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XI
EXPEDITION TO THE REVILLAGIGEDO ISLANDS,
MEXICO, IN 1925, VI

THE BIRDS AND MAMMALS¹

BY

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In pursuance of its long established policy of studying the fauna and flora of Lower California and the adjacent islands, the California Academy of Sciences despatched its expedition to the Revillagigedo² and Tres Marias islands in 1925. The United States government placed the mine-sweeper *Ortolan* at the disposal of the Academy for this purpose, and, under the leadership of Dr. G. Dallas Hanna, the expedition sailed from the Mare Island Navy Yard on April 16.

Clarion Island, the outermost of the Revillagigedo Islands, was reached on the morning of April 26, and the six succeeding days were devoted to securing a representative collection of land and sea birds. The natural barriers furnished by masses of *Opuntia* and dense growths of vines made traveling

¹ This paper is No. 6 of the Revillagigedo Islands Expedition of 1925. Previous papers dealing with the scientific results of that expedition are to be found in preceding papers of Vol. XV of these Proceedings, No. 1, pp. 1-113, being the General Report with itinerary.

² A note on the previous scientific expeditions which had visited this group was published by the author in *Science*, n. s., Vol. 62, No. 1599, pp. 171-173.

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difficult, but both northern and southern slopes of the island were traversed, and the central ridge surmounted. In spite of handicaps, a good series of birds was obtained.

For a few hours on May 2 the *Ortolan* lay off Roca Partida, and, although it proved impossible to make a landing, the collectors obtained specimens of sea birds by approaching the rocks in a small boat.

On the afternoon of the same day the island of Socorro was reached. Land birds were found to be abundant about the spring near Grayson's Cove, and at many points in the heavy growth at higher levels. On account of the difficulties encountered in the ascent, no collections were made at elevations higher than the steam vents on the slope of Mt. Evermann. Ten days were spent on Socorro with very satisfactory results.

San Benedicto was visited on May 12, and, so far as time permitted, representatives of the resident species of birds were obtained.

The *Ortolan* arrived at Maria Madre on the evening of May 13, and the five ensuing days and the days between May 21 and 23, inclusive, were spent in securing birds from the eastern slope of the island from Arroyo Hondo at the north to the salinas at the south. Land birds were plentiful in the neighborhood of fresh water, and a good series was acquired.

Four days were allotted to the work on Maria Magdalena, but an unavoidable interruption to the labors of the collectors somewhat diminished the returns from that island.

May 24 was spent on Isabel Island, and specimens of the resident birds, as well as some stragglers, were obtained.

Incidentally to the main objectives, calls were made on the outward voyage at Guadalupe Island and Alijos Rocks, and homeward bound, the *Ortolan* visited Cape San Lucas, Magdalena and San Bartolome bays, and San Quintin on the peninsula, and Cedros and San Martin islands.

It had originally been intended that a census of the elephant seal herd on Guadalupe Island should be taken, and a thorough search of the island made for certain of the rarer endemic species of birds. Weather conditions at the time the *Ortolan*

reached the island rendered these plans abortive. It was noted, however, that the juncos had become greatly reduced in numbers since 1922, and there seems to be reason to fear that they are soon to become a matter of history. No cross-bills or nuthatches were noted; and, as no kinglets or Guadalupe Petrels have been observed in recent years, it is believed that these birds have joined the ranks of the extinct species.

The birds and mammals of Cedros Island are apparently in a fair way to follow the birds of Guadalupe. Deer, which had been fairly common on Cedros Island when the *Tecate* called there in 1922, were not seen, and few signs of them were in evidence; no rabbits, nor recent signs of them, were observed; and birds were exceedingly scarce. Feral dogs and cats, as well as destructive humans, seem to have played their part in the reduction of wild life on the island.

The *Ortolan* reached San Francisco on June 12, bringing with her for the Department of Ornithology and Mammalogy a satisfactory total of 548 bird skins, 62 sets of eggs, and 29 mammalogical specimens.

Mr. Frank Tose, chief taxidermist of the Academy's Museum, assisted by Mr. J. T. Wright, faithfully represented the Department of Ornithology and Mammalogy, and to their energy and devotion is due the very gratifying results attained. The department is also indebted to the other members of the scientific staff and the officers and crew of the *Ortolan* for the assistance they generously afforded the collectors.

The specimens thus secured, and the field notes made by Mr. Tose form the basis of the present report.

Within the bounds of the A. O. U. *Check-List* (3rd ed.) and *Supplements*, its nomenclature has been employed in this paper, and the terminology of Miller's *List of North American Recent Mammals*, 1923, has been applied to the mammals.

LIST OF SPECIES OF BIRDS

1. *Brachyramphus hypoleucus* Xantus. Xantus's Murrelet

Attracted by the lights of the fishing party, two males of this species came on board the *Ortolan* as she lay in Melpomene Cove, Guadalupe Island, on the night of April 19.

One specimen has the plumage of the upper parts quite fresh, but the other has these parts considerably worn. In neither instance is there any evidence of moult. In both examples the white of the malar region extends upward in front and above the eye to form a supraorbital stripe, and the auriculars are invaded by the white of the under parts.

2. ***Cerorhinca monocerata*** (Pallas). Rhinoceros Auklet

A Rhinoceros Auklet flew on board the vessel at Guadalupe Island, April 19. The plumage is greatly worn on all areas, but renewal of the contour feathers is in progress.

Another specimen, taken on San Martin Island on June 8, is a bird in much faded livery. Moult, however, is in progress on the upper parts, it being almost complete on the head. Feather replacement in this example has probably been delayed on account of the bird's physical condition, the web of one foot having been injured.

Both birds are apparently young of the previous year.

3. ***Larus occidentalis*** Audubon. Western Gull

Western Gulls were noted in the vicinity of the Santa Barbara Islands on April 16. They were also seen on April 18, after the departure of the vessel from San Diego.

On Clarion Island, Mr. Tose noted an immature individual on the beach at Sulphur Bay on April 26. Others were seen by Doctor Hanna on April 30.

The nesting season was over at San Martin by June 8. Many well grown young were in evidence, but no eggs were found.

4. ***Larus heermanni*** Cassin. Heermann's Gull

Heermann's Gulls were numerous on Isabel Island on May 24, and a breeding colony was discovered close to shore on the northwestern side of the island. The young were fully fledged and almost ready to fly.⁸

⁸ Hanna, Proc. Calif. Acad. Sci., 4th Ser., Vol. XV, p. 77.

The six specimens (two males and four females) collected are in greatly worn plumage. Postnuptial moult is in progress. In all but one specimen, the inner primaries are being replaced, and fresh feathers are present on the mantle and breast. One individual has pin feathers appearing on the head.

5. *Sterna fuscata* Linnæus. Sooty Tern

Sooty Terns were first seen at Alijos Rocks. They appeared to be the only dwellers on East Rock, but they shared with the Blue-faced Boobies the rookeries on South Rock.⁴

Roca Partida is evidently a breeding ground for these terns, as a juvenile is among the specimens taken there. They were not noted on Socorro, but some were seen in the vicinity of Oneal Rock.

Thousands were seen on Isabel, a large number being young almost fully grown. The nesting season was probably over, and the one fresh egg taken may have been infertile.

Nine specimens (six males and three females) were obtained on Alijos Rocks, April 24; four males (one juvenile) were taken at Roca Partida on May 2; and three males, two females, and one unsexed juvenile were collected on Isabel Island on May 24.

Save for abraded rectrices, the plumage of the Alijos Rocks birds is in good condition. The examples from Roca Partida are in more worn dress. One specimen seems to have recently acquired a new inner primary and most of the secondaries. Two of the specimens from Isabel have new feathers appearing on cervix and crown, and one of them is developing new lateral rectrices. The juvenile has down still adhering to the feathers of the rump and flanks.

As the birds from Alijos Rocks seem to approach in size those from the eastern rather than the western Pacific, the measurements, in millimeters, of the series are given below:

⁴ Hanna, Proc. Calif. Acad. Sci., 4th Ser., Vol. XV, p. 28.

	<i>Wing</i>	<i>Tail</i>	<i>Exposed culmen</i>	<i>Tarsus</i>	<i>Middle toe</i>
Males	307	190	48.0	22.00	22.0
	302	...	44.2	21.00	21.0
	300	...	41.0	21.90	21.5
	298	...	43.5	22.50	21.5
	298	...	43.5	23.25	21.0
	296	188	48.5	23.00	21.5
Average	300.1	189	44.7	22.27	21.4
Females	300	178(worn)	43	23.00	22
	285	...	41	23.00	21
	302	210	43	23.00	21
Average	296.3	194	42.3	23.00	21.3

6. *Anoüs stolidus* (Linnæus). Noddy

Noddy Terns were first found at Roca Partida, where they were believed to be breeding. A few were noted at sea near Socorro. Upon Isabel Island these terns were very numerous, nesting on the bare rocks on the north shore.⁵

The collection includes one female from Roca Partida, May 2; and two males, two females, and one unsexed young (just passing out of natal down) from Isabel Island, May 24. Nine eggs in all stages from fresh to more than half incubated were collected on Isabel, May 24.

