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## BIRDS COLLECTED DURING THE WHITNEY SOUTH SEA EXPEDITION. XIII<sup>1</sup>

### A SYSTEMATIC LIST OF THE BIRDS OF RENNELL ISLAND WITH DESCRIPTIONS OF NEW SPECIES AND SUBSPECIES

BY ERNST MAYR

The exploration of the bird fauna on Rennell Island has always been considered as one of the outstanding ornithological tasks since C. M. Woodford discovered there in 1906 an endemic genus of the Zosteropidae. But the inaccessibility of the island and the bad reputation of the inhabitants prevented a thorough exploration for many years, till Mr. H. Hamlin's enterprise and courage finally led to success in an investigation of this isolated island. The results of this collecting trip have far exceeded expectations, and the bird fauna of Rennell Island has turned out to be one of the most interesting in the whole South Sea. With a feeling of great satisfaction I accepted the offer of The American Museum of Natural History to work out this fine collection. My work was greatly facilitated by the kind help and advice I received from my colleagues, Dr. F. M. Chapman, Dr. R. C. Murphy, and Mr. J. T. Zimmer. My special thanks are due to Lord Rothschild, who permitted the loan of valuable specimens from the Tring collection, and to Mr. Arthur Goodson, who supplied me with many notes and measurements from collections in the Tring Museum.

In the arrangement of the families and genera I have departed from the former publications in this series in order to accord with Mr. James L. Peters' forthcoming 'Check List' of the birds of the world, which in turn follows the arrangement proposed by Dr. A. Wetmore.<sup>2</sup> All measurements are in millimeters, weights in grams, and colors according to Ridgway's 'Color Standards.'

Mr. Hannibal Hamlin has increased the value of the collection considerably, by notes on the geography of Rennell Island and the ecology of its bird life.

<sup>1</sup>Previous papers in this series comprise American Museum Novitates, Nos. 115, 124, 149, 322, 337, 350, 356, 364, 365, 370, 419, and 469.

<sup>2</sup>Alexander Wetmore, 1930, 'A Systematic Classification for the Birds of the World.' Proc. U. S. Nat. Museum, LXXVI, Art. 24, pp. 1-8.

## SYSTEMATIC LIST OF THE BIRDS COLLECTED ON RENNELL ISLAND

1.<sup>1</sup> *Colymbus*<sup>2</sup> *ruficollis longirostris*, new subspecies

TYPE.—No. 224664, Amer. Mus. Nat. Hist.; ♂ ad.; Rennell Island; September 5, 1928; H. Hamlin.

SUBSPECIFIC CHARACTERS.—Similar to *novæhollandiæ*, but bill larger and longer; chestnut on the sides of the head darker; white on the wing, especially on the secondaries, farther extended.

	WING	BILL	TARSUS
5 ♂	105-111(107.4)	22-24(23.1)	37-42(39.8)
5 ♀	100-104(102)	20-23(21)	37-39(38.4)

RANGE.—Rennell Island (collected Sept. 1928 and May 1930).

It is a remarkable discovery that this subspecies, which is so close to the Australian *novæhollandiæ*, occurs on Rennell Island, and that *tricolor* does not. This fact, and specimens collected by the Whitney Expedition on the New Hebrides make it probable that the species also breeds on New Caledonia. It has been recorded from there several times (Sarasin, 'Die Vögel Neu-Caledoniens,' p. 68), but the specimens were always considered as winter migrants from Australia.

The birds from the New Hebrides are also new.

*Colymbus ruficollis leucosternos*, new subspecies

TYPE.—No. 215376, Amer. Mus. Nat. Hist.; ♂ ad.; Dolphin Island, New Hebrides Islands; September 7, 1926; R. H. Beck and J. G. Correia.

SUBSPECIFIC CHARACTERS.—Similar to *novæhollandiæ*, but at once distinguishable by its pure white lower breast, lacking the dusky feather centers of *novæhollandiæ*; the wing is more white also; in some specimens the secondaries are almost entirely white, although this character varies to a great extent; bill and tarsus of about the same size as in *novæhollandiæ*.

	WING	BILL	TARSUS
5 ♂	108-113(109.8)	20-22(21.6)	36-39(38.2)
10 ♀	100-106(102.8)	19-21(19.7)	35-37(36.1)

RANGE.—Dolphin Island, New Hebrides (collected Sept. 1926).

The small Dolphin Island (off the northeastern coast of Espiritu Santo Island) is the only place in the New Hebrides where this species has thus far been found.

To make a comparison possible, I will give the measurements of some typical *novæhollandiæ*, which were kindly sent to me from the Tring Museum.

<sup>1</sup>Species known from Rennell Island are numbered consecutively.

<sup>2</sup>*Colymbus* seems to be the correct name for this genus, although the question has not as yet been settled.

***Colymbus ruficollis novæhollandiæ* (Stephens)**

*Podiceps novæhollandiæ* STEPHENS, 1826, in Shaw's 'Gen. Zool.,' XIII, pt. 1, p. 18, Feb.; New South Wales.

*Podiceps fluviatilis carteræ* MATHEWS, 1912, Nov. Zool., XVIII (1911), p. 197; Broome Hill, Southwest Australia [type examined].

*Podiceps fluviatilis parryi* MATHEWS, idem, p. 197; Parry's Creek, Northwest Australia [type examined].

I measured 6 adult specimens: *parryi* (type), ♀; *carteræ* (type), ♀; Cape York, 1 ♀; Queensland, 1 ♂; Sydney, 1 (unsexed); Talaut Island, 1 (unsexed) migrant. Wing: 102, 110, 110, 106, 113, 102. Bill: 20, 17+x, 21, 21.5, 21, 19. Tarsus: 36, 36, 38, 38, 40, 34.

The type of *carteræ* has the tip of the bill broken off, which explains the shortness on which Mathews based his description. Otherwise I cannot find any differences between *carteræ*, *parryi*, and the other Australian material, although my material is limited.

**2. *Phalacrocorax melanoleucus brevicauda*, new subspecies**

TYPE.—No. 224574, Amer. Mus. Nat. Hist.; ♂ ad.; Rennell Island; September 4, 1928; H. Hamlin.

SUBSPECIFIC CHARACTERS.—Smaller than *melanoleucus*.

	WING <sup>1</sup>	TAIL	CULMEN	TARSUS
10 ♂ ad.,	204-217(211.8)	124-143(132.3)	30-31(30.2)	36-40(38.5)
8 ♀ ad.	194-206(202.4)	116-132(125.9)	30-32(30.8)	35-38(36.6)
4 ♂ imm.	195-209(202)	120-127(123.9)	30	36-37(36.5)
1 ♀ imm.	195	112	30	35

RANGE.—Rennell Island (collected Sept. 1928).

Most of the specimens are freshly molted. The juvenal specimens are distinguished by the brownish edges of the feathers (especially on head, scapulars, and wing-coverts) and by the smaller measurements.

***Phalacrocorax melanoleucus* subspecies**

	WING	TAIL	CULMEN	TARSUS
Tucopia, 2 ♀ ad.	221, 227	151, 153	29, 31	37, 38
" 3 ♂ imm.	230, 235, 237	155, 155, 159	30, 30, 32	38, 38, 40
" 1 ♀ imm.	223	146	30	37
Santa Anna, ♀ ad.	230		28	35
Guadalcanar, ♂ imm.	231	160	30	41
Guadalcanar, ♀ imm.	224	149	28	39

<sup>1</sup>As some of the sexing may not be correct, the difference in size between males and females is perhaps greater than it appears in this table.

RANGE.—Tucopia Island (Santa Cruz group) (Feb. 1927); Santa Anna (Brit. Sol. Isls.) (March 1927); Guadalcanar (Brit. Sol. Isls.) (July 1927).

This material is not sufficient to decide to what subspecies these specimens belong. They agree in size fairly well with typical *melanoleucus*, but seem to differ in the coloration of the upperside; *melanoleucus* has the scapulars, wing-coverts and secondaries 'dark slate-gray with well-defined narrow black edges, while these black edges are broader and gradually merge into the blackish-gray centers in the above-named specimens. To show the difference in size between *brevicauda* and typical *melanoleucus*, I shall list some measurements of the latter.

### ***Phalacrocorax melanoleucus melanoleucus* (Vieillot)**

*Hydrocorax melanoleucus* VIEILLOT, 1817, 'Nouv. Dict. d'Hist. Nat.,' nouv. éd., VIII, p. 88, March 15; Australasie [terra typica restricta: New South Wales].

*Carbo melanoleucus melvillensis* MATHEWS, 1912, Austral Av. Rec., I, pt. 3, p. 74, June 28; Melville Island, north Australia.

