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MISCELLANEOUS TAXONOMIC NOTES ON AFRICAN BIRDS

XII

by

P. A. CLANCEY

(Director, Durban Museum, South Africa)

I. GEOGRAPHICAL VARIATION IN THE NARINA TROGON

APALODERMA NARINA (STEPHENS) OF AFRICA

The colourful Narina Trogon *Apaloderma narina* (Stephens) of the forested parts of the Ethiopian Region is generally credited by workers with four nomenclaturally recognisable racial groups of populations, these being *A.n.narina* (Stephens), 1815: Knysna Forest, southern Cape Province, South Africa; *A.n.littorale* van Someren, 1931: Sokoke Forest, coastal Kenya Colony; *A.n.brachyurum* Chapin, 1923: Avakubi, Ituri district, eastern Belgian Congo; and *A.n.constantia* Sharpe and Ussher, 1872: Denkeria, Gold Coast (Ghana) (*vide* Peters, *Check-List of Birds of the World*, vol. v, 1945, pp. 159, 160; Chapin, *Birds of the Belgian Congo*, part ii, 1939, pp. 480, 481). In a short paper dealing mainly with the geographical variation of the South African populations in the *Durban Museum Novitates*, vol. iv, 3, 1952, pp. 39-44; I recognised an additional race from equatorial Africa, restricting the range of the nominate form to the southern extremities of the continent. For this additional race I resuscitated the name *Hapaloderma rufiventre* Dubois, *Proceedings of the Zoological Society of London*, 1896, p. 999, type-

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locality: region of Lake Tanganyika, which, judging by the characters given in the Latin diagnosis, was founded on a discoloured skin, prepared presumably from a specimen preserved originally in alcohol. In 1952 the range of *A.n.rufiventre* was not accurately known, and the northern and north-eastern populations, *i.e.*, those of French Equatorial Africa, the Sudan, Abyssinia, Eritrea, northern Somaliland, northern Uganda and the highlands of Kenya Colony, were only tentatively assigned to the new taxon pending a comprehensive revision of the whole species.

In August, 1958, I studied and measured the entire series of *Narina Trogons* in the collection of the British Museum (Nat. Hist.), London, and since returning to South Africa have examined further material preserved in the collections of the East London and Durban Museums, the Transvaal Museum, Pretoria, and the National Museum of Southern Rhodesia, Bulawayo. Mr. John G. Williams, Ornithologist of the Coryndon Museum, Nairobi, and Dr. A. A. da Rosa Pinto, Director, Museu Dr. Alvaro de Castro, Lourenço Marques, have also kindly provided me with details of the series of *A.narina* in their respective institutions. As a result of these more extensive investigations, I now consider that at least six races require to be admitted in our formal taxonomic arrangement of the populations, while it is conceivable that even further forms will ultimately require to be recognised from Angola and the lowlands of southern Portuguese East Africa on the production of fresher and more extensive material (see discussion below).

Geographical variation in *A.narina* affects the lengths of the wing and tail, the distribution of the metallic green feathering on the face, the colour of the dorsal surfaces of the three inner-most pairs of rectrices, the intensity of the ventral colouration, particularly in adult males, and the quality of the vermiculations on the secondaries and secondary-coverts. Females show additional variation in the colouration of the non-metallic face, throat and upper breast. It is unfortunate that in this species the vibrant red pigment of the ventral surfaces, especially in the males, is highly unstable, and much of the material preserved in the older ornithological research collections is now all but valueless in so far as a study of geographical colour variation in the species is concerned. In arriving at my conclusions on the colour characters of the races recognised, I have used as far as possible material obtained since 1950 in the case of the South African populations, and skins collected since 1930 for the populations of the rest of Africa.

In toptypical nominate *A.narina* from Knysna the red of the under surface in the males is between Spectrum Red (Ridgway, *Color Standards and Color Nomenclature*, 1912, pl. i) and Rose Red (pl. xii), and the wings and tails measure 129-139 and 166-183 mm. respectively. The female has the face, throat and upper breast about Buckthorn Brown (pl. xv), as against metallic bluish Peacock Green (pl. vi) in the male, while the lower breast and upper abdominal surface are greyish white, indistinctly transversely vermiculated with grey, the whole lightly washed with Begonia Rose (pl. i), as opposed to brilliant Spectrum Red/Rose Red in the adult male. Females are similar in size to the males, but it is interesting to note that juveniles of both sexes have the rectrices markedly pointed, and are not infrequently very much longer tailed than adults of the same population.

Populations with the characters of the toptypical ones range from the forested districts of the southern Cape Province through the eastern districts to Natal, where, in the littoral from about Durban northwards, a marked stepping of the mensural and colour character gradients is demonstrable in the material examined by me. 11 adult ♂♂ from Durban and district have wings 123.5-135 mm., six of which have wings of 130 mm. and below. Other material from Natal and Zululand examined also demonstrates this shift from long-winged to short-winged birds. A ♂ from Scottburgh (Natal South Coast) has a wing-measurement of 132 mm., while others from Umhlongo Nek, Richmond, and Illovo, Natal, have wings 129 and 127.5 mm. Males from the Ngoye Forest and Sibudeni (Nkandhla Forest), Zululand, have wings 135.5 and 127.5 mm., and another from "Zululand" has a wing of 130.5 mm. Running parallel with the reduction in size just demonstrated for the Natal and Zululand populations, is the appearance of intensely coloured birds in the same populations, which agree in their brilliant ventral colouration with the eastern coastal form, *A.n.littorale*. In southern Portuguese East Africa the birds are short-winged (wings of ♂♂ 125-131 mm.) and brilliantly coloured, as already recorded in my revision of the South African sub-continental populations (1952), when I attributed specimens from near Beira, Sofala district, in the collection of the Transvaal Museum to the small East African race, *A.n.littorale* (see also S.A.O.S. List Committee Report, *Ostrich*, vol. xxvii, 4, 1956, p. 177, where the southern range limits of *A.n.littorale* are given as "about the mouth of the River Save in P.E.A."). The southern range limits of the small-sized and brightly coloured birds, here called *A.n.littorale*, require to be now extended

considerably further south (to about north-eastern Zululand) in view of the new findings recorded above.

It is evident that in 1930 van Someren compared his paratypical series of *A.n.littorale* with East African *A.n. "narina"* and not with topotypical material from the Union of South Africa. *A.n.littorale* is not only separable from *A.n.narina* on a statistically significant size-difference (wings of 14 ♂♂ 118.5-130, tails 154-166.5 (171). Van Someren gives tails of *A.n.littorale* as 155-160 mm.), but is also distinguishable on important colour criteria as outlined above. In the adult male the red of the ventral surfaces inclines more to Scarlet-Red, as against the pinker and duller Spectrum Red/Rose Red of *A.n.narina*. This intensification of the ventral colouration reaches its culmination in the singularly brilliant East African topotypical populations of *A.n.littorale*, and it is conceivable that the small-sized populations of the eastern African littoral could be arranged in two races on the basis of variation in the intensity of the red on the under-parts of adult males. Unfortunately, the material available to me from the area extending from the mouth of the Juba River, Somalia, south to southern Portuguese East Africa (Zululand border) is extremely uneven chronologically, and I hesitate to split *A.n.littorale* at the present time. *A.n.littorale*, as here understood, also differs from *A.n.narina* in being usually more bronzed, less bluish, metallic green on the upper-parts, face, throat and upper breast, and in having paler grey, often almost whitish, secondaries and secondary-coverts, the vermiculations appreciably finer grained. The female of *A.n.littorale* is a trifle paler over the face, throat and upper breast, and paler on the lower breast and upper abdomen, the wash of Begonia Rose considerably reduced. The range of *A.littorale* is now fairly well-known and is given in detail below in my formal arrangement of the populations.

Authors of all recent standard works still stubbornly insist that *A.n.narina* extends northwards between the ranges of *A.n.littoralis* and *A.n.brachyurum* to northern and north-eastern tropical Africa. On theoretical and zoogeographical grounds the range generally accorded *A.n.narina* is both unlikely and unnatural, and in my revision of the South African forms in 1952 I showed that the nominate race is in actual fact restricted to the Union of South Africa, the northern populations of the *A.n.narina* of authors being sufficiently distinct to bear a name of their own. *A.n.rufiventre* is similar to the nominate race in size (wings of ♂♂ 130-137, once 143 mm.) but differs in being deeper red (pure Spectrum Red) below in the adult male, the sides of the lower breast below the metallic

green breast shield with a heavy overlay of a colour between Carmine and Ox-blood Red (pl. i), while the metallic green upper-parts, face, throat and breast, and the secondaries and secondary-coverts are coloured as in *A. n. littorale*. The female of *A. n. rufiventre* resembles *A. n. narina* but is often darker and browner on the face, throat and upper breast (an adumbration of a character which becomes salient in *A. n. brachyurum*), and has a more heavy overlay of rose on the lower breast and abdomen. The flanks, lower abdominal surface, crissum and under tail-coverts are of a markedly deeper shade of rose.

