X. *Butterflies of Southern Kordofan, collected by Captain R. S. Wilson, Lancashire Regiment.* By G. B. Longstaff, M.A., M.D., F.L.S.

[Read May 3rd, 1916.]

With Map.

A valuable addition has been made recently to the Hope Collection at Oxford in the shape of a number of butterflies from the Nuba Hills in Southern Kordofan, presented by Mr. C. A. Willis, late an Inspector in the Civil Service of the Anglo-Egyptian Sûdân, but now Assistant Director of Intelligence at Khartûm.

The butterflies were collected by Captain R. S. Wilson, of the Lancashire Regiment, more than ten years ago, in November and December 1904, but owing to various circumstances they were not examined until recently.

The collection comprises 223 specimens belonging to 62 species of butterflies, and one moth, all from the hilly country lying between El Obeid on the north and Lake Nô on the south, and between Darfur on the west and the White Nile on the east, and is especially interesting since little or nothing has been published concerning the butterfly fauna of that remote part of the world.

To speak more precisely, the area to be dealt with lies between Lat. 12° 40′ N. and Lat. 10° 40′ N.—a distance of about 120 miles, and between Long. 29° 40′ E. and 30° 31′ E.—about 90 miles.

Although none of Captain Wilson's collecting ground is nearer to the White Nile than 90 miles, it all lies within the basin of that river, and it was for that reason that I was asked by some of my Oxford friends to write a memoir setting forth the geographical relationship between the insects in Captain White's collection and those previously dealt with by me in a paper entitled "The Butterflies of the White Nile: A study in Geographical Distribution." *

Naturally, my first desire was to get into communication with the collector, but war conditions made this impos-

* Trans. Ent. Soc. Lond., 1913, pp. 11–56.

sible. However, Mr. Willis has been most kind in giving me all the information at his disposal, and I have pleasure in quoting at some length from his quite admirable letters in reply to my numerous queries.

"The season would be after the rains, when the country is still green and water lying out in places." Among Mr. Willis's kind acts was putting me in possession of the official guide-book, entitled "Kordofan and the Region to the West of the White Nile; Compiled in the Intelligence Department, Sûdân Government, Khartûm," Dec. 1912.

From this book, which is not to be obtained through the usual channels, I learned that: The end of the rainy season, when the crops are ripened but still uncut, is in October or November; in the south the first rain-storms may be expected as early as the beginning of March (p. 14). This confirms Mr. Willis' statement, but seasons, even in the tropics, vary, and in considering statements as to "dry-season" or "wet-season forms," it must not be forgotten that "wet" individuals may, and often do, survive some way into the dry season.

Again, we have this statement: "The places mentioned are probably about 400 ft. higher than the White Nile, but there is very little to go on." Khartûm is said to be 1200 ft. above the sea; Kâkâ is 404 miles higher up the river than Khartûm, and is in about the same latitude as Talodi, the headquarters of the Nuba Mountains Province. Now the guide-book (p. 69) states that Talodi is 2000 ft. above sea-level; from this we may deduce that the White Nile falls 400 ft. between Kâkâ and Khartûm. That is all that I have been able to find out; the two statements seem fairly concordant.

"Kadugli and Dilling are villages situated in the plain in the vicinity of hills, with a 'khor' or rain-fed stream, only running as a rule for a few hours at a time, close by.

"Sungikai is on a biggish khor, lying somewhat north of the hills, running through what we call 'forest' here, which means a rolling country covered with trees about the size of an apple-tree, grass, etc., which dries up in winter, and turns green again as soon as the rainfall about the end of May.

"Tira Mandi and Tatcho are both hills—rough granite blocks with practically no vegetation on them except where the black Nubawi terraces the land, which he does

fairly extensively, and gets a considerable crop of red millet. He also grows a little tobacco. . . . These khors sometimes fill with water and remain full for a long time, and even if they do not, water can generally be obtained by digging in the bed of them.

"The country is alternate 'cotton-soil' (black stuff which cotton does not grow in, but in appearance like the cotton-soil of Eygpt) and a reddish soil which is probably the same black soil mixed with sand, etc."

