Las Guacas, Nov. 28, 1915. Male. Fruit seeds in stomach. In a cultivated plantation. There were several flocks in this locality.

**Amazona farinosa inornata.** MEALY AMAZON PARROT.—Casa Largo, May 31, 1914. Male. Large green seeds in stomach. In a high-timbered forest. There were several hundred in this locality.

**Crotophaga ani.** ANI.—(a) Corozal, July 28, 1907. In shrubbery in a clearing. (b) Farfan, May 16, 1915. Grass seeds and Locustidae in stomach. Female. This species was frequently seen, in flocks of from 10 to 20, in the shrubbery, in the clearings. (c) On the Rio Algarrobo, May 30, 1915. Female. Seeds, similar to Cucumber, in stomach. In the jungle along the river.

**Coccyua rutila panamensis.** PANAMA CUCKOO.—Gatun, April 21, 1909. Two specimens. Small Coleoptera and larvae, about 1 inch long, in stomach. In the jungle.

**Piaya cayana.** CENTRAL AMERICAN SQUIRREL-CUCKOO.—(a) Gatun, Feb. 3, 1909. In thick jungle. (b) In the valley of the Rio Algarrobo, May 30, 1915. Male. Hemiptera and one Locustidae in stomach. In the jungle. (c) In the valley of the Rio Algarrobo, June 6, 1915. Male. One Locustidae, 3 inches long, and 14 strong-smelling Hemiptera, ½ inch long, in stomach. In the jungle. (d) Cruces Trail, near Corozal, Sept. 5, 1915. Male. One Locustidae, 3 inches long, in stomach. In a thick-leaved, high tree. (e) New Culebra, Oct. 24, 1915. Lepidoptera larvae. one, 3 inches long, and two, 2 inches long, in stomach. Female. In a Cocoa plantation. (f) Las Guacas, Nov. 28, 1915. Male. Small seeds and Lepidoptera larvae in stomach.

**Tapera naevius.** NORTHERN STRIPED CUCKOO.—In the valley of the Rio Algarrobo, June 6, 1916. Acridiidae, ½ inch long, in stomach. In the jungle.

**Trogonurus curucui tenellus.** GRACEFUL TROGON.—(a) Gatun, Feb. 11, 1909. In thick jungle in a creek bottom. (b) Gatun, Feb. 17, 1909. In thick jungle in a creek bottom.

**Curucujus massena.** MASSENA TROGON.—(a) In the valley of the Rio Chilibre, Jan. 1, 1916. Female. Fruit and fruit seeds in stomach. On a tree. (b) In the valley of the Rio Chilibre, Jan. 16, 1916. Immature male. Fruit fragments in stomach. On a tree. This is a solitary bird. (c) Juan Mina, Feb. 21, 1916. Female. Hard shrub seeds in stomach. In a forest of large trees.

**Notharchus pectoralis.** BLACK-BREASTED PUFF-BIRD.—In the valley of the Rio Caimitillo, Oct. 20, 1915. Small Acridiidae and Coleoptera in stomach. In a tree.

**Streptoceryle torquata.** RINGED KINGFISHER.—(a) Gatun, Aug. 30, 1908. On a river bank. (b) On the Rio Juan Diaz, Oct. 10, 1915. Male. Bone structure of a fish, about 10 inches long, in stomach. On a leafless branch, overhanging the river. (c) On the Rio Juan Diaz, Oct. 10, 1915. Female. Fish fragments in stomach. On a leafless branch overhanging the river.

**Chloroceryle amazona.** AMAZON KINGFISHER.—(a) On the Rio Juan Diaz, Oct. 10, 1915. Female. Fish fragments in stomach. On a leafless

branch, overhanging the river. (b) On the Rio Chilibre, Jan. 1, 1916. One male and two females. Fish fragments in stomachs. On branches overhanging the river.

**Chloroceryle americana isthmica.** ISTRMIAN GREEN KINGFISHER.—(a) Gatun, Feb. 1, 1909. On a limb, overhanging a creek. (b) Old Panama, Feb. 21, 1915. Several fish, about 2 inches long, in stomach. Shot after flying from the shore to a rock in the water. (c) Darien Radio Station, Dec. 12, 1915. Two females. Small fish in stomach. On a limb of dead tree in Gatun Lake. The Kingfishers were numerous on this newly created lake as it had a large population of fish, because the insects were plentiful in the dying trees.

**Chloroceryle aenea aenea.** LEAST GREEN KINGFISHER.—On the Rio Chilibre, Jan. 16, 1916. Male. On a small limb close to the river's edge.

**Urospatha martii semirufa.** GREATER RUFIOUS MOTMOT.—Gatun, Feb. 10, 1909. Several Spiders, several Coleoptera, some an inch in length, and a fish, 4 inches long, were in the stomach. In the dense jungle.

**Electron platyrhynchus minor.** LESSER BROAD-BILLED MOTMOT.—In the valley of the Rio Chilibre, May 31, 1914. Male. Lepidoptera larva, about 2 inches long, in stomach. In a tree about 150 feet from the ground.

**Centurus rubricapillus.** WAGLER'S WOODPECKER.—(a) Farfan, Feb. 28, 1915. Male. Small Coleoptera and insect eggs in stomach. On a leafless tree. (b) Farfan, Mar. 26, 1915. Male. Three hard-shelled berries, about  $\frac{3}{8}$  inch in diameter, in stomach. On a leafless tree. (c) Farfan, May 16, 1915. Female. Mass of green vegetable matter in stomach. On a Cottonwood tree. (d) Darien Radio Station, Dec. 12, 1915. Female. Hard seeds,  $\frac{1}{8}$  by  $\frac{1}{4}$  inch, in stomach. On a tree.