The wing coverts of the Roca Partida bird exhibit some wear, otherwise the plumage is in good condition. The proximal primary appears to be new, and a few of the feathers of the forehead and crown are still in the sheath. Postnuptial moult has begun in the Isabel Island birds. One male shows feather renewal on the crown and throat, and the other is developing the tenth and eleventh primaries. The females have new feathers appearing on all areas of the body plumage, and the three inner primaries are being replaced in one, and two inner primaries in the other.

The juvenile has the contour feathers fairly well developed save on the throat and abdomen. The feathers of the fore-breast, sides of neck, and under tail-coverts are still tipped with brownish-gray down, and the throat and abdomen are clad in neossoptiles of the same shade.

⁵ Hanna, Proc. Calif. Acad. Sci., 4th Ser., Vol. XV, p. 77.

7. **Diomedea nigripes** Audubon. Black-footed Albatross

One Black-footed Albatross was seen at sea north of Magdalena Bay on May 31.

8. **Puffinus opisthomelas** Coues. Black-vented Shearwater

The lights of the fishing party brought one Black-vented Shearwater on board the *Ortolan* as she lay at anchor in Melpomene Cove, Guadalupe Island, on April 19.

The foreneck and sides of breast of this specimen are strongly suffused with gray, and the lining of wing is mottled with the same color.

A fully developed egg was found in the oviduct.

9. **Puffinus auricularis** C. H. Townsend.
Townsend's Shearwater

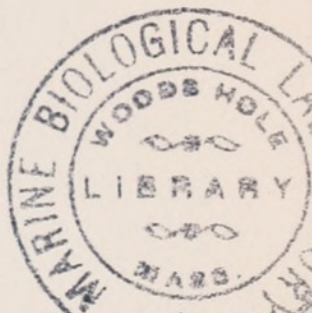
Burrows of Townsend's Shearwaters were found in great numbers at an altitude of about 800 feet under the grass hummocks on the northern slope of Clarion Island.

Not many of the burrows were occupied. A few contained eggs, but more had young nearly half grown.

This shearwater had not been previously reported as breeding on Socorro, but on May 7, Doctor Hanna⁶ discovered burrows and fragments of a recently killed bird which was believed to be one of this species. The burrows were at an altitude of about 3000 feet in the vicinity of the steam vents on the eastern slope of Mt. Evermann. The soil proved to be so exceedingly hard that few burrows were excavated and no other specimens were obtained. The birds were believed to be numerous, however, as they were heard at night flying over the camp.

Three males, four females, and two downy young were gotten on Clarion on April 30. Several eggs were obtained on April 30 and May 1, but only two were retained in the collection. One was addled, and the other was in an advanced stage of incubation.

⁶ Proc. Calif. Acad. Sci., 4th Ser., Vol. XV, p. 56.



In three examples the throat feathers exhibit distinct dark shaft lines, and one has the under tail-coverts largely white. The axillaries of one female have no trace of dark color.

Moult is in progress. One of the birds seems to have recently undergone a complete feather renewal, some of the greater coverts and scapulars alone showing wear. A few pin feathers are present on the throat. Two others in slightly worn plumage have new feathers appearing on the cervix, back, and breast. Two birds have the plumage much abraded, and a general renewal of the contour feathers is in progress. The remiges and rectrices are in fair condition; the secondaries appear to have been recently replaced. Of the downy young, one is in the protoptyle state and the other has the mesoptyles developed on the back.

10. *Puffinus cuneatus* Salvin. Wedge-tailed Shearwater

Thousands of Wedge-tailed Shearwaters were nesting on the Ash Heap on San Benedicto Island, and six unsexed specimens were obtained (May 12).

The specimens are all of the dark phase. The plumage is fresh, only the scapulars exhibiting signs of wear.

The average length of culmen in five specimens is 39.32 mm.; the maximum, 40.10; the minimum, 37.⁷

11. *Oceanodroma leucorhoa kaedingi* Anthony. Kaeding's Petrel

In following the nomenclature of the A. O. U. *Check-List* (3rd ed.) and *Supplements*,⁸ the name *kaedingi* has been used for the petrel which came on board the *Ortolan* at sea south of Guadalupe Island on April 23. The upper tail-coverts are extensively white, not interrupted medially by darker. The measurements are as follows: wing, 152 mm.; tail, 82.75; fork of tail, 20; culmen, 16; tarsus, 23.5; middle toe and claw, 24. Thus in regard to both color and measurements the specimen in hand differs from the typical *kaedingi*.

⁷ Cf. Mathews, *Birds of Australia*, Vol. II, p. 84.

⁸ *Auk*, Vol. XL, p. 514.

The flight feathers are in good condition, pin feathers are present on the upper tail-coverts, and only a few worn feathers are to be found among the fresh ones on the crown and back. The frontal feathers are greatly worn.

12. *Phaëthon æthereus* Linnæus. Red-billed Tropic-bird

Red-billed Tropic-birds were first seen on North Rock (Alijos Rocks) where they were supposed to be breeding.⁹ They were not common on either Clarion or Socorro Island, but they were more numerous on San Benedicto and were believed to be nesting¹⁰ on the Ash Heap. On Isabel tropic-birds were abundant. They were noted on the shore line, and their nests were discovered in holes in the cliffs on the southwest side of the island by Doctor Hanna and Mr. Wright. Nests contained eggs, downy young, and many fully fledged immature birds.

The collection includes an adult male and female from Clarion Island, April 28; and six adult males and two adult females, two unsexed immature individuals, and two downy young from Isabel Island, May 24. Twelve eggs were obtained on Isabel. Two eggs were fresh, and others were in various stages from slightly to almost fully incubated.

The postnuptial moult of the female from Clarion Island is nearly complete. The body plumage seems to have been entirely renewed, and but two primaries and the rectrices are still to be developed. The male is undergoing a similar moult which has not advanced quite so far. Three of the Isabel Island birds are acquiring central rectrices. A few new feathers are appearing also on the under parts.

13. *Sula dactylatra* Lesson. Blue-faced Booby

Blue-faced Boobies were discovered on North and South rocks of the Alijos group, where they were believed to be breeding.¹¹ On Clarion Island they were nesting in the vicinity of Sulphur Bay. A good many nests contained fresh eggs, and newly hatched young were numerous. They did

⁹ Hanna, Proc. Calif. Acad. Sci., 4th Ser., Vol. XV, p. 29.

¹⁰ Hanna, Proc. Calif. Acad. Sci., 4th Ser., Vol. XV, p. 65 (red-tailed, *lapsus calami*).

¹¹ Hanna, Proc. Calif. Acad. Sci., 4th Ser., Vol. XV, pp. 28-29.

not appear to be present on Socorro, but there were breeding birds on San Benedicto on May 12.

One bird in immature plumage was taken on Alijos Rocks on April 24, and six adult males and two downy young (male and female) were collected on Clarion Island on April 27 and 28.

A postnuptial moult involving the body plumage has commenced in all the Clarion Island birds. Two of the males are also developing new rectrices. The immature bird from Alijos Rocks has the dark color of the head broken by patches of drab feathers. The young are clothed in pure white down.

In dried skins the colors of the soft parts vary considerably. The bill is horn color in some specimens and straw yellow in others. The tarsus and toes vary from dirty flesh color to mustard yellow.¹² In life, according to the color sketch made by Mr. Tose, the culmen approaches a deep chamois.

The twelve sets of eggs in the collection from Clarion Island (April 27 and 28) were in various stages from slightly to well incubated, and a few were fresh. The heavily incubated eggs discovered¹³ on San Benedicto Island (May 12) were not retained in the collection.

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

Blue-footed Boobies were noted on the beach on Maria Madre on May 17, and on outlying rocks on Maria Magdalena¹⁴ on May 21. They were very numerous on Isabel Island where they nest under small trees. No eggs were found, but young, in nearly every state from newly hatched to almost fully grown, were present. The older ones were observed at the southwest beach learning to swim.

Two adult males were collected on Isabel Island on May 24. Postnuptial feather replacement has affected the remiges and rectrices, and also the plumage of the back.

¹² Cf. Rothschild, B. O. C., Vol. XXXV, p. 43.

¹³ Hanna, Proc. Calif. Acad. Sci., 4th Ser., Vol. XV, p. 65.

¹⁴ Hanna, Proc. Calif. Acad. Sci., 4th Ser., Vol. XV, p. 74.

15. *Sula brewsteri* Goss. Brewster's Booby

Brewster's Boobies were found nesting in the washes on San Benedicto. They were also seen on Roca Partida, Socorro, and Isabel, but they did not appear to be breeding.