The official guide-book cited above states that the cotton-soil plains contain too high a percentage of clay to be easily worked and are usually covered with forest, but that the slopes of the Dar Nuba hills, the banks of the khors, etc., are eminently suitable for cultivation, with a rich soil capable of bearing good crops of *dura* and vegetables (p. 25).

Again, to quote Mr. Willis' letter: "The hills stand straight up out of the plain, rising abruptly; sometimes there is a considerable extent of plateau high up where soil can be cultivated, but the appearance of the hills is extraordinarily rocky, though trees grow upon them."

This description of the hills vividly recalls to my mind what I saw at Gebel Ên, and more particularly at Rejâf. The mountains there suggest Nasmyth's description of the mountains of the moon, which he compared to pellets of clay thrown by boys so as to stick upon a wall or fence. The official guide shows that these abrupt hills may be anything from 500 ft. to, in exceptional cases, nearly 2000 ft. above the plain, *i. e.* 4000 ft. above the sea.

Mr. Willis goes on to make the sound suggestion: "It is most probable that the butterflies were captured close to water. It is extraordinary to see them collect on any little damp patch of ground which lies in the shade, and there are always quantities by the watering-places, when the ground is clear of grass and the water has been spilled into troughs or the like for watering animals."

I have myself taken butterflies under like circumstances by the watering-places of baggage mules at Malakand (N.W. frontier of India), but I suspect that the staling of the animals has something to do with it.

"Each side of a khor is heavily wooded and covered with thick vegetation, the depth, of course, varying, and it is in that little belt that all the beasts or butterflies lie at some period of the day."

It should be noted that the specimens bear particulars as to the localities and exact dates of capture; but at present I have no information as to the circumstances under which they were taken, or the plants with which they were associated.

The first thing that struck me on looking at the collection was that it bore internal evidence of being a fair sample of the fauna,* inasmuch as, among others, such a comparatively obscure insect as *Pinacopteryx venata* was represented by a series of nine specimens, as compared with four *Danaida chrysippus*, one *Teracolus protomedia* and one *Terias brigitta*. On the other hand, that the collector had not confined his attentions to the more sluggish insects was proved by the presence of six *Eronia leda*.

The collection had been previously critically examined by my friends, Dr. F. A. Dixey—*Pierinae*, Dr. H. Eltringham—*Nymphalidae*, and Mr. G. T. Bethune-Baker—*Lycaenidae* and *Hesperiidae*, who all very kindly placed their notes at my disposal.

In order to make the comparison of the two papers as easy as possible, I have dealt with the insects in the same order as in the paper referred to. Each species has a serial number, the same in the two papers; where a species occurs in this paper not dealt with in the first, letters are added to the last numeral, 7*a*, 7*b*, etc., the interpolated species being put in what seemed to be suitable places.

The very numerous quotations from these three authorities, as well as those from Mr. Willis's letters are within inverted commas. The old plate of the map in the earlier paper has been used again with a few additions.

Family NYMPHALIDAE.

Sub-family *DANAINAE*.

1. **Danaida chrysippus,** Linn.

α. Curiously enough, the typical form is not represented in the collection.

β. Form *alcippus*, Cram.

One ♂ from Jebel Tira Mandi, Nov. 25, 1904.

"The hind-wing upperside nearly all white, with the

* At least so far as the butterflies to be met with in November and December 1904.

usual exception of the black border inwardly tinged with yellow" (Eltringham).

γ. Form *dorippus*, Klug.

One ♂ and one ♀ from J. Tira Mandi, Nov. 25, 1904.

δ. Form *albinus*, Lanz.

One ♂, Kadugli, Dec. 13, 1904.

"The white covers a large area of the hind-wings. There is the usual trace of the ancestral white bar in the subapical region of the fore-wings" (Eltringham).

2. **Tirumala petiverana**, Dbl. and Hew.

One ♀, Khor Nucila [Lat. 11° 21′ N.], May 26, 1906.

The locality is at least 2° further north than that given in the White Nile list.

Sub-family *SATYRINAE.*

3*a*. **Mycalesis milyas**, Hew.

Two ♀♀ of the dry-season form, Tira Mandi, Nov. 23, 1904.