**Melanerpes pucherani.** WHITE-BARRED WOODPECKER.—Gatun, Sept. 6, 1908. On a tree in a clearing.

**Rhamphastos piscivorus brevicarinatus.** SHORT-KEELED TOUCAN.—(a) New Culebra, Nov. 3, 1915. Female. Fragments of green fruit in stomach. On a Papaw tree. (b) In the valley of the Rio Chilibre, Jan. 16, 1916. Fruit fragments in stomach. Male. In a flock, of about 20, in a forest.

**Pteroglossus torquatus.** COLLARED ARACARI.—Las Guacas, Nov. 28, 1915. Three females. Fragments of fruit, like green Papaw, in stomach. Small flocks were seen in a cultivated plantation and, in the forests, in the valley of the Rio Chilibre.

**Nyctidromus albicollis albicollis.** PARAUQUE.—(a) Mindi, Feb. 19, 1909. Two specimens. Small insects and a Coleoptera,  $1\frac{1}{2}$  inches long, in stomach. Spotted at night with a light, on the ground, on a trail. The bird turns one eye to the light and the lucidium tapetum, in the eye, reflects the light strongly in the dark. (b) Gatun, April 11, 1909. In a clump of shrubbery in a clearing, at noon. (c) Sosa Hill, May 14, 1914. Male. About 20 Coleoptera in stomach. On the ground, during the day, in a dense jungle. (d) New Culebra, Oct. 23, 1915. Two males and one female.

Insects in stomach. (e) Cruces Trail, near Corozal, Dec. 24, 1915. Four males and two females. (1) Small and medium-sized Coleoptera and large Diptera in stomach. (2) Small Mantispidae, small Locustidae, small Coleoptera, and a large Tipulidae in stomach. (3) Small Coleoptera and Diptera in stomach. (4) Small Coleoptera and small, hard, white seeds in stomach. (5) Small, hard, white seeds and two Heterocera, with 2½ inch wing expanse, in stomach. (6) Small Coleoptera and Diptera in stomach.

**Stenopsis cayennensis albicauda.** WHITE-TAILED STENOPSIS.—Corozal, July 28, 1907.

**Chordeiles acutipennis texensis.** TEXAS NIGHTHAWK.—Corozal, Mar. 10, 1915. Two females. Small Coleoptera in stomach. Resting on the ground, in the late afternoon, in a shady Mangrove swamp.

**Chordeiles minor** subsp. NIGHTHAWK.—(a) Corozal, Jan. 30, 1916. Female. Small Coleoptera and small red Ants in stomach. Shot on a low branch, after flying from the ground, at noon, in a swamp. (b) Balboa, May 13, 1916. Female. Insects and fragments of Unio shell in stomach. One egg was well developed in the ovaries. Shot on a low branch, after flying from the ground, at noon, on the edge of a Mangrove swamp. (c) Corozal, May 21, 1916. Male. Insects in stomach. Small flock on the wing, in mid-afternoon, in a drizzling rain, darting after insects. At intervals, they gave a penetrative "squeek."

**Phoebastria adolphi saturatis.** DUSKY HERMIT.—Las Cascadas, May 17, 1908. In the jungle.

**Glaucis hirsuta affinis.** LESSER HAIRY HERMIT.—New Culebra, Nov. 3, 1915. Female. On an open trail.

**Chalybura buffonii.** BUFFON'S PLUMELEETER.—(a) Las Cascadas, May 17, 1908. In the jungle. New Culebra, Nov. 3, 1915. Male. On an open trail. (b) In the valley of the Rio Velazquez, May 15, 1916. Male. In the jungle.

**Amazilia tzacatl tzacatl.** RIEFFER'S HUMMING-BIRD.—(a) Las Cascadas, May 17, 1908. In the jungle. (b) Gatun, April 22, 1909. (c) Cruces Trail, near Corozal, Sept. 5, 1915. Male. Small insects in stomach. (d) Cruces Trail, near Corozal, Sept. 19, 1915. Male. (e) New Culebra, Nov. 3, 1915. Male. On an open trail. (f) Corozal, May 21, 1916. Male. Insects in stomach. Resting on a twig.

**Saucerottia edwardi.** WILSON'S HUMMING-BIRD.—Sosa Hill, July 18, 1915. Male.

**Damophila panamensis.** PANAMA HUMMING-BIRD.—(a) Cruces Trail, near Corozal, Sept. 5, 1915. Two specimens. Small insects in stomach. (b) Cruces Trail, near Corozal, Sept. 19, 1915. Two specimens.

**Polyerata amabilis.** LOVELY HUMMING-BIRD.—Gatun, Aug. 26, 1908. In the jungle.

**Thalurania colombica colombica.** COLOMBIAN WOOD-NYMPH.—Gatun, Nov. 24, 1908. Picked up wounded, after flying against a telephone wire.

**Lepidopyga caeruleocularis.** DUCHASSAIN'S HUMMING-BIRD.—(a) Sosa Hill, Sept. 11, 1907. Resting on a dead branch. (b) Sosa Hill, Sept. 13, 1907. Two specimens. Resting on dead branches. (c) Corozal, Mar. 12, 1915. Three specimens. In a Mangrove swamp. (d) Mindi, July 11, 1915. Male. On an open road. (e) Cruces Trail, near Corozal, Sept. 5, 1915. Female. Small insects in stomach.

**Chlorostilbon assimilis.** ALLIED EMERALD.—(a) Corozal, Sept. 8, 1907. Resting on a dead branch. (b) Gorgona, Feb. 20, 1916. Female. Resting on a branch in sparse shrubbery.

**Copurus leuconotus.** WHITE-BACKED COPURUS.—(a) Gatun, Oct. 12, 1908. In a marsh. (b) Gatun, Oct. 18, 1908. In a flock of about 10, on a dead sapling, in a clearing. (c) Gatun, Nov. 18, 1908. This species is generally found perched on a dead branch and when an insect passes, they quickly dart out and catch it. The long feathers in the tail apparently aid them in turning rapidly when pursuing insects which have a jerky flight. (d) Darien Radio Station, Dec. 12, 1915. Male. Small Coleoptera, Diptera and Hymenoptera in stomach. On a high dead tree in Gatun Lake. (e) Darien Radio Station, Dec. 12, 1915. Female. Small Diptera and Hymenoptera in stomach. On a high dead tree in Gatun Lake. (f) In the valley of the Rio Chilibre, Jan. 1, 1916. Male. On a high tree. Numerous in this valley.