MEASUREMENTS.—7 ♂ from Australia<sup>1</sup>: wings, 230, 232, 232, 233,<sup>2</sup> 238, 244, 250. 4 ♀ from Australia: wings, 221, 222, 223, 229. One (unsexed) from Amboina (Moluccas): wing, 235. 2 ♂, north New Guinea: wings, 235, 238; tail, 156, 165; bill, 28, 32; tarsus, 38, 41. Additional measurements in Meyer and Wieglesworth, 'Birds of Celebes,' p. 889.

The much larger size of these birds is conspicuous. Unfortunately, I have no specimens from the Pelew Islands and cannot decide whether it is the same bird as the Australian. In New Zealand there occurs a black phase ("*brevirostris*") with black breast and abdomen. But in the same colonies there are birds (in smaller number) with normal coloration and all kinds of connecting stages (see Oliver, 1930, 'New Zealand Birds,' pp. 184–186).

As there are apparently no other characters distinguishing the New Zealand birds from the Australian, it is doubtful whether we can use the name "*brevirostris*" in a subspecific sense.

### 3. ***Demigretta sacra* (Gmelin)**

*Ardea sacra* GMELIN, 1789, 'Syst. Nat.,' I, pt. 2, p. 640, April 20; Tahiti, Society Islands.

	WING	TAIL	BILL	TARSUS
♂ ad.	303	103	99	85
♂ semi-ad.	306	103	94	88
♀ ad.	289	101	85	79

<sup>1</sup>Mr. A. Goodson, of Tring, kindly took these measurements for me.

<sup>2</sup>Type of *melvillensis* Mathews.

All three birds belong to the blackish-gray phase, although the adult male has a white stripe along the throat. Birds from the Moluccas and Sunda Islands seem to be smaller, but aside from that there seems to be no difference all over the wide range of this species, and the many described subspecies are only color-phases.

#### 4. *Dupetor flavicollis pallidior*, new subspecies

TYPE.—No. 226424, Amer. Mus. Nat. Hist.; ♀ ad.; Rennell Island, May 21, 1930; H. Hamlin, W. F. Coultas, and W. J. Eyerdam.

SUBSPECIFIC CHARACTERS.—Similar to *woodfordi*, but above and underneath much paler; upperside hazel, against chestnut in *woodfordi*; foreneck and throat buff, instead of pale orange-cinnamon (Ridgway XXIX).

	WING	TAIL	CULMEN	TARSUS	MIDDLE TOE
Rennell, 2 ♀ ad.	188, 189	65, 69	78, 79	68, 69	58, 60
Sol. Is. 3 ♀ ad.	190-205	70-72	77-78	66-71	57-60

RANGE.—Rennell Island (collected May 1930).

The Whitney Expedition collected only two females on Rennell Island, but these two specimens are very different from the series of three adult and two young females from the Solomon Islands.

#### 5. *Platalea leucorodia regia* Gould

*Platalea regia* GOULD, 1838, 'Synops. Birds Austr.,' pt. 4, App. p. 7, April 1; New South Wales.

	WING	TAIL	CULMEN <sup>1</sup>	TARSUS
1 ♀ semi-ad.	347	113	164	120

To find this species on Rennell Island is a most interesting discovery. The bird is apparently not quite adult, the sexual organs being indicated as "small." The tips of the primaries are still blackish, which seems to be a juvenal character, but the bill is black and the forehead bald.

Specimens from Australia, which Mr. Goodson, of Tring, kindly measured for me, have the following wing-lengths:

2 ♂, 360, 368; 2 ♀, 330 (type of *stalker*), 330.

I follow Stresemann's arrangement (Nov. Zool., 1912, p. 264) who regards, in my opinion with good reason, *regia* as a subspecies of *leucorodia*.

<sup>1</sup>Not including the bare forehead.

6. *Threskiornis aethiopicus pygmæus*, new subspecies

TYPE.—No. 226420, Amer. Mus. Nat. Hist.; ♂ ad.; Rennell Island, May 23, 1930; H. Hamlin, W. F. Coultas, and W. J. Eyerdam.

SUBSPECIFIC CHARACTERS.—Much smaller than *moluccus*, especially the bill much shorter.

	WING	TAIL	CULMEN	TARSUS	MIDDLE TOE
1 ♂ ad.	339	118	132	95	77
4 ♂ semi-ad.	molting	99-107(103)	105-119(112.2)	75-79(76.8)	73-77(75.2)
3 ♀ semi-ad.	molting	104-105(104.3)	108-113(110)	74-81(77.7)	73-78(76)

RANGE.—Rennell Island (collected Sept. 1928 and May 1930).

The seven semi-adult specimens are molting from the juvenal to the adult plumage.

In four specimens of *moluccus* from southeast New Guinea (Hall Sound) (H. Hamlin, collector), I get the following measurements:

	WING	TAIL	CULMEN	TARSUS	MIDDLE TOE
4 ♂ ad.	360-374(364.5)	115-127(119.5)	177-196(187.2)	104-108(106)	90-95(93.5)

Further measurements of *moluccus* were kindly supplied by Mr. A. Goodson, of Tring.

	WING	CULMEN
New Guinea, ♂	368, 368	175-178
Seran, ♂	358	
New Guinea, ♀	350	152

Measurements of *strictipennis* are as follows:

Australia, 3 ♂	372, <sup>1</sup> 379, 382	196, <sup>1</sup> 197, 208
Australia, 2 ♀	350, 350	142, 156

The only difference between *strictipennis*, *moluccus*, and *pygmæus* seems to be the size. The color pattern on the secondaries varies to a great extent; in some specimens they are almost entirely black (with a metallic sheen), in others, as in the adult male from Rennell Island, strongly mottled with white. This variation appears to have no geographical significance (as Mr. Goodson informs me).

The birds from south New Guinea (Hall Sound) are in size somewhat intermediate between typical *moluccus* and *strictipennis*.

<sup>1</sup>Type of *alligator* Mathews.

7. *Anas superciliosa pelewensis* Hartlaub and Finsch

*Anas superciliosa* var. *pelewensis* HARTLAUB AND FINSCH, 1872, Proc. Zool. Soc. London, p. 108; Pelew Island.

	WING	CULMEN	TARSUS
4 ♂ ad.	225-236(229)	43-46(44.5)	40-41(40.3)
3 ♀ ad.	206-214(210.4)	40-42(40.6)	35-38(36.6)

LOCALITY.—Rennell Island (Sept. 1928, May 1930).

The buff throat, the dark upperside with brownish edges of the feathers, and the short wing mark the specimens as *pelewensis*, which is widely distributed all over the Pacific Islands. There seem to exist some local size varieties (for example, the birds of the mountain lakes of New Guinea are larger), but it would not be wise for the present to split up the *pelewensis* group.

There is a marked difference in coloration between the two sexes which has been thus far overlooked. The female is generally lighter and the buff edges of the feathers of rump and upper tail-coverts are much wider, the white tips on the inner web of the secondaries are smaller and the 10th-12th secondary without (metallic sheening) black on the outer web.

8. *Anas gibberifrons gibberifrons* S. Müller

*Anas (Mareca) gibberifrons* S. MÜLLER, 1842, Verh. Nat. Gesch. Land-en Volkenk., p. 159; Celebes.

	WING	TAIL	BILL	TARSUS
1 ♂ ad.	185	75	32	31
1 ♀ ad.	177	72	31	30

It is very interesting to find this little duck so far east. It had been once recorded from New Caledonia (1860, Rev. Mag. Zool., (2) XII, p. 442), but never has been found on that island again. Besides that, the next known locality is south and southeast New Guinea.

The Australian birds (*Anas gibberifrons mathewsi* Phillips) have been separated from the Celebes birds on account of the slightly larger size, but the wing measurements are overlapping to a large extent (compare: Philipps, 1924, 'Natural History of Ducks,' II, p. 266; and Meise, 1930, Journ. f. Ornith., LXXVIII, p. 181). The Rennell birds agree in size with the Celebes specimens.

Both specimens are in freshly molted plumage (Sept. 1928).

9. *Accipiter fasciatus vigilax* (Wetmore)

*Astur fasciatus vigilax* WETMORE, 1926, Condor, XXVIII, p. 46.

New name for *Astur approximans insularis* F. SARASIN, 1913, 'Die Vögel Neu-Caledoniens und der Loyalty Inseln,' p. 8; *nec* *Astur insularis* Madarasz, 1910.

	WING	TAIL	BILL	TARSUS
♂ ad.	264	199	17	74
♀ ad.	285	230	20	80

LOCALITIES.—Rennell Island (1 ♂, Sept. 4, 1928) and Bellona Island (1 ♀, May 30, 1930).

Both specimens agree in size fairly well with *vigilax*. I have no New Caledonian or Australian material, but Mr. A. Goodson compared both specimens with the Australian *fasciatus* of Tring Museum and could not find any constant differences; *vigilax* is smaller than *fasciatus*, but seems to agree with it in coloration. As I have not seen any New Caledonian skins, I name the Rennell birds *vigilax*, only tentatively.

The male is in worn, the female in freshly molted plumage.