The southern limits of the range of *A. n. rufiventre* are now reasonably well-known. Like some other tropical forest-haunting forms (cf. red-crowned forms of *Cossypha natalensis* Smith), *A. n. rufiventre* in the south of its range is restricted to highland evergreen forest, and the ranges of highland *A. n. rufiventre* and lowland *A. n. littorale* interdigitate to a perplexing degree. In the south of its range, *A. n. rufiventre* ranges to the eastern highlands of Southern Rhodesia and Mt. Gorongosa, southern Portuguese East Africa. In eastern Southern Rhodesia the influence of the austral *A. n. narina* and lowland *A. n. littorale* is evident in the series of skins available to me. The latter race ranges to well within Southern Rhodesian limits, judging by a series from the Chirinda Forest before me (wings of 4 ♂♂ 125, 128, 133, 2 ♀♀ 124, 126.5 mm.). *A. n. rufiventre* also occurs just north of the Zambesi River in the southern highlands of Nyasaland, and its complete range includes the rest of that territory, Northern Rhodesia, southern and eastern Belgian Congo, north-western and central Tanganyika Territory, and presumably in the west to Angola, but I have seen no truly comparable material from the latter territory.

As already noted above, in 1952 I provisionally referred the populations of French Equatorial Africa, the Sudan, Abyssinia, Eritrea, northern Somaliland, northern Uganda and the highlands of Kenya Colony to *A. n. rufiventre*, but I now find, on the basis of the series in the British Museum (Nat.Hist.), that these populations consist of distinctly longer tailed birds than those to which the name *A. n. rufiventre* is strictly applicable. Chapin, *in litt.*, 15 April, 1952, has kindly supplied me with wing- and tail-measurements of the *Type* and one paratype of Dubois' *A. n. rufiventre*, which he measured in Brussels many years ago, as 135 and 175 mm., and 134 and 178 mm. respectively. Material of adult males in the British Museum collection from the interior of Tanganyika Territory is similar in tail-length to the paratypical specimens. One from

Mpanda, E.N.E. of Karema, has a tail of 176 mm., another from Engare Sero, S.E. corner of Mt. Meru, a tail of 171, two from Monduli, W. of Mt. Meru, tails of 174 and 175 mm., a male from Kigoma a tail of 181 mm., and one from Ngare, Mt. Meru, a tail of 178 mm. Five adult males from Nyasaland (Mini Mini Mine, Nchisi, Mlanje, Mpata, Malosa) have tails 175-182, while a series of ten from Northern Rhodesia is similar with tails 170-182 mm. Eastern Southern Rhodesian specimens (mainly *A.n.rufiventre* \geq *A.n.littorale*) have tails 170, 173, 175, 175, 178.5, 179 mm.

North of the areas just dealt with, a marked increase in the length of the tail in fully adult birds is demonstrable. In southern Kenya Colony (north to about Nairobi) birds agreeing in tail-length with *A.n.rufiventre* are found. Two males in the British Museum collection from Nairobi and Athi River, near Nairobi, have tails of 164 (worn) and 174.5 mm., while seven from Nairobi and district in the Coryndon Museum with tails 179, 180, 181, 181, 182, 184, 188 mm. show the transition from short- to long-tailed birds. In the Kenya Colony highlands, north and west of Nairobi, all the birds of which I have measurements are long-tailed: Aberdare Mountains, 181, 190; Nyeri, 186; Kapenguria, 182; eastern Trans-Nzoia, 189. Kenya highland females in the Coryndon Museum are just as long-tailed as the males: Nairobi and district, 184, 187, 188; Kabarnet, 184; Aberdare Mountains, 182, 189; Yala River, 182, 188 mm. In the highlands of Abyssinia similar long-tailed *A.narina* are to be found: Arussi country, 190; Alghe, 186; 30 miles N. of Gardulla, 182; Mega, 182; Big Abbai, S.W. of Lake Tana, 188; Shoa, 182; Yavello, 181, 174; Charada Forest, Kaffa, 184, 176 mm. Highland Somaliland birds are also long-tailed: Waghar (Wogr), 187.5; Durass Forest, 183 mm. The two specimens from Yavello and the Charada Forest with tails well below 180 mm. are suggestive of a measure of marginal instability in the western populations of the long-tailed form, where its range converges with those of *A.n.littorale* (Tana River) and *A.n.rufiventre* (southern Kenya Colony). Two males from Mt. Moroto, northern Uganda, have tails measuring 190.5, 194 mm. In the southern mountains of Equatoria Province, Sudan, all but one of the specimens measured by me have tails well in excess of 180 mm.: Kajo Kaji, 184, 193; Lotti Forest, Mongalla, 191; Imatong Mountains, 188; Kitibol, Imatong Mountains, 174 (? influence of *A.n.brachyurum*). A male from Roseires, Blue Nile, Sudan, has a tail of 183 mm., while other males from Mandjafa, S.E. of Lake Chad (Boyd Alexander) and Zemio (Semmio) (Bohndorff), French Equatorial Africa, have tails 188 and 191 mm.

In addition to the increased tail-length in the northern and north-eastern populations of the Narina Trogon, there is a valid ancillary plumage-colour criterion. In the races *A.n.littorale* and *A.n.rufiventre* (as defined above) the rump and upper tail-coverts are metallic bronzed Peacock Green, and the dorsal surfaces of the rectrices are a semi-lustrous dull yellowish green. In the longer-tailed populations under consideration the rump and upper tail-coverts are distinctly washed with blue, and the tail-feathers are palpably more blue or violaceous blue than green. In exhibiting this character they resemble the races of the Lower and Upper Guinea rain-forests, *A.n.brachyurum* and *A.n.constantia*.

As will be appreciated from what has already been written, the variation in the eastern, north-eastern and northern tropical African populations is complex and not readily resolved in terms of trinomial nomenclature. There is no doubt that the littoral populations of Somalia, Kenya Colony, Tanganyika Territory and to the southward, consist of birds with significantly small wing- and tail-measurements, and, particularly in the male, intensely brilliant ventral colouration, and I believe the recognition of van Someren's *A.n.littorale* to be more than amply justified. In the elevated interior of these territories the birds are distinctly larger, *i.e.*, longer winged and tailed, and less intensely coloured below. Currently, these are placed by the majority of workers as *A.n.narina*, but as I showed in 1952 the nominate race is restricted to the Union of South Africa, and the populations in question should be called *A.n.rufiventre*. As a result of the further study reported above, *A.n.rufiventre*, as defined in 1952, is found to be an uneven taxon, the southern populations (eastern Southern Rhodesia, Nyasaland, Northern Rhodesia, southern Belgian Congo, Tanganyika Territory (interior), etc.) with tails 170-182 mm., and the rump, upper tail-coverts and dorsal surface of the tail predominantly greenish, being obviously distinct racially from the northern ones (French Equatorial Africa east to the highlands of Abyssinia, northern Somaliland, Kenya Colony, etc.) with markedly longer tails (181-194 mm. and more bluish washed rump, upper tail-coverts and upper surface of the tail. Marked reductions in wing- and tail-length in the Lower and Upper Guinea rain-forest populations, the races *A.n.brachyurum* and *A.n.constantia*, and the eastern coastal *A.n.littorale*, suggest that statistically significant size variations in this trogon are of fundamental subspecific import, manifesting the reactions of the populations to subtle differences in the composition and microclimates

of the forest biomes in which they are largely resident. I believe it desirable to recognise the northern and north-eastern populations of the Narina Trogon as an additional race on the basis of the longer tail-measurements and dorsal colour differences already discussed at length above, and for the new taxon the name *A.n. arcanum* mihi, subsp.nov., is introduced below.

Many years ago Chapin, *American Museum Novitates*, 1923, No. 56, showed that the populations of the Lower Guinea rain-forests of the Belgian Congo were appreciably shorter tailed than the peripheral northern, eastern and southern populations conditioned to live in gallery forests and heavy woodland (see also Chapin, *Birds of the Belgian Congo*, part ii, 1939, pp. 480-484). My measurements of the material of this race in the collection of the British Museum add little that is not already well-known to workers. *A.n.brachyurum* is like *A.n.arcanum* in colouration, especially in respect of the bluish wash over the rump, upper tail-coverts and dorsal tail surface, but is also wholly more metallic bluish green over the face, throat, upper breast and remainder of the dorsal surface. The secondaries and secondary-coverts are darker and more coarsely vermiculated, as in *A.n.narina*. Females have the face, throat and upper breast darker and more olivaceous or umber coloured than in the other forms just considered, while the grey of the lower breast and upper abdomen is darker. In the male the metallic green cheek-stripe is narrower in *A.n.brachyurum*, thereby exposing more livid bluish or glaucous-coloured skin in life. My measurements of the tails of *A.n.brachyurum* are 151.5-168 mm. in 13 adult males, the wings of the same series measuring 125.5-135 mm. Chapin, *loc.cit.*, gives the tail-length of what he considered to be *A.n.narina* (= *A.n.narina*, *A.n.rufiventre*, *A.n.arcanum*) as 165-200 mm. (be it noted that tails of up to 200 mm. are of sub-adult birds still bearing juvenal rectrices), and *A.n.brachyurum* 146-170 mm. The range of *A.n.brachyurum* is from forested Uganda westwards through the Congo basin to the Gabon, French Equatorial Africa, and the Cameroons.

