



DURBAN MUSEUM NOVITATES

Issued by the Durban Museum, Durban, South Africa

Vol. VIII

ISSUED 14TH JULY, 1967

Part 7

MISCELLANEOUS TAXONOMIC NOTES ON AFRICAN BIRDS XXIV

by

P. A. CLANCEY

(Director, Durban Museum, Durban)

SUBSPECIATION IN THE GREEN PIGEON *TRERON AUSTRALIS* (LINNAEUS) IN SOUTHERN AFRICA

Of all the members of the African Columbidae, the Green Pigeon *Treron australis* (Linnaeus) is the most highly polytypic, perhaps more than eighteen subspecies being recognisable. The species, still considered by some systematists as consisting of two semi-species in a superspecies (*T. calva* (Temminck) and *T. australis* (Linnaeus)), is confined to Ethiopian Africa and adjacent islands, as well as the Malagasy Sub-Region.

In so far as zoogeographical South Africa is concerned, some five or six races are believed to occur within the prescribed limits of this sub-region, but there is no unanimity of opinion among specialists as to the exact number of taxa involved, their precise ranges, or the names applicable to them in all instances. The variation present in the populations occurring in the general region extending from north-eastern South-West Africa along the Okavango R., east to Lake Ngami, the Caprivi Strip, northern Botswana, and north-western Rhodesia, in particular has given rise to a highly confused literature, and in the standard texts dealing with the birds

[Price 60 cents nett]

of these territories produced over the past thirty years or so no less than four names have been variably applied to them. The names in question are *V.s.damarensis* Reichenow, 1901; *T.schalowi* Reichenow, 1880; *V.s.chobiensis* Roberts, 1932; and *V.c.salvadorii* Dubois, 1897.

A study of a considerable proportion of the accumulated skin material of the Green Pigeon in the collections of South African museums recently carried out in the Durban Museum shows that no less than seven subspecific taxa require to be admitted for zoogeographical South Africa. Five of these forms have fairly extensive ranges within our limits, but the occurrence of the other two is marginal.

For the loan of material to augment that already in the Durban Museum, I am grateful to the following museums and senior officials: South African Museum, Cape Town (Professor J. M. Winterbottom), Port Elizabeth Museum (Mr. B. G. Donnelly), Albany Museum, Grahamstown, Kaffrarian Museum, King William's Town (Mr. C. J. Skead), East London Museum (Mr. C. D. Quickelberge), Transvaal Museum, Pretoria (Mr. O. P. M. Prozesky), National Museum, Bulawayo (Mr. M. P. S. Irwin), and the Museu Dr. Alvaro de Castro, Lourenço Marques. Over 200 specimens were examined during the course of this research.

Geographical Variation

Variation in *T.australis* affects general size, the width of the nude cere, the colour of the tail, which may be grey in some populations and olivaceous-yellow in others, the colour of the upper and under-parts, the size and shade of the lavender panel on the bend of the wing, and the colour of the feet and eyes.

The marked plasticity of the species finds adequate expression in its fragmentation into numerous races, some with quite localised ranges. The tendency for Green Pigeons breeding in the South West Arid District and its periphery to move about when not breeding, in association with the fruiting of staple food trees, such as wild figs *Ficus* spp., has a prima facie case as a serious inhibitor of subspeciation. However, this appears not to be so, and while single specimens in some collections do appear to be racially out of agreement with the known pattern of variation, the indications are that post-breeding movement is generally entirely local in nature and mainly within the limits of the range of the individual subspecies.

The south-eastern and eastern populations: Green Pigeons in this

assemblage of populations differ from others occurring in South Africa in having the head dark greyish green, the mantle, scapulars and rest of the upper-parts bright yellowish green, and the underside a pale greenish grey (about Water Green (Ridgway, 1912, pl.xli)). Birds showing these characters range from about Humansdorp in the eastern Cape to Natal and Zululand, Swaziland, Moçambique, the Transvaal, eastern Botswana, and Rhodesia, and north of South African zoogeographical limits to eastern Zambia, Malawi, northern Moçambique, and eastern Tanzania.

In this, which may be termed the *delalandii*-group of populations, variation affects size, general colouration, and the size and shade of the lilac "shoulder" panel. Size is closely correlated to the mean temperature of the breeding biotope, large-sized birds occurring in the temperate eastern Cape and Natal, and in the elevated eastern aspects of the interior plateau of the sub-continent, dropping markedly along the hot, humid Moçambique littoral. This is readily demonstrated by means of simple wing-size range spectra for four blocks of populations of the *delalandii* complex occurring to the south of the Zambesi R.: wings of ♂♀ from the eastern Cape measure 172–188, western Transvaal and eastern Botswana 175.5–190, south-western Rhodesia (Matabeleland) 172–187 while Moçambique littoral birds measure 157–171 mm.

