

REVISIONAL NOTES ON AFRICAN
CHARAXES
(LEPIDOPTERA: NYMPHALIDAE)
PART VI



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ref.

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REVISIONAL NOTES ON AFRICAN CHARAXES (LEPIDOPTERA : NYMPHALIDAE) PART VI

By V. G. L. van SOMEREN

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SYNOPSIS

The species and their subspecies are dealt with, one new subspecies and a new form are described and one new name is given in place of a *nomen oblitum*, and one name has been synonymized.

1. *CHARAXES GUDERIANA* DEWITZ, *C. OPINATUS* HERON AND *C. BLANDA* ROTHSCHILD AND THEIR SUBSPECIES

Charaxes guderiana (Dewitz)

(Pl. 1, figs 1-2, Map 1)

Nymphalis guderiana Dewitz, 1879 : 200.

Charaxes pelias var. *tanganika* Robbe, 1892 : 133 [♀].

MALE. Fore wing length 31-33 mm. Shape falcate. *Upperside*. Ground colour blue-black, shading to strong greenish blue at base of wing. Fore wing with a bold pattern of white spots arranged as follows :—a large triangular spot, base toward costa, at end of cell ; two large elongate spots in discal line 5-6, occasionally a thin white streak at costa ; a series of bluish



white spots in postdiscal line, three in line in subapex 7-5, spot in 5 often small, spot in 3 large, followed by spots in 2-1a of decreasing size, the mark in 1b sometimes faint, that in 1a often missing, the spots from 4-1b set out toward the border ; margin with large spots of decreasing size from 1b to apex. Hind wing ground colour black, shading to greyish on inner fold ; a conspicuous greenish blue bar in the postdiscal line, extending from above the anal angle to 5, where the spot may be vestigial ; submargin with series of blue spots with white centres extending from anal angle to costa ; margin with strong white border, interrupted by black veins, shading to olive-green between tails and at anal angle ; anal angle with two black spots. Tails sharp-pointed, upper 4 mm, lower 6 mm. *Underside*. Fore wing ground colour light purplish grey-brown with a darker brown band crossing the disc ; base of wing with short black bars in the cell and sub-bases of 1b-2 ; a white spot at end of cell ; a series of black curved lines outlined distally with greyish, terminating in the two white spots in the discal line ; postdiscal whitish spots accentuated internally with black ; larger black spots at tornus and space above ; margin with light greyish marks, darker in interspaces at end of veins. Hind wing ground colour similar to fore wing, with slightly more vinaceous tint ; pattern rather suppressed, basal area with a fine black line ; discal area crossed by an irregular brownish band outlined finely in black and white, fading out toward inner fold ; postdiscal row of ochreous olive and maroon lunules complete, extending from costa to above anal angle ; submargin with whitish lunules well-spaced, with orange centres, strong to upper tail then shading to olive at the anal angle ; margin brownish black with white fringe.

FEMALE. Larger than the male, fore wing length 46-48 mm ; outer border usually slightly less falcate. Base of wing to end of cell and discal line 1a to 1b rufescent tawny, sometimes darker ; ground colour of distal portion of wing black with a large orange-ochre spot at end of cell, a smaller one sub-basal in 4, sometimes vestigial or absent ; in the discal line two large quadrate orange spots followed by larger spots of increasing size in 3 to hind margin at 1a ; postdiscal spots of same colour, elongate in subapex, increasing in size and more rounded, extending to 2 ; border of wing with large more rusty lunules, mostly separated by black at vein-ends but tending to be confluent toward apex. Hind wing basal area rufous tawny, sometimes dark, shading to more greyish on the inner fold ; discal orange bar, widest at costa, -68 mm, and tapering towards the inner fold where it is ill-defined, is clear-cut distally, and often with bluish scaling at tapered end, where it meets the broad black border which carries large bluish white lunules increasing in size from upper angle to anal angle ; border with strong marginal orange lunules to upper tail, then bluish olive to anal angle ; edge black ; tails long and rounded at ends, upper 7-8 mm, lower 5-6 mm. *Underside*. Fore wing ground colour drab greyish brown with vinaceous tinge ; strength of pattern variable ; three white-ringed dots in the cell ; a wavy black line crosses the subapex of the cell and goes through sub-base of 2, followed by a crescentic mark sub-basal in 1b. A buffish spot at end of cell ; buffish spot in discal row proximally accentuated by black lines ; postdiscal buffish spots, which are not strong at the apical end, become clear toward the hind angle and defined proximally by black lines and distally by large black marks in 2, double in 1b, shaded distally at tornus with whitish which extends up the submargin as ill-defined greyish lunules ; border rusty ochre. Hind wing ground colour as forewing, slightly paler at base and more greyish on inner fold ; sub-base with two fine black lines, the distal one bordering a darker brown zone which defines the inner edge of the discal band and which is again accentuated by a black line, the distal border of the band irregular, especially where it tapers to the inner fold, where it may be represented by a whitish mark ; the postdiscal zone is slightly darker in ground colour and is traversed by a series of rather ill-defined greyish olive and maroon lunules, strongest above the anal angle ; submargin with a series of greyish white lunules outlined distally in black, and represented as three black dots opposite the tails and a double spot in the anal angle ; border with greyish white lunules with orange centres as far as upper tail, then olive to anal angle ; margin darker grey to blackish, ill-defined.

Charaxes guderiana rabaiensis Poulton

(Pl. 1, figs 3-4, Map 1)

Charaxes guderiana rabaiensis Poulton, 1929 : 482.

The male differs from nominate *guderiana* in being generally darker, with smaller and fewer spots in the fore and hind wings, and in lacking the postdiscal blue bar in the hind wing. The female has a much darker ground colour than nominate female, but the bars on fore and hind wing are paler, creamy ochre instead of orange.

MALE. Fore wing length 30-32 mm ; shape as in nominate race. *Upperside*. Ground colour deep black, with only a slight greenish sheen at base of wing. Spots arranged as in nominate race, the subcostal spots equally large, but the spots in the postdiscal row much smaller, not extending beyond 2, rarely a vestigial spot in 1b, all spots white ; marginal spots generally smaller. Hind wing usually without or with only the faintest trace of a postdiscal green-blue bar, submarginal spots much smaller ; marginal white lunules smaller, those at tails and anal angle with larger orange-bronze spots. Tails shorter. *Underside*. Ground colour very similar to nominate race, but basally paler, and the dark brownish band in fore wing in disco-postdiscal interspaces in more contrast. On the hind wing the postdiscal row of olive and maroon lunules stronger and more distinct.

FEMALE. Fore wing length 35-40 mm. *Upperside*. Fore wing basal area blackish brown usually without any rufous tinge ; pattern of spots as in nominate race, but spot at end of cell often small or vestigial ; discal spots wider, more extended distad especially in 1a-2, but postdiscal spots smaller, all spots creamy ochre ; marginal spots smaller, less defined and paler. Hind wing basal area darker ; discal bar creamy ochre, usually wider ; submarginal spots almost obsolete ; rufous orange border strong to upper tail then olive at tails and anal angle. *Underside*. Much as in nominate race, but fore wing discal band stronger and wider ; tornal spots bolder. On the hind wing the creamy white band rather wider and more distinct ; postdiscal series of olive and maroon lunules more defined and distinct on a paler ground ; submarginal greyish lunules less strong.

This subspecies is common in the savanna and bush-veldt and most plentiful in the *Brachystegia* woodlands, Miombo country. The larvae feed on *Brachystegia* spp. (Leguminosae).

Charaxes opinatus Heron

(Pl. 1, figs 5-8, Map 2)

Charaxes opinatus Heron, 1909 : 156, pl. 5, fig. 7.*Charaxes opinatus* Heron ; Jackson, 1956 : 65, pl. 3, fig. 5 ; pl. 4, fig. 5 ; pl. 6, fig. 4 ; pl. 7, fig. 4.

This is an alpine species which is confined to the montane forests of western Uganda, and the highlands of the Kivu region. The male is one of the commonest *Charaxes* in the high forests of the Kigezi country, coming readily to bait (fermenting bananas) and 'droppings' of carnivores ; but in spite of intensive trapping over several years only two females have been taken, both at Mafuga. Heron compared the species with *Charaxes ethalion*, and drew attention to the similarity of the underside to that of *Charaxes anticlea*.

MALE. Fore wing length 30-32 mm. Shape not falcate. The males exhibit three forms on the upperside. Form 1. *Upperside*. Ground colour rather a dull purplish black ; fore wing



MAP 2. *C. opinatus*

immaculate except for a very fine white fringe on margin. Hind wing ground colour as fore wing, slightly more brownish on inner fold, immaculate, except for a row of submarginal bluish linear marks with white centres, largest at hind angle to upper tail, then decreasing in size to upper angle ; margin with conspicuous brick-red border commencing just short of upper angle and extending to lower tail, then olive at anal angle ; extreme margin black with fine white fringe ; margin only slightly dentate. Tails moderately long and slender, upper 7 mm, lower 5 mm, black-edged, with red central line. Form 2. This is the nominate form. Similar to form 1, but with a row of dull brick-red spots in the postdiscal line on the hind wing extending from above the anal angle at 2, to the upper angle at 6, the lower marks to 4 conjoined, the rest free ; on the margin the brick-red border is more developed. Form 3. Very similar to form 2, but with a conspicuous series of brick-red linear marks in the postdiscal of the fore wing, extending from 1b to 5 following the contour of the outer margin ; the spot in 5, small and set in. Hind wing as in form 2. *Underside.* Ground colour satiny brownish grey, the fore wing crossed by two darker brownish bands, that in sub-base broad, passing through the upper end of the cell where it is 5 mm wide, then tapering very slightly through sub-bases 1b-2, the band is narrowly outlined in black and white. A discal brown band, widest at costa and through 6-5, becomes narrower and irregular through 4-1b. Outer marginal border in curve of the wing brownish, broad at centre but tapering at both apex and tornus. Basal area of cell with three white-ringed black dots. Hind wing ground colour as fore wing, disc of wing crossed by a strong brownish band, in line with that of the fore wing, edged black and white ; the postdiscal band narrow at costa, widens in the middle area and then tapers toward the inner fold above the anal angle, where the edges are more defined ; submargin with a series of linear black marks edged whitish internally and greenish distally, spots double at anal angle ; margin with dull reddish extending from upper angle to lower tail, where the border becomes olive at the anal angle ; extreme edge fringed with reddish.

FEMALE. Fore wing length 35 mm ; apex rather more pointed than male. *Upperside.* Ground colour black ; wing crossed by a white band, divided at costal end into discal and postdiscal spots which become conjoined at 3, forming more quadrate spots and extending to the hind margin in 1a. No spots on margin. Hind wing ground colour black ; disc of wing crossed by a white band, commencing at costa where it is 5 mm wide, is almost parallel-sided to 2, where it tapers toward the inner fold but does not cross it. Submargin with a series of well separated linear white marks, double at anal angle and slightly blue-ringed ; margin with slight rusty lunules from upper angle to upper tail. Tails long and slender, upper 7 mm, lower 5 mm. *Underside.* Fore wing somewhat as in the male, slightly less satiny brown, the ground colour slightly darker ; the discal white band of upperside well represented. Hind wing basal area slightly darker, sub-basal brownish band stronger ; discal white band in strong contrast, offset by a dark postdiscal zone, the white band not crossing the fold but there represented by a greyish mark. Submarginal series of white and black lunules complete ; marginal border as in the male.

Range : This species seems to be confined to the mountains of the western area of Uganda, the Kivu Mountains and is also recorded from the forests N.W. of Lake Tanganyika, no specific locality being given (*Grauer*). It was first taken on the eastern side of the Ruwenzori Mountains, Mubuku Valley, 5000 ft by the BM(NH) Expdt. 1905, and subsequently at the Namwamba Valley, 6500 ft, BM(NH) Expdt. 1934-35. Then there is an apparent break until one reaches the montane forests of the Kigezi area at Mafuga, Rutenga and Ruhiza, 6000-9000 ft. It is also recorded from the Niragongo forest, N.E. Kivu (*T. A. Barnes*).

Charaxes blanda blanda Rothschild

(Pl. 1, figs 9-10, Map 1)

Charaxes blanda Rothschild, 1897 : 507 ; Rothschild & Jordan, 1898 : pl. 6, fig. 3 (*blandus*).

The unique type of this species was taken by Reimer in the Mikindani area of Tanzania, which lies to the north of the mouth of the Ruvuma River on the Tanzania-Mozambique border. It has remained the sole example of the species from that area in spite of intensive search of recent years ; the female is still unknown. This is the more surprising since the subspecies *blanda kenyae* of the Kenya coast has been taken in some numbers.

MALE. Fore wing length 31 mm ; shape rather falcate, though the apex of wing is rather rounded ; margin bluntly dentate. *Upperside.* Fore wing ground colour black, with greenish sheen at base of wing. Pattern not strong, consisting of a small obscure spot at distal upper end of cell ; four blue spots in discal line (no spot in 4), subcostal mark elongate, one below small, spots in 3 and 2 larger and more rounded ; the postdiscal series of spots are bluish white, three subapical in a line followed by spots of increasing size more or less parallel to the margin of the wing, those in 1b and 1a more diffuse and bluish ; margin without marks except for slight white fringe between dentations. Hind wing, basal area black, shading to brownish on inner fold ; disc of wing crossed by a bluish white band, represented at subcosta by a small free spot, the rest conjoined and of increasing width to 2, then tapering toward the inner fold, where it is represented by a whitish triangular mark above the anal angle. Well separated submarginal linear marks pale blue, more purplish at anal angle ; marginal lunules present, commencing above upper tail, greenish blue to golden olive at anal angle. Margin dentate, tails long and thin, pointed, upper 5 mm, lower 6 mm, black with thin median line. *Underside.* Boldly patterned. Fore wing basal area greyish brown, with black spots and lines crossing the cell, one at base, a double spot beyond, followed by an angled line in subapex and a straighter line at apex continued through sub-base 3 with a line sub-base in 2. These lines define the inner edge of a darker brown bar, which in turn is accentuated by a wavy black line where it meets the discal bar ; the latter is silvery grey and rather ill-defined distally, where it borders on a broader dark greyish brown zone. It is fairly straight on its inner border but irregular on outer, where it is crossed by the postdiscal row of silvery grey spots, bordered with blackish in 2 and 1b but ill-defined at upper half, where it merges into the submarginal silvery grey band. The latter is forked at the costal end, fading out at the tornus, where there is a double blackish mark ; the curved outer border of wing dark greyish brown. Hind wing basal area greyish brown to discal silvery white bar, sub-base crossed by a silvery bar outlined in black stopping short of the inner fold ; the narrow discal bar crosses the wing from the costa to inner fold, where it stops short but is represented on the inner fold by a whitish line, the inner edge of the bar accentuated by black. The outer edge merges into a dark brownish zone which carries a series of black and olive lunules extending from costa to above the anal angle ; submargin with a continuous series of whitish lunules, distally edged in black, which forms loops between the tails and at anal angle, these all have lilac centres ; admarginal maroon to upper tail then golden olive, edged white, then black. Margin dentate, tails black with olive mid-line.

Range : The only known locality for this race is Mikindani, north of the mouth of the Ruvuma River on the Tanzania-Mozambique border.

***Charaxes blanda kenyae* Poulton**

(Pl. I, figs 11-12, Map 1)

Charaxes blanda kenyae Poulton, 1926 : 552.

MALE. Fore wing length 31-34 mm ; more falcate than nominate race. *Upperside.* Fore wing, the spot in the cell well developed and blue ; the upper spots in the discal and postdiscal lines as far as 2 larger and white, the spot in 1b of the postdiscal line larger and often extended proximad to discal line, the mark in 1a a long streak, these latter marks strongly blue. Hind wing, the broad disco-postdiscal band brighter iridescent blue ending in whitish toward the inner fold, at the costal end the blue is continuous to the subcosta, and in addition, a discal subcostal spot is present ; the spots on the black border as in the nominate race. *Underside.* Fore wing much as in the nominate race but discal and postdiscal spots more distinct, the dark quadrate brown mark in subapex stronger, and the black surrounding the postdiscal spots in 1b and 2 stronger. Hind wing, the discal silvery bar is more angled on the outside in 5, and the inner fold to as far as the discal bar is distinctly buff ; the postdiscal row of black and olive lunules is more distinct on a paler ground ; the submarginal whitish lunules distinctly more bluish distally ; the admarginal more reddish to upper tail, then golden olive to anal angle, which has the two bluish white spots ; margin as in the nominate race.

FEMALE. Larger than the male, fore wing length 36-37 mm ; shape slightly less falcate. *Upperside.* Fore wing ground colour less intense black and with less greenish at base of wing. Pattern as in the male but all spots larger, the spots in 1a-1b conjoined, all spots bluish white ; some dark scaling indicating the line of junction of the two rows in 2 and 1b, the mark in 1a a long streak. Hind wing discal patch bluish white, more strongly blue on distal border, represented at subcosta by a free white spot in the discal line and conjoined spots in the postdiscal line ; submarginal spots bluish white ; admarginal angled marks somewhat orange above upper tail, then olive to tails but bronzy at anal angle. Tails long with rounded ends, upper 8 mm, lower 7 mm. *Underside.* Pattern essentially similar to that of male, but fore wing ground colour paler and more satiny, the silvery sub-basal area and that of the discal row of spots more distinct ; tornal double black mark strong. On the hind wing the silvery discal bar strong ; the zigzag postdiscal line of lunules stronger and the border of the wing more satiny ; the admarginal reddish lunules above upper tail strong, golden olive at anal angle with greyish blue spots outlined in black, strong.

The female oviposits on *Dalbergia* (Papilionaceae) and also on *Brachystegia* spp. (Caesalpinaceae).

Range : Occurs in the forests north of Mombasa ; the types are from the Sekoke forest, 1921 (*van Someren*), but it is now known to occur not only in the Sekoke-Arabuko forest but also in the forest patch around Gedi and Kilifi.

2. CHARAXES ACHAEMENES FELDER AND ITS SUBSPECIES

A species with a very wide distribution, extending from the Natal area of South Africa to northern Ethiopia and Sudan, then westward to the West Coast. It is found in the savannah country and light woodland, wherever its food plants, *Pterocarpus* spp., are abundant.

Various 'forms' have been described, but no attempt has been made to divide the species into geographical races or subspecies, though there is an obvious difference between the females of the southern group and those of the northern and western areas ; the males however exhibit no great difference in pattern or colour.

In 1904, Suffert described the form (subsp.) *fasciatus*, based on males and females from the Mhonda area of the Morogoro district of Tanzania. In 1925, Joicey & Talbot described a female from the southern Sudan as f. *monticola*. Poulton (1926) refers to these two 'forms' as 'Abs'. Up to this time, the species was represented in most collections mainly by male specimens, this sex being much in evidence throughout its range. Since the introduction of the 'hanging trap' method of capture, large numbers of females have been taken, and these indicate clearly that the species can be divided up into two main groups, *achaemenes* of the southern areas and those of the northern zone, north of the Equator.