10. *Porphyrio albus melanopterus* (?) Bonaparte

*Porphyrio melanopterus* BONAPARTE, 1856, Compt. Rend. Acad. Sci., Paris, LXIII, p. 599; no locality [terra typica restricta: Seran].

	WING	TAIL	TARSUS	MIDDLE TOE
♂ ad.	237	88	85	93
♀ ad.	233	85	86	101

  

	CULMEN (incl. shield)	BILL (from nostril)	WIDTH OF SHIELD
♂ ad.	70	30	27
♀ ad.	72	30	25

LOCALITY.—Rennell Island (Aug. 1928).

Both specimens are rather worn.

All the Old World purple coots (except the much smaller *alleni*) represent each other. Whether they are considered subspecies or not, at least all the birds of the Sunda Islands, Australia, Melanesia, and Polynesia must be united into one species. The oldest available name is unfortunately *Fulica alba* White, 1790, which was given to an albinistic specimen of the (now apparently extinct) Norfolk Island race (see Mathews, 1911 'Birds of Australia,' I, pt. 5, pp. 250–254). The second oldest name is *Porphyrio cyanophalus* Vieillot, 1816.

From the range of *Porphyrio albus* (*calvus* auct.), Mathews ('Syst. Av. Austr.,' pp. 99–102) records not less than nineteen subspecies, some of which undoubtedly are synonyms. It would be only possible in a



monographic revision to clear up the geographical variation of this species.

The Rennell birds have a rather dark, almost black back, scapulum, and wing; the shield on the head is very wide and the blue on the wing-bend, throat and upper breast is of a pure shade, not greenish, as in the Polynesian and Solomon Islands birds. The scanty material available to me does not permit me to separate the Rennell specimens from *melanopterus*.

#### 11. *Sterna sumatrana sumatrana* Raffles

*Sterna sumatrana* RAFFLES, 1822, Trans. Linn. Soc. London, XIII, pt. 2, p. 329; Sumatra.

	WING	BILL	TARSUS
2 ♂ ad.	230, 235	35	30

LOCALITY.—Rennell Island (Sept. 1928, May 1930).

Both specimens are in fresh plumage, but the bird does not seem to breed on Rennell Island.

There are apparently no subspecies in the eastern part of the range of this widespread species. The wing measurements of the two Rennell specimens are rather large for *sumatrana*, but the length of the bill is the same as in typical birds, while *mathewsi* Stresemann has a longer bill.

#### 12. *Sterna bergii cristata* Stephens

*Sterna cristata* STEPHENS, 1826, in Shaw's, 'Gen. Zool.,' XII, p. 146; China.

	WING	BILL	TARSUS
♂ imm.	340	57	29
♀ imm.	332	53	28

LOCALITY.—Rennell Island (Sept. 1928).

Both specimens are immature, in a rather worn condition, and in partly molted body plumage.

I refer these birds to *cristata*, which seems to be distributed all over the tropical waters of the Pacific Ocean. The coloration of the back is not of a very high systematic value. One of the two specimens (♂) has a dark back, the other (♀) a very light one. Hartert 'Vögel Pal. Fauna,' p. 1717) also says that he got dark-colored birds from the Pacific as well as light-colored ones. Size seems to be the best distinguishing character between the different subspecies.

13. *Anous stolidus pileatus* (Scopoli)

*Sterna pileata* SCOPOLI, 1786, 'Del. Faun. et Flor. Insubr.', II, p. 92; Philippine Islands.

	WING	BILL	TARSUS
3 ♂	279	40, 42	26, 27, 27
4 ♀	275, 278, 284	40, 40, 41	26, 26, 27

LOCALITY.—Rennell Island (Sept. 1928).

All the specimens are either molting or in a very worn condition; the measurements are therefore only approximately correct.

14. *Ptilinopus rhodostictus cyanopterus*, new subspecies

TYPE.—No. 224471, Amer. Mus. Nat. Hist.; ♂ ad.; Rennell Island, Aug. 28, 1928; Hannibal Hamlin.

SUBSPECIFIC CHARACTERS.—Similar to *rhodostictus* Tristram, but the bill shorter and thicker; the green on the scapulars, mantle, back, rump, and upper tail-coverts deeper (more moss-green than olive-green); the bluish sheen of the wing-feathers and base of the tail-feathers much more pronounced; the olive edges of the wing-coverts smaller; the red patch on the belly less orange (flame-scarlet against orange-chrome in *rhodostictus*); the crown pure gray without any violet tinge; slightly larger.

Males, adult: wings, 133–141 (137.4); tail, 75–77. Females, adult: wings, 131–138 (134.4). Birds in first year plumage: wings, 129–135 (131). Weight of 2 males, adult: 115 and 116 grs.

The typical subspecies of this rare little dove was discovered on Ugi Island (Brit. Sol. Islands) by Richards in 1880, and in the following years collected by Morton and Lewis on the same island, but never recorded after 1882. It was found again (and collected in small numbers) by the Whitney Expedition on Ugi Island and on Santa Anna Island.

It seems to be restricted to the small islands along the north coast of San Cristobal Island. The species has geographical representatives east and west of the Solomon Islands (superspecies *Ptilinopus porphyra-ceus*), which have been reviewed recently by Rensch (1929, Verh. VI. Internat. Ornith. Kongress, Berlin, p. 235, with map).

15. *Ducula pacifica tarrali* (Bonaparte)

*Globicera tarrali* BONAPARTE, 1854, Compt. Rend. Acad. Sci., Paris, XXXIX, p. 1073; Vanikoro Island, Santa Cruz group.

*Carpophaga Frauenfeldii* PELZELN, 1865, 'Reise der Novara,' Zool. Theil I, p. 106, Stewart Island (Sikaiana).

	WING	TAIL	BILL	WEIGHT
5 ♂ ad.	235, 240, 241	138, 141, 145	28–29	400, 550, 550
	242, 253	150		
2 ♀ ad.	232, 232	140	28, 28	420
1 ♀ imm.	225	137	28	

LOCALITY.—Rennell Island (Aug.–Sept. 1928 and May 1930).

All specimens (from May, Aug., and Sept.) are molting wing and tail-feathers.

The classification of this species is in a state of great disorder. The bird has a very extended range, but occurs within this area only on certain localities. All those belonging to the western part of its range seem to correspond to *tarrali*. After a careful examination of the large series in the American Museum, I arrive at the conclusion that the birds from the Santa Cruz group, Stewart Island, Gower Island, Rennell Island, Florida Island, the Louisiade Archipelago, and the islands off the north coast of New Guinea (Tarawai and Seleu) should be grouped under this name; but it needs a monographical treatment to reach a final decision.

The individual variation is much greater than it has hitherto appeared in descriptions of this species. I have before me, in series from the same localities, specimens with bluish-green and with bronze-green back, with a large knob on the base of the bill and almost none; with a light gray head and hind-neck and with a dark one; with a distinct gray tinge on the breast and with a pure vinaceous breast; with a light-colored belly and with a chestnut-colored one, etc.

The birds from Rennell Island compared with typical Vanikoro specimens show a tendency towards a lighter coloring of neck and underside; the breast is usually more vinaceous (less gray), and the knob on the bill more pronounced; but most of the specimens of the two localities cannot be distinguished from each other.

When Pelzeln described *frauenfeldii* (*loc. cit.*) he compared it with two such distinct species as *ænea* Linnæus (India) and as *myristicivora* Scopoli from Waigi (called *sundevalli* by Pelzeln). Naturally he found quite a lot of differences. Unfortunately, Stewart Island (now called Sikaiana) has never been visited by an ornithologist since the voyage of the 'Novara,' but I have a series of *Ducula pacifica* from Gower Island (northwest of Malaita) which is the nearest locality to Stewart Island where this species occurs. These birds do not differ noticeably from Vanikoro specimens. We can safely conclude that *frauenfeldii* is an absolute synonym of *tarrali*.

Geographical representatives of the species *Ducula pacifica* are: in the west, *Ducula myristicivora*; in the north, *Ducula oceanica*; in the east, *Ducula aurora* and "*Serresius*" *galeatus*.

Concerning the invalidity of the genus *Globicera*, I quite agree with Hartert (1901, Nov. Zool., VIII, p. 111).

16. *Gallicolumba beccarii solomonensis* (Ogilvie-Grant)

*Phlogænas solomonensis* OGILVIE-GRANT, 1888, Proc. Zool. Soc. London, p. 200; Aola (Guadalcanar, Brit. Sol. Isls.).

	WING	CULMEN	TARSUS	WEIGHT
1 ♂ ad.	108	15	28	95
3 ♂ imm.	109-117	14	28-30	82-83
3 ♀ ad.	103, 105, 108	14-15	27-28	76, 79, 82
2 ♀ imm.	98, 104	14	26, 27	71, 82

LOCALITY.—Rennell Island (Aug. 1928 and May 1930).