Variation in colour follows a closely analogous pattern to that described by the size variable, but there is a more marked tendency to form comparatively locally established differences. The darkest and most saturated populations are those of the eastern Cape, Pondoland, East Griqualand, and Natal, which are characterized by the dark purplish and small sized nature of the lilac "shoulder" panel. Populations almost as dark as those just considered are present over most of the Transvaal highveld, western Botswana along the Limpopo R., and in Matabeleland, in Rhodesia, but they show several quite well-marked criteria of their own. For instance, they are more extensively grey over the mid and lower hind neck, slightly more olive, less lucid yellowish green, over the back, wings and tail, and about 50 per cent of specimens, and especially breeding birds, are much greyer, revealing a marked reduction of lipochrome over the ventral surfaces. These characters are normal ones associated with populations of polytypic species inhabiting drier and less humid biotopes when compared with others resident in hygric environments. Another difference, and one which seems to have attained a greater degree of constancy than the others just enumerated, judging by the material available to me, is a marked

increase in size and a lightening of the lilac "shoulder" panel in birds in definitive dress.

At this stage I believe it opportune to point out that birds in first basic dress do not show racial colour variation as well as definitive adults, being more heavily washed dorsally and ventrally with yellow-green (lipochrome), with the result that the blue-grey neck band, so prominent in the adult, is obscured, and the "shoulder" panel is variably invaded with green. In arriving at decisions on the grouping of populations into racial taxa, I have formulated conclusions solely on adult birds.

In direct association with the markedly increased mean annual summer temperature of the flat coastal regions of Moçambique, there is, as already pointed out, a significant diminution in size in accordance with Bergmann's law. In the tropical littoral populations of *T. australis* the lilac "shoulder" is small-sized, as in the birds of the eastern Cape Province and Natal, but even more pinkish than those of the eastern high level plateau regions. They also show a greater intensification of lipochrome in being yellower, less greenish grey, over the head, and the back, wings and tail are brighter and yellower, being more inclined to citrine than green. They are also yellower below and lighter grey over the lower hind neck, and have paler and yellower apical panels to the rectrices.

On the basis of the assembled material, it appears that three racial groupings of populations can be conveniently recognised from within the South African components of the *delalandii*-group on combinations of the variables described above. The main characters of use in the allocation of populations to racial taxa are those of general size, the shade of the blue-grey neck bar, and of the mantle, scapulars, caudad dorsal surface and adjacent wings, and the size and shade of the "shoulder" panel. The three races which may be recognised within the South African elements of the *delalandii*-group are *T. a. delalandii* (Bonaparte), 1854: Durban, Natal, *T. a. orientalis* (Gunning and Roberts), 1911: Nicuadala, Quelimane district, northern Moçambique, and *T. a. glauca* Clancey, 1967: Fort Tuli, south-western Rhodesia.

In South Africa, *T. a. orientalis* is centred on the plain of Moçambique, extending marginally into adjacent territories to the west and south. North of South African limits, populations attributable to *T. a. orientalis* are present in eastern Zambia in the Luangwa Valley, southern Malawi, and northern Moçambique, but its limits in the north-east are currently uncertain, although it almost cer-

tainly ranges to parts of south-eastern Tanzania. *T.a.granti* van Someren, 1919: Kilwa, coastal Tanzania, seems to differ little if at all from *T.a.orientalis*. White (1965) describes *T.a.granti* as smaller than *T.a.delalandii* (wings, after White, 161–171 mm.), and with the middle of the underside yellower. As demonstrated by Lawson (1963), as well as above, these are simply the characters which separate *T.a.orientalis* from *T.a.delalandii*, and it seems as if *T.a.granti* and *T.a.orientalis* are names given to one and the same racial group of populations. White's synonymizing of *T.a.orientalis* with *T.a.delalandii* and recognition of *T.a.granti* are inexplicable actions if he had material of these Green Pigeon forms before him when he prepared his subspecific treatment.