The first reference in literature to a recognition of a northern subspecies is that of Carpenter & Jackson, 1950, when they refer to examples of the species from the Suk area of Kenya, trinominally, as *achaemenes monticola* Joicey & Talbot. This is a reference in the text, but there is no formal elevation of the name *monticola* to sub-specific rank.

Having examined a large quantity of material from throughout the range of the species, the following division is submitted. It is supported by ecological factors.

Charaxes achaemenes achaemenes Felder

(Pl. I, figs 13-14, Map 3)

Charaxes achaemenes Felder, 1866 : 446, n. 739, pl. 59, figs 6-7.

MALE. Fore wing length 36-38 mm. Shape rather falcate, but degree of inward curvature of the outer margin at 4-6 variable ; strongly falcate forms commoner in dry areas of distribution. *Upperside.* Fore wing ground colour of basal area to just beyond mid cell and proximal border of discal bar, 1a-1b, brownish olive, shading into the brownish black ground colour of the rest of the wing ; a small creamy spot occasionally present at end of cell, a sub-basal spot in 4. Discal bar pale creamy white : two upper spots, rounded or irregular in shape at about mid-point areas 6-5, no spot in 4, sub-basal spots in 3-2 larger and more rounded on inner side, slightly indented distally, large quadrate mark in 1b, a linear mark in 1a, the bar is widest in 1b : 5-6 mm. Postdiscal series of spots : three in line in sub-apex, the lower small, spot in 4 set in, followed by angular marks in 3-2, in contact with, or slightly separate from discal marks in same areas. Margin with small linear marks in centres from 7 to hind angle, double mark in 1b. Hind wing, brownish olive at base, more greyish on inner fold. Discal creamy white bar clearly defined in upper part at costa and on outer edge to cell it fades out into the greyish inner fold, width 4-6 mm at cell. Distal half of wing black or brownish black, submargin with series of slightly angular or crescentic white marks from upper angle to anal angle, those opposite tails slightly blue-edged distally ; margin with narrow bluish line in tail region, the blue extending into the mid-line of tails which are thin, upper 5-6 mm, lower 7-8 mm long. *Underside.* Fore wing, ground colour brownish grey, slightly paler in the cell, which is crossed by thick chestnut lines, one at base, a short bar at mid point, followed by a curved line and a transverse one at end of cell. The pale whitish discal bar is accentuated proximally with thick chestnut lines in 3 and 2, the latter with an additional sub-basal line, the chestnut line in 1b in the form of a U, the outer arm continuous with the sub-basal line in area above. The division between the discal and postdiscal whitish spots indicated by a dark area in 6-7, then by brownish black marks in 5-2 ; the postdiscal pale spots accentuated distad by black dots becoming larger in 2, and conspicuous in 1b, where the mark is double and bold. The submargin is ornamented by a brownish line interrupted distally by marginal whitish marks which extend from apex to hind angle. Hind wing, ground colour brownish grey, the basal area crossed by heavy chestnut lines at the base, and by finer interrupted ones toward the inner fold and over lower end of

discal zone, the two lower ones crossing at right angles to the fold above the anal angle. Post-discal zone with a series of brownish grey lunules strongly accentuated proximally in black in the upper half but less strongly in 4 to above the anal angle. Submargin with whitish lunules distally accentuated in black, with strong black at base of upper tail, and two black dots in the olive anal angle. Margin with some rufous orange coloration above the upper tail; margin narrowly black with some white scales.

FEMALE. Fore wing length 40–42 mm. Shape similar to that of male or less falcate. *Upperside.* Fore wing, base rufous or rufous chestnut to as far as the discal line in 1a–2 and to the end of the cell; remainder of the wing brownish black; an ochre spot indicated at end of cell, a more distinct spot sub-basal in 4; disco-postdiscal bar as in the male, but spots larger and ochre-orange in colour, the upper spots in 4–5 conjoined by rufous scaling; margin with large orange-ochre, rather quadrate marks from apex to hind angle, the marks twice the size of the intervening black. Width of discal bar in 1b–2, 5–6 mm wide, the conjoined bar



MAP 3

almost parallel-sided up to 3. Hind wing basal area rufous, merging into proximal edge of discal bar in cell area and into the more greyish of the inner fold ; the upper end of the bar slightly paler than fore wing bar ; distal portion of wing black with a well marked series of white lunules edged with bluish opposite the tails in submarginal zone ; marginal border slightly orange toward upper angle, more strongly blue opposite tails, then olive at anal angle. Tails thin and long, upper 8–9 mm, lower 10 mm. *Underside*. Much as in the male, pattern slightly bolder ; the disco-postdiscal and discal bars in hind wing creamy white.

Variation. The males are remarkably constant ; a few may show a slight increase in size of the submarginal spots in the hind wing. Females also hardly vary ; there may be an increase in the degree of blue around the submarginal spots in the hind wing, this colour sometimes tending to encircle the spots of the lower end opposite the tails ; these slight variations seem to occur more often in the low coastal areas of Mozambique. Occasional aberrations exhibiting partial melanism have been recorded. Overlaet figures a gynandromorph from Upemba Park, Katanga.

Range : The type is said to have come from Port Natal (Durban), but probably came from further inland. The species occurs commonly in Transvaal, S. Mozambique, Rhodesia, Zambia, eastern Angola and Katanga ; western and central Tanzania ; also in the savannah country of Kenya around Taveta, Voi and Kibwezi. In south-eastern and eastern Tanzania the ' form ' *fasciatus* Suffert occurs, and is dealt with separately hereafter.

***Charaxes achaemenes* form or var. *fasciatus* Suffert**

(Pl. 2, figs 15–16, Map 3)

Charaxes achaemenes form/subspecies *fasciatus* Suffert, 1904 : 123.

Charaxes achaemenes f. ab. *fasciatus* Suffert ; Poulton, 1926 : 573.

Special mention is made of this variation since it appears to be dominant in eastern parts of Tanzania, and is probably a climatic variant.

MALE. *Upperside*. Fore wing, ground colour rather darker than nominate race, the white bar sometimes very narrow in 1a–1b, but variable. The marginal white spots often larger. On the hind wing the submarginal white spots are large and often blue-ringed, especially the lower ones opposite the tails ; the marginal border usually more strongly marked, sometimes extending beyond the upper tail. *Underside*. Ground colour darker.

FEMALE. Fore wing length 42–43 mm. *Upperside*. Fore wing, ground colour darker, especially at base. The disco-postdiscal bar tending to be wider in 1a–3 ; the hind wing bar paler than that of fore wing, strongly encroached upon by the basal rufous colour. Submarginal white spots larger with strong blue surround, the blue scaling more often extending inward over the distal portion of the black band ; marginal border orange in upper portion, bluish white in region of tails, olive at anal angle. *Underside*. Ground colour often paler.

Range : Tanzania. From Lindi to Songea and north to the Morogoro area at Mhondo and (?) Turiani.

***Charaxes achaemenes monticola* Joicey & Talbot**

(Pl. 2, figs 17–12, Map 3)

Charaxes achaemenes f. *monticola* Joicey & Talbot, 1925 : 645.

Charaxes achaemenes ab. ♀ *monticola* Joicey & Talbot ; Poulton, 1926 : 573.

Charaxes achaemenes monticola Joicey & Talbot ; Carpenter & Jackson, 1950. [Referred to trinominally in text, but no formal elevation of status.]

Charaxes achaemenes Felder ; Carpenter, 1935 : 359 . [Referred to binominally.]

Charaxes achaemenes Felder ; Wilson, 1950 : 231.

C. achaemenes of the northern regions, north of the Equator, from north of Lake Victoria to Ethiopia and Sudan represents an ecological aggregate sufficiently distinct from nominate southern *achaemenes*, deserving of recognition, as a good subspecies. Representatives of this aggregate in the more western areas of the Central African Republic, N. Cameroons and N.E. Nigeria differ slightly and are referred to separately.

Males of *monticola* are very stable, but females are rather variable within the restrictions which separate them from nominate *achaemenes*.

MALE. Fore wing length 35–36 mm ; shape usually rather falcate. *Upperside*. Fore wing pattern as in the nominate race, the junction of the olive base with the black beyond, more strongly greenish ; the disco-postdiscal bar rather narrow as a rule, seldom exceeding 5 mm in 1b. The marginal spots very small. On the hind wing the submarginal spots are usually small with little or no blue distally. Upper tails short, 4–5 mm, lower 8 mm. *Underside*. Pattern as in nominate race, but distal portions of both wings more brownish ; the postdiscal lunules stronger.

FEMALE. Fore wing length 41–45 mm ; shape less falcate than in the male. *Upperside*. Fore wing pattern generally similar to that of the nominate race but spots rather more restricted, the marginal spots smaller.

Three forms occur : Form 1. The ground colour is very similar to that of the male ; the fore wing disco-postdiscal bar creamy white except for the spots in the postdiscal line, which are slightly tinged ochreous ; the marginal spots small and ochreous. Hind wing black band broad, the submarginal spots moderately large. This form is thus somewhat ' male-like ', and is exceptional. Wing length 41 mm.

Form 2. Ground colour of fore wing as in form 1, but disco-postdiscal spots orange-ochre except for lower ones in 1b & 1a, which are creamy white. Marginal spots small, ochre-orange. This is the dominant form and agrees with the type. (Pl. 2, fig. 19.)

Form 3. The base of the fore wing rufous chestnut ; the spot at end of cell more distinct ; the disco-postdiscal bar more orange-ochre to hind margin ; the marginal spots larger. The bar on the hind wing ochreous ; the submarginal spots larger. Undersides in all three forms much as in the male, but pattern bolder. (Pl. 2, fig. 18.)

Range : Kenya : West of Rift Valley, at Baringo, Suk and Turkana. Uganda : Karamoja ; Nile Province, Madi, Metu. Lake Albert area at Masindi and Budongo area outside forest. Sudan : southern and mid Sudan. Ethiopia : in the south-western regions.

Charaxes achaemenes f. *erythraea* Storace

(Pl. 2, fig. 22, Map 3)

Charaxes achaemenes f. *erythraea* Storace, 1948 : 132–41.

Charaxes achaemenes Felder ; Wilson, 1950 : 231.

This ' form ' of uncertain status was described from a single male taken at Asmara, Eritrea on the Red Sea coast. It was described as being ' a little smaller than the nominate form. Dorsal pubescence of the thorax the same colour as the adjoining parts of the wings ; otherwise colour and pattern of body as in typical form '. There

is nothing in the detailed description which follows to distinguish it from males from further south in S. Sudan. i.e. *monticola*. Storace compared it with males from S. Congo (Katanga).

Butler records *achaemenes* from Atbara and Kandera on the Nile in northern Sudan, and Wilson (1950) notes the species as common in 'Central Sudan' around Khartoum.

The female has not been recorded so far as I know. The status of this taxon requires re-investigation.

Charaxes achaemenes* cline *monticola* × *atlantica

(Map 3)

Specimens from the northern Cameroons were originally associated with *monticola* but examination of material from the Central African Republic west to northern Cameroons and eastern Nigeria suggests that this aggregate really represents a cline between typical *monticola* and the more western race of Senegal, Gambia etc.

MALE. Fore wing length 40 mm. *Upperside*. Coloration and pattern similar to *monticola*. *Underside*. Ground colour paler throughout, but pattern similar.

FEMALE. Variable. Form 1. Very similar to Form 2 of *monticola*. *Upperside*. The disco-postdiscal bar similar in colour but rather broader throughout, orange-ochre to 2, then creamy to hind margin. *Underside*. Very similar to *monticola* but paler.

Form 2. *Upperside*. Somewhat similar to Form 3 of *monticola* but fore wing disco-postdiscal bar broader and rich rufous orange; the marginal spots larger. On the hind wing the basal area more rufous, the black band less wide, the submarginal spots bolder, those in the lower half with strong blue distally. Marginal border orange at upper half, then white with strong blue scaling to anal angle. *Underside*. As in Form 1.

Mr R. G. T. St Leger suggests that the forms are 'climatic', Form 1 being found in the Enugu area and the rufous orange form further north-west near the border between east and north Nigeria, but in the Cameroons they occur together.

Range : Central African Republic, northern Cameroons and eastern Nigeria.

***Charaxes achaemenes atlantica* ssp. n.**

(Pl. 2, figs 20-21, Map 3)

Charaxes jocaste Butler, 1965 : 274 footnote. [Application submitted for the proposed suppression of this name under the plenary powers of the International Commission on Zoological Nomenclature. See van Someren, 1967 : 255.]

MALE. Fore wing length 35-37 mm. *Upperside*. Pattern rather similar to those of the Cameroon area but disco-postdiscal bar broader, the upper spots larger. The submarginal spots in the hind wing tending to be small; the marginal border more greenish blue. *Underside*. Discal areas of both wings paler, more whitish.

FEMALE. Fore wing length 43 mm. Form 1. *Upperside*. Ground colour at base brownish olive to mid cell and inner border of discal bar. Spots at end of cell distinct; disco-postdiscal bar broader than in *monticola* or Cameroon cline, all spots creamy ochre, spots in 6-4 conjoined by rays; marginal spots large, creamy ochre. Hind wing bar broader, creamy white, extending beyond the cell area toward inner fold where it is bluish white, brownish grey beyond. Black

band broad ; submarginal spots large, white with blue surround. Tails long, more robust, 10–11 mm. *Underside*. Ground colour paler but row of dark spots in hind wing well marked.

Form 2. *Upperside*. Differs by being slightly smaller, with more rufous at base of fore wing ; the bars in fore and hind wing broad as in Form 1, the spots in fore wing orange-ochre to 2, then whitish to hind margin. Hind wing bar creamy. This corresponds to Form 1 of the intermediate 'cline'.

Holotype male. SENEGAL : 'jocaste Bdv.', 'Charaxes jocaste, 5. ♂ Sene'.

Allotype female. SENEGAL : 'jocaste Bdv.', 'Charaxes jocaste, 3. ♀ Sene'.

Range : West Africa: Senegal, Gambia, Guinea and Ivory Coast.

SYSTEMATIC LIST

Charaxes achaemenes Felder

Charaxes achaemenes achaemenes Felder, 1866. Type locality : 'Natal'.

Range : South Africa ; N. Natal, Delagoa Bay ; Mozambique ; Transvaal ; Botswana ; eastern S. W. Africa. Central Africa ; Rhodesia, Zambia, Manicaland, Malawi, Katanga, eastern Angola. Eastern Africa ; southern Tanzania to east side of Lake Tanganyika, central Tanzania to south of Lake Victoria. Kenya ; coast and savannah country of hinterland to Ukambani, Voi, Kibwezi. (Small form).

Charaxes achaemenes f. *fasciatus* Suffert, 1904. S.E. Tanzania ; at Mondo, Morogoro Distr.

Charaxes achaemenes monticola Joicey & Talbot, 1925. Type locality, S. Sudan.

Range : Kenya ; west of the Rift Valley, Baringo, Suk, Turkana. Uganda ; Karamoja, Nile Province, Lake Albert area, Masindi, Budongo. Ethiopia ; S.W. area. Sudan ; southern Sudan.

Charaxes achaemenes f. *erythraea* Storace, 1948. Type locality: Asmara, Red Sea. Doubtfully distinct from *monticola*.

Charaxes achaemenes cline *monticola*.

Range : Northern Central African Republic ; N. Cameroons ; Eastern Nigeria.

Charaxes achaemenes atlantica ssp. n., n. n. for 'jocaste' Butler, 1896. *Nomen oblitum*. Type locality : Senegal.

Range : West Africa ; Senegal, Guinea, northern Ivory Coast, N. Ghana.

3. *CHARAXES PHOEBUS* BUTLER, *C. BRUTUS* CRAMER AND ITS SUBSPECIES AND *C. ANDARA* WARD.

Charaxes phoebus Butler

(Pl. 3, figs 23–24)

Charaxes phoebus Butler, 1865 : 625.

The upperside of the male bears a superficial resemblance to *Charaxes druceanus*, but the underside is totally different.

MALE. Fore wing length 41–44 mm. *Upperside.* Fore wing, ground colour of basal area rufous tawny; discal band more orange; distal border of wing black; there is a short black narrow bar in subcostal area before the end of the cell, followed by larger black bars, basal in 4, 5, 6; then an irregular black bar beyond on inner border of discal orange band in 6–5 followed by a larger mark in 4 and larger rounded marks in 3–2 with a smaller spot in 1b; a triangular black subcostal mark, apex down, separates the 'fork' of the rufous orange band at its costal end and is represented in 5–2 by smaller spots indicating the line of fusion between the discal and postdiscal series; width of band at hind margin 10 mm. Margin of wing with strong orange spots, double in 1b. Hind wing, basal area slightly duller rufous, shading to dull rusty on the inner fold; discal band, more orange, 10 mm wide at costa, is uniform in width to cell area, then tapers toward the inner fold above the anal angle. It is ill-defined on inner edge, clearly defined on outer margin where it is bordered by a black band, tapering at both ends but is rounded at the anal lobe which carries one elongate or two mauve spots. Margin with strong tawny orange lunules separated only by black veins; edge black with slight white fringe within the bluntly dentate margin; tails short, robust, sharply pointed, at 2 & 4, 4–5 mm long. *Underside.* Fore wing, basal area rufescent chestnut, more olive-russet on outer border. Discal band rusty ochre, paler at hind end, the 'forked' upper portions accentuated by black lines with buff surround; the subcostal bars narrowly black with silvery white outlines, the bars in sub-bases of 1b–3 more strongly black, outlined whitish. The postdiscal series of black spots, narrowly edged bluish grey distally, complete, the spots increasing in size from apex to the double mark at the tornus; edge of wing slightly orange with a series of black marks at ends of veins, interrupted by whitish ochre in between. Hind wing, ground colour in basal triangle rufescent chestnut to discal line where the band is hardly indicated, but is crossed by transverse buff lines along the veins, offset proximally by a series of short black lines strongly edged with white distally and extending to the inner fold above the anal angle; the basal area crossed by three white-edged fine black lines; the three lines on the inner fold above the anal angle more or less parallel. The border of the wing more orange-olive; edge black with white fringe.

FEMALE. Larger than the male, fore wing length 46–48 mm, with a straighter outer border than the male. *Upperside.* Fore wing, basal area as in the male, the black marks similarly placed, but discal band paler creamy yellow from hind margin to 2–3 proximally, shading to orange-rufous distally, the 'fork' of the band rufous orange with paler centres; border black with large rufous orange marks on margin. Hind wing, extreme basal triangle rufous tawny, shading to greyish ochre on inner fold; discal band yellowish creamy, not sharply defined on inner border and distally shading to tawny orange at the broad black border, which carries a black ocellus with lilac spots at the anal angle. Margin with conspicuous orange lunules; edge black, slightly dentate; tails on 2 & 4 black, upper 6 mm, lower 4–5 mm. *Underside.* Ground colour as in the male but duller, though bars and spots are strong; discal band buff-white and clear-cut and extending through the inner fold; the postdiscal and submarginal alternate black and whitish marks on a duller more olive ground are well represented, the white marks of the two rows connected by white streaks. Margin as in the male.