Two adult females, and an immature male and female were collected on Roca Partida on May 2, and an adult female and three unsexed immature birds were obtained on San Benedicto on May 12.

Postnuptial moult is apparently in progress on the Roca Partida birds. Both adult females are undergoing a complete replacement of the body and flight feathers. The female from San Benedicto has some of the breast and abdomen feathers still in the sheath, otherwise there is no indication of moult. One of the immature examples from the same island is developing a new rectrix and a few white feathers on the abdomen. The immature bird from Roca Partida is acquiring fresh feathers on the upper parts, throat, and breast.

Three sets of eggs were obtained on San Benedicto, one being fresh, the others slightly and one-half incubated. The eggs measure as follows: 60.0 mm. x 39.5, 52.0 x 39.0, 59.1 x 41.4, 51.0 x 38.1, 54.5 x 36.6.

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

Large colonies of Red-footed Boobies were nesting in the Euphorbias near Sulphur Bay, Clarion Island. Some of the nests contained eggs, others well developed young. Groups of birds in immature plumage kept to themselves, and a few of such birds were found to be breeding.

On San Benedicto, Red-footed Boobies were roosting on the cliffs, but they nested in the grassy areas, building up platforms of grass culms to a height of a foot or more. The eggs found in these nests were all heavily incubated¹⁵.

Two adult males, four adult females, four immature birds (one female and three unsexed), and one downy young were taken on Clarion Island, April 27.

The contour plumage of the adult birds is but little worn, but a moult of the flight feathers is in progress in two examples.

¹⁵ Hanna, Proc. Calif. Acad. Sci., 4th Ser., Vol. XV, p. 65.

The three immature unsexed individuals are in much worn livery. They are probably young of the previous year, for, although the under tail-coverts are white, the rump is still dark. A moult involving all areas is in progress. In all cases the new rectrices are dark colored.

The immature female is probably a bird experiencing its second postnuptial moult. The head, neck, and underparts are white, save for a slight clouding; the rump is dark, and the incoming feathers only partially white; the feathers of the back are broadly margined with white; and the newly acquired rectrices are dark.

The downy young is still in the protoptyle stage, but pure white mesoptyles are well developed.

The eggs in the collection were all obtained on Clarion Island on April 27. Some of the eggs were fresh. In others incubation had begun, and in others it was advanced.

17. ***Phalacrocorax auritus albociliatus*** Ridgway.

Farallon Cormorant

Cormorants were reported to be breeding in large numbers on San Martin Island on June 8. One set of half incubated eggs (said to be those of the Farallon Cormorant) was obtained.

18. ***Phalacrocorax penicillatus*** (Brandt). Brandt's Cormorant

The one Brandt's Cormorant in the collection was a member of a small breeding colony on the north side of Outer Island, Guadalupe. It was taken by Captain Nelson on April 21.

19. ***Pelecanus californicus*** Ridgway. California Brown Pelican

On the southward voyage, brown pelicans were seen off the Santa Barbara Islands, April 16. On Maria Madre they were seen on the beach to the north of the settlement, and on Maria Magdalena they were roosting in trees near shore. Pelicans with young almost as large as the adults occupied a rocky area near the highest part of Isabel Island on May 24.

An egg one-third incubated was taken on June 7 on San Martin Island, where this species was nesting in large numbers.

20. *Fregata aquila* (Linnæus). Man-o'-war-bird

The first Man-o'-war-bird observed by the *Ortolan* party was noted by Mr. Musser on April 23, when the vessel was about half way between Guadalupe Island and Alijos Rocks.

On Clarion Island many Man-o'-war-birds were seen on the cliffs, and in flight after boobies, but there was no indication of nesting. They seemed to be absent from Socorro, but they occurred about Roca Partida, and were found nesting¹⁶ in large numbers on the high central plateau of San Benedicto. Many of last year's young were seen about the nests, and the rookery was strewn with dead birds of this age. Several fresh eggs were secured from the nests, and the one preserved in the collection was only slightly incubated.

Frigate Birds were seen about Maria Magdalena, and they were found nesting on Isabel Island on May 24. The nests were weak platforms placed in the tops of low trees. Most of the eggs had hatched.

The collection comprises one immature female from Clarion (April 28); one adult and four immature males (one marked female, two unsexed), and two immature females from San Benedicto, May 12.

The adult male from San Benedicto has postnuptial moult in progress. The flight feathers are being renewed and moult is advanced on the head and back, but only slightly so on the neck and under parts.

Two immature males (one unsexed) from San Benedicto wear the plumage of the adult bird, save for the grayish feathers of the breast. Moult has commenced on both birds, but the new feathers on the breast still have a grayish cast. Two younger males (one labeled "female" and one unsexed) have the head and forebreast cinnamon, the breast and sides more or less dark colored, and the abdomen white. New

¹⁶ Hanna, Proc. Calif. Acad. Sci., 4th Ser., Vol. XV, pp. 64-65.

feathers of a darker cinnamon are appearing on the crown. Two immature females are acquiring new flight feathers and darker cinnamon plumage on the crown.

21. ***Guara alba*** (Linnæus). White Ibis

Two birds of this species were noted flying overhead at Magdalena Bay on May 29.

22. ***Ardea herodias*** subsp.

Since no specimens of great blue herons were secured during the voyage, the exact status of the birds seen must remain in doubt.

Great blue herons were noted by Mr. Wright and Captain Nelson near Sulphur Bay, Clarion Island, on April 28 and 29, but none was seen on Socorro.

Three of these herons were seen by Mr. Tose on Maria Madre on the shore north of the settlement. They were also noted on Maria Magdalena by Doctor Hanna. On Isabel Island, also, they were present.

On May 29, birds of this species were observed at Magdalena Bay.

23. ***Nyctanassa violacea*** (Linnæus).

Yellow-crowned Night Heron

Yellow-crowned Night Herons were present on Socorro in small numbers. They frequented a patch of *Opuntia* to the east of Braithwaite Bay, and Doctor Hanna¹⁷ found that they nested there. In the evening they visited the spring near Grayson's Cove to drink. Crabs seem to play a large part in the food of these birds.

Birds of this species were also noted on the shores of Maria Magdalena.

Four specimens were secured on Socorro on May 3 and 11.

An unsexed bird is evidently just passing into fully adult plumage. A few dark feathers are still retained on the fore-

¹⁷ Proc. Calif. Acad. Sci., 4th Ser., Vol. XV, p. 61.

head. An immature female is in fresh feather. Two juveniles show little feather deterioration, and exhibit no indications of moult.

24. **Phalaropus fulicarius** (Linnæus). Red Phalarope

When the *Ortolan* was about 55 miles east of San Benedicto Island on May 12, one of these birds flew on board and was captured by Mr. Duhem.

This bird has just acquired fresh remiges and rectrices, and new contour feathers are in evidence on all areas.

25. **Heteroscelus incanus** (Gmelin). Wandering Tattler

About the Revillagigedo Islands a number of Wandering Tattlers were observed. They were common on Clarion and two males and one female were secured at Sulphur Bay, April 26. They were also noted near Braithwaite Bay, Socorro.

Prenuptial moult is well advanced in one male; only the tertials and greater coverts are worn. Feather replacement has commenced in the flight feathers of the second male, but it has barely begun on the body plumage. The female is in worn dress, but the secondaries and inner primaries are apparently newly developed.

26. **Actitis macularia** (Linnæus). Spotted Sandpiper

Several birds, believed by Mr. Tose to be of this species, were noted on the beach on Socorro. No specimens were secured.

27. **Numenius hudsonicus** Latham. Hudsonian Curlew

Several Hudsonian Curlews were seen in the vicinity of Sulphur Bay, Clarion Island, and one was taken on April 26. This specimen is a female undergoing a prenuptial moult. The outer three pairs of rectrices and several of the inner primaries have been recently renewed. New feathers are present on the rump and upper tail-coverts, and pin feathers have appeared on the crown.

28. *Pluvialis dominica* subsp.

Doctor Hanna noted two golden plovers on Clarion Island, April 30.

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

Turnstones were fairly numerous on Clarion Island. A male and a female were taken from a flock of about 15 on April 26.

Both birds are undergoing prenuptial moult, the remiges and rectrices (except the central ones of the male) having been recently renewed.

30. *Hæmatopus frazari* Brewster. Frazar's Oyster-catcher

Oyster-catchers were seen on the beaches of Maria Madre, Maria Magdalena, and Isabel. One male was obtained on Maria Magdalena, May 20, and a set of three eggs was taken on the same day.

31. *Columba flavirostris madrensis* Nelson.

Tres Marias Pigeon

Although these pigeons were present on Maria Madre and Maria Magdalena, they were far from common. They frequented the taller timber, and were noted at the spring at Arroyo Hondo.