The adult birds are freshly molted, the immature specimens molting the body plumage into the adult one.

Compared with Solomon Islands specimens, the Rennell birds show a tendency to have the back and nuchal patch more purplish; the belly darker chocolate-brown, and the lower edge of the breast-shield lighter (more whitish); but in every one of these characters there is a wide margin of individual variation. I have, for example, two specimens from Santa Anna Island (both are males with large testes, shot in March 1927), one of which has the back dark purplish, and the belly coffee-brown; while the other one has the back with a greenish sheen and the belly grayish beige.

Rothschild and Hartert (1905, Nov. Zool., p. 246) described a subspecies "*intermedia*" from the western Solomon Islands on account of slight color differences and considerably smaller size; but they gave no measurements, which is not a very scientific procedure.

*Gallicolumba beccarii johannæ* (Sclater) differs from *solomonensis* by the smaller bill, smaller nape-patch, and by the constantly lighter coloration of breast-shield and abdomen.

17. *Caloenas nicobarica nicobarica* (Linnæus)

*Columba nicobarica* LINNÆUS, 1758, 'Syst. Nat.,' 10 Ed., p. 164; Nicobar Islands.

	WING	TAIL	BILL	TARSUS
1 ♂ ad.	271	90	26	43

LOCALITY.—Rennell Island (May 1930).

The bird is in freshly molted plumage.

The specimen agrees perfectly with Solomon Island specimens. Birds from the western part of the range of this species (including Nicobar Islands) seem to have a different sheen on the upperside; not almost pure greenish; with just a little coppery tinge, but distinctly bronze coppery, sometimes even almost purplish. But Mr. Goodson assures me (after having examined the Tring material) that Nicobar birds do not differ from Solomon Island specimens.

18. *Lorius*<sup>1</sup> *chlorocercus* Gould

*Lorius chlorocercus* GOULD, 1856, Proc. Zool. Soc. London, p. 137; San Cristobal Island (Brit. Sol. Isls.).

	WING	TAIL	CULMEN	WEIGHT
1 ♀ ad.	152	90	20.5	150
2 ♂ imm.	154, 157	85, 86	20.5, 22	

The adult bird (collected in May 1930) has nearly finished its molt; the two young birds (Sept. 1928) are in a rather worn condition and beginning to molt their body plumage.

The thighs of the Rennell birds are lighter blue and the wing-band less whitish than in a large series of *chlorocercus* from San Cristobal, but the Rennell material is too small to decide if this character is constant.

19. *Geoffroyus heteroclitus hyacinthinus*, new subspecies

TYPE.—No. 226433, Amer. Mus. Nat. Hist.; ♂ ad.; Rennell Island, May 25, 1930; Hannibal Hamlin, W. F. Coultas, and W. J. Eyerdam.

SUBSPECIFIC CHARACTERS.—Males: the Ontario violet (Ridgway XXXVI) of throat and upper breast is extended all over the breast, flanks, and upper abdomen; on the nape also the violet color is more extended, reaching the foreback; wing-bend bluish, blue edges of primary-coverts much wider. Female: primary-coverts more bluish, the bluish gray of the head deeper and more extended on the sides and on the neck.

	WING	TAIL	BILL	WEIGHT
3 ♂ ad.	173, 175, 176	97, 101, 101	21, 22	200
4 ♀ ad.	169–178 (175)	99–102 (100.2)	21–21.5	210

RANGE.—Rennell Island (collected Aug.–Sept. 1928 and May 1930).

The May specimens are freshly molted, the birds from September slightly worn.

20. *Micropsitta finschii finschii* (Ramsay)

*Nasiterna Finschii* RAMSAY, 1881, Proc. Linn. Soc. N. S. W., VI, p. 180; San Cristobal.

	WING	TAIL	BILL	WEIGHT
1 ♂ ad.	66	33	8.5	16

I cannot discover any differences between this specimen (collected May 1930) and a large series of typical *finschii* from San Cristobal, which is the more remarkable as *finschii* has several subspecies in the Solomon Islands.

<sup>1</sup>*Lorius* Brisson, 1760, Ornithologia, IV, p. 215; type (by subs. design., Gray, 1840, 'Genera of Birds,' p. 52); *Psittacus domicella* L. Syn.: *Domicella* Wagler, 1832 (Monogr. Psitt.), Abh. Akad. Wissensch. München, I, p. 495; type (by tautonymy): *Psittacus domicella* L.

21. *Cacomantis pyrrhophanus meeki* Rothschild and Hartert

*Cacomantis meeki* ROTHSCHILD AND HARTERT, 1902, Nov. Zool., XIV, p. 436; Ysabel Island (Brit. Sol. Isls.).

	WING	TAIL	TARSUS	WEIGHT
1 ♀ imm.	140	147	18.5	54

Iris, orange; eyelids, yellow; bill, black; feet, yellow-brown.

The specimen (collected on Bellona Island, May 1930) almost completed its molt to the adult plumage, but there are still left some juvenal feathers on the hind-neck and among the scapulars and upper wing-coverts. The bill has the tip shot off and cannot be measured.

Mr. A. Goodson kindly compared the specimen with the series of *meeki* in the Tring Museum (including the type) and could not find any differences in size or coloration, except that the upper tail-coverts in the Rennell specimens have very conspicuous white markings which are only slightly indicated in the Solomon Island specimens. It needs additional material to decide whether or not this character is constant.

22a. *Chalcites lucidus lucidus* (Gmelin)

*Cuculus lucidus* GMELIN, 1788, 'Syst. Nat.,' I, pt. 1, p. 421 (in nova Selandia).

	WING	TAIL	WEIGHT
3 ♂ ad.	90, 93, 95	62, 63, 64	19, 20, 20.5

All three specimens (collected on Rennell Island, May 1930) are in fresh plumage, one is still molting, and the sexual organs are small.

22b. *Chalcites lucidus plagosus* (Latham)

*Cuculus plagosus* LATHAM, 1801, 'Index Ornith.,' Suppl. 2, p. xxxii ("hab. in Nova Hollandia").

	WING	TAIL	WEIGHT
2 ♀ ad.	90, 95	60, 63	19

Both specimens (collected on Bellona Island and Rennell Island, May 1930) are just at the end of their molt.

According to all descriptions the five specimens of glossy cuckoos collected on Rennell Island should be classified as above. In the two "*plagosus*" the head and back is much more purplish, the throat has a rusty tinge and the two outer tail-feathers are strongly marked with rusty chestnut. On the other hand, it might be just a sexual difference. The measurements are rather small for *lucidus* and *plagosus*.

23. *Collocalia esculenta desiderata*, new subspecies

TYPE.—No. 226447, Amer. Mus. Nat. Hist.; ♀ ad.; Rennell Island; May 25, 1930; H. Hamlin, W. F. Coultas, and W. J. Eyerdam.

SUBSPECIFIC CHARACTERS.—In size and general coloration similar to *uropygialis*, but feathers of rump and shorter upper tail-coverts not entirely white, but just with white edges; upper surface dull bluish-green, gray of throat restricted and sharply separated from white of belly.

	WING	TAIL	WEIGHT
4 ♂	95-97(96.5)	39-40	5.5
7 ♀	96-101(99.1)	39-41	5.5

This new form is the long-desired missing link between *esculenta* and *uropygialis*. It combines characters of both subspecies. For *uropygialis* I find a wing measurement of 95-100 mm.

REVISION OF THE SUBSPECIES OF *Collocalia esculenta* IN THE  
SOLOMON ISLANDS

A large amount of material from the American Museum, the Tring Museum, and the Berlin Museum (altogether 192 skins) permits me to give a review of the subspecies inhabiting the area between New Guinea and the New Hebrides.

The species of the genus *Collocalia* have the same peculiarity, which I mentioned in my paper on *Halcyon chloris* (*loc. cit.*, p. 7) of showing slight differences on every island; but it would lead too far to name every one of the different populations, so I shall describe the differences only and give names solely to those populations that show very distinct characters. The females usually exceed the males in size, but I have not separated the measurements of both sexes in the following tables, as most of the material is very badly sexed. Wear has some effect on the coloration, as worn specimens are more bluish on the upper side and blacker on the throat after having the white edges of the feathers worn off.

*Collocalia esculenta makirensis*, new subspecies

TYPE.—No. 217434, Amer. Mus. Nat. Hist.; ♀ ad.; San Cristobal Island; April 4, 1927; R. H. Beck and F. P. Drowne.

SUBSPECIFIC CHARACTERS.—Very small, similar to *desiderata*, but less dull above and without white edges on the central rump feathers; gray of breast sharply separated from white of belly.

Measurements of 10 specimens collected on San Cristobal (March and April 1927 and December 1929): wings, 91-96 (93.9).

DISTRIBUTION.—San Cristobal Island, also called Makira or Bauro (British Solomon Islands).

