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BIRDS COLLECTED DURING THE WHITNEY SOUTH SEA EXPEDITION. XIX¹

NOTES ON THE BRONZE CUCKOO *CHALCITES LUCIDUS* AND ITS SUBSPECIES

BY ERNST MAYR

The Whitney Expedition has collected a series of Bronze Cuckoos in the Solomon Islands and also some specimens on Rennell Island. When reporting on this latter collection,² I lacked material from New Zealand and Australia, and was not able to identify the specimens with certainty. The males I called provisionally *Chalcites lucidus lucidus* and the females *Chalcites lucidus plagosus*, as the descriptions fitted best this way. However, certain color characters and the small size of the specimens made me suspect that Rennell Island had an endemic subspecies of this cuckoo, and in order to clear up the question, I decided to undertake a revision of this difficult group. The Zool. Museum in Tring, the U. S. National Museum in Washington, and the Museum of Comparative Zoology in Cambridge kindly loaned me their specimens, and I am much indebted to Lord Rothschild, Dr. Herbert Friedmann, and Mr. James L. Peters for access to this material.

All the measurements are in millimeters; tail and wing are measured as described in my previous papers; the bill is measured by dividers from the nostril to the tip; the culmen from the base to the tip; the width of the maxilla is measured just before the nostrils.

The differences between *lucidus* and *plagosus* that are given in the last revision of the genus³ are not complete and are partly misleading, and the identifications of the material in most collections are far from correct. For example, all the specimens from the Solomon Islands identified as *plagosus*, which I was able to examine, turned out to be typical *lucidus*, and several New Guinea and Australian specimens, identified as *lucidus*, turned out to be *plagosus*. It was therefore necessary for me first to work out the characters of these forms. This task was made more difficult by the doubtful sexing of most of the specimens.

¹Previous papers in this series comprise American Museum Novitates, Nos. 115, 124, 149, 322, 337, 350, 356, 364, 365, 370, 419, 469, 486, 488, 489, 502, 504, and 516.

²1931, Amer. Mus. Novit., No. 486, p. 14.

³Hartert E., and Stresemann, E., 1925, Nov. Zool., XXXII, p. 159.

Although it is said in all the previous descriptions that males and females are identical, I have some evidence for a sexual dimorphism in color.

Another interesting feature of this species is that two of its subspecies are migratory, while two others are sedentary. More remarks about the migration will be made in connection with *lucidus* and *plagosus*.

Chalcites¹ lucidus lucidus (Gmelin)

Cuculus lucidus GMELIN, 1788, 'Syst. Nat.,' I, pt. I, p. 421, Queen Charlotte Sound, New Zealand.

Cuculus nitens FORSTER, 1844, 'Descript. Anim.,' p. 151 (new name for the same bird.)

?*Lamprococyx lucidus australis* MATHEWS, 1916, Bull. Brit. Orn. Club, XXXVI, p. 83, Capricorn Islands, Queensland.

SUBSPECIFIC CHARACTERS.—Bill very much broader than in *plagosus*, especially at the base; forehead, lores, supercilium, cheeks and ear-coverts with much white. Crown and hind neck not pure purple-bronze, but always with some greenish reflections; bars on underside more greenish, less bronze; throat not so broadly barred; white spots and bars on outermost tail-feather (V) pure white, not washed with rufous or russet, white tip usually extending to outer web; on the fourth tail-feather (next to the outermost) one or two reddish spots, mostly small, sometimes barely indicated, but seldom entirely missing.

FEMALE CHARACTERS.—Females have the broad bill of the males, but approach *Ch. l. plagosus* in several characters of coloration. Crown and hind-neck are much more purplish bronze, the bars on the underside also less greenish; the rusty spots on the fourth tail-feather in females are usually larger than in males.

IMMATURE.—I have no nestling, but have several immature birds, which show the following characters: Base of mandible yellowish; wing-coverts with buffy or cinnamon edges; bars on sides of head, throat and breast dull grayish-brown, rarely with a slight greenish gloss; white bars and spots on two outer tail-feathers much wider.