Two specimens were taken on Maria Madre on May 17. The prenuptial moult of the male is somewhat more advanced than that of the female, but in both cases there are still many of the flight feathers to be replaced. Many pin feathers are present on the crown and throat of the female.

32. *Zenaidura macroura clarionensis* Townsend.

Clarion Island Mourning Dove

These doves seemed to be common on Clarion Island, and apparently were most abundant in the vicinity of Sulphur Bay.

Eleven males and six females were collected on April 27, 28, and 29. Most of the birds are in worn plumage, but feather renewal has commenced. Contour feathers are in most

instances being replaced, but flight feathers also are being developed in seven cases. One specimen has acquired fresh flight feathers, but the distal primaries and the rectrices are not fully grown.

33. ***Zenaidura graysoni*** Lawrence. Socorro Mourning Dove

Mourning doves were very numerous on the island of Socorro, being particularly abundant on the higher wooded levels, and ranging almost to the top of the island. They were so fearless that no difficulty was experienced in catching them alive. At the time of the visit of the *Ortolan* the fruits of *Bumelia socorrensis* and *Prunus capuli* entered very largely into the diet of these birds.

Ten males (two immature), eight females (one immature), and one unsexed juvenile were collected on May 7 and 9.

A postnuptial moult involving all areas is in progress. Two immature males are acquiring adult plumage. The unsexed juvenile (evidently a late fall bird) has new feathers appearing on the crown and throat, and new remiges are developing.

34. ***Leptotila fulviventris capitalis*** Nelson. Tres Marias Dove

The Tres Marias Dove seemed to be common on both Maria Madre and Maria Magdalena. It was noted particularly in the vicinity of Arroyo Hondo, and at the water hole on Maria Magdalena.

A male and three females (one immature) were collected on Maria Madre May 17 and 20.

One female has not yet begun to acquire nuptial dress, the other and the male are in an advanced state of moult, a complete one being in progress. The immature female has a few feathers of the adult present on the crown, and the inner two primaries have recently been renewed.

35. ***Melopelia asiatica mearnsi*** Ridgway.
Western White-winged Dove

This species did not appear to be common at any place visited. A few of the birds were noted on Maria Madre, and one male was secured on Maria Magdalena, May 21. Another

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male was taken on Isabel Island, May 24, the only one seen on that island.

Both birds are assuming nuptial plumage. Pin feathers are present on nearly all the body feather tracts, the inner two primaries are new ones, and the rectrices of the Maria Magdalena bird are not fully developed. The example from Isabel Island has a central rectrix only partially grown.

36. *Chæmepelia passerina pallescens* Baird.

Mexican Ground Dove

These birds were reported to be abundant near the shore on Maria Madre, May 14; and at the water hole on Maria Magdalena, May 20; and were noted at Cape San Lucas, May 28. No specimens were taken, however.

37. *Chæmepelia passerina socorroensis* (Ridgway).

Socorro Ground Dove

No great number of ground doves was seen on Socorro. A flock of about 50 birds was noted near the spring at Grayson's Cove, and Mr. Slevin saw two other birds near Braithwaite Bay.

Five males (one immature), eight females (one immature), and one unsexed immature bird were collected on May 4 and 11.

A prenuptial moult is in progress. Two of the females are in worn plumage, but a few new feathers are appearing on the back. Other specimens show a more advanced feather replacement,—some renewing the body plumage, others undergoing a moult of the flight feathers, as well. The immature birds are assuming nuptial plumage by a complete moult.

38. *Cathartes aura septentrionalis* Wied. Turkey Vulture

39. *Coragyps urubu urubu* (Vieillot). Black Vulture

Mr. Tose records Turkey Vultures as being numerous on the beach on Maria Madre, and he also mentions the presence of "vultures" on Maria Magdalena. It seems probable that

both Black and Turkey vultures were represented on the Tres Marias at the time of the visit of the *Ortolan*, as, during the days the author spent on Maria Madre in October, 1925, the flocks haunting the beach in front of the settlement comprised both species.

40. **Buteo borealis calurus** Cassin. Western Red-tail

On April 19, Doctor Hanna saw two red-tailed hawks flying over the cliffs on Guadalupe Island.

41. **Buteo borealis socorroensis** Ridgway. Socorro Red-tail

Red-tailed hawks were fairly common and not at all wild on Socorro Island. A pair was seen near Grayson's Cove, and many others were in evidence about the steam vents. On one occasion a pair was disturbed in a feast on a three weeks old lamb. The crop of one of the examples contained nearly the whole of a Grayson's Dove. One nest was placed in the face of a cliff near Braithwaite Bay; another, discovered by members of the *Ortolan's* crew, contained a young bird about four weeks old; a third nest, in a lava bubble on the wall of an arroyo, was noted by Mr. Slevin.

Several specimens were obtained by various members of the party. The collection includes the skins of three males and one female, taken on May 3 and 11.

One of the males is in greatly abraded plumage. Two others have commenced their postnuptial moult, fresh body and flight feathers appearing. Two of the birds are melanistic ones.

42. **Buteo borealis fumosus** Nelson. Tres Marias Red-tail

Red-tailed hawks were said to be numerous on Maria Madre. They were quite fearless and so easily approached that one was killed by a shot from a collecting pistol. No specimens of this species are included in the collection.

43. *Cerchneis sparveria phalæna* (Lesson).

Desert Sparrow Hawk

Mr. Tose saw one sparrow hawk on Guadalupe Island, April 19.

44. *Polyborus cheriway pallidus* Nelson.

Tres Marias Caracara

Caracaras were very abundant on Maria Madre, particularly in the vicinity of the settlement. One specimen was taken on May 22, but the skin was not preserved.

45. *Pandion haliaëtus carolinensis* (Gmelin). Osprey

Although Ospreys did not appear to be as numerous as they were in 1922, they were still common on Cedros Island. No specimens were secured.

46. *Tyto alba pratincola* (Bonaparte). American Barn Owl

Doctor Hanna and Mr. Wright discovered the kitchen midden and feathers of a barn owl in a cave on San Martin Island.

47. *Micropallas graysoni* (Ridgway). Socorro Elf Owl

Socorro Elf Owls were found in the dense growth on the lower levels of the island. They appeared to be less rare than they were formerly supposed to be. Mr. Slevin obtained three in a tree at the bottom of an arroyo near Braithwaite Bay. Sailors obtained two downy young, but the location of the nest was not recorded.

Five specimens are in the collection,—an adult male and female, one unsexed bird, a juvenile female, and a downy young, all taken on May 10.

The remiges and rectrices of the adult birds are worn, and a few pin feathers are appearing on the crown and throat. The juvenile female is in the hemiptyle stage and worn filaments of down still adhere to the feathers. The plumage of this juvenile lacks the intensity of color possessed by the adult.

The upper surface is clove brown (somewhat paler and grayer on the crown and forehead), varied by pinkish cinnamon spots and margins on the feathers. The white is absent from the nuchal collar. The lower surface is deep mouse gray, banded by white, and anteriorly suffused by pinkish cinnamon.

The unfledged young is clad in grayish white down, through which the hemiptyles are appearing.

The measurements, in millimeters, of the adult birds are given below:

	<i>Wing</i>	<i>Tail</i>	<i>Culmen</i> <i>without cere</i>	<i>Tarsus</i>	<i>Middle</i> <i>toe</i>
Male	106	49.0	9.5	19.0	14.50
Female	108	47.5	10.0	19.5	15.00
Unsexed bird	105	51.0	10.5	20.0	15.25

48. *Speotyto cunicularia rostrata* Townsend.

Clarion Island Burrowing Owl

Burrowing owls were common on Clarion Island. They had been nesting in the cliffs, and burrows were found under vines and cacti. No eggs were discovered, and the young birds were all able to fly¹⁸. Insects seemed to be the staple food.

Three males and eight females are in the collection.

One male appears to have completed its postnuptial moult. Two females are in worn dress, and show no indications of feather replacement. The contour plumage of a male and two females is in good condition, save for that of the head, upon which pin feathers are showing. Three other birds are in worn plumage, but new feathers are appearing on crown and throat.

49. *Aratinga brevipes* (Lawrence). Socorro Paroquet

Large flocks of paroquets were seen in the hinterland of Socorro, and several pairs of supposedly breeding birds were observed about Grayson's Cove. No nests, however, were discovered. The fruit of *Bumelia socorrensis* seemed to be a favorite food of this paroquet.

¹⁸ Hanna, Proc. Calif. Acad. Sci., 4th Ser., Vol. XV, p. 35.

Five males, nine females, and four unsexed birds were collected on May 4 and 9.

Feather renewal is in progress. In some cases the first pin feathers are appearing on the throat, other birds have almost completed the moult. The feather replacement experienced by the birds at this season seems to be a complete one, as the contour feathers, rectrices, remiges, and wing-coverts are all involved.