Specimens of *T.australis* attributed by most workers to *T.a.salvadorii* are recorded from one or two widely scattered localities within the South African range of *T.a.orientalis*, such as Mt. Gorongoza and Tete, in southern Moçambique, and Salisbury, Rhodesia. While the occasional incursion of birds of the *T.a.salvadorii* (= *T.a.schalowi*) populations deep into the range of *T.a.orientalis* cannot be ruled out, the somewhat circumscribed nature of this fruit pigeon's post-breeding wanderings in other southern African populations suggests that *T.a.schalowi*-type specimens from within the range of *T.a.orientalis* result from introgression. Both *T.a.orientalis* and *T.a.schalowi* hybridize along the middle reaches of the Zambesi R. in the Kariba Lake region and along the north-western periphery of the Luangwa Valley, and the occurrence of *schalowi*-like birds far south-east of this region almost certainly has an introgressive basis.

The north-central populations: Of all the assemblages of populations occurring in zoogeographical South Africa, those present from the region of the Okavango R., east through Ngamiland, the Caprivi Strip and northern Botswana to north-western Rhodesia have had the most inconsistent treatment from systematists. Birds of the present populations differ from those in the *delalandii*-group in being bright yellow-green over the head and on the underside, the mantle, scapulars, caudad dorsal surfaces and adjacent wings olivaceous or greyish. They may be referred to as the *schalowi*-group.

Within the South African elements of the *schalowi*-group of populations variation is relatively slight, but its elucidation has resulted in the employment of a confusing array of names. In association with dry environmental conditions, the populations resident in the South West Arid District along the middle and lower reaches of the Okavango R., and in the Caprivi Strip and Ngamiland are, in definitive dress, distinctly greyer over the back

than those of the high rainfall regions of the Zambesi/Congo watershed. On average they are paler yellow-green over the head and on the under-parts, and range larger in size. Birds in pre-basic dress do not always show these differences, but they are generally quite well-marked in definitive adults.

Birds of the upper and middle Zambesi R. valley are in transition towards populations with the head and underside a little duller and greener, less yellow, and the back is also more olivaceous or greenish, less grey. They also range somewhat smaller in size (wings 172–182, against 178–189 mm.). These populations are also generally conceded as having a more boldly defined blue-grey hind neck bar, but this is not always particularly well-marked, and its emphasis in the literature probably derives from the more contrasted effect an olive or green as opposed to a greyish back has against the grey of the hind neck.

The question of names for these two racial assemblages of populations can easily be resolved. *T.a.damarensis* (Reichenow), 1901: Nukana, Okavango R., is applicable to the grey backed, yellowish headed and large sized birds of the Okavango R. and Ngamiland regions. For the more olive or greener backed populations, which also exhibit a more sharply defined blue-grey neck bar, duller and more olive tinged yellow-green over the head and under-parts, and range smaller in size, *T.a.schalowi* Reichenow, 1880: Impalila Island, Chobe-Zambesi confluence, requires to be used. Of *T.a.schalowi*, *T.a.chobiensis* (Roberts), 1932: Kasane, Chobe R., is a straight synonym. Most recent workers on central African birds, notably White, Benson and Irwin, have used *schalowi* for the Okavango and Ngamiland populations, placing those to the north-east of this race under the trinomen *T.a.salvadorii* (Dubois), 1897: Mpala, western L. Tanganyika, Congo. Using a series of a dozen specimens from Nampini and the Victoria Falls, on the middle Zambesi, north-western Rhodesia, and Kasane, Chobe R., in Botswana, as toptypical material of *schalowi*, I find that only one specimen is grey enough over the back to be referred to the same race as occurs in the Okavango R. and Ngamiland region. The others are distinctly more olivaceous or greenish on the stated parts, the blue-grey neck bar correspondingly more marked. From this observation, and in the absence of the *Type* of *schalowi* for comparison, it can be deduced that *schalowi* is not an earlier name for *T.a.damarensis* as here interpreted.

Chapin (1939) admitted *T.a.chobiensis* (= *T.a.schalowi*) as valid, and extended its range north to Marungu, the Upper Katanga, and

the southern Lulua district of the Congo, this senior worker apparently not appreciating any subspecific difference between the populations of the Chobe R. and middle reaches of the Zambesi R. and those of the southern Congo. Chapin's finding of nearly thirty years ago is pertinent to the issue, as it agrees entirely with my own conclusions that the names *schalowi* and *salvadorii* (as now understood) are applicable to one and the same racial group of populations. For those not conversant with the changes of name in the central African races of *T.australis* it should be pointed out that the *T.a.salvadorii* of Chapin now corresponds to *T.a.gibberifrons* (Madarász), 1915: Mujenje, Uganda, and his *T.a.chobiensis* is the *T.a.salvadorii* of most current workers on central African birds. This latter name must now be sunk into the synonymy of *T.a.schalowi*.