The female thus bears a resemblance to that of *Ch. druceanus teita* on the upper side.

This species was reared in some numbers by the late Malcolm Berkeley, from eggs and larvae found on *Bersama abyssinicus* (Melianthaceae) in the Adola district of southern Ethiopia.

Range: This species is somewhat restricted, being confined to the north-west, west and southern districts of Ethiopia. It is recorded from Shoa: Mahal-Uong, Axelena, Felekalek and Scioatalit, where it was originally discovered by Antinori in

1865 ; it also occurs at Youbdo in south-west Ethiopia where it was common (*Ungemach*) and was plentiful at Adola in southern Ethiopia.

Charaxes brutus Cramer

The species *Charaxes brutus* ranges through a large part of Africa, from Ethiopia to the Atlantic coast of Senegal and Sierra Leone, then south to Angola. On the eastern side, it extends to the Natal area of South Africa. It has evolved into several distinct subspecies, but where two of these converge and tend to overlap, there is evidence of intergradation ; thus *brutus brutus* intergrades with *brutus angustus* in the mid Nigerian area, and *angustus* intergrades to an even greater extent with *alcyone* in the eastern Rift Valley ; and *alcyone* with *natalensis* in Tanzania. There is evidence to suggest that *junius* meets *somalicus* in the south-west of Ethiopia. It is a forest, woodland and heavy savanna species, and since suitable habitats exist in almost continuous sequence throughout its range, clear-cut ecological barriers hardly exist. The species has extended to some of the islands in the Gulf of Guinea, and also to the islands off the east coast.

The insular race *antiquus* Joicey & Talbot of São Thomé clearly exhibits relationship to mainland *brutus*, but that of Fernando Po has not diverged from the mainland race. On the other hand, the insect found in Madagascar, *andara* Ward, has a very distinctive female which has resulted from complete separation over millions of years. It should, in my opinion, be considered a distinct species. The fact that the genitalia of *andara* is very similar to that of *brutus* is of little significance, for many well-defined species of *Charaxes* have almost identical genitalia.

Rothschild (1900) recognized five subspecies and since that date one more insular race has been added ; several forms have been described. I propose to deal with each in geographical sequence.

Charaxes brutus brutus Cramer

(Pl. 3, figs 25-26, Map 4)

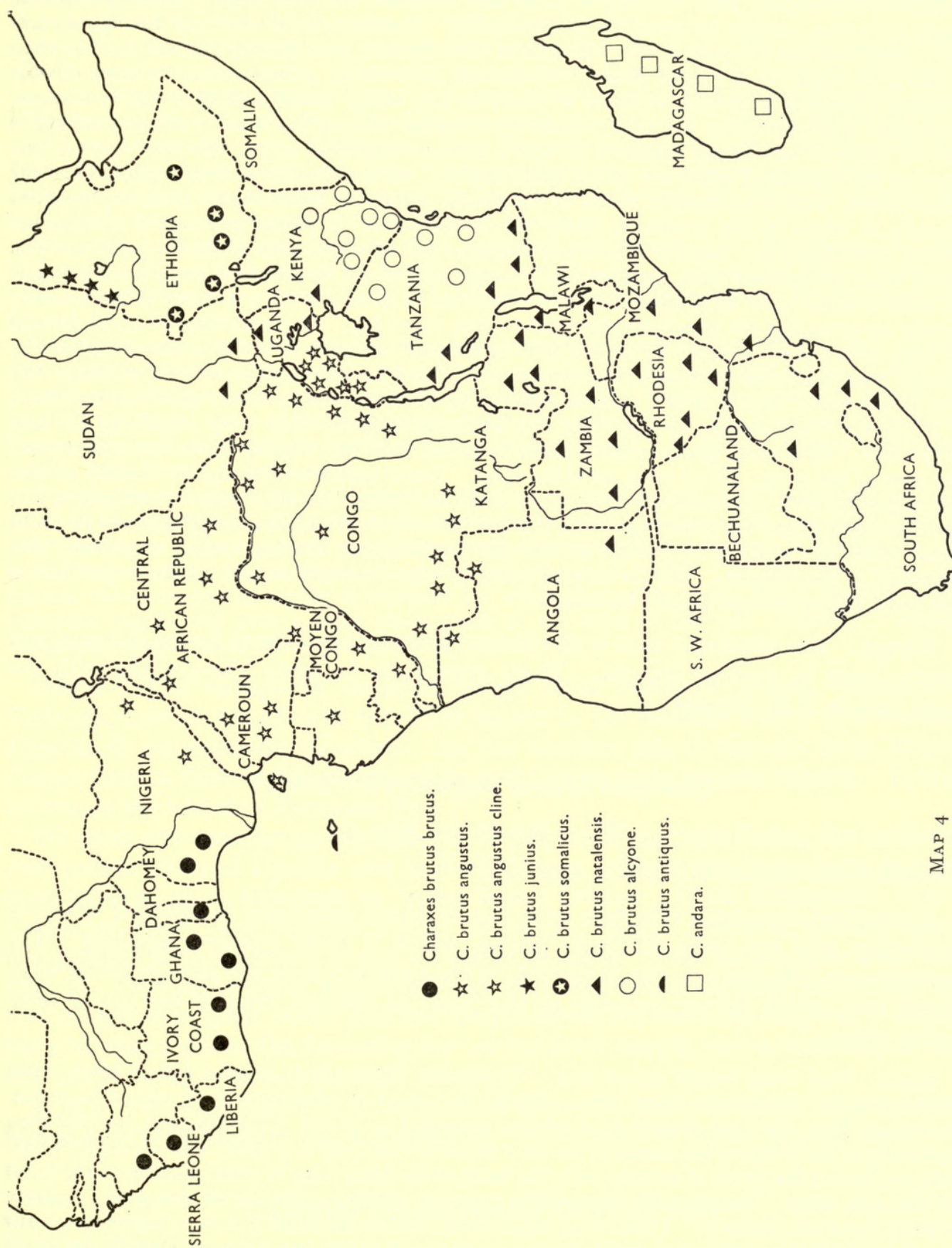
Papilio eques Achivus brutus Cramer, 1779 : 82, pl. 241. Locality : Cape d. g. Hoffn. [Patria falsa.].

Papilio Eques Achivus cajus Jablonsky & Herbst, 1790 : 65. Locality : Cap. d. g. Hoffn. [Patria falsa.].

For full synonymy *vide* Rothschild, 1900 : 423. Corrected type-locality : Guinea-Sierra Leone.

This is a black species with white bands crossing both wings, the hind portion of the fore wing band coinciding with the costal portion of the hind wing band.

MALE. Fore wing length 42-44 mm. *Upperside*. Fore wing, ground colour black, with slight greeny sheen toward base. Disc of wing crossed by a white or slightly yellowish creamy band, widest at the hind margin at 1a-1b, 8-9 mm wide and contiguous ; spots from 2-7 of decreasing size and well separated so that the band appears broken and tapers toward the costa. Margin with small internervular white dots or lines, distinct or vestigial. Hind wing, ground colour as fore, slightly more greyish toward inner fold, which shades to rufous along the inner



MAP 4

edge and above the anal angle. Disc of wing crossed by a white band, widest at costa, the band almost parallel-sided, then tapering at inner fold to above the anal angle. Average width of band 8–10 mm, usually bordered by bluish scaling. Tornus or anal lobe with two bluish dots and sometimes one in space above. Margin of wing serrate, with sharply pointed tails at veins 2 and 4, of about equal length, 5 mm. *Underside.* Fore wing, ground colour at bases of wing chestnut, shading to greyish at bases of 1a–1b in fore wing. Basal half of costal vein white. Subcostal area, including the cell, crossed by irregular shaped black bars boldly outlined in silvery white; two similar marks in 1b and 2 and one sub-basal in 3; the outer spots accentuating the graduated white bar on its inner border. Ground colour on distal portion of wing olive-brown, with a continuous series of somewhat triangular black marks narrowly outlined distally in white in the postdiscal line; the black marks at tornus with more conspicuous bluish white margins; margin with black marks at end of veins, with white fringe in between. Hind wing ornamented with angular black marks, long ovoid in subcostal area, more elongate to linear toward inner fold, all marks boldly outlined in silvery white; a series of black marks boldly accentuating the proximal edge of the white discal bar. Ground colour of distal portion of wing olive-brown, crossed by an intricate pattern of two rows of black marks connected by silvery blue criss-cross lines on a chestnut ground; spot at anal angle more solidly black, with two bluish white central dots; margin with strong black lunules narrowly bluish internally.

FEMALE. Very similar to the male but generally larger; fore wing length 45–47 mm. *Upperside.* Fore wing, ground colour black as in the male but slightly more brownish toward the base of the wing. Hind wing, as in the male. Discal bars white or slightly creamy yellowish, in general form conforming to that of the male, but bolder, the hind wing bar extending into the inner fold above the anal angle. In this sex also, the fore and hind wing bars are of about equal width at the point of overlap, so that the bands appear continuous and unbroken. (Cf. *angustus*, in this respect.) Border of wing black to edge; margin serrate; tails longer than in the male, the upper one usually the longer.

Range: The nominate race is distributed from Guinea-Sierra Leone, Liberia and Ivory Coast to western Nigeria. There appears to be some intergrading with the next race in N.E. Nigeria.

Charaxes brutus angustus Rothschild

(Pl. 3, figs 27–30, Map 4)

Charaxes brutus angustus Rothschild, 1900 : 432.

Rothschild compared this race with the southern *natalensis* Staudinger which is confusing, and not with nominate *brutus*, which it more closely resembles. The conspicuous difference on the upper side is the narrowness of the fore and hind wing discal bars which do not coincide at the point of overlap, that of the upper wing being offset.

MALE. Fore wing length 43–46 mm. *Upperside.* Fore wing, ground colour black, with slight greenish sheen over basal area. Discal bar white or slightly tinged yellowish cream, extending from the hind margin to subcosta, arranged as in the nominate race, but differing markedly in the width of the marks in 1a–1b–2 which are reduced to 3–4 mm wide on the proximal side, so that at the point of overlap with the band of the hind wing is offset distally to the band of the fore wing. Margin with very slight trace of whitish spots, or immaculate; margin slightly incurved above 3. Hind wing band white, widest at costa, 5–6 mm, tapering toward the inner fold above the anal angle, but not crossing it; the band almost straight on inner border but slightly curved on outer. Basal area greenish black shading to brownish on inner fold. Anal lobe with two blue dots, a blue spot in area above, and a trace of one beyond,

opposite upper tail ; margin with narrow white interspaces present or absent. Margin serrate ; tails 4 mm long, of equal length, or lower one slightly shorter. *Underside*. Colour and pattern as in nominate race but slightly paler, the white bars narrower.

FEMALE. Fore wing length 46–52 mm, thus larger than the male ; the outer margin only slightly incurved. *Upperside*. Fore wing, ground colour as in the male, but basal areas more greenish brown ; bands of wings similar in shape but bolder, bar of hind wing extending through the inner fold above anal angle. Two blue spots in anal lobe larger ; margin serrate and tails well formed as in the male. *Underside*. As in the male, but ground colour slightly paler and the submarginal black marks and those in the postdiscal row showing up more clearly.

Specimens from the island of Fernando Po are similar in pattern and colour to those of the mainland ; they may be slightly larger, but not always so.

Variations : Two aberrations have been described and named, viz.—*fractifascia* Le Cerf, 1923 : 365. Gabon ; *nigrescens* Le Moulton, 1933 : 17, T. 4, fig. 9. Etoumbe, Moyen Congo.

Two aberrations taken by Mr T. H. E. Jackson's African collector in the Moyen Congo are figured (Pl. 3, figs 29–30).

Fig. 29 depicts a male with the fore wing bar almost completely obliterated by black scaling, and barely indicated. The hind wing however is normal. On the underside the usual chestnut ground colour of the basal area is replaced by creamy white ; the margin border is greyish, so that the postdiscal series of black triangular spots are conspicuous. The hind wing is however more or less normal though the chestnut ground colour is paler. Locality : French Equatorial Africa, Kata Forest, Ouessou, vii.59.

Fig. 30 depicts a male with the usual white bars of the fore and hind wings reduced to a series of dyslegnic spots, those of the fore wing not reaching the subcosta, and only slightly indicated in 1a. The underside exhibits a strong development of melanism in the basal 2/3rd of the fore wing up to the discal line which is reduced in width. On the hind wing the normal chestnut ground colour is replaced by white, but with heavy black streaks in the subcostal region and with a large black mark at the base of the cell. Locality : French Equatorial Africa, Kata Forest, Ouessou, viii. 59.

Range : The subspecies *angustus* ranges from northern Angola, Kasai and Katanga, central Congo and the Kivu region to the Semliki Valley and western Uganda in an eastward direction ; on the western side it extends from Moyen Congo, Gabon, Central African Republic and Cameroon to eastern Nigeria. It also occurs on the island of Fernando Po.

We must now consider an aggregate occurring in the southern Sudan, the northern and eastern areas of Uganda and in N.W. Kenya. These specimens have usually been referred to in literature as *brutus brutus* Cramer. (*Vide* Rothschild, 1900 ; Carpenter, 1928 ; van Someren, 1928 ; Stoneham, 1964.) However, this aggregate is separated from nominate *brutus* by *brutus angustus*. (*Vide* distribution *ante*, and Map 4.) They are variable, some exhibiting the characters of *angustus*, i.e. the narrow fore wing bars in areas 1a–1b, and the comparatively narrow hind wing bar ; others have an expansion of the fore wing bar on the hind margin, and a widening of the bar in the costal region of the hind wing.

In my view, they represent a transitional aggregate between *brutus angustus* and *brutus alcyone* Stoneham, and are unstable. (*Vide* note on *brutus alcyone*, post.)

Charaxes brutus junius Oberthür 1883

(Pl. 3, fig. 31. Pl. 4, fig. 32, Map 4)

Charaxes brutus var. *junius* Oberthür, 1880 : 166.

Charaxes junius Oberthür, 1883 : 728.

Charaxes junius f. *ragazzi* Storace, 1948 : 132.

Characterized by the very narrow creamy yellowish white bars of fore and hind wings and strong marginal spots on both fore and hind wings.

MALE. Fore wing length 42–44 mm. *Upperside*. Fore wing, ground colour black, with slight olive-brown at base of fore wing, more brownish on hind wing, shading to greyish brown on inner fold. Fore wing with comparatively narrow yellowish cream bar crossing the wing from about mid hind margin to subcosta ; widest at hind margin, 6 mm, the spots gradually decreasing in size ; the marks in 1a–1b separated by black vein ; the general arrangement of the spots similar to that of *angustus*. Margin of wing with conspicuous ochreous spots between veins. Hind wing, bar very slightly wider than that of fore at costa, of even width to 4, then narrowing slightly toward inner fold and crossing this above anal angle. Anal lobe with two blue dots. Margin of wing only slightly serrate, more dentate. Tails robust and sharply pointed, 5–4 mm long. *Underside*. The basic pattern similar to that of other *brutus* ssp., but the ground colour is less deep chestnut and the distal portion of the fore wing more brownish, less olive ; the bars are less strongly black-centred ; the postdiscal black spots less intense black except toward the hind angle. The discal band is creamy ; margin of wing distinctly ochreous, broken by intermediate black spots. On the hind wing the basal bars are mainly chestnut, thinly outlined in silvery white ; the discal bar creamy, while the postdiscal black is limited, the upper marks are more arrow-shaped, but the two toward the anal angle are distinct black rings with bluish ocelli. The marginal border is strongly ochreous, black edged with white internervular fringe.

FEMALE. Very similar to the male but much larger, fore wing length 46–48 mm. *Upperside*. Ground colour rather browner than male especially at base of wings and along the inner fold of the hind wing. Creamy discal bands on fore and hind wing broader throughout ; marginal spots on fore wing distinct. Hind wing ochreous lunules well marked. *Underside*. As in the male, but pattern bolder.

I have not been able to examine the form *ragazzi* Storace.

Range : This race is apparently limited to the Shoa districts of western Ethiopia, and is recorded from Sciotalit and Feleklek (Antinori).

Charaxes brutus somalicus Rothschild

(Pl. 4, fig. 33, Map 4)

Charaxes brutus somalicus Rothschild, 1900 : 432.

Characterized by the very narrow discal bars of both wings which are yellowish cream to ochre. Spots on margin of both wings small.

MALE. Fore wing length 40–43 mm. *Upperside*. Fore wing, ground colour black with slight purplish brown sheen on bases of wings, more greyish on inner fold. The fore wing band yellow-creamy white, very narrow throughout, the spots in 1a–1b not more than 3–4 mm wide ; the remaining spots gradually reduced in size as the band tapers toward the costa. Marginal spots small but clear. Hind wing, the band is widest at costa, 4 mm, then tapers to 2 mm at inner fold where it is slightly ochreous ; the mark at the costa set in so that the hind wing band is 'stepped' and not in line with the hind marginal spot of the fore wing. The margin carries dark ochreous lunules, sometimes obscured ; two blue spots present in the anal angle ; margin of wing slightly dentate. Tails short, robust, 3–4 mm long. *Underside*. Fore wing, ground colour deep chestnut-brown at basal 2/3rds, the distal portion of the wing brownish olive ; the bars and spots of the fore wing greyish rather than black, with narrow black and white

edges. The discal band creamy ; the postdiscal triangular black spots narrowly edged greyish, those at the tornus with more greyish distally ; margin with ochreous spots, slightly blackish in between. Hind wing basal bars and lines chestnut finely outlined in white ; discal creamy bars strong and clear-cut. Distal portion of wing paler chestnut ; the postdiscal series of black spots distinct, narrowly edged greyish distally ; the black spot with double purplish blue dots in anal angle ringed with deep ochreous which is continued up the margin ; edge black.

FEMALE. I have not been able to examine this sex, and can find no description.

Range : Found mainly in the southern districts of Ethiopia, ranging from the Harar highlands in the east to Adola in the south, then crossing the Rift to Youbdo in the west. Carpenter reports some evidence of transition toward '*brutus*' [*sic*] in the Didinga Mts region, but this needs clarification.

Charaxes brutus alcyone Stoneham

(Pl. 4, figs 34-35, Map 4)

Charaxes brutus alcyone Stoneham, 1943 : 3.

Charaxes brutus natalensis van Someren & Rogers, 1928 [*nec* Staudinger & Schatz, 1886].

Very similar to *natalensis* Staudinger & Schatz, with which it has hitherto been associated. It is of interest to note that when Rothschild wrote his *Charaxes* Monograph in 1900, he records the statement, under the heading *brutus natalensis*, 'not yet recorded from the coast districts of British East Africa.' He, however, records this race from Kilimanjaro and the coastal belt of German East Africa (now Tanzania). Specimens from Nandi, N.W. Kenya, are stated to agree better with nominate *brutus* than with *angustus*. I have already pointed out that these insects are not typical *brutus* but are a mixed aggregate. We now know that a race of *brutus* does extend all along the Kenya coast and inland to the Kikuyu country east of the Rift Valley and that west of the Rift we find a mixed aggregate or cline, largely tending toward *angustus*. The coastal insect has received the name *alcyone* Stoneham, and though the characters of the race are not outstandingly different from those of *natalensis*, they are sufficient to warrant recognition.