A.n.constantia, the race of the Upper Guinea rain-forests, is only slightly differentiated from *A.n.brachyurum*, being precisely similar in size—wings of 5 ♂♂ 125.5-129, tails (3) 157-172 mm. The secondaries and secondary-coverts in the males of *A.n.constantia* have the ground colour more whitish than in *A.n.brachyurum*, this character being somewhat similar to one of the major characters separating *A.n.rufiventre* from *A.n.narina*. Bannerman, *Birds of West and Equatorial Africa*, vol. i, 1953, p. 711, gives the tail-length

of *A.n.constantia* as 140-150 mm., which is incorrect. The range of *A.n.constantia* is poorly understood, the race being recorded at scattered localities from Sierra Leone and Liberia eastwards to the Gold Coast (Ghana).

We can conclude that in the present state of our knowledge of the geographical variation of the Narina Trogon, six races are recognisable on both dimensional and plumage colour characters. The nomenclature, characters and ranges of these are as follows:

(1) ***Apaloderma narina narina*** (Stephens)

Trogon Narina Stephens, in Shaw's *General Zoology*, vol. ix, part i, 1815, p. 14: Country of the Auteniquoi to the river Gamtoo, *i.e.*, Knysna Forest, southern Cape Province, South Africa.

Adult ♂. Upper surface, face, throat and upper breast metallic bluish Peacock Green, occasionally washed with bronze; rest of under-parts Spectrum Red/Rose Red, sides of the lower breast usually with light overlay of Carmine. Secondaries and secondary-coverts vermiculated dark olivaceous grey and off-white. Dorsal surfaces of three innermost pairs of rectrices lustrous greenish yellow. Adult ♀. As male on the upper-parts, but with the face, throat and upper breast of a colour about Buckthorn Brown; lower breast and upper abdomen greyish white, vermiculated transversely with grey and suffused with Begonia Rose; flanks, lower abdomen, crissum and under tail-coverts Begonia Rose/Scarlet Red.

Wings of 12 ♂♂ 129-139 (133.1), 8 ♀♀ 128-137.5 (132.0), tails 166-183 (174.4), 166-178.5 (173.3) mm. 20 southern and eastern Cape specimens measured.

Material: 44. Southern Cape Province ("Cape of Good Hope", 1; Knysna, 10). Eastern Cape Province (Patensie, 2; East London, 5; King William's Town, 4; Grahamstown, 2; Committee's Drift (Albany Div.), 1; Kei Bridge, 2; Woolridge (Peddie), 1; Port St. Johns, 6; Embotyi (Lusikisiki dist.), 1). Transvaal (Woodbush, Zoutpansberg, 3; Letaba River, 1). Southern Rhodesia (Mt. Selinda, 2; Sabi-Lundi confluence, 1; Buby-Limpopo confluence, 1 (allocation uncertain); Haroni-Lusitu confluence, 1 (allocation uncertain)). *A.n.narina* \supseteq *A.n.littorale*, 23. Natal (Illovo, 1; Scottburgh 1; Umhlongo Nek (Richmond dist.), 1; Durban and district, 13). Zululand ("Zululand", 1; Ngoye Forest, 1; Sibudeni (Nkandhla Forest), 3; Ingwavuma, 2).

Type: None. Based on the Couroucou Narina of Levaillant, *Histoire Naturelle des Oiseaux d'Afrique*, vol. v, 1806, pls. 288-289.

Range: The evergreen forests and dense riparian growth of the southern (from Knysna) and eastern Cape Province north-eastwards to Natal, eastern Orange Free State, western Swaziland and the eastern and northern Transvaal (not in the eastern lowveld). Also ranges, perhaps only seasonably, to south-eastern Southern Rhodesia. Intergrades with *A.n.littorale* in Natal and Zululand, and with *A.n.rufiventre* to the north of its range.

(2) ***Apaloderma narina littorale*** van Someren

Apaloderma narina littoralis van Someren, *Bulletin of the British Ornithologists' Club*, vol. li, 5, 1931, p. 80: Sokoke Forest, coastal Kenya Colony.

Smaller than *A.n.narina* in all its critical measurements. Adult ♂ with more bronzed metallic green on upper-parts, face, throat and upper breast, and more brilliant red below—Scarlet-Red as against the pinker and duller Spectrum Red/Rose Red of the nominotypical race, and with the secondaries and secondary-coverts much lighter, owing to the greater amount of white in the vermiculated patterning. Female rather paler Buckthorn Brown on face, throat and upper breast, and whiter grey over the lower breast and upper abdomen, the latter surfaces less washed with rose.

Wings of 18 ♂♂ 118.5-130 (125.5), 3 ♀♀ 124-126.5 (125.7), tails 154-166.5 (171) (160.0), 161.5-167.5 (165.5) mm. 21 specimens measured.

Material: 27. Eastern Southern Rhodesia (Chirinda Forest, Mt. Selinda, 4). Southern Portuguese East Africa (Dondo, near Beira, 1; Zimbiti, near Beira, 3). Northern Portuguese East Africa (Boror, Zambezia, 1). South-eastern Nyasaland (Mini Mini Mine, 1). Eastern Tanganyika Territory (Nguru Mountains, 1; eastern Ulu-guru Mountains, 1; Amani, 2; western Usambara Mountains, 1; Mombo, Tanga Line, 1; 10 miles N.W. of Tanga, 1; Kilimanjaro, 1; Bonha River, 60 miles S. of Morogoro, 1). Coastal Kenya Colony (Malindi, 1; Tana River, 3; Shimba Hills, 1). Somalia (25 miles W. of Gelib, 1). Mafia Island, 2.

Type: In the collection of the Chicago Natural History Museum, Chicago, Illinois, U.S.A.

Range: From southern Somalia (Webi Shebeli and Juba Rivers), coastal Kenya Colony (on the Tana to beyond Garissa, and in the

south inland to the Chyulu Range), eastern Tanganyika Territory (west to the montane forests of the Paré, Usambara, Nguru and Uluguru Mountains; one from as far west as Mt. Kilimanjaro), northern Portuguese East Africa, south-eastern Nyasaland (Mini Mini Mine (not traced in Benson, *Check List of the Birds of Nyasaland*, 1953)), southern Portuguese East Africa, south-eastern Southern Rhodesia (Chirinda Forest), and eastern Swaziland and north-eastern Zululand (mainly intergrades *A.n.narina* \gtrsim *A.n.littorale*). Also on Zanzibar and Mafia Islands.

Note: The status of the tiny population resident in the Chirinda Forest in eastern Southern Rhodesia is difficult to understand in the absence of really adequate material. Two males and two females in the collection of the National Museum of Southern Rhodesia collected in November, 1930, are *A.n.littorale*, the wings measuring 124.5, 124.5, 126, 127 mm., and even allowing for a slight amount of pigment deterioration, the females agree well with a recent Beira example of the race before me. However, two males in the collection of the Transvaal Museum from Mt. Selinda (presumably obtained in the Chirinda Forest, which is on that mountain) taken in December, 1935, and December, 1937, are more like *A.n.narina* in plumage colouration and size (wings 128, 133 mm.). It is to be expected that oscillations in the genetic composition of populations inhabiting racial contact zones occur almost constantly. Mt. Selinda is approximately the point where the ranges of the three races *A.n.narina*, *A.n.littorale* and *A.n.rufiventre* converge.