**Oncostoma olivaceum.** LAWRENCE'S BENT-BILLED FLYCATCHER.—In the valley of the Rio Velazquez, Feb. 13, 1916. Male. This bird perches, quite motionless, in the thick shrubbery and huddles close to the branch, with its head elevated and gives a soft, peculiar call.

**Todirostrum cinereum finitimum.** NORTHERN TODY-FLYCATCHER.—Sosa Hill, Sept. 26, 1915. One male and one female. Insects in stomach. In dense vines and shrubbery.

**Todirostrum schistaceiceps.** SLATE-HEADED TODY-FLYCATCHER.—Balboa, June 30, 1915. Male. Small seeds in stomach. In tall grass in a clearing.

**Atalotriccus pilaris pilaris.** PYGMY FLYCATCHER.—(a) Farfan, Jan. 23, 1916. Male. Small insects in stomach. In thick shrubbery. (b) Farfan, May 11, 1916. One male and one female. Small seeds in stomach. In shrubbery. There were about 6 in the flock and at times they would chase each other rapidly through the shrubbery with a noisy twitter and then rest for long periods on bare twigs with their feathers puffed out, uttering sharp twitters at intervals. (c) Farfan, May 14, 1916. Female. In shrubbery.

**Camptostoma pusillum flaviventre.** YELLOW-BELLIED CAMPTOSTOMA.—Sosa Hill, Feb. 26, 1915. In shrubbery.

**Elaenia flavogaster subpagana.** NORTHERN ELAENIA.—(a) Gatun, Mar. 31, 1909. Shot after leaving the nest at noon. The nest was about 5 feet from the ground, on a tree near the river's edge. It was made of grass, leaves and fibrous roots, closely woven, with a few feathers on the inside and bits of bark and lichen on the outside, making it resemble the

limb which was about an inch thick. The nest cavity was 3 inches in diameter and  $1\frac{1}{2}$  inches deep with two eggs, dull white, with reddish-brown and faint purple spots which were almost entirely confined to the larger end and they measured .86 by .65 and .85 by .63 inches. (b) Gatun, April 13, 1909. One specimen. (c) Farfan, Feb. 6, 1916. Female. The nest was suspended near the end of a long limb, about 6 feet above the water and about 10 feet from the shore. It was made of dried grass and lined with finer, dry grass with the opening concealed by the grass ends and its outside diameters were 7 and 11 inches. Four eggs, dull white, with reddish-brown and purple spots, mostly on the larger end, and one measured .77 by .61 inches. A similar nest was suspended, about 30 feet high, on the end of a limb on a thorn tree. It was made of coarse grass and leaves and lined with fine grass, with the opening concealed by the grass ends. Three eggs, dull white, with reddish-brown and purple spots, mostly on the larger end, and measured .91 by .65, .91 by .66 and .90 by .67 inches. (d) Gatun, April 25, 1909. Shot after leaving nest. The nest was on a thorn tree at the extremity of a lower limb, about 12 feet from the ground. It was made of grass, fine roots, and cotton waste, from a nearby oil house lined with fine grass and the opening concealed with the grass tops. Two eggs, pointed, dull white, with reddish-brown and purple spots, mostly on the larger end, and one measured .92 by .60 inches. (e) Gatun, May 8, 1909. Shot after leaving nest. The nest was on a thorn tree at the extremity of a lower limb, about 15 feet from the ground. It was made of grass, fine roots, and cotton waste, from a nearby oil house, lined with fine grass with the opening concealed by the grass ends and its outside diameters were 5 and 8 inches. Two eggs, pointed, dull white, with reddish-brown and purple spots mostly on the larger end and one measured .93 by .67 inches.

***Elaenia chiriquensis.*** LAWRENCE'S FLYCATCHER.—(a) In the valley of the Rio Velazquez, Feb. 13, 1916. Male. Shrub berries in stomach. In shrubbery. (b) Balboa, May 13, 1916. Female. Insects in stomach. On the edge of a Mangrove swamp.

***Capsiempis flaveola.*** YELLOW FLYCATCHER.—(a) Farfan, June 20, 1915. Female. In a clump of shrubbery in a clearing. Coleoptera and a nymph of a Locustidae in stomach. (b) Corozal, May 21, 1916. Male. Insects in stomach. In shrubbery.

***Myiobius barbatus atricaudus.*** BLACK-TAILED MYIOBIUS.—In the valley of the Rio Algarrobo, July 4, 1915. Male. Seeds and small insects in stomach. In the jungle.

***Myiochanes richardsoni.*** WESTERN WOOD PEWEE.—New Culebra, Nov. 3, 1915. Female. Insects in stomach. On a trail.

***Myiochanes brachytarsus.*** SHORT-LEGGED WOOD PEWEE.—(a) New Culebra, Oct. 24, 1915. In a Cocoa plantation. (b) New Culebra, Nov. 3, 1915. Insects in stomach. On a trail. Small shrub berries in stomach. Shot after leaving the nest. The nest was about 8 feet from the ground, on an outer branch of a sparse-leaved, thorn tree, growing on the edge of the sand beach.

**Myiozetetes cayennensis cayennensis.** CAYENNE FLYCATCHER.—

(a) Mindi, July 11, 1915. Female. On an open road. (b) New Culebra, Oct. 24, 1915. Female. Insects and seeds in stomach. In a Cocoa plantation.