**Collocalia esculenta becki**, new subspecies

TYPE.—No. 217501, Amer. Mus. Nat. Hist.; ♂ ad.; Florida Island, June 20, 1927; R. H. Beck and F. P. Drowne.

SUBSPECIFIC CHARACTERS.—Upperside more glossy than in *makirensis* and *desiderata*, but not as much as in *stresemanni*; sheen bluish green, not greenish; underside very different from the hitherto mentioned forms, the feathers of the belly not being more or less white but greenish gray with narrow white edges; there is a great deal of variation in this character, but in some specimens the whole underside appears to be dark scaly gray.

DISTRIBUTION.—Guadalcanar Island, Florida Island, Pavuvu Islands, central Solomon Islands (Tetipari, Kulambangra, Bagga and Vella Lavella), northern Solomon Islands (Ysabel, Choiseul, Shortland, and Bougainville). As I stated above (p. 15), the birds from the different islands of this range do not agree perfectly, so I shall list them separately in the following tables of measurements. I choose Florida Island as *terra typica*, it being the most visited island of the British Solomon group, the capital, Tulagi, being situated on it.

I name this new subspecies in honor of R. H. Beck, who collected more specimens of *Collocalia* on the Solomon Islands than anyone before him.

Florida Island (June, 1927), typical *becki*: wings, 98, 98, 98, 101, 103 (99.6).

Guadalcanar Island (July, 1927): wing, 104.

Pavuvu Islands (August, 1927): wings, 101, 101, 102, 104, 105, 106, 107 (103.9).

These specimens are very similar to typical *becki*, but a little more glossy above and with more white on the belly.

Tetipari Island (Aug. 1928): wings, 98, 99.

Kulambangra Island (Oct. 1927): wings, 100, 102, 104.

Bagga Island (Nov. 1927): wing, 100.5.

Vella Lavella Island (Oct., Nov. 1927): wings, 98, 99, 99, 100, 100, 101, 101, 102, 106.

The specimens from the central Solomon Islands are very similar to typical *becki*, but usually more glossy and more greenish above.

Ysabel (July 1901, Meek Coll.): wings, 99, 99, 101, 101, 102, 104.

Choiseul (Jan. 1904, Meek Coll.): wings, 98, 99.

Breast and flanks are distinctly lighter gray, back more greenish; but as the Bougainville specimens are very similar again to typical *becki*, I do not dare to separate the birds of Ysabel and Choiseul.

Shortland Island (Dec. 1927): wing, 101.

Bougainville Island (Dec. 1927, Jan. 1928): wings, 101, 101, 102, 102, 103, 103, 104, 106, 109, 109 (104).

Similar to typical *becki*, but in the average larger, with more white on the belly and more glossy above.

Nissan Island (July, Aug., Sept. 1924, Eichhorn; Aug. 1929, Hamlin and Mayr): wings, 96, 96, 96, 96, 98, 98, 99, 99 (97.2).

Similar to typical *becki* (being duller and smaller than the Bougainville specimens), but more greenish above and with more white on the belly.



***Collocalia esculenta stresemanni* Rothschild and Hartert**

*Collocalia esculenta stresemanni* ROTHSCHILD AND HARTERT, 1914, Nov. Zool., XXI, p. 239; Manus, Admiralty Islands.

*Collocalia uropygialis heinrothi* NEUMANN, 1919, Ornith. Monatsber., XXVIII, p. 110; Nusa Island, New Ireland [type examined].

*Collocalia esculenta tametamele* STRESEMANN, 1921, Anzeiger Ornith. Ges. Bayern, No. 5, p. 37; Ralum, New Britain [type examined].

SUBSPECIFIC CHARACTERS.—Very glossy above, as *esculenta*, but smaller, feathers on the side of the rump sometimes with white edges; white area on belly more restricted; *becki* is much duller above and has less white on the belly.

New Britain: wings, 98, 99, 101, 102.<sup>1</sup>

Witu Islands: wings, 96, 99, 101, 102.

New Ireland: wing, (molting).<sup>2</sup>

New Hanover: wings, 95, 96, 96, 98.

DISTRIBUTION.—Admiralty Islands and Bismarek Archipelago.

Specimens of *esculenta* Linnæus from northeast New Guinea (Bürgers, Mayr, Beck coll.) have the following wing-measurements: 102, 103, 104, 104, 106, 106, 109 (105).

Specimens from New Britain and the Witu Islands have the throat and upper breast very dark (metallic), while in those from New Ireland and New Hanover they are lighter and more grayish. Two of the New Hanover specimens are abnormal in the coloration of the rump, the pigmentation has been interrupted during the molt, perhaps on account of hunger and cold weather. The type of *heinrothi* Neumann seems to be an albinistic specimen.

**24. *Hemiprocnis mystacea woodfordiana* (Hartert)**

*Macropteryx mystacea woodfordiana* HARTERT, 1896, Nov. Zool., III, p. 19; Guadalcanar (Brit. Sol. Islands).

	WING	LONGEST TAIL-FEATHER
♂ ad.	215	181
♀ ad.	211	182

There is no difference from typical *woodfordiana*, except that the two Rennell birds (collected Aug. 1928) have the gray on upperside and underneath slightly darker (especially) on rump and under tail-coverts), and that the size is a little larger. Both specimens are in fresh plumage.

<sup>1</sup>Type of *tametamele* Stresemann.

<sup>2</sup>Type of *heinrothi* Neumann.

25. *Halcyon chloris amœna* Mayr

*Halcyon chloris amœna* MAYR, 1931, Amer. Mus. Novitates, No. 469, p. 10; Rennell Island.

The necessary data already have been given in the original description (*loc. cit.*). The weights of two specimens are 45 and 45.5 grs. The May specimens are just at the end of the molt, the August birds in rather fresh plumage.

26. *Halcyon sancta* Vigors and Horsfield

*Halcyon sanctus* VIGORS AND HORSFIELD, 1827, Trans. Linn. Soc. London, XV, p. 206; New South Wales.

	WING	TAIL	BILL
3 ♂ ad.	91, 91, 92	(58)	30, 32, 33
1 ♀ imm.	92	57	31

The three adult birds (collected in August) have almost completed their molt; the young specimen is in very worn plumage (weight 46 grs.).

27. *Coracina lineata gracilis*, new subspecies

TYPE.—No. 226212, Amer. Mus. Nat. Hist.; Rennell Island, August 30, 1928; H. Hamlin.

SUBSPECIFIC CHARACTERS.—Similar to *lineata* from Australia, but smaller and darker; the gray of upperside, throat, wings and under tail-coverts much darker; lower breast, belly, under wing- and under tail-coverts in both sexes narrowly barred with black and white; the black bars being broader than the white ones. There is no difference between the two sexes, except that in females usually the white bars on the under tail-coverts are broader, in the males the black ones.

	WING	TAIL	WEIGHT
4 ♂	143-146(144.2)	103-110(105.5)	94
1 " ♀ " (? ♂)	143	105	
3 ♀	138, 138, 139	97, 98, 98	81, 90
1 ♀ imm.	140	100	83

RANGE.—Rennell Island (collected Aug.-Sept. 1928, and May 1930).

In *lineata* from Australia the wing is about 145-151.

The May (1930) specimens are in very fresh plumage, the Aug.-Sept. (1928) birds slightly worn.

It is remarkable that the Rennell bird is so unlike the Solomon Island subspecies of *lineata*, in which there is always a marked sexual dimorphism.

28. *Aplonis cantoroides cantoroides* (Gray)

*Calornis cantoroides* GRAY, 1862, Proc. Zool. Soc. London (1861), p. 431; Mysol Island.

	WING	TAIL	INDEX <sup>1</sup>
1 ♂ ad. (testes small)	103	69	67.0
Wing formula:	4>3>2>5		

It is unexpected to find a typical *cantoroides* on Rennell Island, which agrees in every detail with a large series from the Solomon Islands. More collecting is necessary in order to find out whether this species is breeding on Rennell Island or not. For the present the occurrence of this one specimen, collected on Rennell Island, Sept. 4, 1928 (which might be a straggler from the Solomon Islands), forces me to treat the undoubtedly indigenous Rennell Islands starling as a distinct species.

29. *Aplonis insularis*, new species

TYPE.—No. 226540, Amer. Mus. Nat. Hist.; ♂ ad; Rennell Island; May 21, 1930; H. Hamlin, W. F. Coultas, and W. J. Eyderdam.

SPECIFIC CHARACTERS.—Similar to *cantoroides*, but differing in the following points: bill stronger and upper mandible more curved; the glossy edges of the feathers of back, wings, and underside more narrow and bluish green, instead of bottle-green; all the plumage softer, less compact; the feathers of throat, upper breast and neck shorter, less lanceolate; juvenal plumage very different (see below); slightly larger; different proportions and wing-formula. Wing, 101–109; tail, 50–59; tarsus, 25–27; exposed culmen, 17.5–19.5.