I have seen insufficient material from areas of overlap between populations of *delalandii* and *schalowi* to be in a position to describe its true nature. On the basis of a few skins from Mrowa, 40 miles E. of Chirundu, 7 miles W. of Mola, Kariba, and even as far west as Nampini, on the Zambesi R. in north-western Rhodesia, it can be concluded that straightforward hybridization takes place comparatively narrowly wherever the ranges of *T.a.orientalis* (*delalandii*-group) and *T.a.schalowi* (*schalowi*-group) impinge. As mentioned earlier, I believe introgression also results in birds applicable to *T.a.schalowi* being present deep in the range of *T.a.orientalis*. I have been unable to ascertain if these records are of singletons or if integral isolate populations of *schalowi*-like birds are involved, and the question warrants detailed study. Clearly isolating mechanisms between these two widely differing groups of Green Pigeons have broken down, presumably as a result of comparatively recent climatic changes, but as the habits of all *Treron* forms are virtually alike it is at present difficult to visualise what these might have been. It is conceivable that birds of the *delalandii*-group are derivatives of an ancestral form of relatively dry savannas, where largely riparian in disposition, and those of the *schalowi* and *calva* groups descendents of progenitorial forms of heavy forest, which as a result of forest shrinkage and fragmentation have become adapted to a riverine environment in wooded savanna. Resulting from this adjustment in habitat requirements, range expansion deep into the South West Arid District became possible (witness the evolution of an almost desertic race of Green Pigeon in *T.a.vylderi*, of South-West Africa), and some introgressive penetration of the *delalandii*-group of populations also occurred.

The western populations: Information on the western South

African populations of *T.australis* has until very recently been extremely limited. Birds of these far western populations differ from those of both the *schalowi*- and *delalandii*-groups in having the nude cere enlarged and the tail bluish grey and not green or greenish.

T.a.vylderi Gyldenstolpe, 1924: Quevep, Great Namaqualand, is a clear derivative of the *T.a.ansorgei*-*T.a.calva* assemblage of forms, differing only from the former in the loss of lipochrome consonant with the arid nature of its breeding biotope. In South-West Africa, populations of *T.a.vylderi* range from northern Great Namaqualand (where not recently recorded) to the highlands of Damaraland and the Kaokoveld (north to about Kaoko-Otavi). While closely allied to *T.a.ansorgei* Hartert and Goodson, 1918: Huila, southern Angola, *T.a.vylderi* seems to be an isolate centred on the northern highlands of Damaraland with a remarkably low population density. It also appears to be isolated from *T.a.damarensis* which occurs immediately to the north-east. While resembling *T.a.damarensis* in the greyness of the upper-parts, the head and under surface are duller and greener, less yellow, the tail is blue-grey, the rectrices with almost whitish apical panels, the whole not greenish yellow overlaid, and the size is abruptly smaller. This last feature is particularly interesting, because in the *schalowi*-group size increases as the populations range into the South West Arid District, whereas in the derivatives of the *calva*-group size appears to diminish. In *T.a.damarensis* wings of definitive adults measure ♂♀180–190, while in *T.a.vylderi* wings of both sexes measure 162–174 mm. In four of *T.a.ansorgei* measured during the course of this research the wings are 166–178 (mean 172, as against the mean of ten of *T.a.vylderi* 167.3 mm.). While not clearly defined, there is nevertheless a marked tendency for *T.a.vylderi* to be smaller sized though longer tailed than *T.a.ansorgei*. I am at a loss to explain this, more especially as in the *schalowi*-group wing- and tail-lengths appear to become enhanced in association with increasing aridity in the biotope, while in the *delalandii*-group the effect of Bergmann's law on both wings and tails has been adequately demonstrated. Populations of most polytypic birds resident in the South West Arid District tend to consist of larger sized birds than those of mesic and hygric regions to the south and east, and it is strange that some of the populations of the Green Pigeon should react unevenly in this respect.

Populations attributable to *T.a.ansorgei* occur in riverine cover along the Cunene R., on the South-West African–Angolan border, where only recently discovered by Winterbottom (1966). This race

is much brighter and yellower green over the head and on the underside, and darker and more yellowish or greenish washed over the mantle, scapulars and caudad dorsal surface than *T.a.vylderi*. The grey tail also has some yellowish intrusion. In general body colouration, *T.a.ansorgei* does not differ greatly from *T.a.schalowi*, though the yellow-greens are brighter and more vivid, but it is readily distinguishable on the basis of the much broader and more tumid nude cere (12–14, as against 8–11 mm. in *T.a.schalowi*), and the grey tail. The populations of *T.a.vylderi* have probably been sundered from those of *T.a.ansorgei* for a long time. It is worth noting that the population of *T.a.ansorgei* resident along the Cunene R. in northern South-West Africa and southern Angola, in a particularly dry region, appears to differ in no way from the populations of the highlands of Angola. Gene-flow along the course of the Cunene undoubtedly militates against subspeciation in this particular sector, while there is also the possibility that *T.a.ansorgei* is a recent colonist to the lower reaches of the Cunene, as this river formerly debouched into the Etosha Pan before forming its new course to the South Atlantic. This probably accounts for the existence of the xeric *T.a.vylderi*, which is a relict resulting from this earlier phase of the Cunene's debouchment.