MALE. Fore wing length 40 mm (average). *Upperside*. Differs from *natalensis* mainly in the formation of the creamy white bar of the fore wing, which is straighter on the distal border, less strongly curved, the three upper spots being in line ; the mark in area 2 is larger, thus the band does not taper so rapidly from this point to the costa. The marginal white spots usually larger and more distinct. The white band on the hind wing slightly wider, being extended basad ; the margin with more conspicuous white triangles or lunules.

FEMALE. The same characters as those of the male are present, to a greater degree, in the female, the hind wing band being very wide and expanded proximad. *Underside*. Very similar to that of *natalensis*, the white bands stronger generally, while the distal portion of the fore wing ground colour is paler, the angular marks less extended.

Range : The coastal belt of Kenya and hinterland, extending inland to the eastern side of the Rift Valley ; also in the adjacent coast of Tanzania.

***Charaxes brutus natalensis* Staudinger & Schatz**

(Pl. 4, figs 36–37, Map 4)

Charaxes brutus var. *natalensis* Staudinger & Schatz, 1886 : 169.*Charaxes brutus* var. Butler, 1865 : 625.

MALE. Fore wing length 40–41 mm. FEMALE. Fore wing length 45 mm. *Upperside*. This race is characterized in both sexes by the white fore wing bar, which tapers from the hind margin to 2, then more rapidly up to subcosta. Margin with small ochreous spots on veins in fore wing and some indication of white dashes in the serrations of the hind wing. Hind wing white bar with bluish borders wider than in *brutus brutus*. *Underside*. Ground colour slightly paler chestnut in basal areas but black, white-outlined marks strongly developed ; white bars strong ; submarginal triangular marks well developed in fore wing ; those of the hind wing more in the form of irregular ocelli ; marginal border broad, edge black ; margin of hind wing strongly serrate.

Range : From the Natal district of South Africa, northward through Rhodesia, Zambia, Malawi and northern Mozambique to Tanzania.

Biological note. The early stages of most of the races have been recorded. Numerous food plants are recorded and these include : Euphorbiaceae, *Fluggea microcarpa* ; Tiliaceae, *Grewia forbesi* & *Grewia* sp. ; Melanthaceae, *Bersama* sp. ; Meliaceae, *Turraea* sp., *Ekebergia reupelliana*, *Melia volkensii*, *Melia azarach* ; Sapindaceae, *Philodiscus zambesiacus*. The great variety of food plants accounts for the wide distribution of the species. It is of interest to note that although eggs are freely laid on *Melia azarach* (Tiliaceae) (an exotic, often called Cape or Persian Lilac), the larvae when hatched, refuse to feed and die ; they can however be raised on this plant in captivity.

On three occasions I have found a female *brutus* 'in cop' with a male *candiope* in a 'charaxes trap' ! One such female was caged and she laid a batch of eggs which all produced normal *brutus*!

***Charaxes brutus antiquus* Joicey & Talbot**

(Pl. 4, figs 38–39, Map 4)

Charaxes brutus antiquus Joicey & Talbot, 1926 : 1–5.

Characterized by the thick tails in both sexes and the presence of a series of pale lunules along the admarginal of the hind wing.

MALE. Fore wing length 42 mm. *Upperside*. Ground colour black with a slight greeny sheen at base of fore wing, more greenish on hind wing ; the inner fold of the hind wing more greyish. Fore wing, creamy white bar widest at the hind margin, 6 mm in 1a, the inner end of the mark oblique, the remaining marks decreasing in size rather rapidly toward the costa ; margin of wing with small white spots. Hind wing, discal bar extending from the costa, where it is 7 mm wide, and slightly inset to the mark on the fore wing in 1a ; the bar is of about equal width or slightly expanded over the cell area, then tapers to the inner fold above the anal angle ; the bar is slightly greenish on its borders. Admarginal of wing with whitish lunules which are rather obscured in the region of the tails ; margin black and slightly dentate, but tails are thick and robust, upper 6 mm, lower 5 mm and more pointed ; anal lobe with double bluish dots. *Underside*. Fore wing, ground colour chestnut at base, rather more ferruginous on distal

portion of wing. Bars and spots in basal area black with strong white edging, the spots bordering the white discal band stronger black. Postdiscal triangular black marks lightly bordered with greyish white, the marks at the tornus strong ; margin with alternating black and white spots. Hind wing, basal area chestnut ground colour with silvery white marks enclosing chestnut, but smaller spots adjoining the discal bar, blacker. Discal bar silvery white with irregular outer border offset by a zigzag line of strong chestnut turning to black above the anal angle. Postdiscal row of chestnut triangles, edged greyish internally, is offset by a row of black lunules which form ocelli at the anal angle. Admargin with a more orangy line, edges whitish distally, and accentuated by the black margin. Tails black.

FEMALE. Fore wing length 50 mm. *Upperside.* Pattern of wing generally similar to that of the male but ground colour rather more brownish black. Fore wing creamy bar similar to that of male but bolder, the mark on hind margin 1a 11 mm wide. Margin with rather obscure white internervular spots, more distinct toward the apex of the wing. Hind wing basal area brownish black with slight olive tinge, shading to greyish on the inner fold. Discal band broad, 10 mm at costa, creamy white, with irregular outer border in mid area, tapers toward the inner fold but does not cross it. Admarginal pale lunules somewhat obscured ; edge black, with a very narrow white fringe. Tails thick and robust, upper 10 mm long. *Underside.* Generally similar to that of the male ; fore and hind wing bands silvery white and strong.

Range : Known only from the island of São Tomé in the Gulf of Guinea.

Charaxes andara Ward

(Pl. 5, figs 40-42, Map 4)

Charaxes andara Ward, 1873 : 209.

I referred to this insect, very briefly, in the introductory remarks, where I gave my opinion that *andara* should rank as a species, distinct from *brutus*, and stated my reasons. The sexes are dissimilar, thus differing markedly from any mainland race of *brutus*. That *andara* may have been derived, many millions of years ago, from a common ancestor with *brutus* is not denied, but one must realize that Madagascar now has several endemic species peculiar to the island. The relationship, if any, of *andara* to *brutus* might be clarified by inter-breeding.

MALE. Fore wing length 40-42 mm. *Upperside.* Fore wing, ground colour black with a strong greenish sheen over the cell and base, blacker on distal portion. Margin bluntly dentate, with a distinct projection at upper part of 1b, the dentate appearance enhanced by the strong ochreous white internervular spots ; the wing appears strongly incised in area 2. Discal white band, strongly bluish on borders at 1a-1b where the marks are 7-8 mm wide and conjoined, tapers to 2-3 where the marks are free ; the spot in 4 is much smaller and linear, that in 5 set out, followed by two smaller spots in 6-7, so that the bar is strongly 'kinked' at 4-5. Hind wing, basal area black with slight greenish sheen, becoming greyish on the inner fold which is edged with rufous. Discal white band, which is 5-7 mm wide at costa, bulges inward over the cell area ; the outer border is here slightly curved and strongly edged with blue, but on the inner border the band tapers toward the inner fold, but stops short at this point. The outer border of the wing is blacker, with a bluish sheen ; the margin strongly serrate ; each serration with a white V at base ; anal lobe greenish on edge, carrying two lilac spots ; the tails long, thin and sharply pointed, 7 mm. *Underside.* Fore wing, basal ground colour light chestnut, the distal portion of the wing more orange-olive. The subcostal marks are very strongly edged with satiny white, the marks at bases of cellules blacker, with narrower white edging. The discal white bar strong but irregular in outline, especially on the outer border at 2-4. The postdiscal series of black marks rather rounded, outlined in bluish grey, particularly on the outer aspect, thus forming ocelli, the black marks more angled at the tornus ; margin with

black at end of veins with white in between. Hind wing, basal area lighter chestnut, the basal marks and longitudinal lines narrowly black-centred with white borders ; the discal satiny white bar, narrower than above, narrowly crosses the inner fold at an angle and is flanked proximally by black linear marks, and distally by a darker chestnut zone carrying a zigzag olive line. The submarginal row of linear marks shaded with lilac-grey proximally, terminates at the anal angle in a chestnut ocellus bearing lilac dots ; margin orange-olive, more olive at anal lobe ; edge black.

FEMALE. Usually larger than the male, but occasionally as small ; fore wing length 42–47 mm. *Upperside.* Fore wing, differs from the usual *brutus* female in that the bar is expanded from 4–7 and consists of conjoined discal and postdiscal marks, the mark in 4 extending toward the end of the cell ; moreover, the bar is largely rufous orange in colour. Ground colour in basal area deep brownish black with slight greeny sheen ; the discal area blacker with distinct orange spots on the margin, though small at tornus below the projection at upper part of 1b. Margin of wing less incurved than in the male. The discal bar is unusually wide, white in areas 1a–1b, slightly orange distally, width at hind margin 12 mm in large specimens, usually 10 mm in average females, the mark in 2 quadrate and orange, that in 3 smaller and quadrate or angled distally, followed by a long linear orange mark basal in 4, the long orange mark in 5 set out ; above this the bar divides into two, discal and postdiscal, two marks each in 6–7, though those in 6 may be slightly conjoined. Hind wing, basal area more greyish with slight greenish bloom turning grey on inner fold and slightly rufous on margin. The discal bar white, edged with bluish particularly on outer border, 7–8 mm wide at costa expanding over the cell area to 10–12 mm, then tapering towards but not crossing the inner fold. Border of wing deep brownish black ; anal lobe with two bluish green dots. Margin with conspicuous orange lunules shaded greenish at anal lobe ; margin strongly serrate ; tails long and thin, sharply pointed, 10 mm, with a definite tail at 3 in between, 6 mm long. *Underside.* Pattern as in the male but bolder, the basal chestnut paler but the orange border wider.

There is some superficial resemblance on the upperside between these females and those of *Charaxes cacuthis* ; both are limited to Madagascar.

Range : Limited to Madagascar, the species is generally distributed on the island but the majority of specimens come from the eastern side. Variation in size has been noted. The species has been bred in numbers but unfortunately no record kept of the foodplant.

SYSTEMATIC LIST

Charaxes phoebus Butler

Charaxes phoebus Butler, 1765. Type locality : ' Abyssinia '.

Range : Somewhat restricted and confined to N.W., W. & S. Ethiopia.

Charaxes brutus (Cramer)

Charaxes brutus brutus (Cramer, 1779). Type locality (corrected) : Guinea-Sierra Leone.

Range : Guinea-Sierra Leone, Liberia, Ivory Coast, Ghana to western Nigeria.

brutus angustus Rothschild, 1900. Type locality : Upoto, Bangala country, Kasai in southern Congo.

Range : northern Angola, Kasai, central Congo, Moyen Congo, Central African Republic, Fernando Po, Cameroon to eastern Nigeria ; eastward to the Kivu region and the Semliki Valley to western Uganda, where it meets a cline in eastern Uganda, S. Sudan toward *alcyone* Stoneham.

A cline toward *alcyone*, in the high country east of the Rift Valley.

brutus junius Oberthür, 1883. Type locality : Ethiopia, Shoa.

Range : western Ethiopia in the Shoa country ; Sciotalit and Feleklek.

brutus somalicus Rothschild, 1900. Type locality : Harar Highlands.

Range : the southern districts of Ethiopia, Adola, and crossing the Rift into Youbdo country to the west, and S.E. Sudan.

brutus alcyone Stoneham, 1943. Type locality : Dida Creek, north of Mombasa, Kenya.

Range : the coastal belt of Kenya, extending inland to the eastern side of the Rift to Mt Kenya. Also in adjacent coastal area of Tanzania.

brutus natalensis Staudinger & Schatz, 1886. Type locality : Natal, South Africa.

Range : from the Natal district northward through Rhodesia to Malawi, northern Mozambique to Tanzania, where it meets *alcyone* in the north east.

brutus antiquus Joicey & Talbot, 1926. Type locality : São Tomé, in the Gulf of Guinea.

Range : only known from the island of São Tomé.

***Charaxes andara* Ward**

Charaxes andara Ward, 1873. Type locality : Madagascar.

Range : Known only from the island of Madagascar.

4. *CHARAXES BOUETI* FEISTHAMEL and *CHARAXES LASTI* GROSE SMITH

***Charaxes boueti* Feisthamel**

References to this species in literature present a rather confused picture, due mainly to the following factors, the paucity of nominotypical material, the variability of the species and the association with it of a rather similar though distinct species, *Ch. lasti* Grose Smith. The picture is further complicated by the curious discontinuity of distribution, which is difficult to explain.

The species can be divided into two groups, on evidence of pattern, as detailed below ;

GROUP 1. *boueti boueti*, *boueti ghanaensis*, and *boueti macclounii* ;

GROUP 2. *boueti rectans* and *boueti alticola*.

Originally described from Casamanca, Senegambia, in 1850, this species is still badly represented in collections ; the few examples of the nominate race all come from the extreme west : Senegal, Portuguese Guinea and Sierra Leone. It has not been recorded from Liberia (Fox, 1965), nor from the Ivory Coast in spite of extensive collecting. A distinct race is recorded from the borders of Togo and Ghana. The species is not recorded from Nigeria, Cameroons nor the northern area of the Central African Republic. This is difficult to explain, since suitable habitats containing the known food-plant *Oxytenanthera* (Solid Bamboo), Gramineae, occur throughout the savannah belt which extends from western Abyssinia to Senegal ; (Zones 16 & 17, UNESCO Vegetational Map, 1959). Even more remarkable is the fact that in the eastern extremity of these zones, a representative of Group 2, viz., *boueti rectans*, occurs. Equally strange is the fact that the third representative of Group 1, viz., *boueti macclounii* occurs in the areas of south Katanga, Zambia, Malawi, S. Tanzania and Rhodesia, and this is separated from western representatives by the whole of the vast low tropical forest of the Congo. The food plants are *Oxytenanthera abyssinica* and *O. brounii*.

The second member of Group 2, viz., *boueti alticola*, is limited to the high Bamboo zones of the Kivu-Kigezi countries, where it feeds on the Alpine Bamboo, *Arundinaria alpinus*, a hollow species.

Variability of the species takes two forms : a) a pale, lightly marked form ; b) a dark, heavily marked one. Moreover, the undersides may be lightly or heavily marked in the two forms. This variation is not seasonal as they can be taken at one and the same time.

Talbot (1927) expressed the view that *alticola* Grünberg was a distinct species, basing this opinion on the evidence of the very strong pattern and rather distinctive white area in the hind wings of the males. He suggested that *alticola* was mimetic of *Charaxes ansorgei ruandana*. Though the two may occur in the same general area, their habitats are different and do not coincide ; *alticola* is restricted to bamboo zones and *ansorgei* to forest, and where the two habitats may be contiguous, *alticola* outnumbered *ansorgei* in the ratio 100-1. This was my experience at the Kanaba Gap, in Kigezi, where I spent three weeks in 1950 and again in 1952.

Talbot failed to note that in female *boueti rectans* there is a pattern transitional between that of *alticola* and *macclounii*, but tending more to the former, as is to be expected.

GROUP 1.

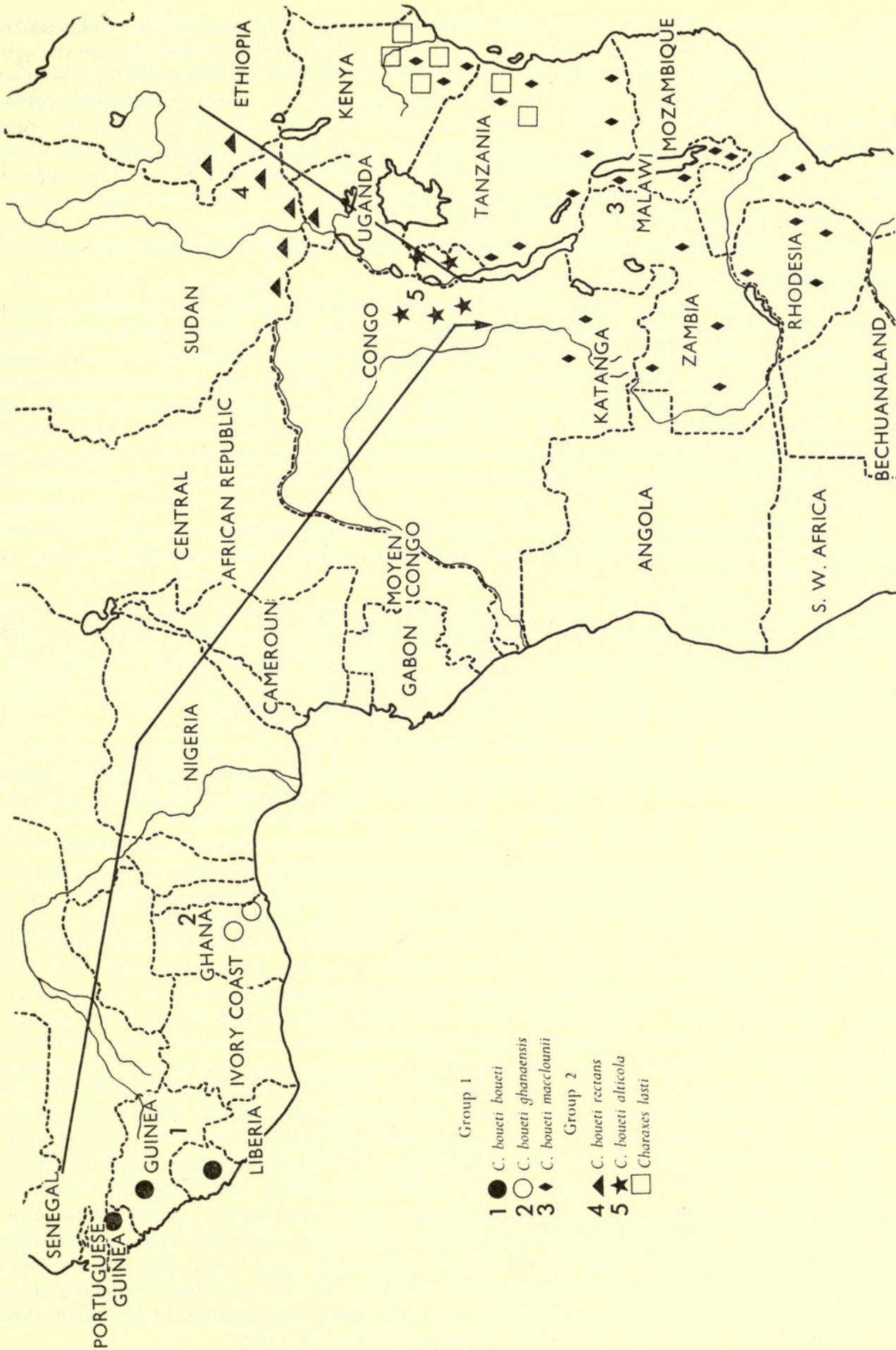
Charaxes boueti boueti Feisthamel

(Pl. 5, figs 43-48, Map 5)

Charaxes boueti Feisthamel, 1850 : 261.