Not in the White Nile list. Dr. Eltringham notes that the British Museum specimens are from Atbara (Abyssinia). Aurivillius [Seitz, "Gross-Schmetterlinge der Erde"] gives White Nile, and says it spreads to the Congo and Togo.

Sub-family *NYMPHALINAE.*

[4. It is remarkable that *Pyrameis cardui*, Linn., is not included in the collection.]

5. **Precis oenone cebrene**, Trimen.

One ♂, two ♀♀, Kadugli [Lat. 11° 0′ N.], Dec. 13, 1904.

6. **Precis clelia**, Cram.

One ♂, Tira Mandi [Lat. 10° 52′ N.], Nov. 25, 1904.

This is more than 1° further north than in the White Nile list.

"This species has recently suffered from the attention of the German entomologist Strand, who has given nine new names to trifling aberrations" (Eltringham).

7. **Precis orithyia madagascariensis,** Guen.

Three ♂♂ and two ♀♀, Dilling, Nov. 16, 1904; three ♂♂, Tira Mandi, Nov. 23, 25, 26, 1904; one ♂, Kadugli, Dec. 13, 1904.

Of this species Dr. Eltringham says: "The typical *orithyia* was first described from China, the sub-species *madagascariensis* (= *boopis*, Trimen) being the form inhabiting the African continent and Madagascar. The sub-species *here*, Lang, is found in Arabia, and is smaller, and without the red marks in fore-wing cell."

Dilling is nearly 2½° north of the Bahr al-Zarâfa, the previous White Nile record.

7*a*. **Precis octavia, f. sesamus,** Trimen.

One ♀, Jebel Shwai, Nov. 21, 1904; one ♂, Kadugli, Dec. 13, 1904, and one ♀ from the same locality, Jan. 18, 1905.

"The dry-season form of *P. octavia;* one ♀ may be regarded as tending slightly to an intermediate in that it shows rather more red, especially in the fore-wing cell" (Eltringham). Prof. Poulton tells me that this specimen much resembles the Abyssinian form, which is nearer to the western sub-species than to the southern form, which is found in British East Africa.

Although occurring in Abyssinia and Somaliland and widely distributed throughout South Africa, it is not in the White Nile list.

7*b*. **Catacroptera cloanthe cloanthe,** Cram.

One ♂, Khororak, Nov. 29, 1904; one ♂, one ♀, Kadugli, Dec. 13, 1904.

"One ♂ specimen tends towards the dry-season form named *obscurior* by Staudinger, in which the underside is darker" (Eltringham).

This species is not in the White Nile list, but has been found in Abyssinia and is widely distributed in Africa south of the Equator.

9. **Hamanumida daedalus,** Fabr.

One ♂ and one ♀, Dilling [Lat. 12° 3′ N.], Nov. 16, 1904; one ♀, Jebel Shwai [Lat. 10° 11′ N.], Nov. 21, 1904.

"The ♂ tends towards the form *meleagris*, Cram., being somewhat paler underneath" (Eltringham).
At least $2\frac{1}{2}°$ north of previous records.

10. **Neptis agatha**, Cram.

Five ♂♂ at Khororak [Lat. 10° 48′ N.], Nov. 29, 1904.
In my White Nile list, after mentioning that a *neptis* had been seen by me at Kîrô [Lat. 5° 22′ N.], I remark: "This species has been taken at Shoa, in Abyssinia [*circa* Lat. 10° N.]—perhaps the northern limit of the genus in East Africa."

11. **Byblia ilithyia ilithyia**, Drury.

One ♂, "of the wet-season form" (Eltringham), Kadugli, Dec. 23, 1904.

12. **Byblia acheloia acheloia**, Wall. (= *goetzius*, Herbst.).

One ♂, "of the dry-season form" (Eltringham), J. Tatcho [Lat. 10° 48′ N.], Nov. 28, 1904, *i. e.* at least 1° further north than in my White Nile list.

Sub-family *ACRAEINAE.*

14. **Acraea acerata acerata**, Hew.

"One ♂, more or less intermediate to the form *vinidia*, Hew." (Eltringham).
Tira Mandi, Nov. 25, 1904.

15. **Acraea terpsichore**, Linn.