The South African Subspecies

Delalandii-Group

Grey-green head and under-parts; greenish tail.

(a) *Treron australis delalandii* (Bonaparte)

Phalacrotreron delalandii Bonaparte, *Comp.Rend.Acad.Sci.Paris* vol. xxxix, 1854, p. 873: South Africa=Durban, Natal (*ex Verreaux*).

Head-top and nape in definitive dress Krönberg's Green (pl. xxi); lower hind neck dark olivaceous blue-grey; mantle, scapulars, tertials, rump and upper tail-coverts Serpentine Green (pl. xvi). On underside, throat and breast Water Green or Water Green/Light Grape Green (pl. xli). In wings, lilac "shoulder" panel small and dark (Dark Vinaceous-Gray (pl. l), width as measured from point of bend of wing 26–36 mm.). Tail with the retrices, except on the innermost pair, with the apical third light greyish green.

Wings of 10 ♂♀ 172–188 (178.2), tails 93.5–107.5 (100.3) mm.

Material: 27. (Eastern Cape, 10; Pondoland, 6; coastal Natal, 4; eastern Zululand, 1; southern Moçambique, 5 (Inhaca Island, Santaca, Lourenço Marques).

Range: Eastern Cape Province from about Humansdorp to Pondo-land, East Griqualand, Natal, eastern Zululand and Moçambique south of Delagoa Bay.

Remarks: Characterized by dark dorsal colouration, and dark, small lilac "shoulder" panel in definitive adults. The southern Moçambique birds show some characters of the following race.

(b) ***Treron australis glauca***, subsp.nov.

Type: ♂, adult. Fort Tuli, south-western Rhodesia. 20 October, 1965. Collected by Wolfgang Erz. In the collection of the National Museum, of Rhodesia. Nat.Mus. Reg. No. 58391.

Diagnosis: Closely similar to *T.a.delalandii* of the humid south-eastern Cape and Natal coast but differs in having the grey of the hind neck in definitive dress not quite so dark and overlaid with olive and more extensive in its distribution, extending up over most of the hind neck; rest of upper-parts slightly less clear green, and more inclined to olive. On underside ranging distinctly paler in series, about 50 per cent of specimens markedly lighter and greyer, less yellowish or greenish tinged, this becoming very marked in breeding birds. In wings, lilac "shoulder" panel paler and pinker and larger in size than in *T.a.delalandii* (Light Vinaceous-Drab (pl. xlv), the width as measured from the bend of the wing 36–59, most 38–44 mm.). Tail with the pale apical panels to the rectrices less greyish. Bill somewhat heavier and tail ranging longer. Wings of 10 ♂♀ 175–190 (183.2), tails 100–115 (105.8) mm. Eye colour different: vivid cobalt blue as against greyish white in *T.a.delalandii* and *T.a.orientalis*.

Material: 37. (Eastern Botswana, 2; Rhodesia, 10 (Fort Tuli, Matopos, Semokwe Nat.Res., Nuanetsi R.); Transvaal, 23 (Marico dist., Rustenburg, Waterberg, Ellisras, Mokeetsi, Blouberg, Motale R. (mainly intergrades *glauca* \supseteq *orientalis*)); Swaziland, 1 (Big Bend); north-eastern Zululand, 1 (Candover)).

Measurements of the Type: Wing 184, culmen from feathers 20, tarsus 27, tail 103.5 mm.

Range: Centred on the upper and middle Limpopo R. in western Transvaal and eastern Botswana, extending north to Matabeleland, Rhodesia, and the northern Transvaal. Intergrades to the east of its range with *T.a.orientalis*, as shown by specimens from Motale R. and Newington, in the Transvaal, Big Bend, in Swaziland, and Mashonaland localities, in Rhodesia.

Remarks: Characterized by the extensive grey area over hind

neck, large pinkish lilac "shoulder" panels to wings, more olive tinge to back, and marked tendency to greyness ventrally. Vivid cobalt blue eye colour also now known to be a definitive criterion.