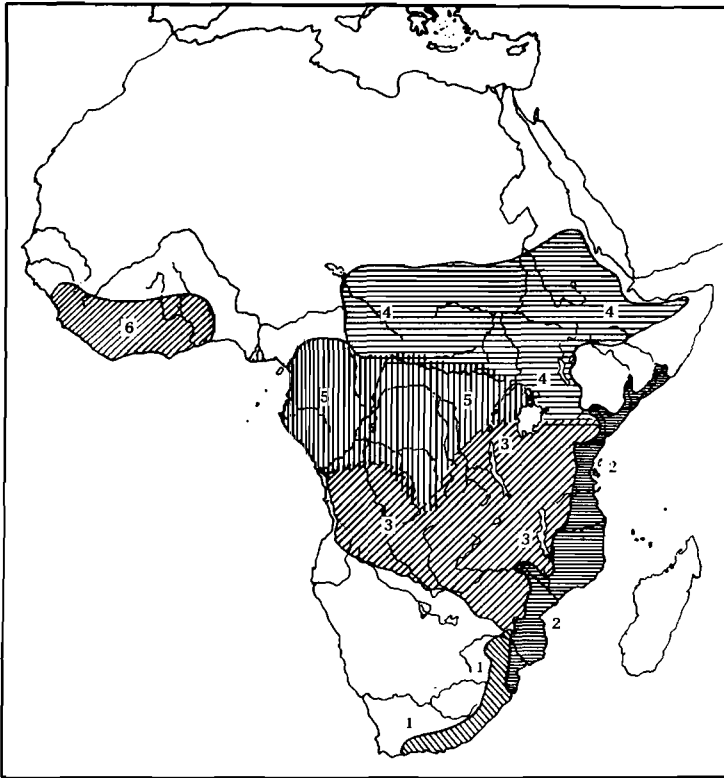
Dr. A. A. da Rosa Pinto, Director of the Museu Dr. Alvaro de Castro, Lourenço Marques, has kindly measured the wings of the series preserved in that institution for me: Lourenço Marques, Portuguese East Africa, ♂♂ 130, 130, 131, 132; ♀♀ 124, 124 125, 126, 128, 128, 129, 130; 00 128, 128. Umbeluzi (near Lourenço Marques), ♀ 128. Tinonganine, Maputo, ♀ 127. Nicoadala (Zambeze dist.), 0 127 mm. A male from Espungabera (near Mt. Selinda) has a wing of 132 mm. (*cf.* my comments on this population in previous paragraph).

As noted in the general discussion above, the southern populations of what is here called *A.n.littorale* lack the intense brilliance of the ventral colouration present in topotypical birds, and could conceivably be segregated as an additional form.

(3) *Apaloderma narina rufiventre* Dubois

Hapaloderma rufiventre Dubois, *Proceedings of the Zoological Society of London*, 1896, p. 999: region of Lake Tanganyika. Type-

locality here restricted to Mpala, western shore of Lake Tanganyika, eastern Belgian Congo.



APALODERMA NARINA (Stephens)

Sketch-map showing the approximate ranges of the six geographical races of the Narina Trogon

1. *Apaloderma narina narina* (Stephens)
2. *Apaloderma narina littorale* van Someren
3. *Apaloderma narina rufiventre* Dubois
4. *Apaloderma narina arcanum* Clancey
5. *Apaloderma narina brachyurum* Chapin
6. *Apaloderma narina constantia* Sharpe and Ussher

Similar in size to nominate *A.narina*. Adult ♂ distinguishable by the more bronzed, less bluish, metallic green of the upper-parts, face, throat and upper breast, and the deeper red of the under-parts—about pure Spectrum Red as against the pinker Spectrum Red/Rose Red of *A.n.narina*, and with the sides of the lower breast, below the metallic green breast shield, with a heavy overlay of a colour between Carmine and Ox-blood Red. Secondaries and secondary-

coverts pale, as in *A.n.littorale*. Female rather darker and greyer or olivaceous tinged (near Saccardo's Umber (pl. xxix)) over the face, throat and upper breast, and with the flanks, lower abdomen, crissum and under tail-coverts deeper rose (about Rose Doree/Scarlet-Red).

Wings 12 ♂♂ 130-137 (132.8), 2 ♀♀ 129, 132, tails 170-182 (176.3), 169, 178 mm. 14 Tanganyika Territory, Northern Rhodesia and Nyasaland specimens measured.

Material: 33. Uganda (Mt. Burumba, 1; Mpumu, 1). Tanganyika Territory (Mpanda, E.N.E. of Karema, 2; Engare Sero, S.E. corner of Mt. Meru, 1; Monduli, W. of Mt. Meru, 2; Ngare, Mt. Meru, 1; Kigoma, 1). Northern Rhodesia (Mwinilunga, 2; Mpika, 4; Mporokoso, 4). Nyasaland (Mini Mini Mine, 1; Nchisi, 1; Mlanje, 5; Malosa, 1; Mpata Karonga, 1). Southern Rhodesia (Holdenby, Pungwe R. valley, 2 (actually intermediate towards *A.n.littorale*); near Bulawayo, 1). Southern Portuguese East Africa (Gorongozo Mountain, 2). *A.n.rufiventre* \leq *A.n.arcanum*. 7. Southern Kenya Colony (Nairobi and district, 6; Athi River, 1).

Type: In the Musée Royal du Congo Belge, Tervuren, Belgium. Specimen collected by Storms almost certainly at Mpala (Chapin, *in litt.*).

Range: Still imperfectly known. Ranges from northern Angola (no material examined, and allocation of populations tentative) and the southern and south-eastern Belgian Congo (the Katanga, and the eastern districts of Tanganika, Maniema, Kivu Sud and Ruanda Urundi), parts of Uganda (Mt. Burumba; Mpumu), Tanganyika Territory (western, northern and central districts and the Southern Highlands) to Northern Rhodesia, Nyasaland, most of Southern Rhodesia, and Mt. Gorongozo, southern Portuguese East Africa. Intergrades with neighbouring races wherever the ranges are in contact.

(4) ***Apaloderma narina arcanum***, subsp.nov.

Type: ♂ adult. Lotti Forest, Mongalla, Equatoria Province, southern Sudan. 11 March, 1936. Collected by F. O. Cave. In the collection of the British Museum (Nat.Hist.), London. Brit.Mus. Reg.No.1936.9.13. Wing 139.5, tail 191 mm.

Diagnosis: Similar to *A.n.rufiventre*, but distinctly longer tailed in series. Tails of 20 adult ♂♂ 181-194 (185.6) (French Equatorial Africa, Sudan, Abyssinia, Somaliland, northern Uganda, etc.), as

against 170-182 (176.3) mm. in 12 ♂♂ of *A.n.rufiventre* from Tanganyika Territory, Northern Rhodesia and Nyasaland. Metallic feathering of lower back and rump washed with steel blue, and the upper surfaces of the three innermost pairs of rectrices distinctly more lustrous blue or violaceous blue than green, in this respect rather similar to *A.n.brachyurum*.

Wings of 20 ♂♂ 132.5-141 (136.1), tails of 8 ♀♀ 182-190 (186.5) mm. 28 specimens measured.

Material: 38. French Equatorial Africa (Mandjafa, 1; Zemio, 1). Southern Sudan (Kajo Kaji, 2; Lotti Forest, Mongalla, 1; Imatong Mountains, 2 (one with tail of 174 mm., revealing influence of *A.n.brachyurum* or *A.n.rufiventre*); Roseires, 1). Northern Uganda (Mt. Moroto, 2). Abyssinia (Arussi country, 1; Algehe, 1; 30 miles N. of Gardulla, 1; Mega, 1; Big Abbai, S.W. of Lake Tana, 1; Shoa, 1; Yavello, 2 (one with tail of only 174mm.); Charada Forest, Kaffa, 2 (one with tail of 176 mm.). British Somaliland (Waghar (Wogr), 1; Durass Forest, 1). Eritrea (Bogosland, 1). Kenya Colony highlands (Aberdare Mountains, 4; Nyeri, 1; Kapenguria, 1; Trans-Nzoia, 1; Kiambu, near Nairobi, 2; Ngong, near Nairobi, 2; Nairobi, 1; Kabarnet, 1; Yala River, 2).

Range: French Equatorial Africa from about the region of Lake Chad and Fort Lamy, eastwards to the highland of Darfur and the provinces of Bahr el Ghazal, Equatoria and Upper Nile, Sudan, and in the highlands of Abyssinia, adjacent Eritrea and British Somaliland, northern Uganda (Mt. Moroto) and the highlands of Kenya Colony.

Note: When laid out alongside material of the other races of the Narina Trogon, the long tail of *A.n.arcanum* is at once apparent without recourse to measuring. The name of the new race is from the Latin *arcanus*, hidden, secret, concealed.

(2) *Apaloderma narina brachyurum* Chapin

Apaloderma narina brachyurum Chapin, *American Museum Novitates*, No. 56, 1923, p. 4, fig. 1 B: Avakubi, Ituri district, eastern Belgian Congo.

Nearest *A.n.arcanum* in colouration, but adult ♂ rather more bluish metallic green on upper-parts, face, throat and upper breast (rather similar in this respect to *A.n.narina*), and with darker basic grey to vermiculated secondaries and secondary-coverts. Metallic green cheek-stripe distinctly narrower, exposing a greater area of

livid blue or light greenish naked facial skin. Female with the brownish feathering of the face, throat and upper breast darker, more olivaceous coloured, and with the grey of the lower breast and upper abdomen generally darker. Much shorter tailed than *A.n. arcanum* and shorter tailed than *A.n. rufiventre*, thus: 13 ♂♂ 151.5—168 as against 170-182 (176.3) in *A.n. rufiventre* and 181-194 (185.6) mm. in *A.n. arcanum*.

