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THE MAMMALS AND BIRDS OF THE PEARL ISLANDS;
BAY OF PANAMA.

By JOHN E. THAYER AND OUTRAM BANGS.

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No. 8. — *The Mammals and Birds of the Pearl Islands,
Bay of Panama.*¹

BY JOHN E. THAYER AND OUTRAM BANGS.

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I. INTRODUCTION. BY OUTRAM BANGS.

During the John E. Thayer Expedition of 1904 Mr. W. W. Brown, Jr., made a second visit (his first expedition to the islands having been made in the spring of 1900) to the Archipelago de las Perlas in the Bay of Panama. Here he remained, collecting assiduously, for two months, — from the latter part of February to the latter part of April, 1904.

On his first trip, in 1900, Mr. Brown devoted much time to collecting mammals, and took specimens of probably every species that occurs in the islands, with the possible exception of some bats. He felt, however, that there were many birds in the islands of which he failed to secure representatives. The birds taken on the first expedition were also, many of them, in poor plumage, — some so worn and faded as to be misleading. On the first trip, also, Mr. Brown collected only in San Miguel Island, and took no reptiles or amphibians. It therefore seemed desirable that a second visit should be made.

On the present trip Mr. Brown collected on San Miguel, Saboga, and Pacheca Islands. The biota of all three is similar, and no species taken has differentiated on the several islands, owing to their closeness. San Miguel, being the largest island of the group, has the richest fauna, and many species occur there that are not found in the other islands. Saboga is the "bird rock" of the group, and here cormorants, boobies, man-o'-war birds, and terns breed in great numbers.

¹ Papers from the John E. Thayer Expedition of 1904, No. 2.

Pedro Gonzales and San Jose Islands were not visited; lying a little apart from the other islands, these two might prove to be interesting, but time did not permit of their being explored.

The vertebrates of the Pearl Islands are derived for the most part from the adjacent mainland, being either the same as, or slightly differentiated, island races of widely distributed Panamic forms. There are, however, some striking exceptions to this rule. Among the mammals, for instance, the nearest ally of the island vesper rat — *Zygodontomys seorsus* — seems to be *Z. brevicauda* of Trinidad; and a species of *Loncheres* allied to the Colombian *L. caniceps* occurs in the Pearl Islands, though the genus is as yet unknown from anywhere else north of South America proper.

Among the birds the more peculiar cases of distribution are the yellow honey-creeper, which is not nearly related to *Coereba mexicana* of the adjacent mainland, but finds its closest ally in *C. luteola* of the Caribbean coasts of Colombia and Venezuela; the *Phaethornis* of the islands, which is related to *P. anthophilus* of central and eastern Colombia and Venezuela; and the ant wren, which, though very distinct, is a representative of *Formicivora intermedia* of Venezuela and Colombia.

Geologists appear to know very little about the Pearl Islands, and I can find nothing in print. Mr. Brown collected specimens of rock, and these, according to Professor Crosby, are of volcanic origin. From what little I can gather, I infer that the Archipelago de las Perlas has never been connected with the mainland since the elevation of the isthmus and the separation of the waters of the Bay of Panama from the Caribbean Sea.

The islands lie in the middle of the Bay of Panama, distant about twenty miles from the nearest point on the mainland. The larger ones are hilly and covered with a dense, luxuriant tropical forest, with the shores in many places fringed by mangroves. The waters of the Bay of Panama all about the islands are very deep.

The collections of reptiles, amphibians, and fishes will be reported upon in the third paper of this series.

Mr. Brown also made a small collection of trees and woody shrubs. These arrived in splendid condition and have been presented by Mr. Thayer to Prof. C. S. Sargent.

II. LITERATURE. BY OUTRAM BANGS.

As the papers on Mr. Brown's first trip to the Pearl Islands were scattered, it is well to give a list of them here. They are as follows:

Bangs, Outram. Birds of San Miguel Island, Panama. Auk, vol. 18, pp. 24-32, January, 1901.

Bangs, Outram. A New Honey Creeper from San Miguel Island, Panama. Proc. New Eng. Zool. Club, vol. 2, pp. 51-52, Feb. 8, 1901.

Bangs, Outram. A New *Ortalis* from the Archipelago de las Perlas, Bay of Panama. Proc. New Eng. Zool. Club, vol. 2, pp. 61-62, July 31, 1901.

Bangs, Outram. The Mammals Collected in San Miguel Island, Panama, by W. W. Brown, Jr. Amer. Nat., vol. 35, pp. 631-644, August, 1901. (Actual date of distribution, Aug. 22, 1901.)

Bangs, Outram. Two New Birds from San Miguel Island, Bay of Panama. Proc. New Eng. Zool. Club, vol. 3, pp. 71-73, March 31, 1902.

Bangs, Outram. A New Wren from San Miguel Island, Bay of Panama. Proc. New Eng. Zool. Club, vol. 4, pp. 3-4, March 16, 1903.

Besides these papers very little has been published, except a description of a supposed new dove, *Zenaida hypoleuca* G. R. Gray MS. Mus. Brit. 1854; Bp. Consp. Av. II. p. 83, 1854. The specimen was collected by Captain Kellett and Lieutenant Wood, and was said to have come from the Pearl Islands (see under Aves of the present paper, species No. 31). One or two other birds are listed in the Catalogues of Birds in the British Museum from the same source.

Mention of birds and mammals described from the islands is of course made in lists and reviews since published, such as, —

Systematic Results of the Study of North American Land Mammals during the years 1901 and 1902, Miller and Rehn; Land and Sea Mammals of Middle America, Elliot; Hand-List of Birds, Sharpe; Birds of North and Middle America, Ridgway.