		WING	TAIL	BILL ²	CULMEN ³
New Zealand	7 ad.	102-105(103.7)	67-70(68.7)	11-12(11.4)	18-20(18.9)
Chatham Islands	2 ad.	106, 107	70, 70	12, 12	20
Lord Howe Isl.	1 ♂ ad.	104	69	11.5	19
Norfolk	1 ♀ imm.	100	66	11	19
Solomon Islands ⁴	3 ♂ ad.	molt.	68, 70	11, 11, 12	18, 18, 19.5
Solomon Islands ⁴	3 ♀ ad.	104, 105	67, 68, 69	11.5, 11.5, 12	19, 19, 19.5
Solomon Islands ⁴	2 ♀ imm.	98, 101	molt.	11, 11.5	18.5, 19

RANGE.—Breeding on New Zealand and Chatham Islands. Possibly breeding on Norfolk and Lord Howe Islands. Wintering in

¹The difference between *Chalcites* Lesson, 1830 (Oriental species) and *Chrysococcyx* Boie, 1826 (African species) consists mainly in the barring of the wing. *Chalcites* has only a single oblique white or pale rufous bar.

²From nostril.

³From base.

⁴Weight: 23, 25, 28, 34.

the Solomon Islands, on Nissan, Feni, and possibly the Bismarck Archipelago.

Information concerning the winter quarters and migration routes of this bird is scanty and uncertain. In his recent book, Oliver¹ writes: "Supposed to winter in some of the islands of the Pacific, but localities unknown. Visitor to Lord Howe and Norfolk Islands. The migration route of the shining cuckoo is unknown:" He had overlooked, however, the information given by Hartert and Stresemann²: "Found migrating and wintering in Eastern Australia, Eastern New Guinea, and the Solomon Islands." The correctness of this statement is somewhat doubtful, all the Australian specimens of Bronze Cuckoos identified as *lucidus* that I have seen, turn out to be typical *plagosus* on closer examination. However, I have not seen any one of the birds that served Mathews as material when he described his "*Lamprococcyx lucidus australis*." It is quite possible that some of these birds, collected on the Capricorn Islands off the coast of Queensland, were typical *lucidus*. All the New Guinea specimens I have seen are also *plagosus*, with the single exception of an immature male, collected by Meek on Woodlark Island (on April 10, 1897). This bird has a narrow bill, but agrees otherwise rather well with immature *lucidus*. I have seen no specimens from the Bismarck Archipelago, but I notice that Hartert records a specimen of *lucidus* from Feni Island (southeast of New Ireland)³ and three specimens from New Britain.⁴

The Solomon Islands seem to be the regular winter quarters of this subspecies, and only of this, not of *plagosus*. All the supposed specimens of *plagosus* from the Solomon Islands, which I have had an opportunity to examine, are typical *lucidus*. It may be useful to record here all the previous records of this subspecies from the Solomon Islands:

Chalcites plagosus, RAMSAY, 1879, Proc. Linn. Soc. N.S.W., IV, p. 70 (Savo, Cockerell coll., 2 specimens); Tristram, 1882, Ibis, p. 138 (Russell Island, Richards coll.).

Lamprococcyx basalis, OGILVIE-GRANT, 1888, Proc. Zool. Soc., p. 191 (Guadalcanar, Woodford coll., 2♂, 2♀).

Chalcococcyx malayanus, SHELLEY, 1891, 'Cat. Birds Brit. Mus.,' XIX, p. 298 (erroneous name, based on preceding quotation).

Chalcococcyx plagosus, SHELLEY, 1891, 'Cat. Birds Brit. Mus.,' XIX, p. 297 (no additional material); ROTHSCHILD AND HARTERT, 1901, Nov. Zool., VIII, p. 376 (Guadalcanar, Meek coll., 3 specimens; Woodford coll., 1 specimen); idem, 1902, Nov. Zool., IX, p. 586 (Ysabel, Meek coll., 1♀); idem, 1905, Nov. Zool., XII, p.

¹Oliver, W. R. B., 1930, 'New Zealand Birds,' p. 423.

²1925, Nov. Zool., XXXII, p. 159.

³Nov. Zool., XXXIII, p. 39.

⁴Ibid., p. 136.

258 (Bougainville, Meek coll., 1 ♂); idem, 1907, Nov. Zool., XIV, p. 439 (further details and corrections).

Chrysococcyx plagosus, ROTHSCHILD AND HARTERT, 1908, Nov. Zool., XV, p. 356 (Vella Lavella, Meek coll., 1 ♀).

Chalcites lucidus lucidus, ROTHSCHILD AND HARTERT, 1907, Nov. Zool., XIV, p. 439 (corrected identification of the Bougainville specimen mentioned above); HARTERT AND STRESEMANN, 1925, Nov. Zool., XXXII, p. 159 (revision); HARTERT, 1926, Nov. Zool., XXXIII, p. 39 (Feni Island, Eichhorn coll., 1 ♀); idem, *ibid.*, p. 45 (Nissan Island, Eichhorn coll., 1 ♂).