Wings 13 ♂♂ 125.5-135 (129.3), 1 ♀, tail 153 mm. 14 specimens measured.

Material: 16. Uganda (Kasai Forest, Kampala, 1). Belgian Congo (Upper Congo, 1; Obai, Ituri Forest, 1; Poko, Upper Uele, 3; Tugeddi, Lower Uele, 1; Libokwa, Lower Uele, 1; Likandi R., Uele, 2). French Equatorial Africa (Shari R., 1). Cameroons (Dengdeng, 1; Bitje, Ja R., 2; Efulen, 1; Kumba, 1).

Type: In the American Museum of Natural History, New York, U.S.A.

Range: From the forests of western Uganda and adjacent eastern Belgian Congo (Kivu Nord), westwards through the forested basin of the Congo to the valley of the middle and lower Kasai (*vide* Schouteden, *De Vogels van Belgisch Congo en van Ruanda-Urundi*, vol. iv, 1951, p. 186), the lower Congo, Portuguese Guinea, the Gabon, French Equatorial Africa, Spanish Guinea and the southern Cameroons. Intergrades with neighbouring races (*A.n. arcanum* and *A.n. rufiventre*) on the periphery of its stated range.

(6) ***Apaloderma narina constantia*** Sharpe and Ussher

Hapaloderma constantia Sharpe and Ussher, *Ibis*, 1872, p. 181: Denker, Gold Coast (Ghana).

Exactly like *A.n. brachyurum*, but adult male with the ground colour of the vermiculated secondaries and secondary-coverts markedly paler, almost whitish grey. The vermiculations are also rather finer.

Wings of 5 ♂♂ 125.5-129.5 (127.1), tails (3) 157-172 (164.1) mm. 5 specimens measured.

Material: 5. Sierra Leone, 1; Gold Coast (Ghana), 4.

Type: In the British Museum (Nat.Hist.), London.

Range: Inadequately known. Ranges from French Guinea, Sierra Leone and Liberia, eastwards to the Gold Coast (Ghana) and perhaps western Nigeria.

2. THE SOUTH AFRICAN RACES OF THE ORANGE-BREASTED BUSH-SHRIKE *MALACONOTUS SULFUREOPECTUS* (LESSON)

In the most recent revision of the geographical races of the Orange-breasted Bush-Shrike *Malaconotus sulfureopectus* (Lesson) the South African populations are referred to a single race, namely, *M.s.similis* Smith, 1836: Rustenburg, western Transvaal (*vide* Friedmann, *Occasional Papers of the Boston Society of Natural History*, vol. v, 1930, pp. 251-253). In his revision Friedmann recognises five races of this species: *M.s.sulfureopectus* (Lesson), 1831: Senegal, *M.s.similis*, *M.s.modestus* (Bocage), 1867: Benguela, Angola, *M.s.suahelicus* (Neumann), 1899: Kakoma, Tanganyika Territory, and *M.s.fricki* Friedmann, 1930: Sadi Malka, Abyssinia. Friedmann's racial arrangement of the populations has not been widely adopted by workers, though Chapin, *Birds of the Belgian Congo*, part iv, 1954, pp. 30-33, has followed it closely. Dr. A. L. Rand, *in litt.*, informs me that he only recognises *M.s.sulfureopectus* and *M.s.similis* in his treatment of the species in the continuation of Peter's *Check-List*.

Through the kindness of the Directors of the East London Museum, the Natal Museum, Pietermaritzburg, the Transvaal Museum, Pretoria, and the National Museum of Southern Rhodesia, Bulawayo, I have been able to assemble a series of just under seventy specimens of the South African populations, which shows clearly that three quite distinct races occur within our limits. Of the topotypical populations of *M.s.similis* I have had two specimens from near Pretoria and four from Blouberg. Unfortunately, none from Rustenburg is currently available in South African museums. Contrary to what has been found by other workers, my observations do not confirm that populations of *M.sulfureopectus* show any marked variability, the series before me being remarkably uniform.

Melaconotus similis Smith is a name given to the palest and least richly coloured of the three South African racial groups of populations it is now proposed to recognise, and specimens agreeing with the near topotypes at my disposal have been seen from localities on the eastern and northern periphery of the Kalahari, in western Southern Rhodesia, northern Bechuanaland Protectorate and north-eastern South-West Africa. In *M.s.similis* the upper throat is about Lemon Chrome/Lemon Yellow (*vide* Ridgway, *Color Standards and Color Nomenclature*, 1912, pl. iv), the lower breast, abdomen, flanks, crissum and under tail-coverts Pale Lemon Yellow (same pl.), while

the lower throat and upper breast are similar but with the feathers broadly tipped with orange, forming a distinct breast-band. The inner edges and tips of the rectrices are also lemon yellow, the pale apical spots, particularly in the adult males, often with a light wash of orange. The wings in both sexes measure 90-98 mm.

North, east and south-east of the pale *M.s.similis* occur populations of distinctly more richly coloured birds. Series before me from the eastern Cape Province, Pondoland, Natal and Zululand, eastern Transvaal, southern Portuguese East Africa and Southern Rhodesia, consist of specimens with palpably broader and more richly coloured orange breast-bands and much deeper yellow underparts. Using the great *Color Atlas* of C. and J. Villalobos, Buenos Aires, 1947, the yellow centre of the lower breast in Bechuanaland Protectorate *M.s.similis* gives a reading of Y-15-11°, whereas the reading from eastern Transvaal lowveld birds is YYO-15-12°. The intensity of the colour of the breast-band results from the appreciably longer orange tips to the feathers, which, even when disarranged, obscure most of the underlying yellow. In *M.s.similis* much of the underlying yellow shows through the orange tipping of the feathers of the breast-band, even after the most careful grooming. The tips of the rectrices also reveal the overall tendency to brightness, being generally more strongly tinged with orange. On the upper-parts there is little salient difference, the frons, supercilia and fore-crown are richer coloured, while the grey of the crown, nape and upper mantle is slightly darker and bluer, and the lower mantle, rump and upper tail-coverts more yellowish, less greyish, green, but there is a more significant size difference, the richly coloured birds just discussed being smaller than *M.s.similis*, the wings measuring 83.5-93.5 mm.

The brightly coloured birds of eastern and south-eastern South Africa are themselves readily divisible into two quite discrete groups on the basis of the extent to which the tertials, secondaries and primaries are tipped with pale yellow. The extreme austral populations resident in the eastern Cape Province, Natal and Zululand, eastern Swaziland and the eastern Transvaal (the latter actually an intergrading population), differ from those from further north, *i.e.*, southern Portuguese East Africa, eastern and northern Southern Rhodesia, Northern Rhodesia, Nyasaland and northern Portuguese East Africa northwards, in having the pale yellow tips to the tertials appreciably narrower and the apical spots of the major secondaries and primaries vestigial (see photograph). In this character they agree with *M.s.similis* of the Kalahari and adjacent arid areas. For

these populations a new name is required, and *M.s.terminus* mihi, subsp.nov., is introduced below to fill this void. For the other populations the name *M.s.suahelicus* (Neumann), described from Kakoma, Tanganyika Territory, must be used. Friedmann, *loc. cit.*, gives the southern limits of the range of *M.s.suahelicus* as "central Mozambique", but from the material available to me it is evident that its range must now be extended much further south, to include all Portuguese East Africa and most of Southern Rhodesia (except for the dry west of Matabeleland, where *M.s.similis* occurs).

The pattern of geographical variation shown by the South African populations of the Orange-breasted Bush-Shrike is conservative and strictly orthodox—a large pale race in the arid interior of the sub-continent and two smaller, richer coloured forms in the moister eastern and south-eastern biomes. The nomenclature, characters and ranges of the three subspecies concerned are detailed hereunder:

(1) ***Malaconotus sulfureopectus similis* Smith**

Melaconotus similis A. Smith, *Report of the Expedition for Exploring Central Africa*, 1836, pp. 44: north of Kurrichaine, *i.e.*, Rustenburg district, western Transvaal.

Frons and supercilia Lemon Yellow; fore-crown with a variable light wash of Pyrite Yellow (pl. iv) on a grey ground; head-top, nape sides of neck and upper mantle close to Deep Green-Blue Gray (pl. xlvi); lower mantle, rump and upper tail-coverts Mignonette Green (pl. xxxi). Lores and feathering immediately below the eyes dark slate or blackish slate; ear-coverts blue-grey shading to blackish anteriorly. Malar stripes and most of throat brilliant Lemon Chrome /Lemon Yellow; lower throat and breast yellow, the feathers broadly tipped with orange, forming a distinct breast-band; lower breast and rest of underparts Pale Lemon Yellow, the sides of the body often with a slight overlay of cadmium, and the flanks washed with olive. Wings as lower mantle and rump, the tertials, major secondaries and primaries narrowly tipped with yellowish white. Rectrices about Citrine/Warbler Green (pl. iv), broadly tipped and narrowly fringed on the inner webs with pale lemon yellow, the broad apical spots often distinctly washed with orange.