(c) ***Treron australis orientalis*** (Gunning and Roberts)

Vinago orientalis Gunning and Roberts, *Ann.Transv.Mus.*, vol. iii, 2, 1911, p. 109: Villa Pereira=Nicuadala, Quelimane district, northern Moçambique.

Compared with *T.a.glauca* and *T.a.delalandii* distinctly lighter and more yellowish, less dark greyish, green over the head and upper hind neck (about Deep Grape Green, pl. xli); blue-grey on lower hind neck paler (Deep Gull Gray, pl. liii), but distributed as in *T.a.delalandii*; rest of upper-parts distinctly lighter and more yellowish or golden green (about Yellow Citrine, pl. xvi). Below, paler than in *T.a.glauca*, less inclined to greyish, and more overlaid with yellow, the Lemon Chrome abdominal patch more extensive and brighter, not invaded with white, and often diffused up over the lower breast. In wings, lilac "shoulder" panels small, as in *T.a.delalandii* (width of ten as measured from bend of wing 30–37 mm.), and paler and even more pinkish than in *T.a.glauca* (about Light Purplish Drab, pl. xlv). Tail with apical panels to rectrices more yellowish or buffish white, less greenish grey in series than in either *T.a.delalandii* or *T.a.glauca*. Ranging smaller in size.

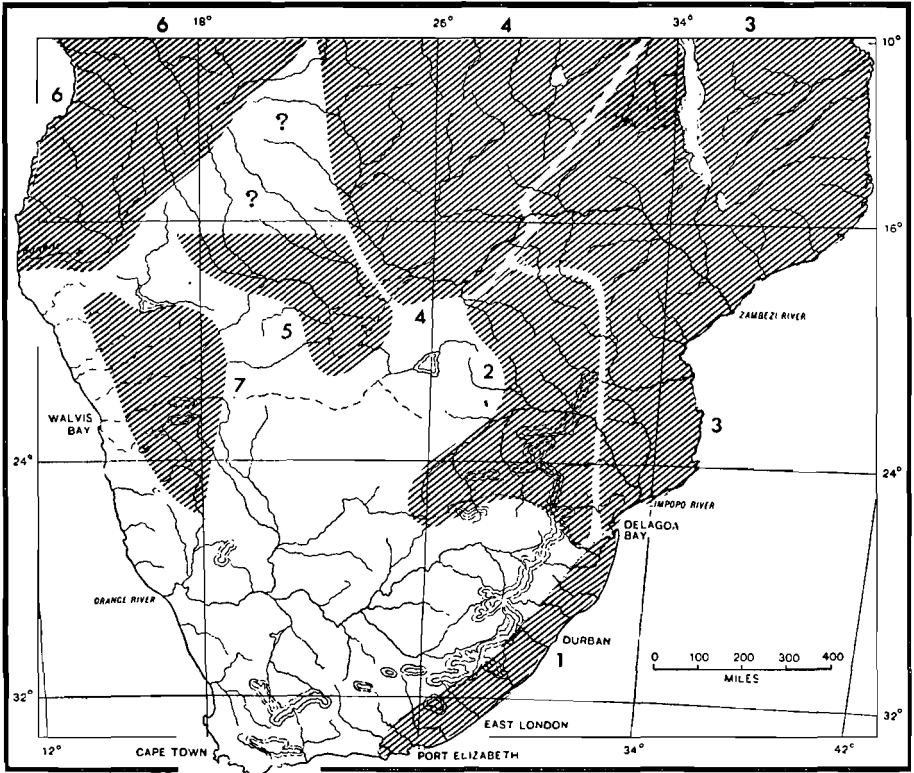
Wings of 10 ♂♀ 157–171 (165.9), tails 87.5–102.5 (95.9) mm.

Material: 60. (Moçambique, 34 (Chimonzo, Panda, Maringua, Pesu Dip, Massinga, Mambone, Massingir, Umbeluzi, Maele, Espungabera, Furancungo, Nauela, Namapa, Mogincual R. near Nampula); eastern Transvaal, 6 (Newington, Messina); Swaziland, 4 (Big Bend); eastern Rhodesia, 12 (Salisbury, Nuanetsi R., Lundi R., Sabi R., Mt. Selinda); Zambia, 2 (Fort Jameson); Malawi, 2 (Chiromo)).

Range: The plain of Moçambique, extending marginally to extreme north-eastern Zululand, Swaziland in the Lebombo Range, eastern Transvaal lowveld, and south-eastern and eastern Rhodesia. Extralimitally, occurs in south-eastern Zambia and the Luangwa R. valley, where intergrading with *T.a.schalowi*, southern Malawi, and northern Portuguese East Africa; perhaps also to south-eastern Tanganyika, but in the event of *T.a.granti* not being separable, will range through eastern Tanganyika to about the Pangani R., as well as the islands of Zanzibar and Mafia.