Not counting the two specimens from Feni and Nissan, this list contains thirteen records of *Ch. l. lucidus* from the Solomon Islands. Of the birds identified as *Ch. plagosus* I have seen two, one from Guadalcanar and one from Vella Lavella (both Meek coll.), and both are typical *lucidus*.

The Whitney Expedition collected 6 specimens:

3 ♂ ad.	Buin, Bougainville,	24-27, July 1929
1 ♀ imm.	“	“ 21, July, 1929
1 ♀ ad.	Choiseul,	25, Sept., 1929
1 ♀ imm.	Gizo,	30, May, 1928

There are now nineteen specimens of *Chalcites lucidus lucidus* known from the Solomon Islands, enough evidence to show that they are regular winter quarters of this subspecies.

TIME OF MIGRATION.—According to all reports¹ the bird starts to leave New Zealand in the latter part of January, its main migration month is February, and the last birds leave in March and the first part of April. Occasionally an individual winters in New Zealand; there are records from May, June and July. The return migration begins in the middle of September (first record Sept. 7) and reaches its height during October. One bird was killed on Nov. 5 at the East Cape Lighthouse which is the last definite migration date. These New Zealand dates correlate very well with the dates of the birds collected in their winter quarters in the Solomon Islands. The earliest date is March 16, 1908 (Vella Lavella Isl., Meek.); the latest date is September 25, 1929 (Choiseul Isl., Hamlin and Mayr). Of eighteen birds of which I know the collecting dates on the Solomon Islands and Nissan-Feni, one was collected in March, three in April, six in May, two in June, four in July, none in August and two in September. No specimen of *Chalcites lucidus lucidus* (Gmelin) was taken in the Solomon Islands during the period from October to February, although the Whitney Expedition, as well

¹See: 1910, Trans. Proc. New Zealand Inst., (1909), pp. 392-408; 1929, Emu, XXVIII, p. 220; 1930, Oliver, 'New Zealand Birds,' p. 423.

as other expeditions, were actively engaged in collecting during that period.

MIGRATION ROUTE.—Nothing is definitely known about the migration route these birds take. On their way from New Zealand to the Solomon Islands these birds could travel either via New Caledonia and the New Hebrides, or via the Australian coast and eastern New Guinea. For the former route, which would be nearer and more direct, there is no evidence. All the specimens collected in New Caledonia and the New Hebrides are *layardi*.

On Norfolk and Lord Howe Islands, the bird is only a visitor according to Oliver (*loc. cit.*, p. 423), but breeds there according to Mathews.¹ This is quite possible, as warblers (*Gerygone*), the usual host of *Chalcites lucidus*, are present on both islands. A specimen from Lord Howe (♂ ad., Feb. 12, 1915, Bell coll.) and a specimen from Norfolk (♀ imm., March 28, 1913, Bell coll.) were both collected during the migration period. They are in every respect similar to typical *Ch. l. lucidus* (Gmelin).

I do not know of any authentic specimens of *Ch. l. lucidus* from Australia, but I accept, with some reservation, the correctness of the identification of the specimens collected on the Capricorn islands² during the middle of October (9–18). More evidence is required before the Australian coast can be definitely established as the regular migration route of *Chalcites lucidus lucidus* from New Zealand to the Solomon Islands.

The migration of this species is very amazing, and requires a perfect functioning of the entire "instinct" apparatus. At the end of January and in February, the adult birds depart for their winter quarters. On the average the young birds depart, according to many reports from New Zealand, later than the adults. Nobody shows them the migration route, as their foster parents (*Gerygone* and *Rhipidura*) are sedentary. Still, they leave and fly 1200 miles across the sea to Australia, if they do not strike Lord Howe which is 900 miles distant from New Zealand. Still more remarkable, after having reached the tropical Queensland coast, they do not stop there, but start flying again across another 950 miles of ocean till they finally reach the Solomon Islands or the Bismarck Archipelago. The slightest error in the direction or in the strength of the migration-instinct, and they would never see land again, but would perish in the wide Pacific Ocean.

¹1918, 'Birds of Australia, VII, p. 352.

²1910, Emu, X, p. 197.

Chalcites lucidus plagosus (Latham)¹

Cuculus plagosus LATHAM, 1801, 'Index Ornith.' Suppl., p. 31, Nova Hollandia, restricted to New South Wales.

Cuculus metallicus VIGORS AND HORSFIELD, 1827, Trans. Linn. Soc. London, XV, p. 302, New South Wales.