Measurements: Wings (flattened) of 10 ♂♀ 90-96.5 (92.2), tails 90-98 (92.7) mm.

Material: 17. Western and north-western Transvaal (near Pretoria, 1 ♂, 1 ♀; Blouberg, 3 ♂♂, 1 ♀). Bechuanaland Protectorate (Kasane, 2 ♂♂; Kabulabula, 1 ♀). North-eastern South-West Africa (Caprivi Strip) (Kabuta, 1 ♂; Linyanti, 1 ♂ (aberrant—lacking orange colour on breast). Western and north-western Southern Rhodesia (Dett, Wankie Game Reserve, 1 ♀; Nampini, Zambesi R., 2 ♂♂; 29 m. W. of Victoria Falls, 1 ♂; Victoria Falls, 1 ♂; Senyati R., 1 ♀).

Range: Western and northern Transvaal, central, eastern and northern Bechuanaland Protectorate, western and north-western Southern Rhodesia, north-eastern South-West Africa and Caprivi Strip. Extralimitally to parts of southern Angola and Barotseland, western Northern Rhodesia (see Remarks). Intergrades with *M.s. suahelicus* in the eastern and north-eastern sectors of its stated range.

Remarks: I have not been able to study any topotypical material of *M.s. modestus*, described from northern Angola, but judging by the characters enumerated for this form by Friedmann, *loc. cit.*, it is extremely doubtfully separable from *M.s. similis* as here defined. Friedmann described *M.s. modestus* as "Like *similis* but with the breast much less suffused with orange; the forehead and the inner margins of the rectrices yellow, not orange-yellow; no black beneath the eyes; auriculars grayish, paler than in any of the other races". These characters are essentially those separating *M.s. similis* from *M.s. suahelicus* and *M.s. terminus*. While Friedmann gives no details of the South African material available to him, most of it appears to have been from localities within the ranges of *M.s. terminus* and *M.s. suahelicus*. Practically all material of the South African populations available to workers is representative of these two forms and not *M.s. similis*.

(2) ***Malaconotus sulfureopectus terminus***, subsp. nov.

Type: ♂, adult. Committees Drift, Albany district, eastern Cape Province. 24 October, 1953. Collected by P. A. Clancey. In the collection of the Durban Museum.

Diagnosis: Similar to *M.s. similis* but slightly darker and purer blue-grey on head-top, nape, sides of neck and upper mantle; frons and supercilia Lemon Chrome as against Lemon Yellow, and the fore-crown with a richer and more extensive amount of Pyrite Yellow; lower mantle, rump and upper tail-coverts slightly darker and greener. Loes and feathering under eyes deeper black, and ear-coverts slightly darker. Much richer coloured below, being an

intensely brilliant yellow, nearest to the Lemon Chrome of Ridgway, and with the breast-band broader and of a more fiery orange. In this race the feathers of the breast-band have longer orange tips than in *M.s.similis*, so that little or none of the underlying yellow shows through the orange, in contradistinction to one of the major subspecific criteria of *M.s.similis*. Wings as in *M.s.similis*, but rectrices with rather broader lemon yellow fringes to the inner-webs and apical spots larger and more orange tinged. Rather smaller in size.

Measurements: Wings of 10 ♂♂ 87-93.5 (89.1), tails 84-90.5 (87.5) mm.

Material: 36. Eastern Cape Province (Committees Drift, Albany, 1 ♂, 1 ♀; East London, 1 ♂, 2 ♀♀; Kei Bridge, 3 ♂♂, 2 ♀♀, 1 0 juv.). Pondoland (Port St. Johns, 1 ♂; Embotyi, Lusikisiki, 1 ♀). Natal (Pietermaritzburg, 4 ♂♂, 1 ♀; Hillcrest, 1 ♀; Ixopo, 1 ♀). Zululand (Kosi Bay, 1 ♂; Ingwavuma R., 1 ♂, 1 ♀; Shimula's Pont, Pongola R., 1 ♂, 1 ♀; Gwaliweni Forest, Lebombo Mts., 1 ♀. (All northern Zululand specimens slightly intermediate towards *M.s.suahelicus*. See also Clancey, *Annals of the Natal Museum*, vol. xii, 2, 1952, p. 265)). Eastern Transvaal (Game Farm "Malamala", Newington, 5 ♂♂, 5 ♀♀).

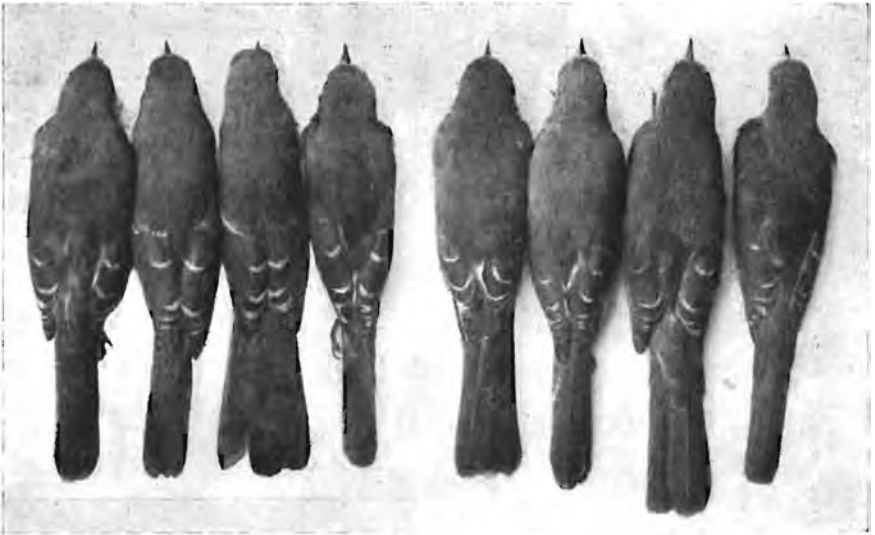
Measurements of the Type: Wing 89.5, culmen from base 18, tarsus 17, tail 85.5 mm.

Range: Eastern Cape Province from the country between the valleys of the Sundays and Great Fish Rivers, north-eastwards through Pondoland and East Griqualand to Natal and Zululand, eastern Swaziland and the eastern Transvaal. Intergrades to the north of its stated range with *M.s.suahelicus*, which extends in the littoral almost to the Zululand border with Portuguese East Africa.

(3) *Malaconotus sulfureopectus suahelicus* (Neumann)

Cosmophoneus sulfureopectus suahelicus Neumann, *Journal für Ornithologie*, 1899, p. 395: Kakoma, Tanganyika Territory.

Similar to *M.s.terminus* but differs in being slightly more yellowish green on the lower mantle, rump and upper tail-coverts, and with the tertials, major secondaries and primaries more broadly tipped with yellowish white on a paler ground (see accompanying photograph). In *M.s.terminus* the pale tips of the tertials are prominent but much narrower than in *M.s.suahelicus*, while the tips of the major secondaries and primaries are usually vestigial. Pale wing-bar



MALACONOTUS SULFUREOPECTUS (Lesson)

Dorsal view of specimens of two south-eastern African races of Orange-breasted Bush-Shrike

Left: *Malaconotus sulfureopectus suahelicus* (Neumann)

Right: *Malaconotus sulfureopectus terminus* Clancey

Note the narrower pale yellowish tips to the tertials, major secondaries and primaries in *M.s.terminus*

(Photo: A. L. Bevis)

on secondary-coverts also more evident. Similar on the under-parts, but rectrices with rather more extensive lemon yellow fringes to the inner webs and the apical spots larger and more suffused with orange. Averaging very slightly smaller than *M.s.terminus* and significantly so compared with *M.s.similis*.

Measurements: Wings of 10 ♂♀ 83.5-91 (88.2), tails 84-90 (87.3) mm.

Material: 16. Eastern Transvaal (Game Farm "Malamala", Newington, 2 ♂♂, 1 ♀). Southern Portuguese East Africa (Vila Luiza (Marracuene), 1 ♀; Manhiça, 2 ♂♂, 1 ♀). Southern Rhodesia (Kariba, 1 ♂). Northern Bechuanaland (Kabulabula, 1 ♂; Sepopa, 1 ♂). Nyasaland (Chiromo, 3 ♂♂). Kenya Colony, 2 ♂♂, 1 ♀.

Range: Southern Portuguese East Africa, and eastern and northern Southern Rhodesia, extending up the valley of the Zambesi to about its confluence with the Chobe River. Extralimitally to northern Portuguese East Africa, Nyasaland, eastern Northern

Rhodesia, Tanganyika Territory, extreme eastern Belgian Congo (Lake Kivu, eastern Ruanda, and Ruzizi Valley (*vide* Chapin, *loc. cit.*, p. 31)), Kenya Colony and Somalia. Intergrades with the nominate race and *M.s.fricki* to the north and north-west of its stated range.