DESCRIPTION.—Male and female (adult plumage).—General color black, feathers with glossy bluish-green edges, more greenish on the head, the sides of the neck and throat; more bluish on the scapulars, back, rump, and belly; feathers of hindneck and throat slightly lanceolate; wings and tail black with a greenish sheen.

FIRST YEAR PLUMAGE (male and female).—General color dark brownish-gray with a slight metallic sheen produced by narrow glossy feather-edges.

NESTLING PLUMAGE (male and female).—Plumage very soft and loose; upper side earth-brown; under side lighter (hair-brown) with buff edges to the feathers of the belly; no glossy feathers at all.

The species of *Aplonis* molt twice before reaching the adult plumage as described by Heinroth (1903, Journ. f. Orn., p. 75) and Stresemann (1914, Nov. Zool., XXI, p. 151).

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<sup>1</sup>Index =  $\frac{\text{Tail} \times 100}{\text{Wing}}$

Measurements of specimens collected on Rennell Island  
(Aug., Sept., 1928; May, 1930)

	WING	TAIL	INDEX	WING-FORMULA	WEIGHT
♂ ad.	106	59	55.7	4>3>5>2	
♂ ad.	107	59	55.2	4=5>3>2	66
♂ ad.	108	56	51.9	Molting	74
♂ ad.	108	59	54.6	4=3>5>2	
♀ ad.	109	56	51.4	4>3>5>2	
♀ ad. (?)	104	53	51.0	4=5>3>2	
♂ imm.	103	55	53.4	3>4>5=2	66
♀ imm.	104	57	54.8	3>4>5>2	
♂ juv.	103	52	50.5	4>3>5>2	
♀ juv.	101	50	49.5	3=4>5>2	
♀ juv.	102	51	50.0	3=4>5=2	
♀ juv.	101	50	49.5	3=4>5>2	

COMPARISON OF *insularis* WITH RELATED SPECIES

There is undoubtedly a faint relation to the starlings of the Polynesian Islands and New Hebrides Islands, but *insularis* is more closely related to *cantoroides*, so close that I might consider it a subspecies of that species if a specimen of *cantoroides* had not also been collected on Rennell Island.

The whole group of starlings related to *cantoroides* has not been fully understood thus far. There is *Aplonis cantoroides cantoroides* with a very wide distribution, reaching from the Aru Islands and western Papuan Islands over all New Guinea, Bismarck Archipelago to the, Solomon Islands without any geographical variation, and there are (besides *insularis*) three forms occurring within this range, but every one restricted to one group of coral islands; *feadensis* Ramsay, on the Fead or Abgarri Island (northeast of the Solomon Islands); *longipennis* Neumann, on Nissan Island, and *heureka* Meise on the Ninigo and Matty Islands. All these three forms are apparently rather different from *cantoroides* and intermediate between *cantoroides* and *insularis*; in some characters these "subspecies" differ even more from *cantoroides*, than *insularis*.

More collecting on the atolls north of the Solomon Islands and in the Bismarck Archipelago and Admiralty Islands is necessary for a full understanding of the relations between the different forms. For the present I confine myself to pointing out the peculiarities of *cantoroides*, *heureka*, *longipennis*, and *insularis*. There is no material available of *feadensis*, which has been recorded only once since its original description (see P. Z. S. L., 1883, p. 347).

Measurements of adult birds of the four forms follow.

	WING	TAIL	INDEX	WEIGHT
<i>cantoroides</i> (8)	99-106	62-70	61.8-67.3 <sup>1</sup>	54-66
<i>longipennis</i> (12)	116-125	65-75	56.0-61.2	67-87
<i>heureka</i> <sup>2</sup> (4)	122-125	79-82	63.7-67.2	
<i>insularis</i> (6)	104-109	53-59	51.0-55.7	66-74

WING-FORMULA.—The normal wing-formula of *cantoroides* is  $2>3>4>5>6$ ; the second and third primary are almost equal in length, sometimes even the third one longer than the second; but I found only three cases in a series of over 35 specimens where the second primary was visibly shorter than the third and fourth primaries ( $3>4>2>5$ ).

In a series of 12 adult *longipennis*, I find a much rounder wing, the second primary is always shorter than the 3d, 4th, and 5th. The usual formula is:  $4>3>5>2$ , with some possible variations as:  $4=3>5>2$ ,  $4>3=5>2$  and  $3>4>5>2$ .

In *heureka* the wing is more pointed, but (according to information from Prof. Stresemann) shows a great deal of variation. Three adult males which I collected have the following wing-formula:  $3=4>2>5$ ,  $3=4>2>5$  (type!), and  $4>3>2>5$ ; three additional birds (Mayr and Kramer, collectors) show:  $4>3>2>5>6$  (juv.!),  $3>2>4>5$  and  $3=4=2>5$ .

The wing-formulæ of *insularis* are listed above. The wing is very round and agrees more or less with the one of *longipennis*. In *insularis* and *longipennis* the first primary is reduced much less than in *cantoroides*.

PLUMAGE.—In *cantoroides* the feathers of the neck and throat are narrowly pointed (lanceolate); this is less so in the case of *heureka*, even less in *insularis*, and reaches the extreme in *longipennis*, where the feathers of the neck are round and only the feathers of the throat are slightly pointed.

### 30. *Turdus poliocephalus rennellianus*, new subspecies

TYPE.—No. 226493, Amer. Mus. Nat. Hist.; ♂ ad.; Rennell Island; May 28, 1930; H. Hamlin, W. F. Coultas, and W. J. Eyerdam.

SUBSPECIFIC CHARACTERS.—Differs from *papuensis* and *heinrothi* by the deeper coloration (more saturated black) and from *vanikorensis*, *samoensis*, and *marensis* by the much smaller size, the light patch on the lower belly and the rust-colored tips of the under tail-coverts.

<sup>1</sup>These measurements are taken from Solomon Islands specimens. For New Guinea specimens Meise found (Orn. Monatsber., 1929, p. 112) the identical index: 62-67.

<sup>2</sup>See Meise (*loc. cit.*), p. 111.

DESCRIPTION.—Male: upperside dark fuscous-black, underside slightly lighter; feathers of the middle and lower belly narrowly edged with cinnamon; feathers on the middle of lower belly sometimes with whitish edges; under tail-coverts with rusty tips; thighs rust-colored; in worn plumage the fuscous-black feathers of the body fade to brownish.

Female: similar to male, but above and below more brownish; feathers of underside, except throat and breast, with buffy or rusty edges; feathers of lower belly with broad whitish tips; under tail-coverts with rusty or whitish shaft-stripes and tips.

Juvenal: Similar to female adult, but very variable; plumage softer and underneath lighter than adult; lores, malar stripe, and chin sometimes buffy.

Bill and feet cadmium-yellow; iris dark brown.

	WING	TAIL	TARSUS	WEIGHT
♂ ♂ ad.	100–107(104.1)	65–73(68.8)	31–32	52–61(56.5)
♀ ♀ ad.	101–103(102.3)	62–70(66.3)		57–67(63)
juvs.	94–99	61–63		57

RANGE.—Rennell Island (collected Aug. 1928 and May 1930).

I consider all the Australonesian thrushes with yellow bills and legs subspecies of one species, of which the oldest name is *poliocephalus* Latham. It is a peculiarity of this species that some of its subspecies inhabit small coral islands, whereas others inhabit the high mountains of the larger islands.

### 31. *Gerygone flavolateralis citrina*, new subspecies

TYPE.—No. 226506, Amer. Mus. Nat. Hist.; ♂ ad.; Rennell Island; May 16, 1930; H. Hamlin, W. F. Coultas, and W. J. Eyerdam.

SUBSPECIFIC CHARACTERS AND DESCRIPTION.—Rather different from *correiæ*; the grayish white of throat and upper breast is much lighter and less extended, not covering the whole breast; lower breast, abdomen, flanks and under tail-coverts bright sulphur-yellow; back warbler-green (Ridgway IV) against olive-citrine (R. XVI) in *correiæ*; wing-coverts, primaries and secondaries edged with the color of the back; rump lighter; upper tail-coverts dusky olive; forehead, pileum, and neck ash-gray with a slight olive tinge; lores, superciliary stripe, and feathers on lower eyelid whitish; axillaries and carpal edge yellow; under wing-coverts whitish with yellow tips; ear-coverts and sides of throat gray, with a slight brownish tinge; much less white in the tail as in *correiæ* or *flavolateralis*. There is a distinct white spot only on the inner web of the three outer tail-feathers; on the three inner tail-feathers there is a lighter shaded area on the inner web, but no white spots; no white is found on the outer web of any tail-feather; a dark subapical band goes across the tail-feathers basad of the white spots.

Iris yellow white; bill and feet black; weight 7.5 gr.; tarsus, 18.0–19.5; culmen, 10–11 mm.