Lamprococcyx poliurus SALVADORI, 1889, 'Ornit. Papuaasia e Mol.' Agg., p. 49, Tarawai Island, N. New Guinea.

Chrysococcyx plagosus tasmanicus MATHEWS, 1912, 'Austr. Avian Record,' I, p. 17, Tasmania.

Chrysococcyx plagosus carteri MATHEWS, *ibid.*, p. 17, Broome Hill, South West Australia.

SUBSPECIFIC CHARACTERS.—Bill narrower than in *lucidus*; forehead, lores, supercilium, cheeks and ear-coverts with much less white than in *lucidus*; crown and hind neck pure purple-bronze, without any greenish reflections,² more narrowly barred on the underside, bars on throat conspicuous; bars on underside more coppery bronze, less greenish; white spots and bars on outermost tail-feather (V) often washed with rufous or russet, white tip usually not extending to outer web; on the fourth tail-feather (next to the outermost) usually two rufous bars and often a third rufous or whitish spot; pattern on this feather very variable, but usually with more rufous than in *lucidus*.

FEMALE CHARACTERS.—My material is not sufficient for me to say anything definite about the sexual dimorphism of this subspecies. Evidently part of my material is wrongly sexed.

IMMATURE.—Smaller, bill shorter, yellow at base; wing-coverts with buffy or cinnamon edges; gloss on head and hind neck greenish, instead of purple-bronze; wings and tail almost without gloss; sides of head and throat, and indistinct throat-band brownish gray. Throat and flanks barred with fuscous, in one specimen entirely whitish without any bars.

		WING	TAIL	BILL	CULMEN
Tasmania	2 ad.	104, 104.5	65, 65	11, 11.5	18, 18.5
Australia	15 ad.	102.5-108(104.9)	66-70(67.6)	10.5-12(11.1)	18-19.5(18.4)
Australia	2 imm.	97, 100	62, 65	10, 10.5	17, 18
New Guinea	3 ad.	103, 105, 107	66, 67	11, 11	18, 18.5

Width of the bill 4.2-5.0 (4.6) against 5.0-6.0 (5.5) in *lucidus*.

RANGE.—Tasmania and southern part of Australia. Wintering in the Lesser Sunda Islands (Lombok, Sumbawa, Flores, and Wetar), in New Guinea, and possibly in the Bismarck Archipelago.³

Three specimens from Tasmania (2 ad., 1 first-year plumage) agree with Australian birds in tail and bill, but have a slight greenish tinge on the hind neck. It is doubtful if this character, even if substantiated by

¹*Sylvia versicolor* Latham, 1801, 'Index Ornith.' Suppl., II, p. 56, has often been quoted a synonym. This is certainly wrong. If *versicolor* is a *Chalcites* at all, which is rather doubtful, it can be only the juvenal of *Chalcites basalix* Horsfield.

²Seen with the light.

³I have not seen enough material from the Bismarck Archipelago to decide which subspecies hibernates there.

more material, would be sufficient to recognize Mathews' *tasmanicus*, which name has been synonymized to *plagosus* by the author himself (1927, 'Syst. Av. Austral.,' p. 415).

Chalcites lucidus layardi (Mathews)

Chrysococcyx layardi MATHEWS, 1912, 'Austr. Avian Record,' I, p. 16, New Caledonia.

TYPE.—In the British Museum of Natural History.

SUBSPECIFIC CHARACTERS.—Smaller than *lucidus* and *plagosus*; bill broad and strong, on the average even heavier than in *lucidus*; white on head very much reduced, no white on forehead, supercilium, upper cheeks and ear-coverts, but sometimes a few whitish feathers behind the eye; throat and sides of throat whitish, almost unbarred; breast, flanks and under wing-coverts also less strongly barred than in *lucidus* and *plagosus*; forehead, crown and sides of head dull purple, very little glossy; hind neck and fore-back bronze-purple, less glossy and more purplish than in *plagosus*; sides of breast frequently washed with cinnamon; pattern on tail entirely different from *lucidus* and *plagosus*; reddish (tawny) colors very much extended; on the fifth (outermost) tail-feather the white tip is reduced, on the fourth, third and second tail-feather two or three tawny or russet bands are present, only the central pair is without these bands.

FEMALE CHARACTERS.—Sexual dimorphism only slight; bars on underside and pattern on tail usually less distinct in females. Apparently no difference in the coloration of hind neck and back.