III. LIST OF THE MAMMALIA. BY OUTRAM BANGS.

The present trip added but little to our knowledge of the mammalian life of the Pearl Islands. No species was taken that Mr. Brown had not collected on his first visit to the islands in 1900. Mr. Brown, however, secured an additional example of the rabbit of the islands — *Lepus incitatus* — which was previously known by the type alone. This specimen, an adult female, taken in San Miguel Island, Feb. 29, 1904, is in

every way similar to the type, with the same peculiar skull with its broad, heavy rostrum.

I give a nominal list of the species of the islands here in order to make the paper complete as to the mammals. The species peculiar to the Pearl Islands are marked with an asterisk.

1. * *Marmosa fulviventris* Bangs.
2. *Didelphis marsupialis etensis* Allen.¹
3. * *Lepus incitatus* Bangs.
4. * *Dasyprocta callida* Bangs.
5. * *Loncheres labilis* Bangs.
6. * *Proechimys burrus* Bangs.
7. * *Zygodontomys seorsus* Bangs.
8. *Mus musculus* Linné.
9. *Mus rattus rattus* Linné.
10. *Mus rattus alexandrinus* (Geoff.).
11. *Vampyrops helleri* Peters.
12. *Hemiderma breicaudum* (Wied.).

IV. AVES. BY JOHN E. THAYER AND OUTRAM BANGS.

On his first trip to the Pearl Islands Mr. Brown secured examples of forty-two species of birds, only two of which were North American migrants. On the present expedition he took representatives of ninety-two species. One species taken in 1900 — *Agamia agami* — was not obtained, and a dove — *Zenaidura auriculata* — recorded from the Pearl Islands on the strength of a skin supposed to have been taken there by Captain Kellett and Lieutenant Wood, was not met with by Mr. Brown.

Thus the number of species of birds so far taken in the Pearl Islands is ninety-four, of which thirty-three are North American migrants, and sixty-one resident breeding birds of the islands.

It is rather strange that this considerable increase in the numbers of resident birds added but one new species, — the Booby, already described (Bull. M. C. Z., vol. 46, p. 92, June, 1905). All the others, with the possible exception of the rail, which we refer hesitatingly to *Aramides cajanea chiricote*, prove the same as mainland species.

The large series collected on the present trip shows one species,

¹ Allen, Bull. Amer. Mus. of Nat. Hist., vol. 16, Aug. 18, 1902, p. 232. I fail to see how this form from the continent and the Pearl Islands differs from *D. marsupialis battyi* Thomas, described from Coiba Island (Novit. Zoöl., vol. 9, p. 137, April, 1902). Dr. Allen, however, keeps them distinct in his review.

Ortalis struthopus, described by Bangs as peculiar to the islands, to be the mainland form, *Ortalis cinereiceps*.

Two new subspecies are described in the following list, — one a tyrant, of which Mr. Brown had previously taken but one example, and another, the blue tanager of the islands, which differs sufficiently from the mainland form to be considered a subspecies.

Unfortunately very little can be noted as to the habits of the birds. Mr. Brown states that in the islands, heavily forested right to high-water mark, the smaller birds all live in much the same manner, except that some keep to the underbrush and others to the trees, and that frequently one does not know what bird one has shot until it is secured.

In the following list North American migrants are marked with an asterisk, measurements are in millimetres, and the colors are according to Ridgway's nomenclature.

PHALACROCORACIDAE.

1. *Phalacrocorax vigua vigua* (VIEILL.).

Sixteen specimens, adults and young, San Miguel and Saboga Islands, March and April. A nest placed in a tree containing six incubated eggs was taken, April 14, in Saboga Island.

SULIDAE.

2. *Sula etesiaca* THAYER AND BANGS.

Seventeen specimens, adults of both sexes and young, San Miguel and Saboga Islands, March and April. No nests were found, the breeding season being apparently over.

FREGATIDAE.

3. *Fregata aquila* (LINNÉ).

Three adults, ♂♂ and ♀, San Miguel and Saboga. A number of eggs were also taken.

ARDEIDAE.

4. *Nyctanassa violacea* (LINNÉ).

Twelve specimens, adults and young, San Miguel and Saboga, March and April. A nest containing two fresh eggs was taken from a tree in San Miguel, March 14.

5. *Agamia agami* (Gmel.).

This bird was not observed on the present trip. One adult ♀ was taken in San Miguel, May 8, 1900, on Mr. Brown's former excursion to the islands.

6. *Butorides virescens maculata* (Bodd.).

Twenty-one specimens, adults and young, San Miguel Island, February and March. A nest containing one fresh egg was found March 15.

At first we thought this series represented a well-marked new form of the Little Green Heron, but on close comparison with considerable material from the West Indies we are unable to find a single character by which the Pearl Islands birds can be distinguished from *B. virescens maculata*. The skins agree in measurements with West Indian examples, as can be seen from the following tables. In color the Pearl Islands series presents the most astounding amount of individual variation. Some specimens have entirely lost all markings on the neck, this being dark maroon chestnut with a purplish bloom. Others have the neck normally striped and marked, agreeing exactly with birds from Cuba and the Lesser Antilles. Some have the throat white, others rufous, and others again have it either white or rufous heavily striped with black. The color of the belly varies from olive gray in some individuals to brownish slate color in others. The edgings to the wing coverts vary individually from whitish to rusty, and in some fully adult birds these edgings are broad and conspicuous, while in others they are very narrow, — almost wanting in one skin. In fact, among the adult birds it is hard to find two alike. The birds that have the neck uniform maroon-chestnut, or nearly so, have blacker bills than the others, with less yellow on the mandible. These skins represent a phase of plumage much like, if not the same as, the so-called *Butorides brunnescens* of Cuba, which most certainly is nothing but a phase of plumage of the ordinary species with which it occurs in Cuba. We have, as it happens, however, never seen intermediate examples from Cuba, all birds examined from that island being either in the *brunnescens* or the *maculata* phase. In the Pearl Islands series there is every stage of intermediate coloring.