**Myiozetetes similis columbianus.** COLOMBIAN FLYCATCHER.—

(a) Gatun, Feb. 1, 1909. On a shrub in a clearing. (b) Gatun, April 26, 1909. Shot after leaving nest. The nest was on a tree on the extreme end of a lower limb, which extended over the water, and about 10 feet up from the surface. It was made of grass and lined with fine grass and the entrance was concealed with the grass tops. Two eggs, slightly pointed, with reddish-brown and purple spots, almost entirely on the larger end and one measured .89 by .66 inches. The spots on the eggs were somewhat larger than the Gray-capped Flycatcher. A nest of a Northern Elaenia was on the same limb. (c) On the Rio Algarrobo, May 30, 1915. In deep jungle. (d) New Culebra, Nov. 28, 1915. Small Diptera and Hymenoptera in stomach. This bird rested on a branch and frequently flew out quickly for passing insects. (e) In the valley of the Rio Velazquez, Feb. 13, 1916. Male. Small insects in stomach. In shrubbery. (f) Corozal, May 21, 1916. Insects in stomach. Shot from a flock while they were darting after insects in a drizzling rain.

**Myiozetetes granadensis.** GRAY-CAPPED FLYCATCHER.—

(a) Gatun, April 4, 1909. One specimen. (b) Gatun, April 8, 1909. Shot near the nest.

**Myiophobus fasciatus furfurosus.** BRAN-COLORED FLYCATCHER.—

Farfan, Jan. 23, 1916. Female. Black Ants, 5/16 inch long, in stomach. In thick shrubbery.

**Megarhynchus pitangua mexicanus.** BOAT-BILLED FLYCATCHER.—

(a) In the valley of the Rio Algarrobo, May 30, 1915. Female. Longicorn beetle, 3/4 inch long, in stomach. In deep jungle. (b) In the valley of the Rio Algarrobo, May 30, 1915. Male. In deep jungle.

**Tyrannus tyrannus.** KINGBIRD.—

(a) Gamboa, Oct. 15, 1915. One specimen. (b) Juan Diaz, Oct. 17, 1915. Male.

**Tyrannus melancholicus satrapa.** LICHTENSTEIN'S KINGBIRD.—

(a) Gatun, Feb. 17, 1909. On the edge of a jungle, near a clearing. (b) In the valley of the Rio Algarrobo, July 4, 1915. Male. Small insects in stomach. In the jungle. (c) Taboguillo Island, Aug. 15, 1915. Seeds and small Coleoptera in stomach. In the forest. (d) Corozal, Aug. 29, 1915. Male. Small Coleoptera in stomach. (e) Corozal, Aug. 29, 1915. Female. Small Coleoptera and Odonata in stomach.

**Manacus vitellinus.** GOULD'S MANIKIN.—

(a) In the valley of the Rio Algarrobo, May 30, 1915. In deep jungle. The bird makes a noise like the sharp cracking of a small stick. (b) In the valley of the Rio Algarrobo, July 4, 1915. Male. Small insects in stomach. In the jungle. (c) Gorgona, Feb. 20, 1916. Female. (d) In the valley of the Rio Velazquez, May 15, 1916. Female. Small berries in stomach. In a thicket. (e) Corozal, May 21, 1916. Male. In shrubbery.

**Chiroziphia lanceolata.** SHARP-TAILED MANIKIN.—(a) Sosa Hill, Sept. 13, 1907. Shot on the nest. The nest was on a low bush, about 3 feet from the ground. It was a shallow mat of fine dried twigs and dried leaves hung loosely on the sides and bottom. Two eggs, brownish-white, with spots, of reddish-brown, mostly in a ring around the greatest width, and measured .86 by .62 and .86 by .60 inches. A similar nest was taken, about 4 feet from the ground, in a low bush, in the ruins of the Merced Convent Tower in Old Panama City, Aug. 11, 1907. It was a shallow mat of fibrous grass, bound with spider webs. Two eggs, brownish-white, with spots of reddish-brown, mostly in a ring around the greatest width, and measured .86 by .62 and .86 by .60 inches. (b) In the valley of the Rio Algarrobo, July 4, 1915. Male. Small seeds in stomach. In the jungle. (c) In the valley of the Rio Velazquez, May 2, 1916. Female. In the jungle. (d) Sosa Hill, May 23, 1916. Female. Small Coleoptera and other insects in stomach. In shrubbery.

**Cotinga nattererii.** NATTERER'S COTINGA.—Sosa Hill, Oct. 31, 1915. Male. Berries and small seeds in stomach. In shrubbery.

**Tyrannulus elatus.** RIKER'S YELLOW-CROWNED TYRANNULET.—Gorgona, Feb. 20, 1916. Male. Soft green seeds in stomach. In thick shrubbery.

**Attila citreopygus citreopygus.** SCLATER'S COTINGA.—Cruces Trail, near Corozal, Sept. 19, 1915. Female. Elateridae,  $\frac{3}{4}$  inch long, and small Acridiidae in stomach.

**Thamnophilus radiatus nigricristatus.** BLACK-CROWNED ANT-SHRIKE.—(a) Mindi, July 11, 1915. Male. Hymenoptera,  $\frac{5}{8}$  inch long, and small Coleoptera in stomach. In thick shrubbery. (b) Sosa Hill, July 18, 1915. Male. Insects in stomach. In the jungle. (c) Cruces Trail, near Corozal, Sept. 19, 1915. Insects in stomach. In thick shrubbery. (d) Sosa Hill, Sept. 26, 1915. Female. Small insects, a small Damsel Fly, and seeds,  $\frac{1}{4}$  inch in diameter in stomach.

**Thamnophilus atrinuchus.** SLATY ANT-SHRIKE.—Gatun, Feb. 1, 1909. In the jungle near a creek.

**Ramphocaenus rufiventris.** NORTHERN LONG-BILLED ANT-WREN.—Farfan, May 14, 1916. Female. Small seeds and small insects in stomach. In shrubbery.

**Cercomacra nigricans.** BLACK TYRANNINE ANT-BIRD.—Gorgona, Feb. 20, 1916. Male. Small insects in stomach. In thick shrubbery.