Remarks: *M.s.fricki* Friedmann, described from southern Abyssinia, may not be separable from *M.s.suahelicus*, judging by the comments of other workers recorded in the literature. I have seen no material of the race concerned.

3. ON THE RACES OF THE MASKED WEAVER *PLOCEUS VELATUS* VIEILLOT OCCURRING IN THE SOUTH AFRICAN SUB-CONTINENT

Authoritative opinion is divided on the number of races of the Masked Weaver *Ploceus velatus* Vieillot to be admitted from South Africa. Shelley, *Birds of Africa*, vol. iv, 1905, pp. 404-411, Sclater, *Systema Avium Aethiopicarum*, part ii, 1930, p. 739, and Roberts, *Birds of South Africa*, 1940, p. 343, recognise three racial divisions. Vincent, *Check List of the Birds of South Africa*, 1952, p. 104, recognises four races, and this unqualified opinion is followed by McLachlan and Liversidge in their recent *Roberts' Birds of South Africa*, 1957, p. 433. A study of series of breeding males and other specimens in the collections of the Durban, East London and South African Museums indicates that four races can be admitted in our formal arrangement of the South African sub-continental populations. This study also shows that no less than seven names have been given by workers since the time of Vieillot (1819) to a single taxon, and reveals the necessity for describing as new the *P.v.velatus* of authors (not of Vieillot) and an entirely new race from the western, south-western and Karoo districts of the Cape Province.

P.v.velatus Vieillot, 1819: Namaqualand, *i.e.*, lower Orange River valley, is usually believed by workers to be a pale form of the Masked Weaver resident in the arid west, ranging from the north-western Cape Province and lower Orange River drainage northwards to Damaraland, Ovamboland and south-western Angola. On the basis of the very adequate series of breeding males now available from the north-western Cape and lower Orange River (Upington) it is evident that Vieillot's name *velatus* rightly belongs to richly coloured birds subspecifically identical with the populations occurring further east and north-east generally called either *P.v.arundinarius* (Burchell), 1822: Klaarwater, Griqualand West, or *P.v.tahatali* Smith, 1836: between the Orange River and the Tropic.

The birds of central and northern South-West Africa and south-western Angola, to which the name *P.v.velatus* is usually applied by workers, will require to be given a new name. They are readily distinguishable from topotypical *P.v.velatus* on account of their paler and duller general colouration and clearer yellow rumps, and are given the name *P.v.caurinus* mihi, subsp.nov., below.

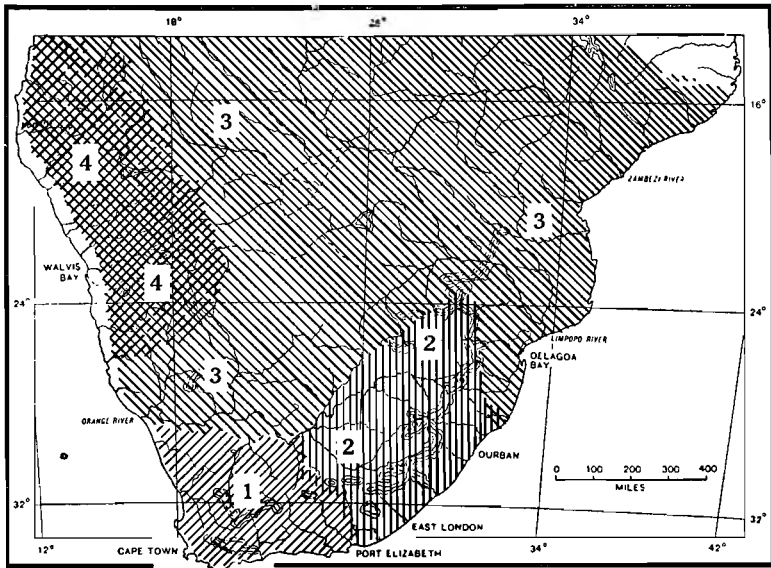
The large sized and rather darker coloured birds of the populations of the Karoo and eastern districts of the Cape Province, Orange Free State, Basutoland, Transvaal highveld and Natal, currently treated as a single race: *P.v.nigrifrons* (Cabanis), 1851: eastern Cape Province, are now found to be divisible into two subspecies. The populations of the western (Calvinia) and central and eastern Karoo (Beaufort West, Merriman, Murraysburg, Fish River Station) districts of the Cape Province are separable from those of the eastern Cape (topotypical of *P.v.nigrifrons*), Orange Free State and the south-east African highland area generally, by the paler yellow under-parts and the absence of a wash of Raw Sienna (Ridgway, *Color Standards and Color Nomenclature*, 1912, pl. iii) over the lower throat. These western populations are also rather paler and greener on the upper-parts, and the crowns are clearer yellow, lacking much of the heavy overlay of Raw Sienna present in true *P.v.nigrifrons*. It seems advisable to recognise these differences, and as no name is applicable to the populations concerned I propose to designate them *P.v.inustus* mihi, subsp.nov. It is interesting to note that the species is not generally recorded as occurring in the arid areas of the western and central Cape Province from which the new form is described.

Four races of the Masked Weaver can be admitted in our formal taxonomic arrangement of the South African sub-continental populations, and the nomenclature, characters and ranges of these are as follows:

(1) ***Ploceus velatus inustus***, subsp.nov.

Type: ♂, adult. Lokenburg, Calvinia, western Cape Province. 21 October, 1956. Breeding. Collected by Dr. J. M. Winterbottom. In the collection of the South African Museum, Cape Town. S.A.Mus.Reg.No.20427.

Diagnosis: Similar to *P.v.nigrifrons* (Cabanis) as defined here-under, but distinguishable by the paler yellow under surface in the breeding male (about Lemon Chrome as against vibrant Light Cadmium (Ridgway; *loc. cit.*, pl. iv)), and the absence of a wash of Raw Sienna over the lower throat bordering the black bib. On the



PLOCEUS VELATUS Vieillot

Sketch-map showing the approximate ranges of the four South African races of the Masked Weaver.

- | | |
|--|--|
| 1. <i>Ploceus velatus inustus</i> Clancey | 3. <i>Ploceus velatus velatus</i> Vieillot |
| 2. <i>Ploceus velatus nigrifrons</i> (Cabanis) | 4. <i>Ploceus velatus caurinus</i> Clancey |

upper-parts rather lighter and greener on the hind neck and mantle, and with the crown clearer golden yellow, less washed with Raw Sienna. Adult female in breeding dress usually darker and more heavily streaked on the mantle than *P.v.nigrifrons*. Averaging slightly larger in size.

Measurements: Wings of 10 breeding ♂♂ 83-88.5 (85.5) mm.

Material:- 16. (Calvinia, 1 ♂; Beaufort West, 1 ♂; Prieska, 1 ♂; Murraysburg, 7 ♂♂, 2 ♀♀, 1 ♂ juv.; Britstown—Merriman road, 1 ♂; Fish River Station, north of Cradock, 2 ♂♂).

Measurements of the Type: Wing (flattened) 85, culmen from base 21, tarsus 25, tail 59 mm.

Range: From the western (Calvinia) and south-western (Berg River) Cape, eastwards through the interior Karoo districts to about the valley of the Great Fish River, where it meets and intergrades with *P.v.nigrifrons*. In the north of its range it reaches Prieska, where it was found alongside the smaller and brighter coloured *P.v.velatus*.

Remarks: The name of the new race is taken from the Latin *inustus*, unburnt—an allusion to the fact that it lacks the Raw Sienna over the lower throat present in varying degree in the other three South African forms.

(2) ***Ploceus velatus nigrifrons*** (Cabanis)

Hyphantornis nigrifrons Cabanis, *Museum Heineanum*, Theil i, 1851, p. 306: eastern Cape Province.

♂, adult, breeding. Forehead, face, chin and throat black; crown and sides of head semi-lustrous Light Cadmium, the crown with a heavy overlay of Raw Sienna; hind neck and mantle yellowish Citrine, finely streaked with olivaceous brown. Under-parts brilliant Cadmium, the lower throat with an overlay of Raw Sienna on the surface adjacent to the black bib. ♀, adult, breeding. Rather similar to the male in non-breeding dress. Upper-parts about Citrine-Drab (pl. xl), lighter on the head-top and nape, streaked with dark olivaceous brown, prominently on the mantle. Throat and upper breast about Mustard Yellow (pl. xvi), the rest of the under-parts dull white, the flanks washed with olive-grey.

Measurements: Wings of 10 breeding ♂♂ 81-86.5 (83.3) mm.