This series, proving, as it does, that the Green Heron of the Panama region is the same as the West Indian, leads us to suppose that the range of this form includes the whole of southern Central and northern South America, where *Butorides virescens* meets and overlaps the range of *B. striata*.

*Measurements of a series of Butorides virescens maculata.*¹ —

No.	Locality.	Sex.	Wing.	Tail.	Tarsus.	Culmen.
14,891	Cuba, Halquin	♂ ad.	164.5	59.5	45	61
14,892	do.	♀ ad.	166	59	47	59.5
13,486	Isle of Pines, Santa Fé	♂ ad.	170	60	51	63

¹ Collection of E. A. and O. Bangs.

No.	Locality.	Sex.	Wing.	Tail.	Tarsus.	Culmen.
13,487	Isle of Pines, Bibeyhagua	♂ ad.	154	51	43	57.5
13,517	Dominica	♀ yg. ad.	164	59	47	56
13,578	do.	♀ yg. ad.	171	60	47	59
12,897	Bequia, Spring Est.	(?) ad.	171	60	49	61.5
12,896	do.	♂ ad.	171	63	49	63
12,626	Barbados	♀ ad.	168	59	49	60
12,629	do.	♂ ad.	165	58	43	57
12,627	do.	♀ ad.	163		46	58
13,212	Grenada, St. George	♂ ad.	168	60.5	49	57
8,902	Panama, Sona.	♂ ad.	175	61	48	61
14,260	Pearl Islands, San Miguel	♂ ad.	167.5	58.5	48.5	61
14,261	do.	♂ ad.	170	61	47	58
14,262	do.	♂ ad.	169	59	47	59.5
14,263	do.	♂ ad.	165	60	47.5	60
14,264	do.	♂ ad.	166	58	47	58
14,265	do.	♂ ad.	175	63	48	58.5
4,831	do.	♂ ad.	162.5	57	46	
14,266	do.	♀ ad.	163	58	45	57.5
14,267	do.	♀ ad.	163	59	43	57
14,268	do.	♀ ad.	164	57.5	45	61
10,538	Honduras, Ceiba	♂ ad.	174	62	50	60.5
3,423	Bahamas, Nassau	♂ ad.	167	59	44.5	58
14,994	Bahamas, Andros	♂ ad.	157	55.5	43	56

From these measurements it can be seen at a glance that the Pearl Islands Green Heron does not differ in size or proportions from birds from the West Indies and continental tropical America. There is a considerable individual variation in size in the Green Heron everywhere, but averages show that *B. virescens maculata* is easily separable from *B. virescens virescens* of eastern North America on account of its smaller size.

After examining a very large amount of material in this connection, we are forced to place very little reliance on color as a character by which to distinguish the various races of this species. Seasonal difference in this respect is very great, individual variation is also great, and in arid regions the bird bleaches out very fast. Mr. J. H. Riley in a recent publication¹ has stated: "Green herons from the West Indies, except the Bahamas, are smaller, have the crest more plumbeous, and the white edgings to the wing coverts are less pronounced and not so tawny in color when compared with Florida specimens." We cannot find a single one of these color characters stable, and furthermore are unable to separate Bahaman birds from those from other West Indian Islands killed at corresponding dates. Bahaman birds appear to bleach out and become very pale in summer, but so do birds in Barbados and Bequia, and

¹ Catalogue of a Collection of Birds from Barbuda and Antigua, B. W. I., Smith. Misc. Collections, vol. 47.

probably other more barren islands. The subspecies *maculata* also has a rufous phase — the so-called *B. brunnescens* — which thus far has been recorded from Cuba and the Pearl Islands only. That this is merely a phase of plumage is abundantly shown by the Pearl Islands series.

B. virescens anthonyi Mearns is certainly larger than *B. virescens virescens*, but how much its alleged paler color is due to season and to bleaching in its arid habitat remains to be proved. Young individuals, however, seem to have more white in the wing feathers. The two specimens upon which *Butorides virescens frazari* (Brewster) was based were killed in February, and appear to be in full winter plumage, and we cannot help predicting that a careful study of specimens killed at all seasons of the year will show that this is the name of the western bird, and that *anthonyi* is a synonym of it.

IBIDIDAE.

7. *Eudocimus albus* (LINNÉ).

Four adults, both sexes, San Miguel and Pacheca Islands, March and April. An egg ready to be laid was taken from the oviduct of a bird killed April 14 in Pacheca Island.

CATHARTIDAE.

8. *Catharistes urubu* (VIEILL.).

One female, Saboga Island, April 12.

FALCONIDAE.

9. *Polyborus cheriway* (JACQ.).

Two specimens, ♂ and ♀, Pacheca Island, April 14.

10. *Milvago chimachima* (VIEILL.).

Fourteen specimens, young and adults of both sexes, San Miguel and Saboga Islands, April and March.

11. *Buteo abbreviatus* CAB.

Two specimens, ♂ and ♀, San Miguel Island, March 6 and 11.

12. *Rupornis ruficauda* (SCL. AND SALV.).

Four specimens, both sexes, San Miguel Island, February and March.

13. *Urubitinga anthracina* (LICHT.).

Two males, one adult, one young, San Miguel Island, March. These do not differ from mainland specimens.

14. *Regerinus uncinatus* (TEMM.).

One ♂, beginning to attain to blue back of the adult plumage, Saboga Island, April 3. The naked parts are noted by Mr. Brown as "tarsus lemon yellow; skin of loreal region flax flower blue, with a yellow spot in front of eye; iris dirty white."