**Xiphorhynchus nanus nanus.** LAWRENCE'S WOOD-HEWER.—(a) Gatun, Feb. 2, 1909. Creeping around the trunks of trees in the jungle. (b) New Culebra, Nov. 3, 1915. Female. Insects in stomach. On a trail. (c) Juan Mina, Feb. 21, 1916. Male. Creeping up a branch.

**Dendroplex picus (picirostris?).** WHITE-THROATED WOOD-HEWER.—Near the mouth of the Rio Juan Diaz, Oct. 3, 1915. Male. Creeping up a dead branch. This observation extends the known range of this species, northward, into Central America.

**Sittasomus sylvioides levis.** PANAMA SITTASOMUS.—Near the mouth

of the Rio Juan Diaz, Oct. 17, 1915. Insects in stomach. Creeping on the trunks of trees in the jungle.

**Zarhynchus wagleri.** WAGLER'S OROPENDOLA.—(a) Tiger Hill, Jan. 24, 1909. Near the top of a large tree in the jungle, tearing decayed limbs apart. The call of this bird was like rolling stones in the rapids of a small brook and on the wing they made a noise like rapid, light beating on a loose drum-head. (b) New Culebra, Mar. 21, 1915. Four specimens were shot from a flock of about 12, in the tree tops, in a Cocoa plantation. They had a variety of loud, rancorous calls and yodels. (1) Male. Small Coleoptera in stomach. (2) Male. Small Coleoptera and Spiders in stomach. (3) Male. Two Scorpions, one, 2 inches long, and the other, 3 inches long, in stomach. (4) Female. Small Coleoptera and Hemiptera and the larvae of Lepidoptera in stomach.

**Amblycercus holosericeus.** PREVOST'S CACIQUE.—(a) Gatun, April 22, 1909. Insects in stomach. (b) Gatun, April 24, 1909. Insects in stomach. Shot on the nest. The nest was in a crotch of a limb on a sparsely-leaved shrub, in the jungle, about 8 feet from the ground. It was closely woven with heavy grass and light twigs and thickly lined with finer grass, with a cavity,  $3\frac{1}{4}$  inches in diameter and 2 inches deep. Two eggs, light blue, sparsely spotted with black, denser at the larger end. (c) Farfan, Jan. 23, 1916. (d) Farfan, May 14, 1916.

**Cacicus vitellinus.** LAWRENCE'S CACIQUE.—(a) Tiger Hill, Jan. 24, 1909. In a tree top, in the jungle, tearing decayed limbs apart. (b) In the valley of the Rio Algarrobo, May 30, 1915. Male. Four beans,  $\frac{1}{2}$  inch long, in stomach. (c) In the valley of the Rio Caimitillo, Oct. 20, 1915. Male.

**Cacicus microrhynchus.** SMALL-BILLED CACIQUE—Tiger Hill, Mar. 21, 1909. In shrubbery.

**Megaquiscalus major macrourus.** GREAT-TAILED GRACKLE.—(a) Venado Island, Mar. 24, 1915. Female. Small Hermit Crabs and small shell fish in stomach. Perched in a tree. (b) Balboa, April 25, 1915. Female. In a Mango tree, in a mound, in a Mangrove swamp. (c) Balboa, Feb. 13, 1916. Female. In a flock of eight, feeding at a sewer mouth, on the mud beach.

**Icterus giraudi.** GIRAUD'S ORIOLE.—(a) Farfan, May 16, 1915. Male. Small Coleoptera in stomach. In shrubbery. (b) Balboa, May 15, 1916. Female. Small insects in stomach. In a tree in a clearing.

**Leistes militaris.** RED-BREASTED BLACKBIRD.—Casa Largo, May 31, 1914. Male. Grass seeds in stomach. In a flock, of about 20, on the open sabannas.

**Cyanerpes cyaneus.** BLUE HONEY-CREEPER.—(a) Farfan, June 20, 1915. Male. Red mass surrounding the seeds of the Balsam fruit in stomach and one Balsam seed in the mouth. In a clump of shrubbery. (b) Farfan, June 20, 1915. Male. In a clump of shrubbery in a clearing. (c) In the valley of the Rio Algarrobo, July 4, 1915. Small seeds in stomach. In a clearing. (d) Sosa Hill, Oct. 31, 1915. Male. Small hard seeds in stomach. On a Mango tree in a clearing.

**Astragalinus psaltria colombianus.** CENTRAL AMERICAN GOLD-FINCH.—In the valley of the Rio Algarrobo, July 4, 1915. Small seeds in stomach. In the jungle.

**Arremonops conirostris.** LAFRESNAYE'S SPARROW.—(a) Sosa Hill, May 20, 1914. Female. Seeds in stomach. (b) Farfan, June 20, 1915. In a shrub in a clearing. (c) Mindi, July 11, 1915. Male. On an open road. (d) Farfan, Feb. 6, 1916. Female. Berries in stomach.

**Volatinia jacarini splendens.** BLUE-BLACK GRASSQUIT.—(a) In the valley of the Rio Algarrobo, June 6, 1915. Small insects in stomach. In the jungle. (b) Balboa, June 24, 1915. Small seeds in stomach. In tall grass in a clearing. (c) Balboa, June 25, 1915. Male. Small seeds in stomach. In tall grass in a clearing. (d) Balboa, June 25, 1915. Male. Small seeds in stomach. In tall grass in a clearing. (e) Balboa, June 27, 1915. Male. Small seeds in stomach. In tall grass in a clearing. This bird would perch on a twig and, after short intervals, would jump up vertically, about a foot, and alight again in the same place, uttering a few short notes during the jump. (f) Balboa, Dec. 25, 1915. In an open grass plot.

**Euethia olivacea pusilla.** MEXICAN GRASSQUIT.—Cruces Trail, near Corozal, Sept. 5, 1915. Male. Small seeds in stomach. Several small flocks were seen in the thickets.