There are two forms, one with strongly marked pattern on an orange ground, the other lightly marked on a paler ground.

MALE. Fore wing length 34-36 mm. *Upperside*. Fore wing, ground colour rufous orange, slightly darker at basal triangle, border black with conspicuous orange spots on outer edge, increasing in size from apex to 1b. Median black spots arranged as follows : an inverted



MAP 5

'comma' mark beyond end of cell, a linear mark crosses the sub-bases of 5-6, followed by crescentic marks of diminishing size sub-basal in 3-1b, and a larger black mark crosses the sub-bases of 7 & 6. The upper part of the disco-postdiscal orange bars are separated by a broader series of black spots crossing 7-6 & 5-4 in a curve and slightly in 3. Hind wing, ground colour rufous orange in the base, followed by a brighter orange discal band, slightly paler at the costa and tapering to above the anal angle; inner fold paler with some long greyish hair-like scales along 1c. Submargin with a bold black line of contiguous spots from costa in 7-3, then separate smaller spots in 2 to anal angle, the spot at anal angle with two white dots; anal angle greenish. Marginal border orange with narrow black edge; tails sharply pointed, 3 mm long. *Underside*. Rather variable, pattern may be strong or almost completely suppressed, irrespective of upperside pattern.

Variation : a. Fore wing, ground colour ochreous buff, the discal and postdiscal zones paler, the distal border of the wing more greyish. Cell area paler, crossed by 3 wavy rusty lines, a comma mark at end of cell, then rusty lines in median series at sub-base 3, becoming black and double in 2-1b, that in sub-base 1b usually strong; the double black mark at tornus 1b strong and sometimes extended linearly towards border on a greyish ground. Discal and postdiscal pattern suppressed, but border with ochreous buff spots on admarginal. Hind wing, ground colour ochreous buff, paler in the discal line, accentuated proximally by a median greyish brown line with rusty borders extending from costa to above the anal angle but not crossing the end of the discal band; the discal band often with a strong silvery sheen, bordered distally by a series of lunate buff spots outlined in rusty greyish; submarginal band more greyish toward anal angle, which is greenish with two black dots. Admarginal spots buff, edged distally on edge by more rusty lunules.

Variation : b. Ground colour more strongly ochreous buff, slightly more greyish on the outer borders. Fore wing pattern almost completely suppressed except for the faint rusty lines in the cell. Black marks in sub-bases of 1b and 2 distinct but reduced in size; tornal black marks distinct but smaller. Hind wing ground colour strongly ochreous buff; pattern suppressed, although the silvery median line is still well marked but narrow.

FEMALE. Fore wing length 40-42 mm. *Upperside*. Fore wing, ground colour rufous chestnut at base up to discal band in areas 1a-2; distal portion of wing blackish brown, margin with series of ochreous spots from apex to 1b, all spots well separated. The disc of the wing with creamy ochre spots, the discal series as follows: two elongate marks in 6-5 followed by an elongate mark at base of 4, the marks in 3-1b of increasing size, that in 1a, a streak. The postdiscal series of spots more rounded, the three subapical spots in 7-5 set in a curve, that in 4 set in and followed by rounded free spots in 3-2, that in 1b usually fused with discal mark in same area. Hind wing, basal area brownish, merging into the paler inner fold. Discal band creamy ochreous, clear-cut on the inner edge but distally flanked by more rufous ocelli with pale centres in 7-6. Submarginal band black, rather irregular on outer border, carrying white dots in 4-3; the anal angle olive-green with double white and black dots; marginal border rufous ochreous, edged with black. Tails mostly black with slight ochre in mid line, 5 & 6 mm long. *Underside*. Fore wing, pattern strong; the cell crossed by three rusty wavy lines; the mark beyond the cell end U-shaped. The discal series of creamy spots as above but accentuated proximally with chestnut to black marks, double in 2, ovoid in 1b; the postdiscal series of creamy spots accentuated distally, and slightly less strongly proximally with black-brown, blacker in 1b; distal to this line is a zone of greyish lilac with the dark marks in 1b & 2 linear. Hind wing with a strong pattern, the base and sub-base traversed by strong bands of brown with slight greyish mid line; the creamy ochre discal band strong, extending from costa to above anal angle, tapering slightly and crossing the inner fold; this band is distally bordered by creamy spots, largest toward costa and diminishing to lines toward the anal angle; submargin with a series of greyish brown lunules accentuated proximally by a wavy dark brown line; the admarginal is ornamented by a series of creamy ochreous lunules accentuated distally by a more rusty zone, the lunules from anal angle to 4 with black dots, double in the olive anal angle; extreme edge black with some white fringing between the veins.

Habitat : Savannah and light woodland with patches of Solid Bamboo.

Range : The extreme western countries of the West Coast : Senegal, Portuguese Guinea, Sierra Leone.

***Charaxes boueti ghanaensis* Rousseau-Decelle & Johnson**

(Pl. 6, figs 49–50, Map 5)

Charaxes boueti ghanaensis Rousseau-Decelle & Johnson, 1957 : 151, pl. 62.

MALE. Fore wing length 37 mm. *Upperside*. Differs from nominate *boueti* of the western regions, in being more richly coloured ; the basal rufous orange more intense, but the discal and postdiscal orange spots of a lighter shade and in strong contrast to the base ; the black marks stronger. On the hind wing the basal area is deeper rufous brownish ; the discal rufous orange band is more intense ; the black sub-marginal band wider ; the marginal rufous orange border strongly edged with black. Tails slightly longer, 5–6 mm. *Underside*. Fore wing, pattern similar to the dark form in the nominate race, but stronger, the black marks at tornus and space above stronger ; the black mark in sub-base in 1b in the form of a ring. Hind wing pattern stronger, the dark median bar strong and the silvery cream bands on either side well marked.

FEMALE. Fore wing length 46 mm. *Upperside*. Fore wing, pattern very similar to that of the nominate form, but basal rufous orange strong ; the discal and postdiscal spots bolder, richer ochreous, well separated to area 2 ; admarginal spots more orange. Hind wing, basal area darker brownish and extending to the inner fold above the anal angle ; the discal band clear-cut on inner border, but upper spots of postdiscal line tending to be separated as distinct spots, more fused on lower section as a rufous orange band ; submarginal black band wider ; marginal orange border strong with marked black edge. Tails longish, 8–9 mm, lower one slightly upturned. *Underside*. Fore wing, generally similar to that of the nominate race but bolder, the submarginal row of ochreous spots well ringed in black ; the sub-basal black marks in 1b and 2, strong. Hind wing, pattern bolder, the submarginal wavy dark line particularly strong, followed by a greenish grey zone ; the admarginal ochreous lunules bordered distally with rusty ochreous, strongly marked.

Descriptions taken from a pair of paratypes in the British Museum (Nat. Hist.).

Range : Known only from the savannah woodland around Vane near Amedzofe on the Togo-Ghana border at 3000 ft. Three males and three females taken by African collectors for F. L. Johnson.

***Charaxes boueti macclounii* Butler**

(Pl. 6, figs 51–53, Map 5)

Charaxes lasti Trimen [*nec* Grose Smith], 1894 : 59, pl. 5, fig. 6.

Charaxes macclounii Butler, 1895 : 252, pl. 15, fig. 1.

Charaxes 'lasti' var. *flavescens* Lanz, 1896 : 142.

Charaxes boueti var. *macclounii* Butler ; Aurivillius, 1899 : 235.

Charaxes boueti macclounii Butler ; Talbot, 1927 : 109.

MALE. Fore wing length 36–38 mm. *Upperside*. Fore wing, general ground colour richer rufous orange than nominate race, more closely approaching *ghanaensis*, but rather variable. Basal areas darker than disco-postdiscal bands ; black spots in median line stronger and extending to 1b ; intermediate black spots between discal and postdiscal orange spots in upper half larger and more defined and extending to 2, and often to 1b, thus separating the two rows ;

the upper postdiscal spots in 7-5 in a curve as in the nominate race and *ghanaensis*; marginal rufous orange present but not so defined. Hind wing, basal area often darker; the discal rufous orange, paler at costa, in discal line strongly offset by the black submarginal band, which is widest at upper half then tapering toward anal angle and often separated into spots, culminating in the greenish anal angle with its lilac and black spots. Orange border thus wider but black edge less strong. Tails short, upper 2-3 mm, lower 4-5 mm. The upperside may thus be strongly or lightly marked. (*vide* Pl. 6, figs 51-52). *Underside*. The pattern may be strong or weak on a variable ground colour of pale sandy ochreous to dark greyish ochre. The forms are not seasonal.

Variation : a. With a strong pattern. Fore wing, cell with three rusty brown irregular lines, and two lines beyond cell end. Marks in median line on proximal side of discal bar rusty brown in 6, 5 and 3, then black in 2, double in 1b; the discal bar creamy ochre, paler in 1a-1b; the postdiscal series of stronger ochreous spots, curved in sub-apex, are ringed in brownish to black; a double black streak at tornus in 1b; margin with indistinct ochreous spots. Hind wing, basal area more greyish ochre crossed by rusty brown lines; the median line strong and in line with the median series of the fore wing, accentuating the inner edge of the discal creamy band, which is widest at the costa and tapering to the inner fold above anal angle; on its distal side is a series of lunate ochre spots accentuated by rusty brown internally and by brownish grey distally; submarginal ochre line distinct, accentuated distally by an orange admarginal line; edge ochreous with narrow black edge and some white internervular fringing.

Variation : b. The whole ground colour more sandy ochreous. Fore wing, pattern only slightly indicated except for the two black marks in 1b and the tornal black line on a greyish ground. Hind wing, pattern also obscured except for the median brownish line proximal to the discal band, which is narrow and may fade out above the anal angle. The anal black dots on a greenish ground well represented.

Intermediates between these two variations often occur.

FEMALE. A somewhat similar variation occurs in the females though the differences are not so striking. Fore wing length 43-45 mm. *Upperside*. Differing from those of the nominate race and *ghanaensis* in its generally bolder pattern. Basal area bright rufous chestnut; median black spots bold; the discal and postdiscal yellow-ochre bars bolder, the two series well separated to 2, and slightly in 1b; the marginal rufous orange spots not so bold and may be obscured. Hind wing discal band wider, clearcut on inner border, some rufous shading on the outer border; an occasional dark spot present in 6-5 indicating a slight separation of the discal and postdiscal rows in these areas. Submarginal black band bold; marginal rufous border wider, edged black. Anal angle greenish with black spots well marked. *Underside*.

Variation : a. The basal and distal portions of the wings greyish ochre, paler in the fore wing cell. Pattern mainly as above but subdued; rusty brown lines in the cell and in upper part of median line, black in 1b and 2; the postdiscal creamy ochre spots margined proximally and distally in greyish; the double mark at tornus black; marginal spots subdued. Hind wing basal area greyish ochre with rusty brown lines faintly indicated; median brownish line strong and clearly defining the inner edge of the discal ochre-cream band, the outer border carrying the row of postdiscal ochre lunules edged with brownish, and outwardly defined in greyish; the submarginal area paler greyish; the admarginal line ochre with the border more orange, finely edged in black.

Variation : b. Pattern similar, but whole surface yellowish ochre. The median lines on both wings clearly defined.

Intermediates between these two varieties occur and can be bred in one family.

Range : South Katanga, Zambia, Rhodesia, Malawi, western, southern and eastern Tanzania to coast of Kenya.

GROUP 2.

Charaxes boueti rectans Rothschild & Jordan

(Pl. 6, figs 54-55, Map 5)

Charaxes boueti rectans Rothschild & Jordan, 1903 : 540.

MALE. Very similar in general appearance on the upperside to the dark form of male *macclounii* but darker, and at once distinguished by the straight arrangement in the formation of the fore wing postdiscal spots, without any curving toward the costa in the sub-apex. Fore wing length 35-36 mm. *Upperside*. Fore wing, ground colour rich rufous orange slightly darker at the bases, distal portion of the fore wing black. A large black mark at end of the cell ; the median black spots strong often extending to 1b. The rufous orange discal spots tend to be separated in 1b-3 by intrusion of the black median spots in these areas ; the postdiscal rufous orange spots arranged in a straight line from costa to 2, then conjoined with the discal mark in 1b, but often with some black scales indicating line of junction. Marginal rufous orange spots of increasing size from apex to tornus in 1b. Hind wing basal area dark as in fore wing, clearly defined from the rufous orange discal band in the subcostal area where it is paler, by a dark line ; there is also a suggestion of a division of the band into discal and postdiscal by a slight line in this area ; the band is relatively broad to area 4 then tapers toward the inner fold above the anal angle. The submarginal black band of fairly uniform width ends at the anal angle in the olive patch with its lilac and black dots ; there are also two white dots on the margin between the tails ; the rufous orange border, widest at 7-6, tapers gradually to between the tails ; margin black. Tails thin, upper 5 mm, lower 7-8 mm. *Underside*. Fore wing, ground colour fore wing ochre-buff, slightly greyer on the border. Cell with three distinct, rather strong, wavy lines, followed by a double mark beyond cell end ; median marks strong, rusty brown at costa and becoming strongly black in 2 and double or conjoined in 1b. Postdiscal series of spots silvery to ochre, accentuated on both sides by brownish to black, the black marks strongest in 2 and at tornus in 1b with slight darkening in 1a. Hind wing strongly patterned on a buffish ochre ground ; a narrow brown line at sub-base ; median brown band strongly accentuated on either side by silvery white, strongest in disc but fading out at inner fold ; postdiscal line of lunules silvery toward costa but fading out above anal angle ; the postdiscal brownish marks shading to greyish on submargin followed by a silvery ochre admarginal line which shades to greenish at the region of the tails, more green at anal angle, enhanced by black dots, double at anal angle. Border orange to upper tail narrowly edged with greyish to black. There is no great variation on the undersides in a long series of males available.

FEMALE. Fore wing length 40-42 mm. *Upperside*. Coloration generally very similar to that of *macclounii*, but pattern considerably different. Fore wing, base of wing bright rufous chestnut ; distal portion of wing black ; median black marks strong. Discal yellow-ochre spots smaller, and more discrete : two costal marks of about same size, one above the other, elongate-rectangular, spot at base of 4 small and triangular, spots in 3-2 ovoid, that in 1b large, rectangular with indent on inner side, mark in 1a a streak. Postdiscal spots arranged in a straight line from subcosta to hind margin, yellowish ochre to 3, then more rufous to hind margin, contiguous to but contrasting with the discal marks in same area. Admarginal spots orange-ochre from apex to hind angle in 1b, where the spot is double. Hind wing, basal triangle darker and browner than fore, shading to greyish on the inner fold. Discal band narrow, ochre-yellow in colour, fading out toward the anal angle, flanked distally by more rufous postdiscal spots clearly defined at the costal end, ill-defined and merging into discal band in area 3 ; submarginal band black, wide but not strongly defined proximally but with white lines opposite the tails and at anal angle with its two black dots ; marginal border rusty ochre to lower tail, edged black. Tails long, orange at mid base, margins black, 7-9 mm. *Underside*. Generally similar to that of the male, with strongly contrasting pattern. Fore wing, ground colour in cell creamy ochre with three strong brown bars crossing it ; a double bar beyond, often U-shaped. Discal creamy marks strongly accentuated proximally by dark brown to black median lines,

double in 1b ; postdiscal straight row of spots silvery ochre to silvery white accentuated on both sides by black, particularly in 2 and at tornus in 1b ; admarginal with ochreous lunules, clearly marked as a rule. Hind wing, basal area with strongly marked sub-basal and median bars forming a V enclosing a silvery line slightly edged in black. Discal band clearcut silvery whitish on inner border, more buffish grey distally, where it is outlined by an irregular tapering silvery line on the proximal side of the darker submarginal line, which extends to just above the anal angle ; admarginal with silvery creamy lunules with black dots in spaces between the tails ; anal angle with greenish ground colour and two black dots ; margin golden-ochre shading olive toward the anal angle, lightly margined in black and white.

Range : S.W. Ethiopia to Sudan and northern Uganda ; Karamoja and Metu, West Nile. Associated with areas of Solid Bamboo in savannah or low rocky hills.

Charaxes boueti alticola Grünberg

(Pl. 6, figs 56–58, Map 5)

Charaxes boueti var. *alticola* Grünberg, 1912 : 559.

Charaxes alticola Grünberg ; Talbot, 1927 : 109 ; Id., 1932 : 9.

Charaxes boueti alticola Grünberg ; Jackson, 1957 : 66.

As will be noted from the above synonymy and the brief reference in the introduction to this insect, some difference of opinion exists as to its status. My personal view is that it is a member of Group 2 of this species-complex, allied to *boueti rectans*, since both are characterized by the almost straight arrangement of the postdiscal spots in the fore wing pattern in both sexes. Moreover, it will be noted that the underside coloration and pattern conform to that of other members of this species.

Upper and underside coloration is variable, but the pattern is constant.

FORM 1. MALE. Fore wing length 35–38 mm. *Upperside*. Fore wing, ground colour at base bright rufous chestnut ; distal portion of wing black or blackish brown. A large quadrate black mark at end of cell followed by large median black marks which extend to the hind margin at 1a. Discal rufous orange spots well separated and in almost a straight line except for that at base of 4, which is set well in, the mark in 1a and in lower part of 1b extended distad and may be in contact with the postdiscal spots in these areas ; postdiscal rufous orange spots in an almost straight line from subcosta to 1a–1b, these spots usually well separated. Admarginal rufous orange spots large and distinct. Hind wing, basal area dark blackish brown, fading to greyish and buff on the inner fold. The discal band is narrow and pale orange to white at the costa widening in areas 5–2, where it is white in colour ; there is no indication of postdiscal spots but the band merges into the rufous orange zone, which is flanked by a row of contiguous black marks in the submarginal line ; border rufous orange, edged black ; anal angle with greenish spots ringed in black. Tails orange at base, black-bordered, short, thick at base 4–5 mm. *Underside*. Fore wing ground colour, greyish ochreous, paler in the cell and base of 1b, usual rufous lines in the cell and at cell end ; discal and postdiscal spots barely indicated and separated by a series of brownish, rather dyslegnic marks from costa to 1b ; a dark U-shaped mark, sub-basal in 1b with a vertical double brownish mark at tornus. Hind wing, ground colour greyish ochre, base with a slightly darker greyish brown area, adjacent to the darker median band forming an open V and enclosing a silvery bar, the outer arm accentuated by narrow brownish edges ; the silvery discal bar is comparatively narrow, extending from costa to above anal angle, where it turns in toward the inner fold ; this bar narrowly edged distally by a narrow brown line ; postdiscal lunules hardly visible ; submarginal zone slightly greyish but hardly differentiated from the paler marginal border, which is narrowly edged with black ; anal angle with lilac and black dots on a greenish ground.

A slight variation of this form is characterised by its generally paler, more orange colour and less deep black in the fore wing. The hind wing, though dark at base, is brighter orange over the distal portion and the submarginal black spots are smaller and well separated. The underside also exhibits a general paler colour, but the silvery bars are strong.