15. *Ictinea plumbea* (GMEL.).

One adult, ♂, San Miguel Island, March 13.

TINAMIDAE.

16. *Crypturus soui modestus* (CAB.).

Six adults, both sexes, San Miguel Island, February and March. It is rather strange that the Tinamou of the Pearl Islands should be identical with that of the mainland, but such seems to be the case. We can detect no differences either in color or measurements.

CRACIDAE.

17. *Ortalis cinereiceps* (GRAY).

Ortalis struthopus Bangs, Proc. New Eng. Zool. Club, vol. 2, pp. 61-62, July 31, 1901.

Seven adults, both sexes, San Miguel Island, February and March. This series shows that the supposed race from the Pearl Islands is not in any way different from the bird of the mainland. The present specimens are identical in color as well as in measurements with examples from Panama and Chiriqui. The type of *O. struthopus* marked "♂" is probably a female, wrongly sexed. The other original skin, No. 4882, adult ♀, from Pedro Gonzales Island, is the smallest in the whole series, and has the smallest and shortest foot and tarsus; it is probably a dwarf. Apart from this specimen, measurements of the island birds agree exactly with those of a series from the mainland, the males in all cases being much larger than the females.

RALLIDAE.

18. *Aramides cajanea chiricote* (VIEILL.).

Four adults, both sexes, San Miguel, February and March.

These rails, when compared with a series from Panama and Chiriqui, are paler below and average smaller; there is such an amount of individual variation in size in both series, however, that this apparent difference might not hold good if still more material was measured. The paler color of the under

parts of the island birds also may not be a real difference, but is perhaps seasonal. Specimens measure as follows:

No.	Locality.	Sex.	Wing.	Tarsus.	Culmen.
14,297	San Miguel Island	♀ ad.	163	67.5	52
14,298	do.	♀ ad.	170	66	52
14,299	do.	♂ ad.	165	67	52
40,343	M. C. Z. do.	♂ ad.	169	67	53
7,060	Panama, Loma del Leon	♂ ad.	173	69	55
7,649	Chiriqui, Divala	♂ ad.	185	71	56.5
7,650	do.	♀ ad.	177	72	53.5

CHARADRIIDAE.

19. *Haematopus palliatus* TEMM.

One adult, ♀, San Miguel Island, March 12. This example is rather small, but E. W. Nelson, who examined it during a study of the American Oyster catchers, considers its small dimensions as only the extreme of individual variation.

* 20. *Arenaria interpres* (LINNÉ).

Three specimens, ♂ ♂ and ♀, San Miguel Island, February 27.

* 21. *Squatarola squatarola* (LINNÉ).

One ♀, San Miguel Island, March 11.

* 22. *Ochthodromus wilsoni* (ORD.).

Three females, San Miguel Island, February 29 and March 11.

* 23. *Aegialeus semipalmatus* (BP.).

Three specimens, ♂ ♀ ♀, San Miguel Island, March 4, 9, and 17.

* 24. *Numenius hudsonicus* LATH.

Three specimens, two females and a male, San Miguel Island and Saboga Island, February 24 and April 5.

* 25. *Catoptrophorus semipalmata* (GMEL.).

Two females, San Miguel Island, February 20 and March 2.

* 26. *Actitis macularia* (LINNÉ).

Five specimens, both sexes, San Miguel and Saboga Islands, March 1, 2, 10, and 17 and April 12. Two of these are spotted below, and three are in the white-bellied plumage.

* 27. *Ereunetes occidentalis* LAWR.

One ♀, San Miguel Island, March 8.

* 28. *Limonites minutilla* (VIEILL.).

Three specimens, two males and a female, San Miguel Island, March 10.

LARIDAE.

29. *Sterna maxima* BODD.

Two females, San Miguel Island, March 15.

COLUMBIDAE.

30. *Columba rufina* TEMM. AND KNIP.

Ten adults of both sexes, San Miguel Island, February and March.

PERISTERIDAE.

31. *Zenaida auriculata* (DES MURS).

Though the Pearl Islands were so thoroughly collected by Mr. Brown, he never saw this dove, and the one specimen — the type of *Z. hypoleuca* Gray — obtained by Captain Kellett and Lieutenant Wood, if it really came from the islands, was probably a stray. It must be borne in mind that this is the only record for the species from north of Ecuador.

Unfortunately many of the birds collected by Kellett and Wood got mixed up, and any unusual record is hardly to be relied upon. While Gerrit S. Miller, Jr., was in the British Museum last winter, we asked him to examine the type of *Z. hypoleuca*, and also to look at other skins obtained on the same trip by Kellett and Wood. This Mr. Miller very kindly did in company with Dr. Sharpe. He informed us that the type of this dove had been injured by a taxidermist in making over, and so little of it remains that it is now impossible to state if it differed in any way from *Z. auriculata*. He also states that the Kellett and Wood skins were put in open tubes of paper and the data written on the tubes, that many got interchanged, and that no reliance can now be placed on the labels. As these officers collected down the west coast of

South America, it is very likely the dove in question never came from the Pearl Islands, or, as we have said above, if it did, its occurrence there must be looked upon as purely accidental.

32. *Columbigallina rufipennis rufipennis* (Br.)

Twelve specimens, adults of both sexes, San Miguel and Saboga Islands, February, March, and April.

It might be expected that a bird of such feeble flight as the ground dove would become modified in some way upon these islands where so many other birds are different from their mainland representatives, but we are unable to find the slightest difference between the Rufous-winged Ground Doves of the Pearl Islands and the continent.

33. *Leptotila verreauxi* Br.

Eleven specimens, adults of both sexes and young, San Miguel and Saboga Islands, February, March, and April.