50. *Amazona oratrix tresmariae* Nelson. Tres Marias Parrot

Tres Marias Parrots were seen in pairs and flocks in various parts of Maria Madre, and there were a number of them about the water hole on Maria Magdalena. The fruit of various species of *Ficus* was ripe at the time of the visit of the *Ortolan*, and the parrots were to be found congregated in the neighborhood of the fruit-bearing trees.

The abundance of these birds is rather surprising in view of the fact that the Tres Marias Parrot is held in high regard as a pet because it learns to talk with great fluency. The convicts at the settlement on Maria Madre have built up a flourishing trade with the mainland, and great numbers of young birds are captured each year to supply the market.

No specimens were secured.

51. *Psittacula insularis* Ridgway. Tres Marias Lovebird

Lovebirds did not appear to be very common on Maria Madre, and they were not noted at all on Maria Magdalena. Some examples were collected from a flock feeding in a fig tree in the neighborhood of Arroyo Hondo, others were found in a fig tree near the trail leading across the island.

Four males and two females were taken on May 17 and 22.

The specimens are all moulting birds. An immature male is acquiring its first nuptial dress. Some of the birds have feather renewal only well begun, others have it considerably advanced. Apparently this moult is complete, as the body plumage, remiges and wing-coverts, and rectrices are all involved.

52. *Trogonurus ambiguus goldmani* (Nelson).**Goldman's Trogon**

Like most of the birds on the Tres Marias, trogons were most numerous in the vicinity of water. The Maria Madre specimens were secured at Arroyo Hondo, and in the heavy timber by the trail leading across the island. The only trogons noted on Maria Magdalena were near the water hole.

On Maria Madre four males (three adults and one immature) and one female were collected, and four males and one female were obtained on Maria Magdalena.

The plumage of most of the birds exhibited little wear. Moulting, however, was in progress. In most cases only the contour feathers seemed involved, but one bird is developing new lateral rectrices and the secondaries seem new. An immature bird is just gaining its first nuptial plumage.

53. *Dryobates scalaris lucasanus* (Xantus).**San Lucas Woodpecker**

The collection includes two birds of this species,—an immature male in the first contour feathers, and a female in much worn plumage. The female is acquiring a new central rectrix, the only indication of moulting.

The specimens were obtained at Cape San Lucas (May 28).

54. *Dryobates scalaris graysoni* (Baird).**Tres Marias Woodpecker**

The Tres Marias Woodpecker seemed to be fairly common and generally distributed on Maria Madre and Maria Magdalena.

The collection includes two immature birds (marked females, but acquiring red feathers on the pileum) from Maria Madre, May 15 and 16, and two males (one unsexed) from Maria Magdalena, May 19 and 20. New feathers are appearing on the crown, throat, and breast. The immature birds have the feathers of the under parts a good deal worn, and one has an inner primary not fully developed.

The under parts of the adult birds are streaked, not spotted.

55. **Centurus uropygialis** Baird. Gila Woodpecker

One female of this species was taken at Cape San Lucas on May 28. The plumage on all areas is a good deal worn, but there is no sign of feather renewal.

56. **Nyctidromus albicollis insularis** Nelson.

Tres Marias Parauque

Parauques are common on Maria Madre, and may be seen at any hour of the day on forest trails and in shady cañons. They were also present on the wooded slopes of Maria Magdalena.

An adult male and female were taken on Maria Madre (May 17 and 23), and an immature male was collected on Maria Magdalena (May 20). On May 16, Mr. Mason found a single fresh egg on the road south of the settlement on Maria Madre.

The adult birds have the body plumage greatly worn, but show no indications of feather renewal. In the case of the immature male, the flight feathers are also in poor condition.

57. **Calypte costæ** (Bourcier). Costa's Hummingbird

Twelve Costa's Hummingbirds were taken during the course of the voyage. An immature male and female were secured at Magdalena Bay (May 30), three males and five females were taken at San Bartolome Bay (June 2), and an immature male and female were collected on Cedros Island (June 3 and 4).

The immature male from Magdalena Bay seems to be acquiring adult plumage. Many new feathers are present among the worn ones on the back, and only a central patch of throat feathers is non-metallic. The central rectrices of the female are not fully developed, and pin feathers are present on the throat.

One male from San Bartolome Bay has five of the inner primaries just appearing, and there are pin feathers on the crown, foreneck, and breast. The other adult males are in worn feather, but moult has not commenced. The contour plumage of two females is worn, but the remiges and rectrices

are new ones. Three females with fresh wing feathers are gaining new body plumage.

The Cedros Island birds are in worn dress, but moult has not begun.

58. ***Amazilia graysoni*** Lawrence. Grayson's Hummingbird

This hummingbird is quite common on Maria Madre, although not so abundant about the settlement as Lawrence's Hummingbird. Many were seen at Arroyo Hondo and near the water hole on Maria Magdalena. The specimens (one male and three unsexed birds) in the collection were taken on Maria Madre on May 16, 17, and 20.

The remiges and rectrices of these specimens are fresh, and new feathers are being developed on the throat and forehead. One of the unsexed birds is of a distinctly coppery cast on the head and back. The measurements of this specimen are as follows: exposed culmen, 25.75 mm.; wing, 72; tail, 48.25.

59. ***Cyanthus lawrencei*** (Berlepsch).
Lawrence's Hummingbird

Lawrence's Hummingbird is abundant on Maria Madre—particularly about the settlement—and it was noted about the water hole on Maria Magdalena.

The collection includes four males (two immature), one female, and one unsexed (male) bird taken on Maria Madre on May 15, 16, and 20.

The adult males are in unworn plumage, one having a few pin feathers on the forehead. The female has pin feathers on the crown and throat, and a new fifth primary is just appearing.

60. ***Tyrannus vociferans*** Swainson. Cassin's Kingbird

An adult male in badly worn plumage was obtained at San Quintin on June 7. Pin feathers are present on the anterior portions of the body.

61. **Myiarchus cinerascens cinerascens** (Lawrence).
Ash-throated Flycatcher

An adult male of this species was among the birds collected on Isabel Island (May 24). Moulting is in progress. The tertials and secondaries are fresh, many new feathers are visible on the back and throat, and pin feathers are appearing on the forehead and nape. All the rectrices and upper tail-coverts on one side are being renewed at once.

62. **Myiarchus cinerascens pertinax** Baird.
Lower California Flycatcher

A female was taken at Cape San Lucas on May 28. The plumage on all areas is greatly worn, but replacement has commenced on the back, upper tail-coverts, throat, and breast.

63. **Myiarchus magister magister** Ridgway
Arizona Crested Flycatcher

This flycatcher proved to be very abundant on Maria Madre. The low growth on the eastern side of the island harbored numbers of them, and many hawked for insects at Arroyo Hondo. Four males and one female were taken on May 15 and 16. All of them had recently completed the prenuptial moult.

64. **Myiarchus lawrenceii tresmariae** Nelson.
Tres Marias Flycatcher

Tres Marias Flycatchers were common and shared with the crested flycatchers the low growth near shore and the territory in the vicinity of Arroyo Hondo.

The plumage of the four females in the collection is greatly worn. New feathers are developing on the cervix and throat of one specimen, and on the throat of another.

65. **Empidonax difficilis difficilis** Baird. Western Flycatcher

A male of this species was taken on Isabel Island, May 24. It is apparently undergoing a prenuptial moult, new and pin

feathers being present on the throat, forebreast, crown, and back. The first and third tertials have seemingly been just renewed.

66. ***Myiopagis placens minima*** Nelson.
Little Golden-crowned Flycatcher

One example of the Little Golden-crowned Flycatcher was secured on Maria Madre on May 23. The feathers of the crown, the primaries, greater coverts, and tertials are apparently fresh, and a few new feathers are interspersed among the worn ones of the back.

67. ***Otocoris alpestris actia*** Oberholser.
California Horned Lark

An adult male and an immature female were taken at San Quintin on June 7. The male has just commenced to acquire winter plumage, pin feathers being present on the interspecular region. The juvenile, in first contour feathers, has the three proximal primaries newly developed.

68. ***Aphelocoma californica hypoleuca*** Ridgway. Xantus's Jay

An adult female of this species was taken at Cape San Lucas on May 28. The proximal primary appears to be new, and pin feathers are present among the lesser coverts. The plumage is otherwise a good deal worn.

69. ***Corvus corax clarionensis*** Rothschild & Hartert.
Clarion Island Raven

Ravens were not uncommon on Clarion Island. A number were seen about Sulphur Bay, and a flock of 50 or more was seen on the northern slope of the island. They were seen hovering over the shearwater burrows, and it was thought that they feed to some extent on young shearwaters and boobies. A pair was nesting in the cliff near Sulphur Bay. Doctor Hanna¹⁹ noted ravens on San Benedicto, also.

¹⁹ Proc. Calif. Acad. Sci., 4th Ser., Vol. XV, p. 65.

Two males and a female were collected on Clarion. A set of two eggs (only one of which was preserved) was taken on April 30.