FORM 2. *Variation* : a. A very dark form in which the basal area is the same colour as the distal portion of the wing, both being a very dark chestnut. The discal and postdiscal orange spots stand out in the darker ground. In the hind wing the basal triangle is very dark brownish black, but fading to greyish then buff on the inner fold. The white area of the discal bar in strong contrast, its upper portion may be whitish or all orange ; the submarginal spots are larger and contiguous ; the ocelli at the anal angle strong ; the marginal border darker rufous chestnut, edged in black. *Underside*. Ground colour greyish ochre or putty-coloured. Discal spots ochreous and separated from the postdiscal series by a wide band of chocolate from costa to 1b. Submarginal area of wing greyish ochre with almost complete suppression of the marginal lunules ; the sub-basal U-mark in 1b chocolate and the tornal double vertical mark strong.

Hind wing pattern as in Form 1, but with only the proximal discal band, silvery. The sub-basal area divided up by rufous lines especially in the inner fold. The rest of the pattern as in Form 1, but stronger.

Variation : b. The ground colour is more greyish ochre, except in the fore wing cell, which is buffish ; the discal spots are obscured in the upper portion ; the postdiscal spots also slightly obscured but the brownish intermediate band is stronger up to 1b. On the hind wing, the pattern is stronger, the sub-basal and discal bands strongly silvery, the latter with dark brownish edges, but the pattern in the postdiscal zone and margin rather obscured. (Pl. 6, figs 56-57.)

FEMALE. Fore wing length 42-45 mm. There are two forms.

FORM 1. *Upperside*. The base of the fore wing is chestnut and in contrast with the blacker distal portion of the wing. There are indications of two dark spots in the cell ; median black spots distinct. The discal creamy spots are arranged as in the male, well separated up to 1a ; the postdiscal spots in a straight line from apex to 1b are slightly more ochreous ; marginal spots ochreous. Hind wing basal area brownish black to greyish on inner fold. Discal band white, widest at costa to 3, then tapering to above anal angle. Postdiscal spots, contiguous in 7, are clear in the upper half but fading out toward area 4. Submarginal zone black, with olive anal mark with black dots surmounted by white to lilac lines well developed ; border of wing rufous brown, ornamented with distinct internervular ochre streaks. *Underside*. Fore wing, pattern very bold, and reminiscent of *rectans*. The ground colour is completely broken up by a series of more or less parallel vertical bars. Cell creamy, crossed by three wavy rusty bars ; the discal creamy spots, as above, divided from the postdiscal straight series by a rusty brown band extending from the costa to upper part of 1a, flanked distally by dark marks, 1b-3 and by a greyish ochre submargin in which the creamy ochre spots show up plainly. The creamy ochre line of spots are slightly silvery on margin. Hind wing, basal area greyish brown, joining up with the median bar toward the inner fold, which has three parallel brown lines. The basal and median bars outlined with darker rufous brown, the intervening creamy bars and the discal bar strongly silvery, as also are the series of creamy spots in postdiscal line, outlined distally in blackish which is continuous from costa to anal angle ; submarginal band is complete and greyish brown ; the admarginal ochreous lunules distinct, accentuated proximally with black and distally with double rusty brown spots ; edge black and white.

FORM 2. *Upperside*. Fore wing, ground colour is a deep brown-black, the basal area only slightly browner. The discal and postdiscal creamy spots well separated ; the admarginal spots richer rufous but rather indistinct toward the apex. Hind wing basal area brownish black, browner toward costa. The inner fold greyish ochre. The discal band white, widest at costa then tapering from 3 to the inner fold. Postdiscal white spots distinct in upper portion of the line, then becoming obscured. The admarginal band rufous, with distinct ochreous internervular streaks. *Underside*. Similar to form 1, but pattern stronger and light areas more silvery.

Range : Ruanda & Kivu districts, Uganda and S.W. Kigezi, Kanaba Gap, Ruhiza.

Charaxes lasti Grose Smith

(Pl. 7, figs 59-65, Map 5)

Charaxes lasti Grose Smith, 1889 : 131.*Charaxes lasti* Grose Smith ; Grose Smith & Kirby, 1890 : 8, pl. 4, figs 4-5.*Charaxes boueti* var. *lasti* Grose Smith ; Aurivillius, 1899 : 235.*Charaxes boueti lasti* Grose Smith ; Rothschild, 1900 : 409.*Charaxes boueti lasti* Grose Smith ; Poulton, 1925 : 570 [= var. *alticola* Grünberg].*Charaxes boueti centralis* Neustetter, 1929 : 391. **Syn. n.***Charaxes lasti* Grose Smith ; Talbot, 1932 : 9.

Described as a species, this insect has, in varying degree, been linked with *Charaxes boueti* Feisthamel, because of its somewhat general resemblance to that species. (See Talbot, 1929 : 148.) Since the two overlap to a considerable extent, and do not interbreed, they must be considered distinct species. Moreover, they have different habitats and food plants, *lasti* laying on *Julbernardia*, *Macrolobium* and *Afzelia*, Caesalpinaceae, and *boueti* on species of Bamboo, Gramineae. The wing-antennae ratio is different (*teste* Dr van Son).

The shape of the two insects is different, in *lasti* the fore wing being less elongate, but outer border more incised ; the hind wing is more rounded on outer border but margin is more serrate or dentate at vein ends.

The upper and undersides are subject to considerable variation, which is not seasonal.

There are two forms in both sexes, a strongly marked form and a lightly marked one. These occur in about equal numbers, irrespective of season, and there are many intergrades.

MALE. FORM 1. Fore wing length 35-38 mm. *Upperside.* Fore wing, general colour rufous orange, slightly darker at the base, distal border of wing black. A rounded black spot beyond end of cell conjoined to or separate from a black line at end of cell ; median black marks in 6-5 larger and rounded or elongate, spots in sub-bases 3-2 and an indication of a mark in 1b. The discal and postdiscal rufous orange bands separated in the subapex by a solid black mark in 7-6, a slightly smaller spot in 5, a streak in 4 and smaller spots in 3-2, otherwise the bands are conjoined. The upper postdiscal spots are arranged in a curve. Marginal border black with rufous orange spots on margin increasing in size from apex to double mark in tornus at 1b. Hind wing, basal area slightly darker, sometimes with a dark costal triangular mark or line defining the costal inner edge of the discal band, which may be paler, the rest of the discal band ill-defined proximally especially toward the inner fold which is pale and buffish in its upper half. The submarginal black band, widest at its costal end where the spots are contiguous, narrows rapidly, the spots decreasing in size and well separated. The anal angle olive-green with double lilac and black dots. Marginal border rufous orange, narrowly edged in black ; margin serrate at veins. Tails thin, upper 5 mm, lower 6-7 mm. *Underside.* *Variation :* a. Fore wing, ground colour rufescent greyish with slight vinaceous tinge, paler in the cell and mid area of 1a-1b ; cell with three rusty transverse lines, a double or U-mark beyond. Discal and postdiscal series of ochreous spots hardly indicated, except for rusty lines on margins ; margin without spots but tornal mark consisting of two triangular horizontal black marks, edged with bluish grey, strong, double black lunate mark sub-basal in 1b strong. Hind wing ground colour as fore, basal half with faint rusty lines ; discal area crossed by an almost straight silvery white bar proximally edged in black, and on its distal side, faint greyish white lunules followed by an irregular zigzag rusty band in postdiscal zone. Submargin slightly more greyish

with distinct buff-white dots from tornus to anal angle, which is greenish with two black dots : edge of wing rusty, with slight black fringe and whitish bases to the serrations and tails.

Variation : b. The fore wing very similar to *var. a*, or even more uniform, the hind wing less strongly patterned, the discal silvery line almost lacking, but the dark line on distal edge, strong.

MALE. FORM 2. Upperside coloration and pattern of fore wing much as in form 1 but ground colour slightly paler, the marginal black border less strong, especially in the hind angle, so that the large marginal orange spot merges with the orange of the postdiscal bar in 1b & 1a. On the hind wing the submarginal black spots are missing or only slightly represented, except for the two at upper angle. *Underside. Variation* : a. Ground colour more ochreous, less greyish vinaceous, so that the pattern shows up very distinctly. In the fore wing the rusty brown lines are strong in the basal half ; the discal and postdiscal bars are indicated more strongly. The two black lunules sub-basal in 1b enclose greyish spots, and the tornal black marks are strong. In the hind wing the rusty lines show up more on the paler ground ; the silvery line is broader and proximally lined with black ; the postdiscal pale lunules are stronger while the submarginal rufous wavy line is strong ; the border more greyish ochre, the edge more rusty.

Variation : b. Ground colour is more rufescent grey with a vinaceous tinge ; the pattern is almost suppressed except for the conspicuous black lunules enclosing grey in sub-base 1b, and the tornal black mark is strong. On the hind wing the pattern is subdued except for the narrow silvery discal line.

Intermediates are common. (Pl. 7, fig. 6o)

FEMALE. There are two main forms with many intermediates ; they occur at all times and are not seasonal.

FORM 1. Fore wing length 39–42 mm. *Upperside.* Fore wing, base bright rufous orange ; distal portion of wing brownish black. Median black marks, one heavy rectangular subcostal at sub-bases 7–6, a mark at end of cell separate from or contiguous with marks sub-basal in 3–2 and slightly represented in 1b. Discal and postdiscal series of spots yellowish ochre, spot in 4 in discal line set well in, the postdiscal spots shaded with rufous distally, conjoined with discal marks in 1a–1b, slightly separated in 2, the remainder free. Border black with rufous orange marginal spots, increasing in size from apex to 1b at hind angle. Hind wing basal area greyish rufous, paler on the inner fold, sharply defined from the yellowish ochre band at the costa by a narrow black line, distal border of band shaded with rufous. Submarginal black band strong, consisting of contiguous marks angled on outer border ; anal angle greenish with two black dots surmounted by lilac-white lines ; marginal border orange rufous, edged with black ; margin serrate at vein ends. Tails long and thin, upper 7 mm, lower 9 mm. *Underside.* Variable. Fore wing, base greyish ochre, cell paler ochre, crossed by well marked rusty lines, one sub-basal, one in mid area, the third at end of cell, this last sometimes united to black mark at base of 4 ; median lines strong, rusty coloured in upper half then black in sub-bases 3–2 and 1b, which has a sub-basal black line. Discal and postdiscal series of spots as above but less strong ; submarginal border more greyish with brownish spots along distal edge of postdiscal row, becoming black in 2 and, at hind angle where the black marks are, two horizontal triangles on a bluish grey ground. Hind wing basal area greyish ochre with vertical rusty lines in sub-base ; median line rusty brown by a silvery white line defining the discal creamy yellow bar, which is broad at the costa, tapering rapidly to another silvery line which runs parallel to the median line, both taking an angle toward the inner fold above the anal angle. Postdiscal zone with large diffuse rusty spots, which extend from the costa to above the anal angle ; submarginal band greyish ochre with a satiny sheen, distally bounded by a series of whitish elongate marks accentuated distally by rusty lunules ; border with orange-ochre lunules outlined in whitish ; extreme edge black ; margin serrate at veins.

FORM 2. *Upperside.* Paler and brighter than form 1, the basal area a clearer orange, the discal and postdiscal spots larger and more confluent ; the outer border of the postdiscal spots extended more distad, so that the black border is more restricted, but the marginal spots are larger. Hind wing paler, the basal area not defined and paler ; the discal yellow-ochre band merging into a broad bright rufous orange zone which carries a series of submarginal dyslegnic

well separated dark spots, well defined from the more orange border with black edge. Tails long and thin. Anal angle pale olive-green with usual black spots. *Underside*. Paler and more ochreous ; pattern less strong in the disco-postdiscal bands ; border less dark, but greyish lunules more satiny. There is also a satiny patch at the costa between the disco-postdiscal creamy spots. Hind wing pattern less strong ; the median silvery line narrower ; the discal band less defined ; the rusty postdiscal zigzag narrow but clear ; the border less dark ; the admarginal zone more ochre and the margin rusty with narrow black edge.

Range : In coastal forests from Tana River to Shimba Hills, Kwale & Dalgube, Kenya to the Pugu Forest & Tanga district in the Usambara Mts, Tanzania.

Biological notes, by D. G. Sevastopulo

OVUM. Shape as is usual in the genus, spherical, with a fluted and flattened top. Colour very pale green when first laid, developing the usual brown ring round the top after twenty-four hours. Later the whole ovum becomes speckled with brown, the ring broadens and there is a brown dot over the micropyle. Laid singly on the upper surface of a leaf of the food-plant.

Laid 5.x.64, hatched 9.x.64.

1ST INSTAR. Head very dark mottled brown, the horns very short and stout, the upper pair more or less straight, the lateral upcurved, the tips paler. Body purplish olive when first hatched, becoming green after feeding, with a subdorsal series of minute white specks. Anal somite ending in a pair of incurved, purplish brown processes.

Moulted 17.x.64 (Pl. II, fig. 90.)

2ND INSTAR. Head blackish olive, edged very narrowly with pale buff, the horns also pale buff and with numerous lateral teeth, the points between the upper horns prominent. Body dull green, with a subdorsal series of white specks. Many larvae with a round, whitish, dorsal spot on the 6th somite.

Moulted 23.x.64 (Pl. II, fig. 91.)

3RD INSTAR. Head brown, studded with minute pale specks, the horns paler and with a pale stripe from the base of the lateral horn to outside the jaws. Body similar to previous instar, the dorsal mark outlined with black.

Moulted 31.x.64 (Pl. II, fig. 92.)

4TH INSTAR. Head brown, the facial disc green, the horns paler, fairly straight, a pale stripe, edged behind with blackish, from the base of the lateral horn to outside the jaws. Body rather dull green, minutely shagreened with white. A subdorsal series of white specks and also a lateral series consisting of an outer anterior and an inner posterior on each somite. Dorsal mark on the 6th somite white, outlined with black, roughly semicircular in shape, the straight edge anterior and produced into three lobes. Some larvae with an additional white dot outside the main mark. Some with a similar additional mark on the 8th somite, and a few with an additional elongate dorsal bar on the 10th. Anal processes small, white and joined by a transverse white bar, the processes and the bar itself edged below with black.

Moulted 7.xii.64. (Pl. II, fig. 93.)

FINAL (5TH) INSTAR. Head green, speckled minutely and sparsely with white, and outlined with pale pinkish lavender ; horns slate-grey in front, greenish behind, and studded with minute black points, upper pair fairly long, straight, divergent, lateral pair slightly stouter and shorter, straight, the points between the horns black ; a blackish line behind the pinkish lavender margin. Body fairly dark, bright green, minutely papillated with yellow and with a series of slightly larger white specks laterally. Dorsal mark on the 6th somite roughly semicircular with the straight edge forward and expanded into three rounded lobes, a white spot lateral to the main mark, which may be separate, conjoined or absent. Mark on the 8th somite roughly diamond-shaped, with or without a white spot lateral to it. 10th somite with a short longitudinal dorsal bar, which may be absent. A pale sublateral line. Venter, legs and prolegs glaucous green. Anal claspers and last two segments of venter dull purplish. Anal somite slightly concave, edged with a white line, below which is a purplish one. (Pl. II, fig. 95.)

Some larvae undergo an additional moult, a thing I have not observed before in *Charaxes*. These larvae are slightly smaller than normal in the 4th instar, they undergo no change in appearance in the 5th instar except a slight increase in size, and the 6th instar is similar to the normal 5th, but very slightly larger. The extra moult appears to have no sexual significance.

The larvae turn dull olive-brown when preparing for pupation, the dorsal marks become slightly tinged with pinkish.

PUPA suspended by the cremaster. The dorsum of the thorax and the first two abdominal somites pale lavender, shading into pale brownish olive posteriorly, this area tapering towards the cremaster and shading into darker laterally. A fine, darker dorsal line on the thorax. Lateral area whitish, very faintly tinged with pinkish, due to numerous fine punctures filled in with that colour. Wing cases similar, with an oval, olive-brown spot on the outer margin below the tornus. Leg sheaths with an indistinct olive-brown spot. The pupa is very similar in appearance to that of *Charaxes protoclea* Feisthamel, *azota* Hewitson. The pupa is dimorphic, another form having the pale lavender areas very pale blue, the olive-brown areas olive-green, and the areas faintly tinged with pink in the first described form, very pale green. (Pl. 11, figs 96, 97.)

Food-plant. *Julbernardia magnistipulata* Harms. and *Macrolobium coeruleum* Harms. (both Caesalpinaceae). Dr van Someren (*Butterflies of Kenya & Uganda*) records seeing a female laying on *Afzelia quanzensis*, and females also lay freely on this in captivity. Newly hatched larvae however, usually refuse to eat *Afzelia*, but if they do, fail to thrive and do not get through the first moult.

Described from larvae reared from ova laid by a female caught in the Marere Forest, of which one pupated 22.xi.64 and a male emerged 2.xii.64.

Another brood, reared from ova laid by a Kwale-caught female, were without dorsal markings up to the 4th instar, when they developed a rough diamond-shaped mark on the 6th somite (Pl. 11, fig. 94).

SYSTEMATIC LIST

Charaxes boueti Feisthamel

GROUP I

Charaxes boueti boueti Feisthamel, 1850. Type locality : Gambia, Casamanca.

Range : West Africa ; Senegambia, Guinea, Sierra Leone.

Charaxes boueti ghanaensis Rousseau-Decelle & Johnson, 1957. Type locality : Ghana-Togo border, Volta River area, 3000 ft, Vane near Amedzofe.

Range : Volta River area, Ghana-Togo.

Charaxes boueti macclounii Butler, 1895. Type locality : Malawi, Zomba.

Range : Malawi ; Rhodesia, Manicaland ; Zambia ; Katanga ; N.E. Angola ; Tanzania, Kigoma, Mpanda, Songea, Njombe, Usambara Mts. (foothills) ; Kenya, Kwale, Shimba Hills, Rabai.

Charaxes 'lasti' f. flavescens Lanz, 1896. Type locality : Tanzania, Parumbira.

Considered to be a ♀ of *macclounii*. Type was destroyed during 1939-45 war.

GROUP 2

Charaxes boueti rectans Rothschild & Jordan, 1903. Type locality : Ethiopia, Schoa, Kollu, Ob Urga.

Range : W. Ethiopia ; S. Sudan (Imatong Mts.) ; N. Uganda, W. Madi, Metu, Karamoja.

Charaxes boueti alticola Grünberg, 1912. Type locality : Ruanda, Karisimbia Volcano.

Range : Ruanda and Kivu district ; Uganda, S.W. Kigezi, Kanaba Gap, Ruhiza.

***Charaxes lasti* Grose Smith**

Charaxes lasti Grose Smith, 1889. Type locality : Kenya, Mombasa.

Range : The coastal forests of Kenya from the Tana River to the Shimba Hills, Kwale, and Dalgube ; extending to the Tanga district of Tanzania on the foothills of the Usambara Mts and in the Pugu Forest.