		WING	TAIL	BILL	CULMEN
New Caledonia ¹	1 ♂	99	73	11	18.5
	1 ♀	97		11.5	18.8
New Hebrides ²	9 ♂	96-101(97.9)	66-72(69.2)	11.5-13(12.2)	19-20(19.7)
	1 ♀	100	70	13	21
Banks Islands ²	4 ♂	96-100(97.5)	66-70(68.4)	12-12.5(12.2)	19.5-20.5(20.0)
	1 ♀	96	67	11.5	19
Utupua ²	1 ♀	95	66	12.5	20

Width of bill 5.0-6.0 (5.7), against 5.0-6.0 (5.5) in *lucidus*.

RANGE.—New Caledonia, Loyalty Islands (Lifu), New Hebrides (Epi, Ambrym, Malekula and Santo), Banks Islands (Gaua and Vanua Lava) and Santa Cruz Islands (Utupua).

I was not able to detect any differences among the birds from the said islands. The series from the New Hebrides agrees very well with the two New Caledonian skins which I have examined, and also with the original description by Mathews.

The distribution of this species is apparently closely linked up with that of its foster-parent, *Gerygone flavolateralis*. *G. fl. correixæ* was found

¹From the Tring collection.

²Material of the Whitney South Sea Expedition; new records for this species.

by the Whitney Expedition on Mai, Epi, Lopevi, Ambrym, Malekula, Aoba, Gaua and Vanua Lava. The collecting of one specimen of this cuckoo on Utupua Island is rather a surprise. It is not known which species serves there as foster-parent.

***Chalcites lucidus harterti*, new subspecies**

TYPE.—No. 226455, Amer. Mus. Nat. Hist.; ♂ ad.; Rennell Island; May 28, 1930; H. Hamlin, W. F. Coultas, and W. J. Eyerdam.

SUBSPECIFIC CHARACTERS.—Adult male. Similar to *layardi* by having a long and strong bill and by having the white on forehead, supercilium, lores and ear-coverts much reduced, but differs in other points; still smaller (wing of adult birds 90–95, against 95–101 in *layardi*, and 102–107 in *lucidus*); throat, under wing-coverts and whole underside narrowly barred, bars very glossy; crown, hind neck and fore back not dull purple, but coppery with some greenish reflections and very glossy; wing-feathers and tail-feathers also very glossy; pattern on tail rather different. Fifth tail-feather (outermost): white tip on inner web not touching shaft, but narrow white margin on outer web near the tip, white bars slightly washed with tawny. Fourth tail-feather with two large irregular tawny spots on inner web; part of the inner web of the third tail-feather also broadly edged with tawny; second tail-feather without any bars or spots of tawny.

ADULT FEMALE.—Very different from male. Crown dull purple, hind neck and fore back bronze with slight greenish reflections; throat and breast, especially on the sides, washed with light cinnamon; tail with very much more tawny; on the outermost tail-feather the white is almost entirely replaced by tawny, except for the tip; second to fourth tail-feathers have extended tawny spots.

	WING	TAIL	BILL	CULMEN	WEIGHT
3 ♂ ad.	90, 93, 95	62, 63, 64	12, 12, 12	19, 19, 19.5	19, 20, 20.5
2 ♀ ad.	90, 95	60, 63	12	19	19

Width of bill 5.0–5.5.

RANGE.—Rennell¹ and Bellona Islands.

I name this interesting new subspecies in honor of Dr. Ernst Hartert, who did so much to clear up the classification of the difficult Australo-nesian cuckoos.

The occurrence of a Bronze Cuckoo on Rennell Island is obviously due to the presence of a *Gerygone* on the same island.

The species *lucidus* is rather similar to some of the other members of the genus *Chalcites*, as frequent misidentifications prove. However, it is not certain which other species is the closest relative. Rensch² regards *Ch. malayanus* as a probable representative of *lucidus*, as apparently both species do not occur together in any part of their breeding range.

¹See Mayr, 1931, Amer. Mus. Novit., No. 486, p. 14.

²1931, Mitt. Zool. Mus. Berlin, XVII, p. 544.

Considering the pattern on the tail, *Ch. ruficollis* from the mountains of New Guinea also seems to have some claim to be regarded as a representative of *lucidus*. A study of voice and habits of the three species may help in the final decision.

BIBLIOGRAPHICAL NOTE

To avoid a possible misunderstanding, it may be well to state that in Amer. Mus. Novit., No. 488, the second part (pp. 7-11), on the relationships and origin of the birds of Rennell Island, was written by Ernst Mayr.