Remarks: Pale dusty yellowish green wash to head-top and upper hind neck, narrow pale blue-grey neck bar, light yellowish

citrine upper-parts, small pinkish "shoulder" panels, extensive ventral yellow, and small size distinguish this race. This subspecies is usually synonymized with *T.a.delalandii* but is actually markedly different and corresponds probably to the *T.a.granti* of White's recent "Revised" *Check List* (1965).



Sketch-map showing the disposition of the seven races of the Green Pigeon *Treron australis* (Linnaeus) occurring in southern Africa.

1. *Treron australis delalandii* (Bonaparte)
2. *Treron australis glauca* Clancey
3. *Treron australis orientalis* (Gunning and Roberts)
4. *Treron australis schalowi* Reichenow
5. *Treron australis damarensis* (Reichenow)
6. *Treron australis ansorgei* Hartert and Goodson
7. *Treron australis vylderi* Gyldenstolpe

Schalowi-Group

Bright yellow-green head and under-parts; tail greenish.

(d) ***Treron australis schalowi*** Reichenow

Treron schalowi Reichenow, *Ornith.Centrab.*, 1880, p. 108: Diamond Fields, errore=Impalila Island, Chobe-Zambesi confluence, northern Botswana.

Vinago calva salvadorii Dubois, *Proc.Zool.Soc.London*, 1897, p. 784: Mpala, western shore of Lake Tanganyika, Congo.

Vinago schalowi chobiensis Roberts, *Ann.Transv.Mus.*, vol. xv, 1, 1932, p. 25, Kasane, Chobe R., northern Botswana.

Differs from *T.a.orientalis*, with which it hybridizes, in having the head and upper hind neck bright yellow-green (about Warbler Green, pl. iv), grading to blue-grey over the lower hind neck; rest of upper-parts about Roman Green (pl. xvi) or slightly more olivaceous, not yellowish citrine coloured as in *T.a.orientalis*. On underside, bright yellow-green (Pyrite Yellow, pl. iv) over throat and entire breast. In wings, lilac "shoulder" panel large as in *T.a.glauca*, the shade Vinaceous-Brown (pl. xxxix). Tail greyer, less yellow-green, and apical panels white, less yellowish. Larger; bill heavier. Ceres 8–11 mm. Wings of 10 ♂♀ 172–182 (177.0), tails 93–100 (97.0) mm. Eye colour vivid cobalt blue, as in *T.a.glauca*.

Material: 36. (Eastern Caprivi, 2; Botswana, 4 (Kasane); north-western Rhodesia, 10; Zambia (including Barotseland), 20). *T.a.schalowi* \supseteq *T.a.orientalis*, 4.

Range: Comes within present limits in the eastern Caprivi along the lower Mashi or Chobe R., and the middle reaches of the Zambesi R. in northern Botswana and north-western Rhodesia, in which latter territory hybridizing with *T.a.orientalis* about Lake Kariba. Extralimittally in eastern Angola north of the range of *T.a.damarensis*, and in Zambia, northern Malawi, the southern Congo in Marungu, the Upper Katanga, and the southern Lulua district, and south-western Tanzania.

Remarks: Differs abruptly from previous races in the bright yellow-green of the head and underside, and mantle and caudad dorsal surface more olive, less bright yellow-green. Barotseland and mid-Zambesi R. Valley birds are intergrades in the size variable between *T.a.schalowi* and *T.a.damarensis*. Irwin and Benson (1966) also arrived at the conclusion that *salvadorii* is a synonym of *schalowi*.

(e) ***Treron australis damarensis*** (Reichenow)

Vinago schalowi var. *damarensis* Reichenow, *Vög.Afrik.*, vol. i, 1901, p. 399: Nukana, Okavango R., north-eastern South-West Africa.

Similar to *T.a.schalowi* but yellow-green of head and under-side paler in most, and grey of lower hind neck in definitive adults

lighter, less bluish, and rest of dorsal surface greyer, less overlaid with yellowish or green (mantle greyish Grape Green (pl. xli) (not so in birds in juv. and pre-basic dresses). Ranging larger in size, and about the same as *T.a.glauca*. Wings of 10 ♂♀ 178–188.5 (184.5), tails 98–107.5 (101.1) mm.