	WING	TAIL
6 ♂	53–55(54.1)	39.5–40.5(40)
2 ♀	52, 54	39, 39

RANGE.—Rennell Island (collected Aug. 1928 and May 1930).

This species is widespread in eastern Melanesia and reaches from New Caledonia and the Loyalty Islands (see, Ibis, 1917, pp. 422-428, and Sarasin, 1913, 'Die Vögel Neu Caledoniens,' pp. 20-22), over the New Hebrides and Banks Islands as far as Rennell Island.

The subspecies of the New Hebrides, which was discovered there by the Whitney South Sea Expedition, I name in honor of Mr. J. G. Correia, an able member of the expedition.

***Gerygone flavolateralis correia*, new subspecies**

TYPE.—No. 212594, Amer. Mus. Nat. Hist.; ♀ ad.; Epi Island, New Hebrides; August 5, 1926; R. H. Beck and J. G. Correia.

SUBSPECIFIC CHARACTERS.—In coloration intermediate between *flavolateralis* and *citrina*, differing from *flavolateralis*<sup>1</sup> by the brighter yellow of belly and flanks, and the more greenish, less dusky grayish-olive color of the back; tail with less white; white on the outer web of the outermost tail-feather restricted; there is a distinct (in size gradually decreasing) white spot on the inner web of the four outer tail-feathers, a light area on the fifth and no white at all on the innermost tail-feather.

WING MEASUREMENTS.—New Hebrides: Mai Island (July 1926), 50-52; Epi Island (Aug. 1926), 50-53; Lopevi Island (Aug. 1926), 50-52; Ambrym (Aug. 1926), 49.5-51; Malekula (Aug. 1926), 51; Aoba (Jan. 1927), 49-52. Banks Islands: Gaua Island (Sept.-Nov. 1926), 49-54 (52); Vanua Lava (Nov. 1926), 47-54 (51).

Typical *flavolateralis* (New Caledonia) have a wing of about 50-53 mm.

The juvenal plumage is rather different from that of the adult. The back is dusky brownish-olive, the head dusky olive, the sides of the head yellowish green; underside (yellowish) white with a dusky band across the breast. The bird described by Sarasin as *Pseudogerygone rouxei* seems to be in immature plumage.

**32. *Pinarolestes hamlini*, new species**

TYPE.—No. 226254, Amer. Mus. Nat. Hist.; ♂ ad.; Rennell Island; August 29, 1928; H. Hamlin.

DESCRIPTION.—Male adult: forehead, anterior part of crown, circumocular ring, superciliary, lores, cheeks, auriculars, and upper throat black, forming a black mask; crown snuff-brown (Ridgway XXIX); back cinnamon-brown, more russet towards the rump (R. XV); the edges of the wing-coverts and secondaries colored as the back; the edges of the primaries are darker rusty; wing- and tail-feathers earth-brown, the basal edges of the latter rust-colored; under side ochraceous-rusty, deeper on the breast, the sides of the neck and flanks; middle of belly and under tail-coverts lighter; some specimens are distinctly more rust-colored on back and underside; smaller under wing-coverts blackish; larger under wing-coverts and axillaries white; thighs black with buff feather edges.

<sup>1</sup>Examined: ♂1, 1 ♀, Ba Bay, and 1 ♂ Mt. Panie (P. D. Montague coll.) which were kindly loaned to me by the Tring Museum.

Female adult: similar to male, but duller; thighs brownish black.

Juvenal: similar to female adult, but still duller, especially on the black mask; smaller under wing-coverts and thighs brown; tail-feathers narrower and more pointed.

Iris brown, bill bluish slate-gray with a white tip; feet dark bluish-gray. Bill (from nostril) of ♂ ad., 20–20.5; of ♀ ad., 19.5–20; exposed culmen about 8 mm. longer; tarsus, 23–24 mm.

	WING	TAIL	WEIGHT
♂ ad.	94–101(98.4)	76–85(79.4)	35–37(36.3)
♀ ad.	92–98(96)	74–81(77.8)	32–40(36.7)
♂ imm.	92–97(94.6)	77–80(78.2)	32, 35
♀ imm.	90, 90	76–79(77.6)	31, 31

RANGE.—Rennell Island (collected Aug. 1928 and May 1930).

I name this fine new species in honor of my friend, Mr. Hannibal Hamlin, who by his energy and courage secured this collection.

I have hesitated for some time to include this species, with its tremendously long bill, in the genus *Pinarolestes*. However, after a close study of the two related species (*vitiensis* and *macrorhynchus*), I find no character on which to base a separation. *Pinarolestes* is not a genus of shrikes, as we find it in most of the modern reviews and catalogues, but it is most closely related to the two genera of flycatchers—*Monarcha* and *Pomarea*.

To fit *Pinarolestes* into Sharpe's Key ('Cat. Birds,' IV, pp. 118, 119) would lead to trouble, as in *vitiensis* the second primary is longer than the secondaries; in *macrorhynchus* it is equal, and in *hamlini* shorter. The wing-formula of the latter is:  $5 > 4 > 6 > 7 > 3 > 8 > 9 > 10 > 2$ .

The New Guinea genus *Myiolestes* (type, *megarhynchus*) has a much shorter tail, stouter bill, and softer plumage on the forehead. It belongs, together with *Pachycephala*, to a different subfamily of the Old World flycatchers.

### 33. *Myiagra vanikorensis occidentalis*, new subspecies

TYPE AND ONLY SPECIMEN.—No. 225650, Amer. Mus. Nat. Hist.; ♂ ad.; Rennell Island; September 4, 1928; H. Hamlin.

SUBSPECIFIC CHARACTERS.—Similar to *Myiagra vanikorensis melanura* Gray, but bill much shorter and broader; the white edges on the tail-feathers broader; the glossy parts of breast and head duller; back and rump more distinctly gray; axillaries purer white.

MEASUREMENTS.—Wing, 75; tail, 62; bill (long), 10, (broad), 8.

This is the most western representative of *vanikorensis*, which is distributed as far as Fiji and New Caledonia. The birds from the Solomon Islands (*ferrocyanea*) and Australia (*rubecula*) seem to be repre-



sentatives, but considering the resemblance of some of the species of *Myiagra*, I do not dare to regard all of them subspecies of *rubecula*.

#### 34. *Rhipidura rennelliana*, new species

TYPE.—No. 226459, Amer. Mus. Nat. Hist.; ♂ ad.; Rennell Island; May 16, 1930; H. Hamlin, W. F. Coultas, and W. J. Eyerdam.

DESCRIPTION.—Adult (male and female): crown and sides of the head chestnut-drab (Ridgway XLVI); base of supraloral feathers white; back lighter and more brownish, about clove-brown (R. XL); rump lighter; feathers of chin and upper throat whitish with gray bases; lower throat and sides of breast smoky hair-brown; feathers of the breast with grayish-brown centers and buff edges; feathers of the middle of the abdomen buff with grayish bases; under tail-coverts whitish or grayish buff; thighs smoke-gray; axillaries with gray bases and buff or whitish tips; under wing-coverts light gray; wing-feathers and coverts earth-brown; secondaries and coverts with narrow buff edges; upper tail-coverts and two central pairs of tail-feathers blackish brown; outer tail-feathers much lighter; shafts of the two outermost tail-feathers white, the next two light brown, the two central ones blackish brown; outer web of the outermost tail-feathers white; tip and lower edge of the four exterior tail-feathers white.

Juvenal: similar to adult, but edges of wing-coverts rusty, and the buff of the underside deeper, more cinnamon-buff.

Iris dark brown, bill blackish, lower mandible with whitish base, feet brownish gray. Bill, 10–11; tarsus, 20–22; weight 14–15 grs.

	WING	TAIL
6 ♂ ad.	76–85(81.7)	87–97(93.4)
2 ♀ ad.	77, 85	86, 96
4 imm.	71–78(73.2)	80, 81, 85

RANGE.—Rennell Island (collected Aug. 1928 and May 1930).

The May specimens are in fresh plumage, the August birds rather worn, one specimen already molting.

The relationship of this species to other Melanesian and Polynesian species of *Rhipidura* will be treated in a later paper.

#### 35. *Pachycephala feminina*, new species

TYPE.—No. 226275, Amer. Mus. Nat. Hist.; ♂ ad.; Rennell Island, August 30, 1928; H. Hamlin.

DESCRIPTION.—Male adult: crown brownish olive, sometimes more rusty, sometimes more olive; forehead, superciliary, postocular region, ear-coverts, and cheeks rusty; a collar across the hind-neck rusty olive; lores yellowish buff; circumocular feathers yellow; back dark olive; rump-feathers with yellowish olive tips; upper tail-coverts brownish olive; underside citron-yellow; throat paler; breast and flanks with an olive or rusty-olive tinge; under tail-coverts buffy yellow; axillaries white, washed with greenish yellow; carpal edge yellow; under wing-coverts white with gray centers; wing-feathers and coverts blackish brown with rust-colored edges; tail-feathers dark olive-brown.