Four ♂♂ and one ♀, all taken at Tira Mandi, Nov. 25, 1904. This is 5° 40′ north of the locality in the White Nile list.
"One ♂ is of the form *rougeti*, Guér., and the ♀ example resembles the ♂♂ more closely than is usual in this species" (Eltringham).

17. **Acraea encedon**, Linn.

"Ten ♂ examples, no two of which are exactly alike. Two nearest the typical form have the ground colour dull and somewhat darkly suffused. One resembles these, but has the fore-wing subapical white dusted with tawny.

The next two are intermediate between this and the *daira* form. The sixth is a nearly typical *daira*, Godm. and Salv., the seventh is of the form *lycia*, Wall., with some tawny suffusion, and the remainder are *lycia* of varying degrees of whiteness" (Eltringham).

All taken at Tira Mandi, Nov. 23, 25, 1904.

This series shows how much the species may vary in the same place and at the same time.

17*a*. **Acraea neobule,** Doubl.

One ♀, "unusually small" (Eltringham).

Taken at Kadugli, Dec. 29, 1904.

Not in the White Nile list. It occurs in Somaliland, Abyssinia and Socotra, and has a wide African distribution.

17*b*. **Acraea caecilia caecilia,** Fabr.

Two ♂♂ and two ♀♀, Kadugli, Dec. 17, 21, 23, 29, 1904.

All the specimens "have the characteristics of the western rather than the eastern form. Abyssinian examples may be of the western form or intermediate to *pudera*, Auriv., the eastern sub-species in which the apical black is narrow and sharply defined" (Eltringham).

A widely distributed species recorded from Nubia (Ambukôl), Abyssinia and Somaliland among other places, but not in the White Nile list.

[17*c*. **Acraea marnois,** Rogen.]

This is regarded by Aurivillius as a variety of *oncaea*, Hopff., but Dr. Eltringham ("African species of Acraea," pp. 184, 185) considers it more nearly allied to *caldarena* and *caecilia*. As the type (at Vienna) came from the Bahr el-Zarâfa it should be added to the White Nile list.]

17*d*. **Acraea doubledayi sykesi,** Sharpe.

A ♂, Kadugli [Lat. 11° 0′ N.], Dec. 17, 1904.

Not in the White Nile list. Dr. Eltringham says of it: "A single ♂ example of this rare species in exceptionally fine condition. This is the most northern record for the sub-species." The sub-species *A. doubledayi arabica*, Eltring., occurs in the Azvaki Ravine, S. Arabia.

Family LYCAENIDAE

I have to thank Mr. Bethune-Baker for determining the butterflies in this family.

19. **Polyommatus baeticus,** Linn.

One ♂, Dilling, Nov. 16, 1904.

20. **Lachnocnema bibulus,** Fabr.

One ♂, two ♀♀, Jebel Shwai, Nov. 21, 1904; two ♀♀, Tira Mandi, Nov. 23, 25, 1904.

The latter place is $2\frac{1}{2}°$ further south than any locality for the species given in the White Nile list.

21. **Tarucus theophrastus,** Fabr.

Two ♂♂, Jebel Shwai, Nov. 21, 1904; one ♀, Dilling, Nov. 14, 1904; one ♀ Tira Mandi, Nov. 25, 1904.

22. **Tarucus telicanus,** Lang.

One ♀, Khor Nubbaka, Nov. 12, 1904.

24*a*. **Castalius lactinatus,** Butl.

One, Tira Mandi, Nov. 23, 1904; one, Kadugli, Nov. 29, 1904.

Not in the White Nile list. For *C. cretosus*, Butl., of which Aurivillius considers this to be a variety, he gives Senegal and Abyssinia as localities, as well as the White Nile; for *C. lactinatus* he gives Somaliland only.

26. **Catochrysops malathana,** Boisd.

Four ♂♂, and two ♀♀, Tira Mandi, Nov. 23, 25, 1904; two ♂♂, Kadugli, Dec. 13, 17, 1904.

28. **Chilades trochilus,** Frey.

One, Jebal Shwai, Nov. 21, 1904.

30*a*. **Lycaenesthes crawshayi,** Butl., var. *minuta*, B.-B. var. nov.

A ♂, Dilling, Nov. 16, 1904; a ♀, Tira Mandi, Nov. 23, 1904.