Material: 33. Eastern Cape (Aliwal North, 3 ♂♂, 2 ♀♀; Cradock, 1 ♂, Mostertshoek, near Tarkastad, 1 ♂; Committees Drift (Albany), 5 ♂♂, 1 ♀). Northern Cape (Riverton (rail), 4 ♂♂, 1 ♀; Rooiport, Kimberley, 1 ♂). Basutoland (Mamathe's, near Teyateyaneng, 2 ♂♂). Transvaal (Kendal, near Witbank, 5 ♂♂, 2 ♀♀). Natal (Lady-smith, 1 ♂; Chieveley, near Colenso, 4 ♂♂).

Range: Eastern Cape Province to the east of the valley of the Great Fish River, eastern districts of the northern Cape in the valleys of the Vaal and Hartz Rivers (slightly intermediate towards *P.v.velatus*), Orange Free State, Basutoland, Transvaal highveld, western Swaziland and Natal. Intergrades with the nominate race to the north and east of its stated range.

Remarks: Natal birds average a little smaller than eastern Cape topotypes, revealing the influence of the small *P.v.velatus* in the eastern lowlands.

(3) ***Ploceus velatus velatus*** Vieillot

Ploceus velatus Vieillot, *Nouveau Dictionnaire d'Histoire Naturelle*, New Edition, vol. xxxiv, 1819, p. 132: Namaqualand, i.e., lower Orange River, north-western Cape Province.

Synonyms: (a) *Oriolus arundinarius* Burchell, *Travels in the Interior of Southern Africa*, vol. i, 1822, p. 464: Klaarwater, Griqualand West, northern Cape Province.

(b) *Ploceus tahatali* Smith, *Report of the Expedition for Exploring Central Africa*, 1836, p. 50: between the Orange River and the Tropic.

(c) *Ploceus auricapillus* Swainson, *Animals in Menageries*, 1837, p. 346: South Africa. Based on a Burchell reference.

(d) *Ploceus mariquensis* Smith, *Illustrations of the Zoology of South Africa*, Aves, 1845, pl. 103: North of Kurrichaine.

(e) *Hyphantornis shelleyi* Sharpe, *Catalogue of Birds in the British Museum*, vol. xiii, 1890, p. 464: Tete, Zambesi, southern Portuguese East Africa.

(f) *Ploceus finschi* Reichenow, *Ornithologische Monatsberichte*, vol. xi, 1903, p. 23: Moçamedes, Angola.

♂, adult, breeding. Closely similar to *P.v.nigrifrons* as defined above but still more richly coloured on the mantle, and rump and upper-tail-coverts usually clearer yellow. On under-parts a more intense and vibrant Cadmium, and with the Raw Sienna on the lower throat rather richer and brighter. ♀, adult, breeding. Rather lighter and more greenish or yellowish washed on the upper-parts and with streaking less pronounced. On the under-parts paler and more yellowish tinged, the flanks with little or no greyish olive wash. Both sexes in non-breeding dress are paler above and whiter below than *P.v.nigrifrons* in similar plumage. Much smaller in size.

Measurements: Wings of 10 breeding ♂♂ 76-80 (78.2) mm.

Material: 51. North-western Cape (Brandkros, Alexander Bay, 1 ♂; Great Aughrabies Falls, 1 ♂, 3 ♀♀; Upington, 2 ♂♂; Kenhardt, 11 ♂♂). Northern Cape (Kuruman, 1 ♂, 1 ♀; Buchuberg, Orange R., 3 ♂♂, 1 ♀ juv.; Rietfontein (the Klaarwater of Burchell), Griqualand—Niekerkshoop road, 1 ♂, 4 ♀♀; Prieska, 3 ♂♂, 2 ♀♀). Transvaal (Schoemansdal, near Louis Trichardt, 1 ♂; 8 m.S.E. of Mica, 1 ♂, 1 ♀; Lydenburg, 1 ♂; Newington, 6 ♂♂, 1 ♀). Swaziland (Lubuli, near Nsoko, 1 ♂, 5 ♀♀).

Range: North-western Cape Province, mainly along the Orange River, but occurring some distance to the south in the Kenhardt district, the northern Cape Province west of the Vaal and Hartz River valleys, southern Great Namaqualand, the Bechuanaland

Protectorate and north-eastern South-West Africa, Southern Rhodesia, western, northern and eastern Transvaal, southern Portuguese East Africa, eastern Swaziland and Zululand to the north of Lake St. Lucia. Extraliminally to Nyasaland, northern Portuguese East Africa, Northern Rhodesia and most of Angola. Replaced by *P.v.katangae* (Verheyen) and *P.v.upembae* (Verheyen) in the southern Belgian Congo. It is not known if *P.v.velatus* and *P.v.katangae* meet and intergrade.

(4) ***Ploceus velatus caurinus***, subsp.nov.

Type: ♂, adult. Okahandja, Damaraland, South-West Africa. 21 November, 1955. Breeding. Collected by Dr. W. Hoesch. In the collection of the Durban Museum.

Diagnosis: ♂, adult, breeding. Similar to *P.v.velatus* but rather paler and less richly coloured on the upper-parts. The crown is a paler and duller Lemon Chrome, the fore and central portions with an overlay of Aniline Yellow (pl. iv), as against Raw Sienna in *P.v.velatus*. The nape and mantle are lighter—about Pyrite Yellow (pl. iv) as against a brilliant Sulphine Yellow (same pl.), while the lower rump and upper tail-coverts show a greater unsullied expanse of Lemon Chrome. In *P.v.velatus* the yellow of the lower rump and upper tail-coverts is often obscured with an overlay of Sulphine Yellow and an admixture of greyish unmoulted feathers of the non-breeding dress. On under-parts markedly paler and duller, particularly on the lower breast, abdominal surface, flanks, crissum and under tail-coverts, and with the wash of Raw Sienna on the fore-throat vestigial. Black of forehead, face and throat slightly duller and browner. ♀, adult, breeding. Not constantly different. Similar in size to *P.v.velatus*.

Measurements: Wings of 10 breeding ♂♂ 73.5-79 (77.1) mm.

Material: 12. Damaraland (Okahandja, 7 ♂♂, 1 ♀; Ondongantje, near Omaruru, 2 ♂♂; Omaruru, 1 ♂; Farm Binzenheim, S.E. of Windhoek, 1 ♂).

Measurements of the Type: Wing 78.5, culmen 18, tarsus 23, tail 51.5 mm.

Range: Central and northern Great Namaqualand, Damaraland, Ovamboland and the Kaokoveld, in South-West Africa, and south-western Angola (Mutano (Humbe), in Huila).

Remarks: It is interesting to note that the two main occidental racial representatives of the species in the arid west of the South African sub-continent (*P.v.inustus* and *P.v.caurinus*), both of which show less lipochrome than the eastern and northern forms, are isolated from one another by an intrusive belt of the richly coloured *P.v.velatus*, a predominantly eastern race, which has thrust its range far to the west along the Orange River to its very mouth on the South Atlantic coast.

I am grateful to Dr. W. Hoesch, of Okahandja, for the care taken in collecting and preparing the series of specimens upon which this new subspecies is based.

The name of the new form is from the Latin *caurinus*, of the north-west wind, *i.e.*, north-western.

4. ON SOUTH AFRICAN *PLOCEUS INTERMEDIUS* RÜPPELL

Currently all populations of the Lesser Masked Weaver *Ploceus intermedius* Rüppell occurring in the South African sub-continent are referred to a single race, namely, *P.i.cabanisii* (Peters), 1868: Inhambane, Sul do Save, southern Portuguese East Africa, and Reichenow's description of *P.lübberti* from Damaraland in 1902 seems to have been largely overlooked by later workers. The name is not mentioned by Sclater, *Systema Avium Aethiopicarum*, part ii, 1930, p. 740, who tentatively refers Damaraland birds to the eastern form.

Limited material in the Durban Museum suggests that two races of this weaver should be recognised from South Africa. Damaraland examples of *P.intermedius* differ from certain *P.i.cabanisii* in being paler and less streaked with blackish on the upper-parts, and the breeding male is significantly paler yellow on the under-surface, the fore-throat also rather less extensively washed with Raw Sienna. The differences segregating the populations of our arid west from those of *P.i.cabanisii* are comparable to those distinguishing *P.v.caurinus* from *P.v.velatus*, as detailed in the previous note of this series. I believe it desirable to recognise two races from within our limits, and the pale western form may be known as *P.i.lübberti* Reichenow, 1902: Damaraland (*vide Ornithologische Monatsberichte*, 1902, p. 77).

The range of *P.i.lübberti* is poorly known. Specimens available to me are from central Damaraland, but the form almost certainly occurs throughout much of northern Great Namaqualand, Damaraland, Ovamboland and the Kaokoveld, in South-West Africa, and presumably in south-western Angola. Chapin, *Birds of the Belgian Congo*, part iv, 1954, p. 339, records that birds from the Angola coast near Lobito Bay are very richly coloured and more washed with brown than any in eastern Africa (*P.i.intermedius* and *P.i.cabanisii*). These richly coloured populations of the Lobito area are certainly not *P.i.lübberti*, and may be an undescribed race.