The birds are in somewhat worn plumage. The female is acquiring a new ninth primary.

The measurements, in millimeters, of these examples are as follows:

	<i>Wing</i>	<i>Tail</i>	<i>Culmen</i>	<i>Depth of bill</i>	<i>Breadth of bill</i>	<i>Tarsus</i>	<i>Middle toe</i>
Males	385	210	61.10	23.7	24.0	63.5	41.5
	385	215	60.75	24.2	24.2	65.7	41.0
Female	403	222	66.5	25.2	24.8	66.0	42.5

70. *Icterus spurius* (Linnæus). Orchard Oriole

At Cedros Island, June 3, there was taken a female Orchard Oriole in much worn plumage. A few new feathers are appearing on the throat and breast.

71. *Icterus graysonii* Cassin. Grayson's Oriole

Arroyo Hondo, on Maria Madre, and the water hole on Maria Magdalena were the gathering points for these orioles at the time of the visit of the *Ortolan*. The birds were abundant at those places, and they also occurred about the settlement.

With one exception, the four males and one female collected exhibit more or less wear of plumage. One male is in fairly good feather, and has a central rectrix not fully developed.

72. *Carpodacus cassinii* Baird. Cassin's Purple Finch

Mr. Tose took one Cassin's Purple Finch in a garden in the settlement on Maria Madre (May 16).

The bird is a male with the feathers of the cervix, back, and breast much worn. Fresh feathers and pin feathers are present on the throat.

73. **Carpodacus mexicanus clementis** Mearns.

San Clemente House Finch

Only a few house finches appeared to be present on Cedros Island, but a male and female were collected on June 3. Both birds are in greatly worn plumage, but lack any indications of feather renewal.

74. **Carpodacus mexicanus ruberrimus** Ridgway.

San Lucas House Finch

Although a number of house finches were observed at Cape San Lucas, no specimens were included in the collection.

75. **Carpodacus amplus** Ridgway. Guadalupe House Finch

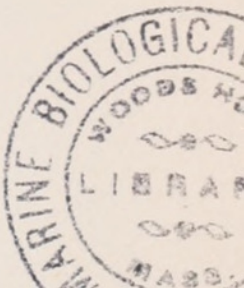
House finches are still abundant and widely distributed on Guadalupe Island. A number were nesting in the cholla. The nests examined were lined with goats' hair. Three were found containing eggs, and one held almost fully fledged young. By dissection of the birds, it was evident that the breeding season was far from over. While some of the birds were unmistakably nesting, other females had ova practically undeveloped, and other birds were almost ready to lay.

Eleven adult and two immature males and nine females were taken on April 21. Three sets of eggs (incubation unrecorded) were obtained on the same day.

All the birds are in somewhat worn plumage, and four of the males are renewing the feathers of the head and throat.

76. **Astragalinus psaltria psaltria** (Say). Arkansas Goldfinch

This species was found to be abundant at Arroyo Hondo, on Maria Madre, and it was also present about the water hole on Maria Magdalena. An adult male and two unsexed birds (a female and an immature male) were taken on Maria Madre on May 17 and 20. A moult involving the body and flight feathers is in progress. The adult male has a few feathers on the interscapulars and rump showing indications of olive-green, and the immature male retains on the cervix and inter-



scapular region a few worn olive-green feathers among the fresh black ones.

77. ***Astragalinus psaltria hesperophilus*** Oberholser.
Green-backed Goldfinch

A flock of about 30 goldfinches was noted on Cedros Island, June 5. They appeared to be very wild. One specimen was secured. It is apparently an immature just passing into adult plumage, moult being in progress on the body feather tracts. The primaries have not been replaced and the white margins of the outer ones have been completely worn away.

78. ***Passerculus rostratus guttatus*** Lawrence.
San Lucas Sparrow

An adult male of this species was taken at Magdalena Bay on May 29. The bird is in worn plumage, but no feather renewal has commenced.

79. ***Junco insularis*** Ridgway. Guadalupe Junco

Juncos appeared to be scarce on Guadalupe Island, but it is possible that they were more numerous at elevations higher than those visited by the Academy's party. A male and female, taken near shore on April 21, were the only ones seen. The male is undergoing a postnuptial moult, a feather renewal involving all areas being in progress. The female is in greatly worn livery, but moult has not yet begun.

80. ***Amphispiza bilineata deserticola*** Ridgway.
Desert Sparrow

At Magdalena Bay, Desert Sparrows were more numerous than elsewhere. They were scarce at San Bartolome Bay, and their numbers had greatly diminished on Cedros Island since 1922. The specimens taken on Cedros were found near the spring at the top of the island.

Seven males (one juvenile), two females, and one unsexed bird were obtained at Magdalena Bay, May 30; two males,

a female, and one unsexed bird were gotten at San Bartolome Bay, June 2; and a male and female were collected on Cedros Island, June 4.

With two exceptions, the birds from Magdalena Bay are experiencing a postnuptial moult. In some cases feather renewal has affected only the plumage of the throat and crown, in others, it has progressed to include all the feather tracts. The juvenile has recently gained its definitive plumage. The birds from San Bartolome Bay are in about the same stage of moult, but those from Cedros Island are a little behind and have but pin feathers on the crown and throat.

81. ***Amphispiza belli*** (Cassin). Bell's Sparrow

Although Bell's Sparrow was not very abundant on San Martin Island, three males, six females (one immature), and two unsexed birds were obtained on June 8. A male and female were also taken at San Quintin on June 7.

Postnuptial moult is well under way in all but three adult birds. All areas, including the wing (coverts and remiges) and tail, are included in the feather replacement. Two immature birds in their first contour feathers show no indications of assuming winter dress.

82. ***Pipilo carmani*** Baird. Socorro Towhee

Towhees were very abundant on Socorro from sea level to an altitude of about 2700 feet. Most of the specimens were secured near the spring at Grayson's Cove. Twelve males and two females were collected on May 4 and 10. All the birds are in worn plumage. A few had not commenced to moult, but the remainder had feather renewal in progress on the crown and throat. In two cases moult has advanced to affect all the body feather tracts.

83. ***Cardinalis cardinalis igneus*** Baird. San Lucas Cardinal

Several cardinals were seen in the scrub about Cape San Lucas on May 28. One adult male was collected.

84. **Cardinalis cardinalis mariæ** Nelson. Tres Marias Cardinal

The cardinal is one of the common birds on Maria Madre. It seemed to be particularly abundant in the Arroyo Hondo vicinity.

Four adult males, one adult female, and one unsexed bird (an immature female) were secured on May 15 and 16.

In the cases of two males, the gray deciduous margins of the upper parts are still in evidence. The plumage of the unsexed bird is greatly worn on all areas, the rectrices being reduced almost to the rachises. A few pin feathers about the nostrils of this bird are the only signs of feather replacement. One male has evidently met with an accident, as the inner secondaries and the tertials are being renewed on one wing.

85. **Piranga ludoviciana** (Wilson). Western Tanager

The only Western Tanager seen on the Tres Marias was a male collected on Maria Madre on May 15. The first nuptial plumage is being assumed, and replacement is nearly complete.

86. **Piranga bidentata flammea** (Ridgway).

Tres Marias Tanager

This is one of the abundant birds on the Tres Marias. It is to be found most commonly in the second growth scrub near the shore. At the time of the visit of the *Ortolan*, many of them were seen near Arroyo Hondo, on Maria Madre, and at the water hole on Maria Magdalena. Four adult males and two females were taken on Maria Madre on May 15, 16, 17, and 23. The plumage of all the specimens shows wear. The "mirrors" on the tertiaries are almost completely worn away. There are no indications of feather renewal.

87. **Vireosylva flavoviridis forreri** (Madarasz).

Forrer's Vireo

Although there were many Forrer's Vireos about the water holes on Maria Madre and Maria Magdalena, their numbers were considerably less than had been expected. Three males

were taken on Maria Madre, May 15, 16, and 23, and a male and female on Maria Magdalena, May 20 and 21. The examples are apparently in nuptial plumage. One of the females has the gray of the nape still somewhat obscured by greenish margins.

88. **Vireo hypochryseus sordidus** Nelson. Tres Marias Vireo

This species appeared to be rare on the Tres Marias, and but one specimen was taken on Maria Madre, May 23. The bird is apparently in prenuptial dress.

89. **Compsothlypis pitiaiyuma insularis** (Lawrence).
Tres Marias Parula Warbler

This warbler was probably the most abundant species on the Tres Marias. At the time of the visit of the *Ortolan*, its metropoleis were at Arroyo Hondo, on Maria Madre, and the water hole on Maria Magdalena. It was found, however, in the scrub near shore and in the various arroyos.

Five specimens (three males and two females) were collected on Maria Madre on May 15, 16, and 23. A pair was also secured on Isabel Island, May 24.