**Sporophila minuta minuta.** MINUTE SEED-EATER.—(a) Balboa, June 20, 1915. Male. Small seeds in stomach. In tall grass in a clearing. (b) Balboa, June 25, 1915. Female. Small seeds in stomach. In tall grass in a clearing.

**Sporophila aurita.** HICK'S SEED-EATER.—(a) Mindi, July 11, 1915. Male. Small seeds in stomach. In grass along an open road. (b) Cruces Trail, near Corozal, Sept. 5, 1915. Male. Small seeds in stomach. (c) Sosa Hill, Sept. 26, 1915. Male. Small white, soft seeds in stomach. In a small clearing. (d) New Culebra, Nov. 3, 1915. Along an open trail. Farfan, May 14, 1916. Male. Small seeds and berries in stomach. In shrubbery.

**Oryzoborus funereus.** LESSER RICE GROSBEEK.—Gatun, April 11, 1909. Shot while leaving nest. The nest was on a small shrub, about 2 feet from the ground, closely concealed in the leaves. It was made of fine roots and grasses, thinly woven. Three eggs, grayish-white, with brown spots and one measured .65 by .52 inches.

**Cyanocompsa concreta cyanoides.** PANAMA BLUE GROSBEEK.—In the valley of the Rio Velazquez, May 2, 1916. Male. Seeds in stomach. In the jungle.

**Saltator albicollis isthmicus.** PANAMA STRIPED SALTATOR.—(a) Las Cascadas, May 10, 1908. Shot on the nest. The nest was on a small shrub, about 6 feet from the ground, in the jungle on the edge of a small clearing. It was made of sticks, twigs, and bark and the cavity was about 2½ inches in diameter. Two eggs, blue, with a few lines near the larger end and measured 1.01 by .73 and .97 by .72 inches. (b) Gatun, April 7,

1909. Shot while leaving the nest. The nest was on a thorn tree, about 12 feet from the ground, on the edge of a clearing. It was made of dried grass, twigs, leaves, bark, and tendrils, with an outside diameter of about 4 inches. Two eggs, blue, with a few lines near the larger end and measured 1.01 by .66 and .97 by .69 inches. (c) Farfan, June 20, 1915. Female. The red mass, surrounding the seeds of the Balsam fruit, in stomach. In a shrub in a clearing. (d) Gamboa, Oct. 15, 1915. Male. Small seeds in stomach. (e) Farfan, Jan. 23, 1916. Male. Small fruit and seeds in stomach. In thick shrubbery. (f) Farfan, May 11, 1916. Male. Small berries in stomach. In shrubbery.

**Saltator atriceps lacertosus.** PANAMA BLACK-HEADED SALTATOR.—New Culebra, Nov. 21, 1915. Male. Buds in stomach. On an open trail.

**Saltator magnoides intermedius.** PANAMA BUFF-THROATED SALTATOR.—(a) Gatun, April 1, 1909. Shot while leaving the nest. The nest was on a bush, about 4 feet from the ground, in a meadow of tall, rank grass. It was made of dried grass, grass roots and leaves, and lined with dried tendrils, with an outside diameter of about 6 inches. Two eggs, spotted with a few black spots, and one measured .98 by .70 inches. (b) New Culebra, Nov. 28, 1915. Female. Black Ants and a pebble,  $\frac{1}{8}$  inch in diameter, in stomach. On an open trail. (c) Gorgona, Feb. 20, 1916. Male. In shrubbery.

**Tangara inornata.** PLAIN Tanager.—New Culebra, Nov. 3, 1915. Female. Small fruit seeds in stomach. On an open trail.

**Tangara lavinia.** LAVINIA'S Tanager.—(a) New Culebra, Nov. 3, 1915. Male. Soft berries in stomach. On an open trail. (b) New Culebra, Nov. 21, 1915. Male. Small, green, shrub berries in stomach. On an open trail.

**Thraupis cana.** BLUE Tanager.—(a) Gatun, April 13, 1909. Two specimens shot near the nest. The nest was on a branch of a tree, about 15 feet from the ground. It was made of leaves and dried grass. Two eggs, grayish-white, very thickly marked with brown, denser towards the larger end, and one measured .84 by .67 inches. (b) Gatun, May 6, 1909. Small grass seeds in stomach. Shot after leaving the nest. The nest was 30 feet from the ground. It was made of grass, flat rush leaves, and cotton waste, cup-shaped, closely woven, and lined with flat rush leaves. Two eggs, grayish-white, very thickly marked with brown, denser towards the larger end, and one measured .97 by .66 inches. (c) Mindi, July 11, 1915. Male. Lepidoptera larva in its bill. On a sparse-limbed tree. (d) New Culebra, Nov. 3, 1915. On a trail. (e) Farfan, Feb. 6, 1916. Female. Small shrub berries in stomach. In a tree. (f) Farfan, Feb. 6, 1916. Male. In a tree.

**Piranga rubra rubra.** SUMMER Tanager.—In the valley of the Rio Caimitillo, Oct. 21, 1915. New Culebra, Oct. 24, 1915. Three males. Small Hymenoptera and Diptera in stomachs. In a Cocoa plantation.

**Tachyphonus rufus.** BODDAERT'S Tanager.—(a) Gatun, Feb. 5, 1909.

Two specimens. On the edge of the jungle in a creek bottom. (b) Gatun, April 22, 1909. Small insects in stomach. (c) New Culebra, Oct. 24, 1915. Female. Insects in stomach. In a Cocoa plantation. (d) New Culebra, Nov. 3, 1915. Male. Small Spiders, small Coleoptera, and soft fruit matter in stomach. In a Cocoa plantation. (e) New Culebra, Nov. 3, 1915. Female. Fragments of fruit and Ants,  $\frac{1}{4}$  inch long, in stomach. In Cocoa plantation. (f) New Culebra, Nov. 3, 1915. Female. Small Coleoptera and other small insects, in stomach. On a trail. (g) Las Guacas, Nov. 28, 1915. Male. Ants and small Coleoptera in stomach. In a cultivated plantation. (h) Juan Mina, Feb. 21, 1916. Male. Small seeds in stomach.