Material: 17. (North-eastern South-West Africa, 3 (Shamvura, Andara); Ngamiland, 12 (Sepopa, Nokaneng, Maun, Shorobe); Barotseland, 2 (Nangweshi)).

Range: Within South African limits occurs along the middle and lower reaches of the Okavango R., in north-eastern South-West Africa, eastwards to Ngamiland in Botswana, and the western aspects of the Caprivi Strip. The influence of this greyer backed race can be observed in samples from Barotseland. Also present in southern Angola along the Okavango and in Bié-Cuando Cubango.

Remarks: Not a particularly satisfactory race, being only readily separable from the last in the definitive stage of plumage, when greyer over the back, and with the yellow-greens paler. Also ranging larger.

Calva-Group

Tail blue-grey; cere markedly tumid.

(f) *Treron australis ansorgei* Hartert and Goodson

Treron calva ansorgei Hartert and Goodson, *Novit.Zool.*, vol. xxv, 1918, p. 325; Huila, Angola.

In colour nearest *T.a.schalowi* but rather clearer and brighter yellow-green below (about light greenish Oil Yellow (pl. v)); grey of lower hind neck somewhat overlaid with green; mantle, scapulars, tertials and caudad dorsal surface Deep Grape Green (pl. xli) with variable yellow overlay. In wings, primrose edging to coverts and secondaries broader. Tail with basal two-thirds Gray (pl. liii), the apical third dull yellowish off-white. Cere markedly broader and more tumid: 12–14 mm. Ranging a little smaller than *T.a.schalowi*. Wings of 4 ♂♀ 166–178 (172.0), tails 91–96 (93.0) mm.

Material: 4 (South-West Africa, 2 (Rua Cana Falls, Swartbooi's Drift); Angola, 2 (Humpi; Faz. da Cacanda)).

Range: Comes within South African limits in riverine cover along the Cunene R., where recently taken at the Rua Cana Falls (*vide* Winterbottom (1966)) and Swartbooi's Drift (P.J.Buys). In Angola occurs throughout southern and central Huila to the central plateau in Huambo, and east to the upper Cuanza and Cuango Rivers, where intergrading with *T.a.calva* (after Traylor (1963)).

Remarks: Differs sharply from *T.a.schalowi* and the other southern forms of Green Pigeon previously dealt with in having the tail blue-grey and the nude cere broad and swollen.

(g) ***Treron australis vylderi*** Gyldenstolpe

Treron calva vylderi Gyldenstolpe, *Bull.Brit.Orn.Club*, vol. xliv, 1924, p. 36: Quevep, Great Namaqualand, South-West Africa.

Head and hind and side surfaces of neck paler and greener, less yellow, than in *T.a.ansorgei*, and mantle, scapulars, tertials, rump and upper tail-coverts pale and greyer, less overlaid with olivaceous or greenish. Below paler and greener, less vibrant yellow-green. In wings, lilac "shoulders" paler, and pale edging to coverts and outer vanes of secondaries whiter. Tail as in *T.a.ansorgei*, but light apical panels to rectrices light grey with no yellowish intrusion. Size averaging smaller, but tail longer, Cere smaller: 9.5–11 mm. Wings of 10 ♂♀ 162–174 (167.3), tails 98–109 (100.9) mm.

Material: 10. (South-West Africa: Grootfontein, Franzfontein, Otavifontein, Klein Otavi, and Kaoko-Otavi).

Range: Restricted to South-West Africa were recorded in Great Namaqualand at Quevep (not traced), northern Damaraland, and the Kaokoveld, north to Kaoko-Otavi. Population small.

Remarks: Marked loss of lipochrome distinguishes this race from its immediate affine, *T.a.ansorgei*. As with most other Green Pigeon forms resident in or peripheral to the South West Arid District, wear and the action of the sun result in a rapid greying of the upper-parts and a dulling and greying of the ventral green.

REFERENCES

- RIDGWAY, R. 1912 *Color Standards and Color Nomenclature*. Washington.
 WHITE, C. M. N. 1965 *Revised Check List of African Non-Passerine Birds*, p. 167.
 LAWSON, W. J. 1963 *Durban Mus.Novit.*, vol. vii, 4, p. 79.
 CHAPIN, J. P. 1939 *Birds of the Belgian Congo*, part 2, pp. 174–180.
 WINTERBOTTOM, J. M. 1966 *Cimbebasia*, Windhoek, No. 19, p. 30.
 IRWIN, M. P. S. and C. W. BENSON 1966 *Arnoldia* (Rhodesia), vol. ii, 37, pp. 11, 12.
 TRAYLOR, M. A. 1963 *Check List of Angolan Birds*, p. 72.