Synonym : *Charaxes 'boueti' centralis* Neustetter, 1929. Type locality : 'French Congo' error! Type examined and considered to be a female *lasti*.

**CHARAXES RICHELMANNI RÖBER AND *C. EUDOXUS* DRURY
AND ITS SUBSPECIES**

***Charaxes richelmanni* Röber**

(Pl. 7, fig. 66, Map 6)

Charaxes fallax Richelmann, 1931 : 105.

Charaxes fallax Richelmann ; Poulton, 1926 : 571.

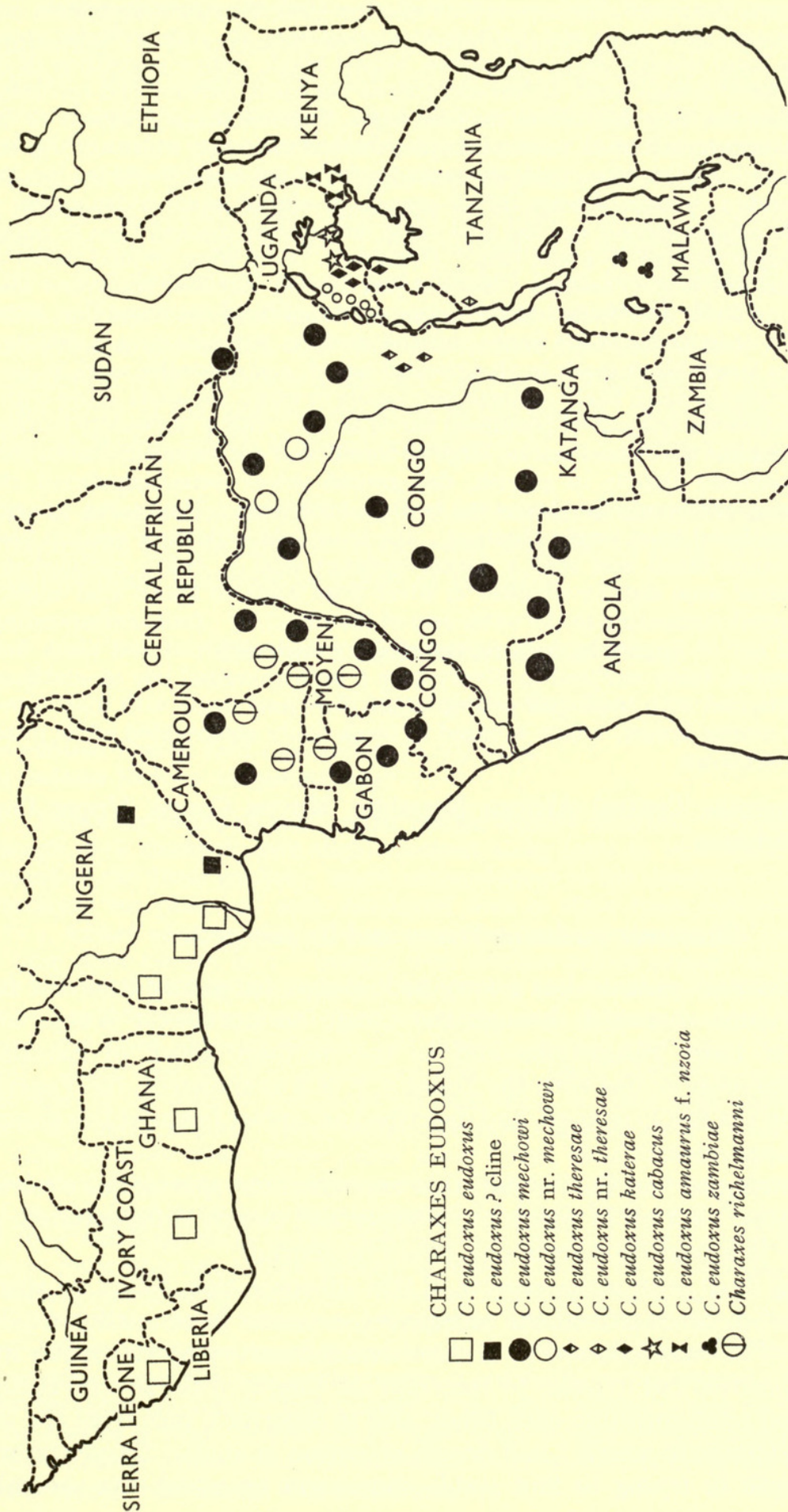
Charaxes richelmanni Röber, 1936 : 578.

Charaxes fallax Richelmann ; Carpenter, 1937 : 96.

The superficial resemblance of this insect to some forms of *Charaxes eudoxus* has given rise to some confusion ; thus, when Holland, 1920, reported on the Lepidoptera of the Congo, he recorded three specimens taken at Medje, as *Charaxes eudoxus eudoxus* Cramer, distinguishing them from *Charaxes mechowii* Rothschild (also taken at Medje) which he considered to be a distinct species, by 'the great reduction in width of the silvery bands on the lower surface of the hind wing'. This identification was accepted by Carpenter (1937), who suggested that the reduction of the silvery lines might indicate that the specimens were transitional towards *eudoxus cabacus* ab. *amaurus*!

I have examined these specimens and consider them to be, without doubt, *richelmanni* Röber, = *fallax* auctt.

MALE. Fore wing length 37–38 mm. *Upperside*. Fore wing, base deep chestnut with a slight vinaceous bloom, extending from the cell end to sub-bases of 1a–1b, shading into the black of the discal zone and the distal part of the wing ; there may be an extension of the black into the cell end. The postdiscal rufous orange bar is almost complete, extending from the hind margin in 1a to 6–7, rather narrow and with little reduction in the size of the spots, the



MAP 6

spots in 1a-1b 4 mm, conjoined, the remainder well separated, the upper ones more rounded ; marginal rufous orange spots large and distinct, extending from 1b, with a double spot, to the apex. Hind wing basal triangle darker than fore, almost black, with a suggestion of chestnut at base ; the postdiscal orange band, widest and pale at the costa, narrows and becomes shaded over as it approaches the inner fold above the anal angle, thus not sharply defined on the proximal border ; the submarginal black band starts just short of the costa, widens in 7-5, thence to anal angle where there are two lilac spots, the inner border of the band ill-defined but the outer clear-cut and dentate ; border of wing rufous orange, of almost equal width tapers at anal angle, edged black, margin serrate and the anal angle rather more marked than in *eudoxus* ssp. Tails thin and sharply pointed, 3-4 mm long. *Underside*. Fore wing, ground colour of basal half up to postdiscal line bright chestnut ; cell and just beyond with four transverse black lines outlined in silver ; a silver and black transverse bar sub-basal in 6-7 in discal line, followed by bolder black marks of irregular shape finely outlined in silver sub-base of 3, a double or conjoined mark in 2, a larger black mark in 1b extended basad, and a smaller mark in 1a. Postdiscal bar tawny orange in 1a-3, finely outlined proximally in white, the spots above with greater amount of white follow the contour of postdiscal bar of above ; this is outwardly bordered by a series of black triangular horizontal marks, large at tornus and decreasing in size to the apex ; these marks are outlined distally in greyish, this greyish colour extending distad along the veins, thus separating the orange lunules on the border of the wing. Hind wing, ground colour in basal area to postdiscal band bright chestnut ; the inner fold with three vertical black lines edged white, the upper discal area with a darker chestnut solid V, boldly outlined in silvery white ; the postdiscal zone distally outlined in silver from costa to above anal angle, with a white line at mid point connecting to the outer arm of the discal V. Zone corresponding to the black submarginal bar of upperside, here represented by dark chestnut and black horizontal triangles, apices distad, finely outlined in silvery grey ; an admarginal line of contiguous lilac marks finely accentuated with black and ending in the olive anal angle with lilac 'eye-spots', sets off the tawny orange border, which is edged in black finely accentuated white proximally.

The FEMALE is unknown.

Range : Cameroon, Central African Republic, Moyen Congo, Upper Congo to Medje in the Ituri area.

Charaxes eudoxus Drury and its subspecies

The species *Charaxes eudoxus* has a very wide range, extending from the forested areas of West Africa eastward through the Congo to northwest Kenya and the eastern shores of Lake Tanganyika and to the northern block of Zambia. Its distribution tallies more or less with the Zones 5, 7, & 8 as shown on the Vegetational Map published by UNESCO in 1958, and described as 'moist forest at low elevations' and 'forest-savanna mosaic'.

It is not surprising to find that within this vast area, the species has evolved into several 'aggregates', not all of which are sharply and clearly differentiated, and in some cases there is a transition from one group to another.

Poulton (1929) dealt with some aspects of this subspeciation, based on specimens then available, when he described the subspecies *amaurus* from north-west Kenya, Mt Elgon area. This was followed by a more detailed survey by Carpenter in 1937. This survey was carried out in order to ascertain the ranges of the several subspecies, their validity, and relationship to each other, and to describe a race from the western shores of Lake Victoria to which I had drawn attention in 1936. Carpenter went to considerable length in trying to find stable characters by which the several races

could be distinguished, selecting certain features which he tabulated (Op. cit. p. 86) and comparing these measurements in the several races then recognized. These comparative measurements were not entirely satisfactory or conclusive, because of the degree of pattern variation in each race ; moreover, exact topotypical material in sufficient numbers was not available for a basis. It is also regrettable that in this review some of the plates do not figure topotypical specimens.

It is surprising to note that Carpenter accepted Holland's identification of three males taken at Medje, North Ituri, Congo, as *eudoxus eudoxus* Drury (*vide* Carpenter, 1937 : 97 ; distribution of races) and did not take the trouble to examine these specimens. They were kindly sent to me by the late Dr R. M. Fox of the Carnegie Museum, Pittsburgh, U.S.A. and they are in fact *Ch. richelmanni* Rob. = *Ch. fallax* Rich., Carpenter *et al.*, which is a distinct species, with distinctive genitalia, occurring within the range of *Ch. eudoxus mehowi* in the Congo. Examples of *mehowi* were also taken at Medje, which Holland considered to be a distinct species, unrelated to *eudoxus*!

In spite of extensive material which has accumulated since Carpenter's review, one is still hampered by the lack of topotypical material of both sexes. The division which follows must therefore be taken as tentative.

Charaxes eudoxus eudoxus Drury

(Pl. 8, figs 67–68, Map 6)

Charaxes eudoxus Drury, 1782 : 44, Index, pl. 33, fig. 4.

Charaxes eudoxus Drury ; Carpenter, 1937.

MALE. Fore wing length 38 mm ; outer margin slightly incurved. *Upperside*. Fore wing, basal triangle dark chestnut, with slight chestnut along costa to mid point, merging into the black ground of the distal portion ; slight encroachment of the chestnut colour toward end of cell. Postdiscal bar paler and more developed than in other races, extending from the hind margin to 7, widest at 1b (5 mm), the spots gradually decreasing in size and becoming more discrete from hind margin to 7 ; margin with distinct rufous orange internervular lunules, double at 1b and extending to the apex. Hind wing basal triangle darker chestnut inclining to blackish towards costa ; discal band orange-rufous, paler and widest at costa, slightly constricted at 7, then widening slightly and tapering toward anal angle but not crossing the inner fold ; outer edge straight, contiguous with the black postdiscal band, which extends from just short of the costa to just above the anal angle, of about even width to area opposite tails, then narrowing slightly, outer margin dentate. Border paler rufous orange ; margin black. Tails relatively short, upper 4 mm, lower 3 mm, black. Anal angle black with slight indication of one or two purple-blue spots. *Underside*. Fore wing, basal ground colour chestnut in subcostal area to subapex, crossed by black lines strongly bordered in silver ; bases of 1b–3 with large black marks edged in silver and bordering the postdiscal bar, which is ochreous on inner edge but orange distally, bordered distally by a black tapering zone, widest at hind margin and carrying bluish grey triangles and lunules to subapex ; border with orange lunules separated by black. Hind wing basal area chestnut, traversed by narrow black lines bordered in silver, most pronounced in the discal line which is Y-shaped at the costa, extending to and widening above the anal angle, bordered outwardly with chestnut, interrupted on the outer postdiscal line by slightly darker chestnut triangles outlined in greyish olive, accentuated basally by a series of black lunular marks edged distally with purplish grey and bordering the paler chestnut border which extends to anal angle which is olive, carrying two violet-white dots ; edge black, bordered internally with purple-grey.

Description based on a male specimen from Sierra Leone, Freetown. (Univ. Mus. Oxford.)

FEMALE. Fore wing length 45 mm ; outer margin of wing less incurved than in the male. *Upperside.* Fore wing, basal area paler chestnut and more extended towards the discal line and in the cell, where there are two dark marks, one subcostal and the other at the cell end ; rest of wing black, traversed by an ochreous orange bar in the postdiscal line, widest at the hind margin (8 mm), gradually tapering to 7, but there are indications of orange scaling sub-basal in 5-7 in the upper discal line. Margin with small orange internervular spots. Hind wing basal area darker chestnut, shading to brownish towards costa ; orange discal band wide, slightly paler towards costa, of equal width, 7 mm, to upper tail then gradually decreasing to above anal angle, inner edge almost straight but outer edge slightly dentate ; outer border pale tawny orange ; anal angle black with two lilac spots ; edge strongly black ; tails short, rather stumpy, upper 3 mm, lower slightly shorter. *Underside.* Pattern as in the male, but bolder ; the discal bars of both wings wider and paler, more whitish ochre, bordered orange distally.

Description based on a female taken at Freetown, Sierra Leone. (Univ. Mus. Oxford.)

Range : Sierra Leone, Ghana, Ashanti ; ? Ivory Coast ; thus *not* crossing the Togo-Dahomey divide. Records from Buea, Cameroons doubtful, since south-eastern Nigerian specimens are not nominate *eudoxus eudoxus*. Hollands' record from Medje, Ituri, accepted by Carpenter, is erroneous (*vide* introductory remarks).

Charaxes eudoxus mechowii Rothschild

(Pl. 8, figs 69-74. Pl. 9, figs 75-77, Map 6)

Charaxes eudoxus mechowii Rothschild in Rothschild & Jordan, 1899 : 454, [in index], pl. 8, fig. 3.

Charaxes eudoxus mechowii Rothschild ; in Rothschild & Jordan, 1900 : 418-420.

Charaxes eudoxus mechowii Rothschild ; Carpenter, 1937 : 93, pl. 3, fig. 9.

Specimens allocated to this subspecies represent a variable aggregate occurring within a very wide area. The variations are not associated with definable areas, but turn up here and there.

It is advisable therefore to quote Rothschild's description (1900) of the type of this race.

MALE. 'Length of fore wing 43 mm. Band of fore wing above about 6 mm distant from tip of vein SM₂, strongly tapering costad, stopping at SC₅, four upper spots small, luniform (type) or rounded elongate.

Black postdisco-marginal band of hind wing interrupted at veins R₃-M₂, or M₁ & M₂, anteriorly as wide as or a little wider than posteriorly, considerably narrower than the ad-marginal band. On the underside the submedian and median bars M₁-M₂ very heavy, patch-like ; black costal and subcostal bars of submedian and median series absent.'

This description is quoted because no topotypical North Angolan examples are available to me. However, I have a specimen from the southern Kasai which agrees with the type, and a comparative description of this with nominate *eudoxus* is desirable.

The main features on the upper surface of the male are : basal area of fore wing brighter reddish chestnut ; the distal portion of the wing blacker ; the postdiscal row of rufous orange spots much reduced in extent, widest in 1b, it tapers rapidly to 3, remainder of spots vestigial. Hind wing basal area as in nominate race ; disco-postdiscal rufous orange band wider, encroaching on the submarginal black bar from above anal angle to 5, thus reducing this bar in its lower half very considerably ; the marginal rufous orange border wider and richer ; the marginal black narrower ; the tails longer and thinner.

Area I

Northern Angola, Kasai and western Katanga, Moyen Congo, Central African Republic, Cameroons to eastern Nigeria. Dominant form.

MALE. Fore wing length 39–40 mm. *Upperside*. Fore wing, basal area reddish chestnut ; distal 2/3rds of wing black, extending from the proximal edge just short of the apex of the cell to just internally of the postdiscal orange bar on hind margin ; this bar richer in colour than nominate *eudoxus*, less wide in 1a–1b and tapering rapidly to 2–3, then represented by spots of decreasing size to 4, obsolete beyond. Margin with small rufous orange spots, double in 1b, and extending to the apex. Hind wing basal area chestnut, shading to blackish toward costa ; the rufous orange discal band, very slightly paler at the costa where it is 6 mm wide, is strongly indented on its inner border at 6–7 then expands slightly, to taper again to above the anal angle, the band is thus of uneven width and ill-defined in its lower half ; the submarginal black bar is widest at its upper half and then represented by contiguous spots from 5 to the anal angle where the last spot has two lilac spots. Border mainly rufous orange of even width, but tapers slightly near the anal angle ; edge narrowly black with slight white fringe in interspaces ; margin slightly serrate ; tails thin, upper 4–5 mm, lower 3–4 mm. *Underside*. Fore wing, basal area up to postdiscal zone, chestnut, but basal half of costa silvery white ; cell and sub-bases 5–7 with irregular black marks outlined in silver ; a large elongate black mark at base 1b filling the whole area up to the postdiscal zone, thinly outlined in white ; space above in 2 with two rounded black spots outlined in silver, one basal, the other touching the postdiscal line where there is a smaller black mark similarly outlined ; postdiscal zone orange in 1a–1b, becoming more rufous to sub-apex and ornamented with greyish loops decreasing in size up to costa ; border of wing rufous chestnut in apical half but with black triangular marks contiguous in 1b–2 and with greyish between apices on orange ground. Hind wing, basal area rufous chestnut with a V-shaped silvery mark, apex toward inner fold where there are three black lines widely bordered in silver ; a slightly curved silvery line extends from costa to above anal angle, touching the outer angled arm of the V-mark ; the postdiscal zone slightly darker and carrying a series of greyish V-marks apices directed outward, followed up by a line of broken dark marks abutting on the more reddish border which is edged outwardly in black ; anal angle more ochreous olive, with a large and small lilac 'eye-spots'.

FEMALE. *Upperside*. Somewhat similar to nominate female but with brighter chestnut at base ; fore wing bar narrower and placed nearer to the margin which has larger orange spots. Hind wing, generally brighter orange, with discal band considerably wider and more curved on outer edge, thus reducing the width of the postdiscal band which, though slightly irregular on the inner edge is dentate on the outer, the band slightly decreasing in width toward anal angle where it expands slightly ; border wider than in nominate *eudoxus*, more uniform in width and more narrowly edged in black. Tails longer, more pointed, upper 6 mm, lower 5 mm. *Underside*. Basal areas of both wings bright chestnut with similar silvery bars and black marks as in the male, but fore wing bands more orange, darkening slightly toward apex of fore wing ; tornal black marks strong. Hind wing border brighter rufous orange.