**Rhamphocelus dimidiatus.** CRIMSON-BACKED TANAGER.—(a) Las Cascadas, May 24, 1908. Shot after leaving the nest. The nest was on a shrub, about 6 feet from the ground, in the jungle. It was made of twigs, roots, bits of bark, with dried leaves on the outside and the cavity was about 3 inches in diameter. Two eggs, light blue, with a few black spots and tangled lines on the larger end. A similiar nest at Las Cascadas, May 10, 1908, was on a limb, about 5 feet from the ground, in the jungle, near a clearing. Four eggs, light blue, with a few black spots and tangled lines on the larger end, and two measured .97 by .65 and .96 by .65 inches. (b) Gatun, Feb. 1, 1909. One specimen in a clump of shrubbery in a clearing. Farfan, May 23, 1915. Female, Seeds, like Cucumber, in stomach. In the jungle. (c) In the valley of the Rio Algarrobo, June 6, 1915. Male. Small larvae and grass seeds in stomach. In deep jungle. (d) In the valley of the Rio Algarrobo, July 4, 1915. Female. Small seeds in stomach. In the jungle. (e) In the valley of the Rio Algarrobo, July 4, 1915. Male. In the jungle. (f) Juan Mina, Feb. 21, 1916. Male. Soft seeds and Lepidoptera larvae in stomach. In a flock in an Orange grove. (g) Juan Mina, Feb. 21, 1916. Female. Small hard seeds in stomach.

**Phoenicothera fuscicauda.** DUSKY-TAILED ANT TANAGER.—(a) Gatun, Feb. 3, 1909. In the jungle near a stream. (b) In the valley of the Rio Algarrobo, May 30, 1915. Female. Soft seeds,  $\frac{1}{4}$  inch long, and grass seeds in stomach. In the deep jungle. (c) Farfan, May 9, 1915. Fragments of Coleoptera, about  $\frac{1}{2}$  inch long, in the neck. In the jungle. This bird makes a low, harsh, scratching note. (d) In the valley of the Rio Algarrobo, May 30, 1915. Two males. In deep jungle. (e) In the valley of the Rio Algarrobo, June 6, 1915. In deep jungle. (f) In the valley of the Rio Algarrobo, July 4, 1915. Male. Insects in stomach. In deep jungle. (g) In the valley of the Rio Velazquez, May 15, 1916. Female. Small berries and small insects in stomach. In the jungle. Under the right wing a Dipterous larva, about  $\frac{1}{2}$  inch long and about  $\frac{1}{4}$  inch in diameter, was eating under the skin and the larva pupated when the bird was put on ice.

**Progne chalybea chalybea.** GREY-BREASTED MARTIN.—(a) Farfan, Mar. 21, 1915. Female. Small Diptera and Hymenoptera in stomach.

In a flock of several flying swiftly over the sand beach and the nearby jungle. One of the flock rested a few moments on the sand beach. (b) Darien Radio Station, Dec. 12, 1915. Male. Small Odonata, Coleoptera, Diptera and Hymenoptera in stomach. On a high dead tree in Gatun Lake. The flock was skimming over the surface of the water for food. (c) Balboa, May 21, 1916. Male. Insects in stomach. Resting on a power wire in the rain.

**Hirundo erythrogastra.** BARN SWALLOW.—(a) Gatun, Nov. 22, 1908. Wounded after flying against a wire screen. (b) La Boca, Nov. 14, 1915. Three specimens. Insects in stomachs. In a large flock, flying in the evening, over a clearing.

**Vireosylva flavoviridis flavoviridis.** YELLOW-GREEN VIREO.—(a) Juan Mina, Feb. 21, 1916. Male. Small shrub seeds in stomach. In a small flock in an Orange grove. (b) Balboa, May 13, 1916. Male. Small insects in stomach. On the edge of a Mangrove swamp. (c) Corozal, May 21, 1916. Male. Seeds,  $\frac{1}{8}$  inch in diameter, in stomach.

**Lanivireo flavifrons.** YELLOW-THROATED VIREO.—New Culebra, Nov. 3, 1915. Female. Small green berries,  $\frac{1}{8}$  inch in diameter, and small white seeds in stomach. On a trail.

**Pachysylvia aurantiifrons aurantiifrons.** LAWRENCE'S VIREO.—In the valley of the Rio Velazquez, Feb. 13, 1916. Male. Small seeds and small insects in stomach. In shrubbery.

**Pachysylvia viridiflava.** YELLOW-GREEN PACHYSYLVIA.—Corozal, May 21, 1916. Male. Hard seeds,  $\frac{1}{8}$  inch in diameter, in stomach. In shrubbery.

**Protonotaria citrea.** PROTHONOTARY WARBLER.—Sosa Hill, Oct. 31, 1915. Small seeds, insects and two small Lepidoptera larvae in stomach. In shrubbery.

**Vermivora peregrina.** TENNESSEE WARBLER.—New Culebra, Oct. 24, 1915. Male. In a Cocoa plantation.

**Dendroica aestiva.** YELLOW WARBLER.—(a) Balboa, Aug. 17, 1915. One specimen. (b) Cruces Trail, near Corozal, Sept. 5, 1915. Female. Small Coleoptera in stomach.

**Dendroica erithachorides.** PANAMA YELLOW WARBLER.—(a) Corozal, Mar. 12, 1915. Female. Small Coleoptera in stomach. In a Mangrove swamp. (b) Corozal, Mar. 12, 1915. In a Mangrove swamp. (c) Cruces Trail, near Corozal, Sept. 5, 1915. (d) Balboa, Dec. 25, 1915. Male. In an open grass plot. (e) Gorgona, Feb. 20, 1916. Female. Insects in stomach. In shrubbery. (f) Balboa, May 13, 1916. Male. Insects in stomach. On the edge of a swamp.