Mr. Bethune-Baker has described this as a new variety of Butler's Nyassaland species.* It is but two-thirds of the size of specimens from Sierra Leone and Uganda, though Mr. Bethune-Baker has specimens intermediate in size from the Budonga Forest, in the Congo [4° 30′ S., 20° E.].

31. **Azanus sigillatus,** Butl. [?= *jesous,* Guér.].

One ♂, Tira Mandi [Lat. 10° 52′ N.], Nov. 23, 1904.
This is 5½° further north than in the White Nile list.

31*a*. **Azanus mirza,** Ploetz.

A ♂, Tira Mandi, Nov. 23, 1904.
Not in the White Nile list. The species has a wide distribution in Central and South Africa.

34. **Virachola antalus,** Hopff.

Two ♂♂, three ♀♀, all from Kadugli, Dec. 16, 17, 19, 1904.
This locality is 2½° further south than that given in the White Nile list.

34*a*. **Rapala licinia,** Mab.

One ♂, one ♀, Kadugli, Dec. 17, 23, 1904.
Not in the White Nile list. A South African species extending to Madagascar.

35*a*. **Axiocerces harpax,** Fabr.

Two ♂♂, eight ♀♀, Kadugli, Dec. 14, 16, 17, 29, 1904.
Not in the White Nile list. This is a South African species, recorded by Aurivillius from Waddelai, Lat. 3° N. Kadugli is in Lat. 11° N.

35*b*. **Spindasis kaduglii,** B.-B. sp. nov.

A ♂, Kadugli, Dec. 29, 1904.
Described by Mr. Bethune-Baker, who says that it is near to *S. victoriae,* Butl.†

* See Ann. and Mag. Nat. Hist., 1916, p. 379.
† Ann. and Mag. Nat. Hist., 1916, p. 379.

35*c*. **Argiolaus ismenias**, Klug.

Two, Sungikai, Nov. 13, 1904; two, Kadugli, Dec. 16, 1904.

Not in the White Nile list. A fine but delicate species; the type came from Ambukôl, 6° to the north.

Mr. H. H. Druce has 6 ♂♂ and 1 ♀ from Lagos, of all places; they were captured by Mr. C. A. (later Sir Alfred) Moloney, then governor of the Colony. Mr. Druce writes me that he has since seen others from the same locality (Ann. and Mag. Nat. Hist. 1891, p. 148).

Prof. Poulton says that there are many resemblances between the fauna of Abyssinia and that of the West Coast.

35*d*. **Stugeta marmoreus**, Butl.

Two at Kadugli, Jan. 18, 1905.

Until lately represented solely by Petherick's type from "the White Nile," in the British Museum, but Mr. Bethune-Baker tells me that he has specimens from the Bahr el-Ghazâl to the south. See White Nile list, p. 55 footnote.

Family PAPILIONIDAE.

Sub-family *PIERINAE*.

Dr. Dixey has examined the butterflies of his favourite sub-family with the thoroughness characteristic of him, and has kindly placed his MS. notes at my disposal. All the determinations are his and the copious extracts from his notes are given in inverted commas.

"The Pierinae captured by Captain Wilson number twenty-one species. Of these all but two occur in the records brought together by Dr. G. B. Longstaff in his paper 'On the Butterflies of the White Nile.' The two not there recorded are *Glutophrissa epaphia*, Cram., and *Teracolus celimene*, Lucas. [See notes to these species, 39*a*, 51*a*.] . . . Of the nineteen species common to the two lists, fifteen were previously known to occur in latitudes corresponding to those explored by Capt. Wilson. . . . Eight of the fifteen occur also in Southern Arabia, and several of them have been recorded from the Nile Valley north of Khartûm. The four species included in Dr. Longstaff's list, but not previously known from localities

so far north as Capt. Wilson's, are *Pinacropteryx venata*, *Teracolus achine*, *Eronia leda* and *Terias brigitta*. [See notes to these species under the serial numbers 40, 55, 63 and 67.] . . . It will be gathered that the predominant forms of Pierines in Capt. Wilson's collection are those characteristic of Arabia and North-east Africa. The chief exceptions to the general 'desert' aspect of the Pierine fauna are afforded by *Eronia leda* and *Glutophrissa epaphia*.