Female adult: very similar to male, but usually duller above and underneath, the yellow of the underparts paler; often not distinguishable from males.

Juvenal: upper side much duller, more fuscous; crown sometimes quite rusty; the whole underside washed with rust-color.

Iris dark brown; bill yellowish brown; feet bluish; length of tarsus, 24-26, of bill (from nostril), 11-12, of culmen, 18 mm.; weight, 32 gr.

	WING	TAIL
♂ ad.	82-93(86.3)	52-62(56)
♀ ad.	81-90(84.9)	52-57(54.4)
imm.	78-87(82.3)	51-57(54.4)

RANGE.—Rennell Island (collected Aug. 1928 and May 1930).

This species belongs undoubtedly to the superspecies *Pachycephala pectoralis*, which has representatives east and west of Rennell Island. *P. feminina* is rather similar to the females of the Solomon Islands and Santa Cruz Islands thickheads. It even combines characters of both. But the most extraordinary fact is, that in *feminina* there is no sexual dimorphism which is so significant in the other members of the *pectoralis* group.

We have no experimental evidence to explain the interesting coloration of the males of *Pachycephala feminina*. The only way we can come to an explanation is to compare this case with similar cases in birds which have already received a genetic or experimental interpretation.<sup>1</sup>

To start from a general basis we must know what our present ideas are on the factors that produce the male coloration in birds. We assume that the secondary sexual characters of the male are directly produced by the genetic composition. The female has this same genetic composition with an additional factor which through an ovarian secretion suppresses the male appearance. If the ovary is excised the female acquires a plumage similar to that of the male.

Castration in normal males does not change the secondary sexual characters to a great extent; the main pattern of coloration remains unchanged. It is therefore more difficult to explain why males, in species with decided sexual dimorphism, sometimes acquire a female plumage.

There are certain breeds of domestic fowl, as for example the Sebright bantams, in which all the males have a hen-feathered plumage. Experiments with them have had the following results<sup>2</sup>: crossing with other strains (of normal coloration) showed that the factor for hen-feathered plumage was produced by two dominant genes.

<sup>1</sup>See R. Goldschmidt, 1931, 'Die Sexuellen Zwischenstufen,' Berlin pp. 285-318, and pp. 475-479.

<sup>2</sup>T. H. Morgan. 'The genetic and operative evidence relating to secondary sexual characters,' Washington, 1919.

Castration, on the other hand, gave the somewhat unexpected result of changing the plumage in the direction of a decided sexual dimorphism. This points to a hormonal influence exercised by the testes, which results in suppressing the normal sexual dimorphism.

The probable interpretation of these experiments would therefore be that, in these hen-feathered races, there is a dominant gene which makes the feather-follicles react aberrantly to the hormones of the testes.

It would be interesting to collect more cases in birds similar to that of *Pachycephala feminina*. I just recall *Amblyornis inornatus* with its hen-feathered subspecies *inornatus* in the northwest of New Guinea and its sexually dimorphic races in central and eastern New Guinea. Murphy and Chapin<sup>1</sup> discussed the hen-feathered plumage of the males of the Azorian bullfinch.

To a similar category belong the cases of many birds with a double molt. Take, for example, many species of ducks and shore birds, which show a marked sexual dimorphism in one season (spring plumage) and a very slight dimorphism in another season (fall plumage). What is the hormonal basis of this phenomenon? We know by experiment that it is caused by an annual hormonal rhythm, but the knowledge of how this rhythm is connected with the physiology and how it is influenced by other internal and external influences is still undetermined. Here is a wide field for experimental work.

### 36. *Myzomela cardinalis sanfordi*, new subspecies

TYPE.—No. 226534, Amer. Mus. Nat. Hist.; ♂ ad.; Rennell Island, May 22, 1930; H. Hamlin; W. F. Coultas, and W. J. Eyerdam.

SUBSPECIFIC CHARACTERS.—Similar to *Myzomela cardinalis pulcherrima* Ramsay, but reddish parts scarlet, not scarlet-red (Ridgway I); scarlet tips on the black feathers of crown and throat much shorter and less brilliant; lower flanks scarlet, not black; even the black under tail-coverts in some specimens with red tips; smaller.

DESCRIPTION.—Male adult: head (except anterior edge of forehead, lores, and chin), hindneck, middle of back, rump, upper tail-coverts, throat, breast, and flanks scarlet; anterior edge of forehead, lores, chin, scapulars, upper and under wing-coverts, axillaries, wings, thighs, middle of belly, undertail-coverts and tail black; the edges of the primaries dusky olive.

Female adult: very different from the females of *pulcherrima* Ramsay and *sanctæcrucis* Sarasin; head, hindneck, ear-coverts, throat, and upper breast scarlet as in male, but the bases of the feathers dark olive-gray, not black; back and scapulars fuscous olive, some feathers with a reddish tinge, but without red tips as in *pulcherrima* and *sanctæcrucis*; upper tail-coverts red; upper wing-coverts, wing- and tail-feathers earth-brown with yellowish-olive edges; breast yellowish olive with

<sup>1</sup>1929, Amer. Mus. Novitates, No. 384, p. 20.

reddish feather-tips; belly olive-buff; sides of breast and flanks gray with light olive feather-tips; axillaries, under wing-coverts, and inner edges of wing-feathers white.

Male juvenal: similar to the adult female, but upper side dull smoky olive, with scattered reddish feather-tips; upper tail-coverts red; ear-coverts, throat, breast, and flanks with reddish feather-tips.

Iris light brown; bill and feet black; tarsus, 22; bill (from nostril) 12.5–13; culmen, 17 mm.

	WING	TAIL	WEIGHT
♂ ad.	70–74(72.2)	44–47(45.4)	16–23(19.3)
♀ ad.	62–65(63.6)	39–41(40.2)	13
♂ juv.	68, 69	43, 45	15

RANGE.—Rennell Island (collected Aug. 1928 and May 1930).

It is a pleasure to name this beautiful bird in honor of Dr. L. C. Sanford, who showed so much interest in the exploration of Rennell Island.

The form *sanfordi* is a subspecies of the widespread *cardinalis*, which reaches from the New Hebrides (*cardinalis*) to New Caledonia in the south (*caledonica*), Rotuma Island (*chermesina*) and Samoa (*nigri-ventris*) in the east, San Cristobal Island (*pulcherrima*) in the west, and the Caroline Islands (*rubatra*) in the north. Closely related to this species are the Australian species *dibapha* and *erythrocephala* and some other species of the Papuan Region, the Moluccas, Lesser Sunda Islands, and Celebes.

### 37. *Zosterops rennelliana* Murphy

*Zosterops rennelliana* MURPHY, 1929, Amer. Mus. Novitates, No. 365, p. 10.

*Zosterops griseotincta rennelliana*, STRESEMANN, 1931, Mitt. Zool. Mus. Berlin, XVII, p. 225.

Murphy has already reported on the birds taken during the first visit. During the second visit (May 16–28, 1930) the expedition took specimens with the following measurements:

	WING	TAIL	WEIGHT
8 ♂	61–66(63.4)	41–43(41.7)	12–17(15)
6 ♀	62–64(63)	41–42(41.7)	14–15(14.3)

Stresemann considers *rennelliana* a subspecies of *griseotincta* in his recent revision of the genus. There is no doubt that *rennelliana* is related to *griseotincta*, but the relationship to the species *rendovæ* seems to be just as close or even closer. On the other hand, *rennelliana* differs from *griseotincta* (of which I have series of most of the subspecies) by several characters. But the bird from Nissan Island (*eichhorni*) is somewhat intermediate. However, even *eichhorni* has a well-developed

eye-ring which seems to be a substantial character of this species. Besides that, *rennelliana* is characterized by the different shape of the bill, the entirely yellow feet, and the structure of the plumage which is intermediate between the soft one of the Louisiade Archipelago species (*griseotincta*, *aignani*, and *pallidipes*) and the strong, almost shiny plumage of *eichhorni*. As there is no other species of Rennell birds which has a similar distribution to *Zosterops griseotincta* in Stresemann's arrangement, and as there are undoubtedly some characters (as mentioned above) which distinguish the Rennell white-eye from the other ones, I prefer for the present to keep *Z. rennelliana* as a distinct species. Possibly it is quite closely related to *rendovæ*.

38. *Woodfordia superciliosa* North

*Woodfordia superciliosa* NORTH, 1906, Victorian Naturalist, XXIII, p. 104, Pl. VIII (Rennell Island). MURPHY, 1929, Amer. Mus. Novitates, No. 365, p. 10.

Iris light brown; bill greenish brown; feet bluish.

Only 5 specimens of this interesting species were taken by the expedition during its second visit, which have the following measurements:

	WING	TAIL	WEIGHT
1 ♂	77	47	28
4 ♀	75-81(77.1)	47-50(48.8)	23-36(29.2)