**Dendroica pensylvanica.** CHESTNUT-SIDED WARBLER.—New Culebra, Oct. 24, 1915. Female. Small insects and one Lepidoptera larva, 1 inch long, in stomach. In a Cocoa plantation.

**Dendroica castanea.** BAY-BREASTED WARBLER.—New Culebra, Nov. 3, 1915. Male. Small seeds in stomach. On a trail.

**Basileuterus rufifrons mesochrysus.** SCLATER'S WARBLER.—(a) In

the valley of the Rio Algarrobo, June 6, 1915. Male. Small insects in stomach. In deep jungle. (b) Sosa Hill, July 18, 1915. Male. Insects in stomach. (c) Sosa Hill, Sept. 26, 1915. Female. Small insects in stomach. (d) Farfan, May 14, 1916. Male. In the muscular tissue there were white worms, about  $\frac{1}{8}$  inch long.

**Troglodytes musculus inquietus.** PANAMA HOUSE WREN.—(a) Las Cascadas, May 22, 1908. On the nest. The nest was under the eave of a house, on the top of a column, about 10 feet from the ground. It was made of sticks, grasses, roots, feathers, bits of tin and wire nails. The opening was well concealed. Three eggs. (b) Corozal, June 12, 1914. In a house. There were several around the house at all times.

**Henicorhina prosthaleuca pittieri.** PITTIER'S WOOD WREN.—In the valley of the Rio Velazquez, May 15, 1916. Male. Insects in stomach. In a thicket in the jungle.

**Phuegopedius hyperythrus.** TAWNY-BELLIED WREN.—In the valley of the Rio Algarrobo, July 4, 1915. Male. In the jungle.

**Thryophilus rufalbus castanonotus.** CHESTNUT-BACKED WREN.—Sosa Hill, July 18, 1915. Male. Insects in stomach. In a small clearing.

**Thryophilus modestus elutus.** PANAMA WREN.—(a) Sosa Hill, July 18, 1915. Male. (b) Sosa Hill, Oct. 31, 1915. Male. Small Coleoptera and Hemiptera in stomach. In shrubbery. (c) Farfan, Jan. 23, 1916. Male. Insects in stomach. In thick shrubbery. (d) Gorgona, Feb. 20, 1916. Female. Insects in stomach.

**Rhodinocichla rosea.** ROSE-BREADED MOCKING-THRUSH.—Gorgona, Feb. 20, 1916. One male and one female. Hard shrub seeds in stomachs. In thick shrubbery.

**Planesticus grayi casius.** BONAPARTE'S THRUSH.—(a) Las Cascadas, May 10, 1908. On the nest. The nest was about 25 feet from the ground, in a tree near a clearing in the jungle. It was made of fibrous roots and tendrils. Three eggs, very light green, nearly evenly spotted with reddish-brown. A similar nest taken in the same locality, May 22, 1908, was made of fibrous roots and tendrils but with no mud lining. Three eggs, very light green, but not so thickly marked, and two measured 1.08 by .79 and 1.09 by .80 inches. (b) Gatun, Mar. 27, 1909. Near the nest in a small grove of thorn trees. The nest was in a crotch of a thorn tree, about 40 feet from the ground and had an outside diameter of about 4 inches with thin walls made of fibrous roots and tendrils and lined with mud. Two eggs, very light green, spotted nearly evenly with reddish-brown and measured 1.27 by .82 and 1.34 by .81 inches. (c) Gatun, April 5, 1909. Two specimens shot after leaving the nest, in the evening. The nest was about 4 feet from the ground, in a crotch of a big-limbed, low shrub, in a clearing near a creek. It was made of small roots, woven in mud, and lined with roots. Three eggs, very light green, spotted densely and uniformly with reddish-brown and measured .97 by .78, 1.03 by .80 and 1.04 by .80 inches. (d) Gatun, May 5, 1909. Small berries in stomach. Shot after leaving nest. The nest was in a small thorn tree, about 15 feet from the ground. It

was made of roots and moss and lined with smaller roots. Two eggs, very light green, spotted nearly evenly with reddish-brown. One egg was very irregular in shape and the other measured 1.24 by .76 inches. (e) In the valley of the Rio Algarrobo, May 30, 1915. Female. One green berry in stomach. In deep jungle. (f) In the valley of the Rio Algarrobo, May 30, 1915. Female. In deep jungle. (g) Sosa Hill, May 7, 1914. Female. Shot after leaving the nest. The nest was about 10 feet from the ground.

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## A NEW BUSH-WARBLER FROM THE FRENCH CONGO.

BY J. H. RILEY.<sup>1</sup>

MR. C. R. ASCHEMEIER, of the staff of taxidermists in the United States National Museum, who accompanied the Collins-Garner Congo Expedition of 1916-1919, made large collections of natural history material in the vicinity of Fernan Vaz, the headquarters of the expedition.

In determining the birds collected on this expedition, all of which came to the National Museum, I found a specimen of *Macrosphenus* that did not agree with any of the described forms as worked out by Bannerman<sup>2</sup> and which was laid aside as being possibly undescribed. Mr. James P. Chapin, whose knowledge of West African birds is unsurpassed, was recently shown this specimen and he has confirmed my suspicions and urged me to describe it at the earliest opportunity.

I take great pleasure in dedicating the new species to Major Alfred M. Collins, whose generosity made the expedition possible.

### ***Macrosphenus collinsi*, sp. nov.**

Type, adult female, U. S. National Museum, No. 255,620, Ogooua, French Congo, November 29, 1918, collected by C. R. Aschemeier (original No. 900).

Similar to *Macrosphenus flavicans flavicans* Cassin, but considerably smaller, more yellowish green above, throat whitish, not neutral gray, gray of chest more extensive, yellow of breast and belly more greenish

<sup>1</sup> By permission of the Secretary of the Smithsonian Institution.

<sup>2</sup> *Ibis*, 1921, pp. 121-125.