"The dry-season characters are strongly marked throughout the series, the chief exceptions occurring in two species of the genus *Teracolus* (*T. eupompe* and *T. evagore*). Of the former species, one specimen is 'wet' and six are 'dry.' Of the latter, two are 'wet' and four 'dry.'"

36. **Herpaenia eriphia**, Godt.

Two ♂♂, Kadugli, Dec. 14, 23, 1904.

"Both of the 'dry' northern form, = *lacteipennis*, Butl."

37. **Belenois gidica**, Godt.

A ♂, Tira Mandi, Nov. 25, 1904; a ♂, Tatcho, Nov. 28, 1904; three ♂♂, Kadugli, Dec. 13, 21, 1904.

"Dry season."

38. **Belenois severina**, Cram.

Four ♂♂, Kadugli, Dec. 27, 1904; one ♀, Sungikai, Nov. 13, 1904.

The latter locality is 1° 20′ north of the furthest range given in the White Nile list.

Dr. Dixey writes: "These are of what is usually considered the wet-season phase. The seasonal colouring resembles that shown by Mr. Marshall's Mashonaland specimens captured in March, and his bred Mashonaland specimens emerging in June after exposure to damp heat as both larvae and pupae. Two of the males are conspicuously marked on the underside with orange-yellow."

39. **Belenois mesentina**, Cram.

A ♂ from Khor Nubbaka, Nov. 12, 1904; two ♂♂, Kadugli, Dec. 23, 27, 1904.

39*a*. **Glutophrissa epaphia,** Cram.

Two ♀♀, Khororak, Nov. 29, 1904.

Not in the White Nile list. Dr. Dixey says: "This species, so far as I am aware, has not hitherto been met with in East Africa further north than Wadelai (about Lat. 2° N.), though Aurivillius gives 'ganz Afrika' as its habitat."

40. **Pinacopteryx venata,** Butl.

Two ♀♀, Sungikai [Lat. 12° 36′ N.], Nov. 13, 1904; one ♂, one ♀, Dilling, Nov. 14, 1904; one ♂, Tira Mandi, Nov. 23, 1904; one ♂, two ♀♀, Tatcho, Nov. 28, 1904; one ♂, Kadugli, Dec. 27, 1904.

Dr. Dixey says: "These differ in some respects from Dr. Longstaff's White Nile series, being generally 'drier.' Two at least of the females are hardly distinguishable (if at all) from dry-season females of *P. simana*, Hopff., and raise doubts as to whether Godart's *doxo*, the locality of which is unknown, may not after all be a female similar to these; in which case *doxo* would have priority as the name of the species."

Dr. Dixey's remarks in "The Butterflies of the White Nile," p. 31, should be compared with this later judgment.

Sungikai is upwards of 3° further north than any locality given for the species in that paper, and its occurrence there was, as Dr. Dixey says, somewhat unexpected.

47. **Teracolus amelia,** Lucas.

A ♂, Tatcho, Nov. 28, 1904; two ♂♂, Tatcho, Dec. 17, 21, 1904.

"Dry: the male taken in November is transitional towards the *catachrysops*, Butl., form of *T. vesta*, Reiche."

48. **Teracolus protomedia,** Klug.

Of this conspicuous species, which I found commonly on the White Nile, a single ♂ was taken at Dilling, Nov. 14, 1904.

49. **Teracolus halimede,** Klug.

Two ♂♂, one ♀, Kadugli, Dec. 14, 23, 1904.

Of these Dr. Dixey says: "Dry; like Dr. Longstaff's and Mr. Loat's from the White Nile."

51. **Teracolus eris,** Klug.

One ♂, Tira Mandi, Nov. 25, 1904; one ♂, two ♀♀, Kadugli, Dec. 14, 17, 21, 1904.

About 2° further south than my specimen captured in 1912. Dr. Dixey says: "Dry. The ♀♀ are 'drier' than any others in the Hope Collection, one of them very remarkably so. This specimen (Dec. 17) is also reduced in size."

51*a*. **Teracolus celimene,** Lucas.

One ♀, Khor Nubbaka [Lat. 12° 36′ N.], Nov. 12, 1904; a ♂, Tira Mandi [Lat. 10° 52′ N.], and another ♂, Kadugli [Lat. 11° 0′ N.], Dec. 14, 1904.