If it should be found necessary to recognize the Central American form as *Leptotila verreauxi riottei* Lawr. (type from Navarro, Costa Rica)¹ on account of its slightly darker brown, back, wings, and upper surface of tail, the Pearl Islands bird will be included with true *L. verreauxi* of South America.

CUCULIDAE.

34. *Crotophaga ani* LINNÉ.

Nine specimens, adults of both sexes and one young (March 28), San Miguel and Saboga Islands, February, March, and April.

PSITTACIDAE.

35. *Amazona salvini* SALVADORI.

Seven adults, both sexes, San Miguel Island, March. We can find no constant differences between these and specimens from Panama and Chiriqui.

ALCEDINIDAE.

36. *Ceryle torquata* (LINNÉ).

Five adults, both sexes, San Miguel Island, March.

¹ The range of this form extends from Costa Rica to Panama, while the paler true *L. verreauxi* occupies the whole of northern South America and the Pearl Islands.

37. *Ceryle inda* (LINNÉ).

Five adults, both sexes, San Miguel Island, February and March.

BUBONIDAE.

38. *Otus choliba* (VIEILL.).¹

Six adults, both sexes, San Miguel Island, February and March.

In all probability the screech owl of the islands is not true *O. choliba*, but lack of material prevents us from forming any definite opinion.

CAPRIMULGIDAE.

39. *Nyctidromus albicollis* (GMEL.).

Five adults, both sexes, San Miguel Island, February and March.

The Parauque of the Pearl Islands does not differ from that of the mainland opposite, but to just what form the Panama bird should be referred is at present uncertain. As a rule specimens from Panama and Chiriqui are larger and darker than those from Guiana and Venezuela, but we have before us one skin from Divala, Chiriqui, of the same small rufous type that is the prevailing bird in Guiana and Venezuela. It is a ♂, and its wing and tail are half an inch shorter than in any other specimen from the same region, and its general coloration much more rufous. Can it be possible that these small rufous examples in reality belong to a species distinct from the larger darker bird? It is difficult to see how any other explanation can account for their presence in the same region with the other kind, and for their being so much alike, whether they come from Guiana or Chiriqui.

TROCHILIDAE.

40. *Phaethornis hyalinus* BANGS.

Phaethornis hyalinus Bangs, Auk, vol. 18, pp. 27-28, January, 1901.

Five adults, both sexes, San Miguel Island, February and March.

These specimens, exactly like the original three, confirm the characters of this well-marked island species.

41. *Saucerottea edwardi* (DELATRE AND BOURE).

Eight adults, both sexes, San Miguel and Saboga Islands, March and April.

¹ One hardly recognizes "*Megascops brasiliana* (Gmel.)" under this name, but according to Von Berlepsch the bird must be known by this specific title, while Stone has shown that *Otus* must replace *Megascops*.

42. *Chlorostilbon assimilis* LAW. R.

Nine adults, both sexes, San Miguel and Saboga Islands, February, March, and April.

PICIDAE.

43. *Melanerpes seductus* BANGS.

Melanerpes seductus Bangs, Auk, vol. 18, pp. 26-27, January, 1901.

Nine specimens, adults of both sexes, and one full-grown young male (March 11), San Miguel Island, February and March.

The woodpecker of the Pearl Islands is a well-marked island form of *M. wagleri*, but whether its differences are better expressed by a binomial or a trinomial is a question for some reviewer of the group to decide.

FORMICARIIDAE.

44. *Thamnophilus nigricristatus* LAW. R.

Eight adults, both sexes, San Miguel Island, February and March.

45. *Formicivora alticincta* BANGS.

Formicivora alticincta Bangs, Proc. New Eng. Zool. Club, vol. 3, p. 71, March 31, 1902.

Thirteen specimens, adults of both sexes, and one young male, changing from a dress similar to that of the female to that of the adult male.

The adult males are similar to the two original specimens upon which this very distinct island species was founded. The female was previously unknown; it differs from the female of *F. intermedia* Cab. in being darker, richer brown above, and much more extensively ochraceous below. In one specimen the whole under parts, except throat and flanks, are of this color. It also wholly lacks the black subapical spots on the feathers of the chest, which in the female of *F. intermedia* form a sort of collar of semi-concealed spots.

46. *Cercomacra nigricans* SCL.

Cercomacra maculicaudis (Scl.) Bangs, Auk, vol. 18, p. 30, January, 1901.

Eleven specimens, adults of both sexes, and one young male in transition plumage, between that of the adult male and that similar to the female, San Miguel Island, February and March.

TYRANNIDAE.

47. *Mionectes oleaginus oleaginus* (LIGHT.).

Two specimens, male and female adult, San Miguel Island, February 24 and March 7. Like the first pair from the Pearl Islands, these two skins agree very well with South American examples, and are slightly larger and a little paler in color than *M. oleaginus parvus* Bangs of Panama.

48. *Myiopagis placens accola* BANGS.

Fifteen adults of both sexes, San Miguel and Saboga Islands, February, March, and April. These skins agree with specimens from Panama, but are slightly paler in color than the typical series from Chiriqui. The back is paler and grayer green, and the throat and breast slightly yellower, less grayish. In these points of difference from *accola* the island bird approaches *M. placens pallens* Bangs of northern South America (described from Santa Marta). On the whole, however, though somewhat intermediate, Panama and the Pearl Islands specimens should perhaps be referred to *accola*.

49. *Ornithion pusillum* (CAB. AND HEINE).

Eighteen specimens, adults of both sexes, and one young ♂ in nestling plumage (March 18), San Miguel, Saboga, and Pacheca Islands, March and April.