Two females taken on Maria Madre appear to be in fresh body and wing feather, the rectrices exhibiting more wear. The remainder of the specimens have the plumage more worn, but only one, which has pin feathers on the forehead, has commenced to moult.

90. **Compsothlypis graysoni** Ridgway. Socorro Warbler

The Socorro Warbler was found to be very numerous, particularly in the vicinity of the spring near Grayson's Cove. It occurred, however, wherever the heavier growth extended, regardless of elevation. Twelve males, one female, and two unsexed birds were taken on May 3. About half the specimens have the feathers of the head and cervix margined with olive yellow. The remainder of the birds are in somewhat worn dress, lack the olive yellow margins to the feathers, and are acquiring new plumage on the forehead, crown, and throat.

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91. *Dendroica æstiva brewsteri* Grinnell.
California Yellow Warbler

A pair of California Yellow Warblers was taken on Maria Madre on May 16. New greater wing coverts and tertials have been acquired, and pin feathers are present on the crown and throat.

92. *Dendroica bryanti castaneiceps* Ridgway.
Mangrove Warbler

A number of these warblers were seen in and about the mangrove swamp at Magdalena Bay. Three adult and two immature males, and one female were taken on May 29 and 30. One male is in good plumage. Two other males and a female are in worn dress. The tertials, secondaries, and greater coverts of an immature male seem to be new, and pin feathers are appearing on the throat. Another male in its first (and greatly worn) contour plumage is acquiring new feathers on the throat.

93. *Dendroica auduboni auduboni* (J. K. Townsend).
Audubon's Warbler

A female and an unsexed example were obtained on Isabel Island on May 24. Prenuptial moult has affected the wing- and tail-coverts, tertials, and rectrices of the unsexed bird, but has not commenced on the female.

94. *Seiurus aurocapillus* (Linnæus). Oven-bird

One Oven-bird was secured on Maria Madre on May 16.

95. *Wilsonia pusilla pileolata* (Pallas). Pileolated Warbler

A male and female in nuptial plumage were taken on Maria Madre on May 16 and 17.

96. **Granatellus francescæ** Baird.

Tres Marias Red-breasted Chat

On May 22 two specimens of this species were taken on Maria Madre near the trail leading across the island. The skins were not preserved. Another bird was seen on the day following, but it was not secured.

97. **Mimus polyglottos leucopterus** (Vigors).

Western Mockingbird

A male in worn plumage was taken on Isabel Island (May 24). A few new feathers are appearing on the throat and upper tail-coverts.

98. **Mimodes graysoni** (Lawrence). Socorro Thrasher

The thrashers were the most abundant and most widely distributed species on Socorro. They were particularly numerous about the spring at Grayson's Cove, and in the heavily wooded cañons. Eight males (one immature) and two females were collected on May 3. Moult is in progress in all but one of the birds. The other specimens are in all stages from initial to almost complete feather renewal, all areas (contour and flight feathers) being involved.

99. **Melanotis cærulescens longirostris** Nelson.

Tres Marias Blue Mockingbird

Mockingbirds were not seen about the settlement, and appeared to prefer the deeper woods. They were common at Arroyo Hondo and about the water hole on Maria Magdalena. The specimens collected on Maria Madre (two males and one female) on May 17 and 19, and on Maria Magdalena (one male) on May 20 were in good plumage, save for a little wear on the rectrices. One female from Maria Madre exhibited some wear on the contour feathers as well.

100. *Toxostoma cinereum cinereum* (Xantus).

San Lucas Thrasher

Three examples of this species were taken at Cape San Lucas on May 28. An adult male is in greatly abraded plumage, but no moult has begun. Two hornotines (a male and an unsexed example) have pin feathers present on the sides of breast and rump. One of them has a central rectrix still in the sheath.

101. *Heleodytes brunneicapillus affinis* (Xantus).

San Lucas Cactus Wren

An adult female was collected at Cape San Lucas on May 28.

102. *Salpinctes obsoletus guadeloupensis* Ridgway.

Guadalupe Rock Wren

These wrens frequented the shore on Guadalupe Island and also occurred in the cañon extending inland from Northeast Anchorage.

Five adult males, three adult females, and one immature male were collected on April 21.

Two males and a female are in worn plumage, and exhibit no signs of moult. The remainder of the adult birds have commenced a postnuptial moult, which in most cases has only affected the upper contour feathers. In one case, however, a new rectrix is being developed and in another the two inner primaries are just being acquired. The juvenile is clad in its first definitive feathers.

103. *Salpinctes obsoletus proximus* Swarth.

San Martin Rock Wren

Rock wrens did not appear to be common on San Martin Island, but four males and one female were secured on June 8.

In spite of the wear exhibited by the feathers of all the specimens, moult has not begun. One bird has recently gained the fourth, fifth, and sixth primaries in one wing, but there is no corresponding replacement in the other.

A male in the collection taken on August 14, 1922, is experiencing a renewal of the wing- and tail-coverts, as well as the contour feathers. An immature in its first contour feathers, taken on July 11, 1905, is much paler than the Guadalupe bird in similar plumage. The under parts shade from white on the throat to a very pale vinaceous-cinnamon on the under tail-coverts. A female taken on July 11, 1905, is in worn plumage. A new third primary is the only indication of moult.

The measurements, in millimeters, of the Academy's series are given below.

	<i>Wing</i>	<i>Tail</i>	<i>Culmen</i>	<i>Tarsus</i>	<i>Middle toe without claw</i>
Males	68	47.75	19.00	21.20	14.1
	69	50.00	20.00	20.50	14.1
	68	50.50	17.75	19.75	14.5
	68	50.00	19.00	20.50	15.0
	68	49.00	18.00	20.50	14.7
Females	70	50.50	18.00	21.00	15.0
	66	45.00	18.00	19.75	14.4

104. ***Salpinctes obsoletus exul*** Ridgway.
San Benedicto Rock Wren

Rock wrens were not numerous on San Benedicto. Mr. Slevin found them on the southern slope of Mt. Herrera and a few on the western shore. According to Mr. Wright, the wrens were nesting at the time of the visit of the *Ortolan*.

Five males, three females (one immature), and one unsexed bird were secured on May 12.

Two males, two females, and the unsexed bird are in worn livery, but moult has not commenced. One male has new feathers on the crown. Another has new flight feathers, and moult on other areas is nearly complete, but many pin feathers are in evidence on the crown and wing- and tail-coverts. A third male is in fresh plumage, save for some worn lesser coverts. This bird is a partial albino. Its plumage is much grayer than that of the other fresh-plumaged male, and there are patches of white on the upper parts. The under parts of the immature bird approximate in coloration those of the San Martin specimen in similar plumage, but the upper parts are

darker. The immature bird from Guadalupe lacks the grayish cast of the upper parts possessed by the one from San Benedicto.

The measurements, in millimeters, of the series from San Benedicto are as follows:

	<i>Wing</i>	<i>Tail</i>	<i>Exposed culmen</i>	<i>Tarsus</i>	<i>Middle toe without claw</i>
Males	69	51.5	18.50	22.0	14.0
	73	52.5	17.75	20.9	13.5
	72	50.0	21.00	21.0	15.0
	66	50.0	20.00	18.5	14.1
	67	51.0	17.75	21.5	15.5
Females	68	51.0	17.25	20.1	16.0
	69	50.0	19.75	19.5	14.0

105. ***Thryomanes bewicki charienturus*** Oberholser.
San Diego Wren

One San Diego Wren (a male) was secured at San Quintin on June 7, and four males were taken near the spring at the summit of Cedros Island on June 4. In all cases the plumage was greatly worn, but moult had not commenced.

106. ***Troglodytes tanneri*** Townsend. Clarion Island Wren

These wrens were common on Clarion Island. Most of the specimens in the collection were taken in the vicinity of Sulphur Bay, where they frequented the scrubby growth and patches of cactus. Although they were most abundant near the shore, they occurred on all parts of the island. According to the notes of Mr. Tose, the specimens collected showed little indication of nesting. On April 28, however, Doctor Hanna²⁰ found a nest containing four half-grown young.

Twenty-one males (one immature), 12 adult females, and two unsexed examples were taken on April 26, 27, 28, and 29.

Postnuptial moult is well under way in these specimens. A few individuals have pin feathers just appearing on forehead and throat, others are gaining new tertials, also. Still others have renewed the contour feathers and remiges, and have

²⁰ Proc. Calif. Acad. Sci., 4th Ser., Vol. XV, p. 35.

moult progressing on upper and under wing-coverts and rectrices. In no case did moult appear to be complete. The one immature bird in the collection shades from mummy brown on the head to a cinnamon brown on the rump and upper tail-coverts. The under parts are suffused with tawny-olive, deepest on the under tail-coverts. The under tail-coverts are immaculate.