This conspicuous and distinct species is not in my White Nile list; Dr. Dixey says of it: "Has occurred in Abyssinia, and is found as far south as Swaziland and the Transvaal."

53. **Teracolus phlegyas,** Butl.

A ♂, Tatcho, Nov. 28, 1904; a ♂ and a ♀, Khororak, Nov. 29, 1904; three ♂♂, Kadugli, Dec. 17, 21, 1904.

"Dry-season phase. The ♂♂ resemble one caught by Mr. W. S. L. Loat twelve miles north of Kâkâ, White Nile. (See Trans. Ent. Soc. London, 1903, p. 146.)"

54. **Teracolus eupompe,** Klug.

Three ♀♀, Sungikai, Nov. 13, 1904; one ♀, Dilling, Nov. 14, 1904; two ♂♂ and one ♀, Kadugli, Dec. 17, 21, 29, 1904.

"One ♀ is 'wet,' the others and the ♂♂ are 'dry.' All the specimens are small; one ♂ and one ♀ are dwarfs. The wet-season ♀ and the dwarf dry-season ♀ were taken on the same day, Nov. 13. [It may be added that both are alike in poor condition.—G. B. L.] They resemble White Nile specimens captured in February by Dr. Longstaff, but are generally somewhat smaller and 'drier' than Mr. Loat's specimens taken in January and March slightly further south."

55. **Teracolus achine,** Cram.

One ♀, Tira Mandi [Lat. 10° 52′ N.], Nov. 23, 1904.

"Dry-season. Resembles Dr. Longstaff's from the

White Nile, but is 'drier' than his series from Port Sûdân (Red Sea)." Tira Mandi is 1° 22′ north of any White Nile locality for this species, but 8° south of Suâkin, 8½° south of Port Sûdân.

57. **Teracolus daira,** Klug.

One ♀, Sungikai, Nov. 13, 1904; one ♂, four ♀♀, Kadugli, Dec. 14, 17, 21, 29, 1904.

"'Dry.' Resemble Dr. Longstaff's and Mr. Loat's from the White Nile; also Dr. Longstaff's from Khartûm."

58. **Teracolus evagore,** Klug.

Two ♂♂, Dilling, Nov. 14, 1904; one ♂, one ♀, Tira Mandi, Nov. 23, 25, 1904; two ♀♀, Kadugli, Dec. 29, 1904.

Dr. Dixey writes: "Two of the ♂♂ (Nov. 14) are wet-season; the remaining ♀ (Nov. 23) and the three ♀♀ are of the dry-season phase (*saxeus*, Swinhoe). The dry-season specimens resemble Dr. Longstaff's and Mr. Loat's White Nile series; the wet-season ♂♂ are like examples from further south and from Somaliland."

61. **Teracolus evarne,** Klug.

One ♂, Khororak, Nov. 29, 1904; one ♂, two ♀♀, Kadugli, Dec. 21, 1904.

"All dry-season. They resemble Dr. Longstaff's specimens from the White Nile (February 1912), but are generally smaller and 'drier' than the same collector's specimens from the west shore of the Red Sea (March 1912)."

62. **Eronia cleodora,** Hübn.

One ♀, Dilling, Nov. 14, 1904; five ♂♂, one ♀, Kadugli, Dec. 17, 21, 1904.

"These are of the North-east African form, and resemble Dr. Longstaff's and Mr. Loat's specimens."

63. **Eronia leda,** Boisd.

One ♀, Khor Nubbaka, Nov. 12, 1904; three ♂♂, Sungikai, Nov. 13, 1904; one ♂, Dilling, Nov. 14, 1904; one ♂, Tira Mandi, Nov. 23, 1904.

These places range from 2° 40′ to 4° 20′ north of the White

Nile records. Dr. Dixey notes that the ♀ is unusually pale; he also quotes my conjecture that "It would appear that this conspicuous insect does not get further down the White Nile than the Sadd."

65. **Catopsilia florella,** Fabr.

One ♂, one ♀, Sungikai, Nov. 13, 1904; two ♂♂, one ♀, Kadugli, Dec. 14, 16, 1904.