This fine series shows that the bird of the Pearl Islands does not differ from that of Panama. At the present time, however, we are not prepared to say that the Panama form is true *O. pusillum* which was described from Cartagena. The rather scanty and poor material examined from Colombia points to the two being subspecifically distinct, in which case the Panama race should bear the name, *Ornithion pusillum flaviventre* (Scl. and Salv.). The one nestling differs from the adults in having the cap less sharply defined and more nearly concolorous with the back, all the colors more blended, and the wing bars rufous instead of whitish or yellowish.

50. *Elainea pagana subpagana* (SCL. AND SALV.).

Twenty-three adults, both sexes, San Miguel and Saboga Islands, February, March, and April.

There appear to be no constant differences between the island skins and those from the mainland of Panama and Chiriqui. The olive green of the back varies much in this series, and some specimens are very pale; others in which the plumage has become faded are very brown. In measurements the series varies a good deal, but this is also true of mainland specimens.

51. *Elainea albivertex sordidata* (BANGS).

Elainea sordidata Bangs, Auk, vol. 18, pp. 28-30, January, 1901.

Fourteen adults, both sexes, San Miguel Island, February and March.

It is claimed by Von Berlepsch and Hellmayr (Journ. f. Ornith. Januar-Heft, 1905, p. 2) that *Elainea sororia* Bangs from the Sierra Nevada de Santa Marta is identical with *E. albivertex* Pelz. of Brazil. The bird of the Pearl Islands seems a subspecies of this species, differing only in average characters. The present series bears out the slight differences noticed in the original description of *E. sordidata*—slightly shorter wing, tail, and tarsus, and longer and rather broader bill; slightly duller and grayer upper parts, smaller white crown patch and narrower wing bars. All these differences are, however, average characters only, and the subspecies is not a very satisfactorily marked one. Specimens from Panama City are troublesome; they are about the size of the island examples, and differ from them only in having slightly smaller bills. It is possible that *sordidata* is too slightly differentiated to stand even as a subspecies.

52. *Sublegatus arenarum* (SALV.).

Nineteen adults, both sexes, San Miguel and Saboga Islands, February, March, and April.

53. *Myiodynastes audax nobilis* (SCL.).

Four adults, both sexes, San Miguel, Saboga, and Pacheca Islands, March and April.

54. *Myiobius naevius furfurosus*, sub. sp. nov.

Myiobius naevius Bangs, Auk, vol. 18, p. 30, January, 1901 (nec. Bodd.).

Three specimens, two adult females, one adult ♂, Saboga Island, April.

Type.—Coll. E. A. and O. Bangs, No. 14,397, adult ♀, Saboga Island, Bay of Panama, April 9, 1904.

Characters.—Similar to true *M. naevius* (Bodd.) of South America (type from Guiana), but differing in being much more strongly buffy below, buff on throat and breast and buff yellow on belly and under tail coverts; the breast very much less distinctly striped with brownish; upper parts rather paler—about russet.

From *M. crypterythrus* Scl. of West Ecuador and *M. cryptoxanthus* Scl. of East Ecuador, the new form differs in its much paler brown back, though agreeing with the former in having the breast indistinctly flammulated.

Measurements. —

No.	Locality.	Sex.	Wing.	Tail.	Tarsus.	Culmen.
14,397	Saboga Isl.	♀ ad.	54	49	15.5	11
14,398	do.	♂ ad.	55.5	47.5	15.5	11
A.	do.	♀ ad.	54	48	15	10
4,876	San Miguel Isl.	♂ ad.	55.5	51	15.5	11.5

Remarks. — The three specimens contained in the present collection agree with one that Mr. Brown took in San Miguel Island on his first trip in 1900, and differ, as pointed out above, from all examples of true *M. naevius* we have examined. The bird is rare in the islands, and though specially on the lookout for it, Mr. Brown was unable to get a large series.

* 55. *Empidonax traillii traillii* (AUD.).

One adult male, Saboga Island, April 13.

* 56. *Empidonax traillii alnorum* BREWST.

Five adults, both sexes, Saboga Island, April 11 to 13. These have been kindly identified for us by Brewster, who pronounces five out of the six *Empidonax* taken by Mr. Brown *alnorum* and one true *traillii*.

* 57. *Horizopus virens* (LINNÉ).

Four adults, both sexes, Saboga and Pacheca Islands, April 6 to 14.

58. *Myiarchus ferox panamensis* (LAWR.).

Twenty-four specimens, both sexes, San Miguel, Saboga, and Pacheca Islands, February, March, and April.

* 59. *Myiarchus crinitus crinitus* (LINNÉ).

Two adult males, Saboga Island, April 9 and 13.

By a mistake Nelson recorded *Myiarchus nigriceps* Scl. from the Pearl Islands in his Revision of the North American Mainland Species of *Myiarchus*, Proc. Biol. Soc. Washington, vol. 17, pp. 49-50, March 10, 1904. The specimens collected by Mr. Brown loaned at the time were from San Miguel in the Sierra Nevada de Santa Marta, which Nelson mistook for San Miguel Island. The species has never been taken in the Pearl Islands.

* 60. *Tyrannus tyrannus tyrannus* (LINNÉ).

Seven specimens, both sexes, San Miguel and Saboga Islands, March 18 to April 8.

61. *Tyrannus melancholicus satrapa* (Licht.).

Thirty-four adults, both sexes, San Miguel, Saboga, and Pacheca Islands, February, March, and April.

TURDIDAE.

*62. *Hylocichla swainsoni* (Cab.).

Two adults, ♂ and ♀, Saboga Island, April 8 and 11.

TROGLODYTIDAE.

63. *Troglodytes musculus inquietus* (Baird).

One adult male, San Miguel Island, March 18. This skin agrees in all respects with specimens from Panama. As it was the only house wren Mr. Brown saw in the islands on either trip, it may have come there by some accident.