107. **Thryomanes insularis** (Lawrence). Socorro Wren

Socorro Wrens seemed to be abundant. Many were noted about the spring near Grayson's Cove, and they also occurred among the trees on the slopes of Mt. Evermann to an elevation of at least 2700 feet. Nine specimens (three males and six females) were collected. An adult male and female are in completely new livery. The remaining examples have the plumage somewhat worn, but show no indications of moult.

108. **Pheugopedius felix lawrencii** (Ridgway).
Lawrence's Wren

Lawrence's Wren is exceedingly abundant on Maria Madre. It is commonly a denizen of the second growth scrub.

Three adult males and an adult female are in the collection, taken on May 15 and 16. They are all in somewhat worn plumage, but exhibit no signs of moult.

109. **Auriparus flaviceps lamprocephalus** Oberholser.
Cape Verdin

A number of these birds were noted about Magdalena Bay, and four males, an adult and an immature female, and three unsexed immature birds were collected on May 29 and 30. One female was taken at Cape San Lucas on May 28.

The plumage of the adult birds shows a good deal of wear, but moult has only just commenced. Pin feathers are present on the throat and breast of two individuals, and a third has just gained a new proximal primary and two new rectrices. The bird from Cape San Lucas has a pair of fresh rectrices, and new feathers are appearing on the crown. The immature birds are wearing the first definitive feathers.



110. ***Polioptila plumbea*** (Baird). Plumbeous Gnatcatcher

One individual of this species was taken at Cape San Lucas May 28. The bird is in good plumage, save for the remiges and rectrices. One secondary and one tertial appear to be new, and a central rectrix is being developed.

111. ***Polioptila californica*** Brewster. Black-tailed Gnatcatcher

Gnatcatchers were fairly common at Magdalena Bay, and two males and a female were taken there on May 30. One adult and an immature male were also taken at San Quintin on June 7.

One male from Magdalena Bay is undergoing a postnuptial moult. The feathers are little worn, but pin feathers are present on the crown and underparts. The central rectrices and proximal secondary appear to be new. The other male is in worn plumage, but no moult has commenced. The plumage of the female is less worn, but pin feathers are appearing on the crown and upper tail-coverts. The adult male from San Quintin has a patch of pin feathers on the breast, the only indication of feather renewal. The immature bird has no replacement in progress.

In the cases of one male and female from Magdalena Bay, the black on the outer web of the outer rectrix is barely perceptible, and the colors of the upper and under parts are intermediate between those of *P. californica* and *P. plumbea*. A male and an unsexed bird, taken at Magdalena Bay, July 25, 1922, exhibit the same characters²¹.

112. ***Planesticus graysoni*** (Ridgway). Tres Marias Robin

Robins were common on the Tres Marias, particularly about Arroyo Hondo, on Maria Madre, and the water hole on Maria Magdalena.

Three specimens were taken on Maria Madre on May 17. The flight feathers are in good condition, but the contour plumage is somewhat worn. Moult has not commenced.

²¹ Cf. Thayer and Bangs, Condor, Vol. IX, p. 134.

LIST OF SPECIES OF MAMMALS

1. *Macrotus mexicanus bulleri* H. Allen.
Buller's Big-eared Bat

A deserted ranch house at the northern end of Maria Madre was found by Doctor Hanna and Mr. Slevin to harbor large numbers of big-eared bats. Other individuals of this species were discovered in the lime kiln near the hospital.

Twelve specimens were taken on May 17, and preserved in alcohol. Later, six of these examples (four females and two males) were made up as study skins.

The measurements, in millimeters, of the skins and skulls are given below.

Skins:

	Total length	Ear from crown	Tragus	Forearm	Thumb	Tibia	Foot	Tail
Males	96	21.00	7.50	46.25	12.75	20.5	13.0	32
	90	20.10	6.50	47.00	12.00	21.5	13.0	28
	90	19.50	6.90	47.25	12.50	20.0	12.5	27
	90	20.5	6.00	48.50	12.00	21.0	12.5	27
Females	86	21.5	6.50	49.5	12.90	21.0	12.0	30
	84	20.5	7.00	49.5	12.90	20.5	12.2	30

Skulls:

	Basal length	Palatal length	Width of braincase	Height of braincase	Interorbital width	Zygoma- tic breadth	Length of mandible
Males	19.00	11.0	9.25	9.00	4.5	11.50	15.50
	10.9	9.00	4.5	11.40	15.50
	19.00	11.0	8.75	9.25	4.7	11.25	15.25
Females	18.75	11.0	9.50	9.25	4.7	11.7	15.4
	18.50	11.0	9.60	8.90	4.9	11.75	15.5

2. *Rhogeessa parvula* H. Allen. Tres Marias Rhogeessa

The collection contains four examples of this species taken on Maria Madre on May 15 and 16. Mr. Slevin saw a number of these small bats under the tiles of the disused hospital building.

The measurements of the one study specimen are as follows:
Skin.—Total length, 73 mm.; ear from crown, 9.5; tragus, 4.5; forearm, 28.5; thumb, 6.0; tibia, 11.25; foot, 5.75; tail, 13.

Skull.—Basal length, 10.5; palatal length, 6.5; width of braincase, 6.0; height of braincase, 4.9; interorbital width, 3.0; zygomatic breadth, 8.25; length of mandible, 9.10.

3. ***Felis catus*** Linnæus. Domestic Cat

Mute testimony as to one force disturbing the balance of nature on Cedros Island, is the skull of a domestic cat which was found there.

4. ***Zalophus californianus*** (Lesson). California Sea Lion

According to Mr. Tose's notes, California Sea Lions were in evidence at sea north of Cape San Lucas, May 29, and many were seen near shore at Cedros Island, June 5.

Doctor Hanna²² counted 34 cows and bulls (no pups) on a narrow shelf of rock just above the surf line on Outer Island, Guadalupe Island. He also records²³ them as occupying the beaches on the western side of San Martin Island. At this place, one skull was collected.

5. ***Phoca richardii geronimensis*** Allen.

San Geronimo Harbor Seal

One skull of a harbor seal was collected by Doctor Hanna at Turtle Bay. There is no record of animals of this species having been seen alive at any of the points visited.

6. ***Peromyscus maniculatus geronimensis*** (Allen).

Ashy-gray White-footed Mouse

The refuse heap of an American Barn Owl domiciled on San Martin Island contained mandibles which apparently are referable to this species.

²² Proc. Calif. Acad. Sci., 4th Ser., Vol. XV, p. 25.

²³ Proc. Calif. Acad. Sci., 4th Ser., Vol. XV, p. 92.

7. **Peromyscus eremicus cedrosensis** Allen.
Cedros Island White-footed Mouse

One female of this species was taken on Cedros Island on June 4.

8. **Neotoma intermedia pretiosa** Goldman.
Matancita Wood Rat

The collection contains a male and female of this wood rat taken at Magdalena Bay on May 30.

9. **Neotoma bryanti** Merriam. Cedros Island Wood Rat

Two of these wood rats were taken in traps set close to the spring near the top of Cedros Island, June 4.

10. **Neotoma martinensis** Goldman.
San Martin Island Wood Rat

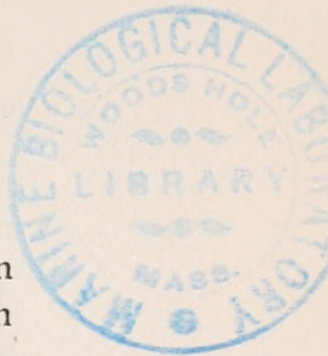
The rubbish heap of an American Barn Owl contained an almost complete skull of the endemic wood rat of San Martin Island. From the number of mandibles and other bones attributable to this species contained in the mass, it would appear that wood rats are fairly common on the island.

11. **Rattus rattus rattus** (Linnæus). Black Rat

The trapping on Maria Madre resulted in the addition of a Black Rat to the collection.

12. **Ammospermophilus leucurus peninsulæ** (Allen).
Lower California Antelope Ground Squirrel

Antelope ground squirrels were noted at Cape San Lucas on May 28. No specimens were obtained.



13. **Lepus californicus magdalenæ** Nelson.
Magdalena Island Jack Rabbit

Three individuals of this species were seen at Magdalena Bay, May 30, but no specimens were taken.

14. **Sylvilagus graysoni** (Allen). Tres Marias Cottontail

Three cottontails were taken on Maria Madre, May 23, between the settlement and the salinas. Others were seen in the vicinity of the wireless station. They were said to be generally distributed over the island, but did not appear to be very abundant.

15. **Megaptera nodosa** (Bonaterre). Humpback Whale

Doctor Hanna²⁴ observed several whales of this species at close range off Clarion Island on April 26.

16. **Prodelphinus longirostris** (Gray). Long-nosed Porpoise

The skull of a Long-nosed Porpoise was picked up on the beach on Isabel Island, May 24.

²⁴ Proc. Calif. Acad. Sci., 4th Ser., Vol. XV, p. 31.



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