These descriptions are based on specimens from southern Kasai, and are applicable to a large majority of specimens from further north, but individual variation is considerable. In the area from Leopoldville to Cameroons and east to the Semliki Valley we encounter an aggregate which, though conforming to the general pattern of *mechowi*, differs mainly in the extent of the rufous orange spots in the fore wing bar and the shape and extent of the black submarginal bar in the hind wing.

Variation : a. The fore wing bar though narrow, consists of rufous orange spots of decreasing size from 1b to 6 ; the marginal spots larger than in nominate *mechowi*. The hind wing basal area blacker toward costa ; the submarginal black bar slightly heavier though similar in shape.

Variation : b. Upperside generally darker, the fore wing postdiscal bar being limited to

rather obscure rufous spots in 1a-1b ; hind wing pattern as usual but darker. Ouessou, Moyen Congo (*Jackson*).

Area 2

The Congo forests east of the Congo River to Ituri and the Semliki Valley.

In this area there is a noticeable tendency towards increase in size and darkening of colour, but the pattern is, in the vast majority, that of *mechowi*.

Area 3

Western Uganda, Kigezi Province, Kayonza forests south of the Ishasha River.

In this aggregate, males and females are more intensely coloured above and below.

MALE. *Upperside*. Fore wing postdiscal bar is more extended, the rufous orange spots usually reaching 5, occasionally 6, but a noticeable feature is the narrowness of the bar in 1a, 1b-2, so that there is not the rapid tapering of the bar from the hind margin, the marginal orange lunules strongly developed. Hind wing, the black costal patch in the basal area is stronger, thus contrasting with the upper end of the discal band which is here pale and wide, but constricted in 7 then widening to 4 and tapering to above the anal angle ; the submarginal black bar is strong and similar in form to that of *mechowi*, more solid and in its widest upper section, the black is extended distad into the rufous orange border along the veins ; the black edge is well marked. *Underside*. General pattern similar to typical *mechowi* but stronger.

FEMALE. *Upperside*. Generally more richly coloured, the reddish chestnut at the bases of the wings stronger. Fore wing, rufous orange bar is deeper in colour and the whole bar is narrower, especially in 1a, 1b & 2, and extends to 6 or even 7. There is often an orange spot subcostal in 7 and another mark beyond end of cell. Marginal spots pronounced. Hind wing, discal band, pale at the costal end and narrow, widens in 5, then gradually tapers to above the anal angle, reaching the inner fold ; pale in the mid area, it is strongly shaded orange on the distal border ; submarginal black bar stronger than in *mechowi*, the anal angle with two distinct lilac spots ; marginal border richer rufous orange, olive at anal angle ; edge black with white internervular fringe. *Underside*. Pattern generally similar to typical *mechowi* but stronger.

Range : Area 1, northern Angola, Kasai and western Katanga, Moyen Congo, Central African Republic, Cameroons to eastern Nigeria.

Area 2, Congo, east of the Congo River to Ituri and Semliki Valley. S.W. Sudan?

Area 3, Uganda, Kigezi District, Western Province, in the Kayonza forests of the Ishasha River Valley.

Note that this area (3) abuts on the Ruanda-Urundi and Lake Kivu areas.

Charaxes eudoxus theresae Le Cerf

(Pl. 9, fig. 78, Map 6)

Charaxes eudoxus theresae Le Cerf, 1932 : 405.

Charaxes eudoxus theresae Le Cerf ; Carpenter, 1937, pl. 5.

I have before me the ♂ type and three ♂ paratypes kindly sent to me by Dr P. Viette of the Paris Museum. Carpenter (1937) upheld this race, citing as diagnostic characters : Fore wing postmedian band very wide at base, (8 mm entire 1-2) rapidly decreasing in 2 to 2 mm ; beyond nerve 3 there are 3 spots, the last minute.

Marginal spots smaller than in *mechowi*. The general form of the hind wing rufous orange band is broader than in *mechowi*; the postdiscal black band also wider and less tapering. This description refers to the type. The paratypes show that in the fore wing, postdiscal bar is widest in 1b, tapering rapidly to 3-4; marginal spots may be strong. Hind wing black submarginal bar variable, wide as in the type or reduced to a series of discrete spots in the lower half, but upper half with conjoined spots. The female is not known.

This aggregate is thus unstable and shows a transition between *mechowi* and the Kigezi form.

Range: The western shores of Lake Kivu.

I have two specimens from the north-east shore of Lake Tanganyika taken at Kigoma. They are rather darker overall than Kivu specimens, but the fore wing pattern is very similar; the hind wing rufous orange band is more restricted in 5-6, where the bar is at its widest, tapering rather rapidly to above the anal angle. The submarginal black bar is rather heavy in its upper half, then tapering to the anal angle which has the usual lilac-white dots. Marginal rufous orange border less wide, being encroached upon at the upper angle by the black bar.

These Kigoma specimens are not *mechowi* but show an approach towards *eudoxus* of the Kigezi area and *theresae*. The female has not been taken.

*Charaxes eudoxus katera*e Carpenter

(Pl. 9, figs 79-82, Map 6)

Charaxes eudoxus subsp. nov.? van Someren, 1936: 178-184, pls 19-23.

*Charaxes eudoxus katera*e Carpenter, 1937: 91, pl. 1, fig. 5, pl. 2, fig. 5.

On an average slightly smaller than the aggregate from the Kigezi area and agreeing more with nominate *cabacus* Jordan from the Entebbe forests. The general impression of the upperside is that this insect might be a melanistic variant of *cabacus*. It was for this reason that I hesitated to apply a name to it in 1936, when it was represented by a single male. In recent years, and on different occasions, several males and females have been trapped in the Katera forest, near Sango Bay. The males are remarkably constant on the upper surface and the female is quite unlike those of other races of *eudoxus*, but both are subject to variation on the underside.

MALE. Fore wing length 39-40 mm. *Upperside*. Fore wing, ground colour almost black, with a slight indication of deep chestnut at the base of the wing; the postdiscal zone with a trace of rufous spots in 1a-1b, and occasionally a mere trace in 2. Margin with small rufous spots seldom extending to the apex. Hind wing with very obscured pattern; basal area mostly black, a slight trace of a rufous chestnut band most apparent at the costa, but suffused over in the disc; submarginal black band wide at upper end near the costa, then tapering slightly to the anal angle; border narrow, dark rufous; tails short and thick at base, 4-5 mm long, edge narrowly black. *Underside*. Pattern generally similar to that of *cabacus*, but chestnut ground colour over distal portion of wings suffused with a vinaceous bloom; ad-marginal greyish triangles well marked in fore wing, marginal orange present only at tornus. Silvery lines and bars as usual in the species.

An interesting variation has the outer border of both wings shot with bluish grey, due to increased size of the greyish admarginal triangles in the fore wing, and in the hind wing, beyond the submarginal chestnut area shot with grey, there follows a thin black line outwardly bordered with mauve and chestnut internervular lunules.

Form resembling *amaurus* Poulton. *Upperside*. Fore wing, in this form the suppressed pattern is more noticable, the basal chestnut is slightly more extended, and the trace of the postdiscal bar may extend to 3 ; the marginal spots are larger. On the hind wing, the discal band is more apparent, and the submarginal black band correspondingly more sharply defined ; the rufous border slightly wider. *Underside*. Ground colour paler rufous, with practically all trace of the silvery lines wanting, or just slightly indicated, but black marks still present. (Pl. 9, fig. 79.)

FEMALE. *Upperside*. Bears a strong resemblance to the female of *Charaxes lucretius* Cr. but the fore wings are more pointed. Fore wing length 44-45 mm. Base chestnut, with an occasional paler subcostal mark at cell end, but extent of chestnut variable toward hind area, rest of wing black, traversed by a postdiscal row of creamy ochreous spots contiguous in 1a-1b, but free from 2-6, spot in 2 usually round, remainder rather ovoid ; margin with distinct rufous orange spots, double in 1b, and extending to apex. Hind wing, basal area blackish brown, paler on inner fold ; discal band creamy ochre with rufous orange shading on distal border in lower half ; inner border with slight kink at 5, outer border almost straight ; submarginal black band strong, rather wide, with dentate outer border ; border orange-ochre ; edge black. Tails thin, 5 & 4 mm long. *Underside*. Very similar to male, especially the variation mentioned above, but pale bands of upperside well represented below.

Form resembling *amaurus* Poulton. *Upperside*. Basal area fore wing brighter chestnut ; postdiscal bar with creamy ochre spots more irregular in shape. Hind wing ochre band less shaded with orange rufous ; submarginal black zone bolder. (The resemblance to female *lucretius* is thus enhanced.) *Underside*. Reddish brown, devoid of silvery bars and lines, but black marks in fore wing strong ; bands of upperside strongly represented below. (Pl. 9, fig. 80.)

Range : Uganda, western shore of Lake Victoria in Buddu district in the Malabigambo forest area at Katera.

Charaxes eudoxus cabacus Jordan

(Pl. 10, figs 83-84, Map 6)

Charaxes eudoxus cabacus Jordan, 1925 : 288.

Charaxes eudoxus cabacus Jordan ; Carpenter, 1937. [*partim*.].

When considering this race, we are faced with the problem of dealing with an aggregate which has evolved into two distinct ecological groups from west to east. This was remarked on by Carpenter (1937 : 89), but he was content to refer to the two groups as nominate *cabacus* Jordan. Furthermore, he drew attention to the fact that Jordan did not have a female associated with his male from Entebbe, but he mentions that I had described a female from Kitale in 1929 and figured it in the same journal in 1936, under the name *cabacus* Jordan. He therefore suggested that this insect should be considered the neallotype.

The problem is further complicated by the fact that in 1929, Poulton described *Ch. eudoxus amaurus* as a distinct race from the Kitale district, S.E. of Mt. Elgon, the chief character of which was the total suppression of the silvery marks on the underside in both male and female. As quoted by Carpenter (1937 : 90), I subsequently bred a family from a known parent which contained examples of both

amaurus and ' *cabacus* '. I therefore came to the conclusion that *amaurus* was a variety and not a geographical race; on the assumption that Kitale specimens were indeed *cabacus* Jordan. Having examined numerous specimens from both Entebbe and S.E. Elgon, I can confirm Carpenter's remark that material from the eastern areas differs from nominate Entebbe specimens. It is unfortunate that Carpenter should have figured an example of the eastern aggregate (Tiriki Hills) as typical *cabacus* (pl. 1, figs 2 & 3), and not a topotypical example from Entebbe. Carpenter notes that some Entebbe examples ' come quite near to the new subspecies ... *katerae* from a locality further west, on the west coast of the northern part of Lake Victoria '.

I therefore propose to deal with this complex as representing two distinct geographical races, *cabacus* Jordan from the Entebbe area and *amaurus* Poulton from N.W. Kenya.

MALE. Size generally smaller, fore wing length average 38 mm. *Upperside*. General colour as in more western examples (Toro and Kalinzu), but basal rufous chestnut slightly more restricted toward hind margin ; a black mark often present in the cell toward end. Postdiscal rufous orange bar very narrow in 1a-1b, seldom wider than 4 mm, the marks here contiguous, the remainder free and of decreasing size to 6 ; marginal spots well developed. Hind wing basal area chestnut shading to black over bases of 6-7 where it encroaches on the rufous orange discal band. The latter is slightly paler at the costa and kinked in 6, where it is narrow, widening slightly, but still comparatively narrow ; the submarginal bar is wide to 3 then tapering toward the anal angle ; thus the rufous orange border is narrow as a rule ; edge black. Tails short, 5 mm. *Underside*. General pattern as in *mechowi*, but chestnut ground colour paler, with full complement of silvery lines and bars ; black marks 1b-2 moderately strong.

FEMALE. No topotypical females are available for study. The female figured by Carpenter (1937, pls. 3 & 4, figs. 10 & 10a) belongs to the eastern race.

Range : Forests around Entebbe : Zika, Kisube, and ? Mabira.

Charaxes eudoxus amaurus Poulton

(Pl. 10, figs 85-88, Map 6)

Charaxes eudoxus amaurus Poulton, 1929 : 478-81.

Charaxes eudoxus cabacus f. *amaurus* Poulton ; van Someren, 1929, 1936.

Charaxes eudoxus cabacus ab. *amaurus* Poulton ; Carpenter, 1937 : 94, pl. 1, fig. 4, pl. 2, fig. 4, pls 3 & 4, figs 10 & 11.

It is unfortunate that when Poulton described the race *eudoxus amaurus*, only one form was available to him. It is now known that there are two forms within this aggregate. If this aggregate is to be considered a valid subspecies, the name *amaurus* must be utilized for it. Since the original description applies to only one form, it would appear desirable to refer to the second form by an infra-subspecific name...form *nzoia*, described below.

The nominate form of *amaurus* is comparatively common amongst the aggregate of N.W. Kenya.

MALE. *Upperside*. There is little or no difference from males of the eastern block, but on the *underside* the characteristic silvery lines are entirely wanting or vestigial ; the black marks are reduced in size, but otherwise normal.

FEMALE. *Upperside*. Identical with females of the eastern area, either with or without rufous orange spots in subcostal area of fore wing. *Underside* without silvery lines.

Form *nzoia* forma n.

MALE. *Upperside*. Differs from the nominate *cabacus* by having the basal areas of fore and hind wing brighter chestnut ; the rufous orange bar of the fore wing not so restricted in the hind portion in 1a-2, the remaining spots decreasing in size and reaching 3-4. The hind wing rufous orange band wider, not so narrow and suffused over in lower half, where it merges into the inner fold above the anal angle ; the black submarginal bar thus narrower in its upper half ; border slightly narrower. *Underside*. Pattern as in nominate *cabacus*, but black marks in fore wing less solid and large.

FEMALE. *Upperside*. Fore wing basal area brighter rufous, black area in disc tapering rapidly and not reaching 1a, subcostal area invaded by trace of rufous marks, one beyond cell and two smaller in 5-6. The postdiscal orange band is broad in 1a-1b, lessening in width from 2 upwards to 6, 7. Marginal spots strong. Hind wing basal area rufous without darkening toward costa ; discal band tawny orange, broad, widest in 5 then tapering to above anal angle. Marginal border relatively narrow ; tails rather short and stumpy at base, upper 5 mm, lower 4 mm. *Underside*. Pattern as in the male but pale bars on both wings conspicuous ; silvery lines less strong ; black marks in fore wing less strong.

Holotype male. N.W. KENYA : Kitale, ix.1933. (Pl. 10, fig. 87.)

Allotype female. Same data. (Pl. 10, fig. 88.)

Distribution : Both forms occur in about equal numbers in the forested areas east of the Nile. Recorded localities are : Tiriki Hills, Kakamega, Kaimosi, Nandi, TransNzoia, in S.E. Elgon area, Kitale.

Charaxes eudoxus zambiae ssp. n.

(Pl. 10, fig. 89, Map 6)

The discovery of this very distinct subspecies extends the south-eastern range of *Charaxes eudoxus* very considerably.

MALE. Fore wing length 39 mm. *Upperside*. Fore wing, pattern somewhat like *eudoxus amaurus* f. *nzoia* but distinguished by the duller basal chestnut and the much paler tawny orange bar, which extends from the hind margin where the marks are conjoined in 1a-2, then as discrete spots of diminishing size to 6. Marginal spots large and distinct. Hind wing basal area chestnut, shading to black in the costal region and to greyish brown on the inner fold. Discal band pale tawny orange of about equal width almost throughout, then tapering toward the anal angle ; submarginal black bar wide, tapering only at anal angle, almost straight on inner border, dentate on outer ; border pale tawny orange narrowly edged in black. *Underside*. Ground colour rather paler rufous chestnut, with paler rufous on outer border of wings. Silvery lines and bars as usual ; black marks in fore wing strong. Tails thin, 6 & 5 mm long.

The FEMALE is still unknown.

Holotype male. ZAMBIA : Shiwa Ngandu, [near Danger Hill, east side Upper Loangwe Valley], 29.xi.62 (C. B. Cottrell) in B.M.(N.H.).

Range : Known only from Loangwe Valley, Zambia.

***Charaxes eudoxus* ? subspecies, status uncertain**

Under this heading we have to consider specimens from the Sudan, one taken in the Imatong Mts in the Mongala Province and one from Bendi, south west of Yambio. There is also a specimen taken in the forests at Arua in north-western Uganda.

Carpenter (1937) placed the two Sudan specimens as *mechowi*, but if this is correct they represent a very dry form of that race. They are characterized by the upper-side having brighter chestnut to the bases of the wings ; paler more extended rufous orange bar up to 6. In the hind wing the orange band is broad, the submarginal black bar much reduced, the upper portion not being more than 4 mm and the remainder of the spots below 5, well separated and decreasing in size. On the underside, it is interesting to note that the Imatong example is devoid of silvery lines and bars, thus analagous to the form *nzoia* of *eudoxus amaurus* but simulating *lucretius* to an even greater extent. It should be noted that amongst the dozens of *mechowi* I have examined, none are without silvery lines below. The specimen from Arua is fully marked with silver lines on the underside.

SYSTEMATIC LIST

***Charaxes richelmanni* Röber**

Charaxes richelmanni Röber, 1936. Type locality : ' Kamerun '.

Range : Cameroon, Central African Republic, Moyen Congo, Upper Congo at Medje in the Ituri area.

***Charaxes eudoxus* Drury**

Charaxes eudoxus eudoxus Drury, 1782. Type locality : Sierra Leone.

Range : Sierra Leone, Gold Coast, Ivory Coast ; thus not crossing the Togo-Dahomey Divide.

eudoxus mechowi Rothschild, 1899. Type locality : N. Angola.

Range : Area 1 ; northern Angola, Kasai and western Katanga, Moyen Congo, Central African Republic, Cameroons & E. Nigeria.

Area 2 ; Congo, east of the Congo River to Ituri and Semliki Valley ; S.W. Sudan.

Area 3 ; Uganda : Kigezi Province, Kayonza forests along the Ishasha River. (Note that this area abuts on the Ruanda-Urundi-Kivu areas.) ?Kigoma, N.E. shore of Lake Tanganyika.

eudoxus theresae Le Cerf, 1932. Type locality : Kitumbo, Lake Kivu, E. Congo.

Range : the western shores of Lake Kivu.

eudoxus katerae Carpenter, 1937. Type locality, Katera Forest, Budu, western shore of Lake Victoria.

Range : Uganda, western shore of Lake Victoria, Budu area in the Katera and Malabigambo Forests.

- eudoxus cabacus* Jordan, 1925. Type locality : Entebbe, Uganda.
Range : Forests around Entebbe ; Zika, Kisubi ; ? Mabira Forest.
- eudoxus amaurus* Poulton, 1929. Type locality : Trans Nzoia, S.E. Elgon, Nandi Hills, Tiriki, Kakamega, Kaimosi, all east of the Nile in N.W. Kenya.
- eudoxus amaurus* f. *nzoia* forma n. Type locality : N.W. Kenya, Kitale.
Range : Timki Hills, Kakamega, Nandi, TransNzoia, in S.E. Elgon area, Kitale.
- eudoxus zambiae* ssp. n.
Range : Zambia, Shiwa Ngandu, nr Danger Hill, east side of Upper Loangwe Valley.

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