64. *Thryophilus galbraithii conditus* BANGS.

Thryophilus galbraithii conditus Bangs, Proc. New Eng. Zool. Club, vol. 4, pp. 3-4, March 16, 1903.

Ten specimens, adults of both sexes, San Miguel Island, February and March. These, like the original specimens, are deeper in color and slightly larger than mainland examples of true *T. galbraithii*.

VIREONIDAE.

65. *Vireosylva insulanus* (Bangs).

Vireo insulanus Bangs, Proc. New Eng. Zool. Club, vol. 3, p. 73, March 31, 1902.

Twenty specimens, adults of both sexes, San Miguel and Saboga Islands, February, March, and April. The present series shows the same characters to distinguish the island bird from true *V. flavoviridis* Cassin as did the original four skins on which the form was based, — smaller size, duller color of back, and more pronounced lateral line of pileum and pale superciliary stripe. Still all these characters are average ones, and had not Ridgway in Birds of North and Middle America treated the bird as a distinct species, we should feel inclined to reduce it to a subspecies of *V. flavoviridis*.

*66. *Vireosylva olivacea* (Linné).

Five adults, both sexes, Saboga Island, April 7 to 12.

HIRUNDINIDAE.

*67. *Progne chalybea chalybea* (GMEL.).

Five adults, both sexes, San Miguel Island, March. One colony of this dull-colored martin was nesting in the church at San Miguel; it was not seen elsewhere in the islands.

MNIOTILTIDAE.

*68. *Protonotaria citrea* (BODD.).

Three females, San Miguel Island, February 24, March 2 and 13.

*69. *Vermivora peregrina* (WILS.).¹

Three males, San Miguel Island, February 26 and March 1, Saboga Island, April 1. The specimen killed February 26 is moulting, as is also the one March 1, the olive green feathers of the cap being replaced by gray ones, and new feathers coming in on the throat and breast. The example taken April 1, however, is wholly in the plumage of the young in first autumn and shows no signs of approaching moult.

*70. *Chrysocantor aestiva aestiva* (GMEL.).

Twenty-five specimens, both sexes, San Miguel and Saboga Islands, February 21 to April 13. Many of these are in the moult; others, especially females, are in much abraded plumage.

71. *Chrysocantor erithachorides* (BAIRD).

Seventy-three specimens, San Miguel and Saboga Islands, February, March, and April.

These skins do not differ from examples from Panama. The series shows a considerable amount of individual variation, apart from that due to age. Several adult males are intensely colored, with the under parts much suffused with cadmium orange, the smaller wing coverts and yellow portion of the tail mostly of this color, and with the colors of the head very intense; others, apparently quite as old, are much duller. The extent of the rufous chestnut of the head varies from, in some skins, where it covers most of the chest to others where it ends at the throat. The rufous chestnut streaks on breast and sides vary much, in amount, in intensity of color, and in width. Some specimens have the back streaked with rufous chestnut, while usually it is plain yellowish olive green. In fact, it is difficult to pick out two skins quite alike.

¹ Cf. Oberholser, Smith. Mis. Collections, vol. 48, pp. 66-67, May 13, 1905, for change of generic name *Helminthophila* to *Vermivora*.

The females vary as much as the males. The fully adult female usually has some rufous chestnut in the crown, but the amount of this color is very variable, and a few, apparently fully adult, have none of it. The shade of yellow of the under parts and the amount of streaking below vary as in the males.

In the immature plumage, in both sexes, the belly and sides are dull whitish, the throat and chest yellowish, and the back and head much mixed with gray. No specimens were taken in nestling plumage, nor probably wholly in the second stage, in which the back and head would undoubtedly be wholly gray.

The species was common in mangrove swamps bordering the islands, much more so than in the mangroves near the city of Panama.

***72. *Dendroica coronata* (LINNÉ).**

One female, San Miguel Island, February 23.

***73. *Dendroica rara* (WILSON).**

One female, San Miguel Island, March 15.

***74. *Dendroica blackburniae* (GMEL.).**

Two males, Saboga Island, April 4 and 11.

***75. *Dendroica castanea* (WILSON).**

Two males, San Miguel Island, March 6, and Saboga Island, April 3.

The specimen taken March 6 is in the midst of the spring moult, changing everywhere from autumn to spring plumage; the one taken April 3 has nearly, if not quite, completed the moult to its summer dress.

***76. *Seiurus motacilla* (VIEILL.).**

One female, San Miguel Island, March 18.

***77. *Seiurus noveboracensis noveboracensis* (GMEL.).**

Three specimens, one male, two females, San Miguel Island, February 24 and March 8, and Saboga Island, April 9.

***78. *Wilsonia canadensis* (LINNÉ).**

One (female?) specimen, Saboga Island, April 4.

***79. *Setophaga ruticilla* (LINNÉ).**

One female, San Miguel Island, March 2.

COEREBIDAE.

80. *Cyanerpes cyaneus* (LINNÉ).

Thirty-eight specimens, both sexes, San Miguel Island, February and March. There seem to be no differences between specimens from the islands and the coast of Panama opposite.

81. *Coereba cerinoclunis* BANGS.

Coereba cerinoclunis Bangs, Proc. New Eng. Zool. Club, vol. 2, pp. 51-52, Feb. 8, 1901.

Twenty-nine specimens, adults of both sexes and young in nestling plumage, the latter taken February 28 to March 16, San Miguel and Saboga Islands, February, March, and April. Many of the specimens taken in February and March are moulting, while those killed in April have, as a rule, completed the spring moult and are in fine plumage.

This is a strongly characterized island species.

ICTERIDAE.

82. *Megaquiscalus major macrourus* (SWAINSON).

Eighteen specimens, adults of both sexes, San Miguel and Saboga Islands, February, March, and April.

This series Nelson kindly compared with typical Mexican specimens, and found no differences whatever between the island birds and those from eastern Mexico and Central America generally.

* 83. *Icterus spurius* (LINNÉ).

One adult male, Saboga Island, April 13.

* 84. *Icterus galbula* (LINNÉ).

One male, San Miguel Island, March 2.

TANAGRIDAE.

85. *Tanagra cana dilucida*, sub. sp. nov.

Type. — Coll. E. A. and O. Bangs, No. 14,482, adult ♂, San Miguel Island, Bay of Panama, Feb. 25, 1904.

Thirty-one specimens, adults of both sexes and two young — male and female, March 3 and April 1, San Miguel and Saboga Islands, February, March, and April.

Characters. — Similar to *T. cana cana* Swainson, but larger with a larger bill; brighter blue, less greenish, on margins of wing and tail feathers; lesser and middle wing coverts darker and brighter blue — smalt blue; the contrast between colors of smaller wing coverts and bastard wing and edging of larger wing feathers not marked, as is the case in *T. cana cana*; rump and upper tail coverts, usually, decidedly bluer, less greenish.

Measurements. —

No.	Sex.	Locality.	Wing.	Tail.	Tarsus.	Exposed Culmen.
14,482	♂ ad.	San Miguel Isl.	92.5	66.5	19.6	15
A.	♂ ad.	do.	91	66	20	14.2
B.	♂ ad.	do.	93	66	20	14
C.	♂ ad.	do.	91	65	20	14.2
D.	♂ ad.	do.	93	67	19.8	14.4
40,556 M. C. Z.	♂ ad.	do.	92	62	20.2	14
40,557 M. C. Z.	♂ ad.	do.	92	63	19	14
40,558 M. C. Z.	♂ ad.	do.	91.5	64	20	14
40,559 M. C. Z.	♂ ad.	do.	91.5	64.5	20	14.2
4,984	♂ ad.	do.	92	64.5	19.2	14.2
4,986	♂ ad.	do.	92	64	20	14.8
14,485	♂ ad.	Saboga Isl.	92	64	19.4	14
14,487	♂ ad.	do.	93.5	67	20.4	14.8
I.	♂ ad.	do.	90	64	20	14
J.	♂ ad.	do.	92.5	64	20.4	14.2
K.	♂ ad.	do.	94	67.5	20.6	14
40,560 M. C. Z.	♂ ad.	do.	91	65	20	13.8
40,561 M. C. Z.	♂ ad.	do.	92	67	19.6	14.2
14,483	♀ ad.	San Miguel Isl.	88.5	62	20	14
N.	♀ ad.	do.	86.5	61	19.8	14
40,562 M. C. Z.	♀ ad.	do.	85.5	61	19.6	13.4
40,563 M. C. Z.	♀ ad.	do.	86.5	61	20	14
14,489	♀ ad.	Saboga Isl.	87	62	20	13.4
14,491	♀ ad.	do.	87	60.5	19.2	13.2

Remarks. — The combination of several slight differences distinguishes the blue tanager of the Pearl Islands from that of the mainland. Of these its larger bill is its best character. Its wings and tail average much brighter and darker blue, and the form averages a little larger. It is, however, a closely related subspecies, and some single individuals might prove troublesome, but in series the differences stand out fairly well.

*86. *Piranga rubra rubra* (LINNÉ).

Three specimens, one male and two females, Saboga Island, April 5, 10, and 12.

***87. *Piranga erythromelas* (VIEILL.).**

Two males, Saboga Island, April 9. Both these are in the scarlet plumage with black wings; one specimen has a *wholly yellow* bill.

88. *Ramphocelus dimidiatus limatus* (BANGS).

Ramphocelus limatus Bangs, Auk, vol. 18, pp. 31, 32, January, 1901.

Forty-five adults of both sexes, San Miguel, Saboga, and Pacheca Islands, February, March, and April.

In Birds of North and Middle America, Ridgway treats this strongly marked island race as a subspecies. Perhaps this is the better course, but it is nevertheless a very distinct form.

FRINGILLIDAE.

89. *Volatinia jacarini splendens* (VIEILL.).

Thirty specimens, adults of both sexes, and young males, San Miguel Island, February and March. Some examples, like the first two recorded from the islands, have larger bills than any in a considerable series of mainland specimens, but as a rule the bill is not larger than in the continental form.

90. *Sporophila gutturalis* (LICHT.).

Two adult males, Saboga Island, April.

***91. *Cyanospiza cyanea* (LINNÉ).**

One female, Saboga Island, April 6.

92. *Oryzoborus funereus* SCLATER.

Ten adults, both sexes, San Miguel and Saboga Islands, March and April.

***93. *Zamelodia ludoviciana* (LINNÉ).**

One female, San Miguel Island, February 28.

94. *Saltator albicollis isthmicus* (SCL.).

Thirty-six adults, both sexes, San Miguel and Saboga Islands, February, March, and April.

In Birds of North and Middle America Ridgway comments on the rather grayer colors of the original series from San Miguel Island taken in April and May. The present series includes many specimens in perfectly fresh unworn plumage. These are hardly distinguishable from mainland examples,

and we have found it impossible to pick out single skins. Still, as a whole, the bird of the Pearl Islands is a trifle darker and grayer olive green on crown and sides of head, and some examples are much more so than any from the mainland. It is possible that in time a recognizable form will be developed in the islands, but at present the slight differences are too inconstant to warrant giving the bird a name. Some examples have the end of the bill yellow (so marked on the labels by Mr. Brown), but usually it is dark-colored throughout.