"Somewhat small. Resemble specimens from Khartûm captured in January and February 1912."

67. **Terias brigitta,** Cram.

One ♀, Sungikai, Nov. 13, 1904 [Lat. 12° 21′ N.].

On this species Dr. Dixey's note is: "Dry-season. Dr. Longstaff remarks (in his paper on the Butterflies of the White Nile, p. 48), 'It might appear allowable to conjecture that *brigitta* does not extend far north of Lake Nô, but the fact that specimens of . . . *T. senegalensis* . . . turned up no less than three degrees north of that place makes one cautious.' Capt. Wilson's specimen was caught in the Nuba Hills nearly 3° north of Lake Nô."

Sub-family *PAPILIONINAE.*

70. **Papilio pylades pylades,** Fabr.

Two, Jebel Shwai, Nov. 21, 1904; eight, Tira Mandi, Dec. 23, 25, 26.

"The western form" (Eltringham).

70*a*. **Papilio antheus nyassae,** Butl.

Three, Serraf Fellata [Lat. 11° 54′ N.], May 28, 1906.

"The East African form" (Eltringham).

Not in the White Nile list. The species has a wide Central African distribution.

Family HESPERIIDAE.

Mr. Bethune-Baker kindly determined these for me.

71*a*. **Sarangesa plistonicus,** Ploetz.

One, Dilling, Nov. 15, 1906; four, Tira Mandi, Nov. 23, 25, 26, 1904.

Not in the White Nile list.

71*b*. **Sarangesa pertusa,** Mab.

Three, Kadugli, Dec. 23, 1904.
Not in the White Nile list.

71*c*. **Caprona adelica,** Karsch, var. *Kordofani*, B.-B. var. nov.

One, Tira Mandi, Nov. 25, 1904.
Mr. Bethune-Baker says that this is the dry-country form, whereas *C. cassualalla*, B.-B., is the more variegated western form of the same insect found at Angola.*
I have taken *C. adelica* at Sydenham, Natal. It is not in the White Nile list.

72*a*. **Gegenes obumbrata,** Trimen.

One ♂ of the typical form, Tira Mandi, Nov. 25, 1904.
Not in the White Nile list.

72*b*. **Hesperia mafa,** Trimen.

One, Sungikai, Nov. 13, 1904; two, Kadugli, Dec. 13, 29, 1904.
Not in the White Nile list. This is a South African species.

How does the butterfly fauna of the Nuba Hills compare with the fauna of the White Nile hitherto known to us?
To begin with, material is sadly deficient for such a comparison, as is so often the case. For example, my White Nile list is founded for the most part on captures made in the month of February, whereas Capt. Wilson's insects were taken in November and December. Again, the time devoted to collecting at each place was a matter of days, more often of hours. These limitations should be kept in mind.
Although much of Northern Kordofan is more or less desert in character, both Mr. Willis and the Government Handbook speak of "forests" in the region of the Nuba Hills; it might therefore be reasonably expected that the fauna of the latter would exhibit a forest rather than a desert aspect.

* See Ann. and Mag. Nat. Hist., 1916, p. 380.

The following lists show (A) the twenty species added to the fauna by Capt. Wilson, and (B) the thirty-five species in my White Nile list which he did not happen upon, or at any rate did not send home.*

A. Species taken by Captain Wilson but not in the White Nile list.

3*a*. *Mycalesis milyas*, Hew.
7*a*. *Precis octavia sesamus*, Trim.
7*b*. *Catacroptera cloanthe*, Cram.
17*a*. *Acraea neobule*, Dbl.
[*f. neobule arabica*, Rebel D]
17*b*. *Acraea caecilia*, Fab. D
17*c*. *Acraea doubledayi sykesi*, Sharpe
[*f. doubledayi arabica*, Eltring. D]

30*a*. *Lycaenesthes crawshayi*, Butl.
31*a*. *Azanus mirza*, Ploetz.
34*a*. *Rapala licinia*, Mab.
35*a*. *Axiocerces harpax*, Fab.
35*b*. *Spindaris kadugli*, B.-B.
35*c*. *Argiolaus ismenias*, Klug. D
39*a*. *Glutophrissa epaphia*, Cram.

51*a*. *Teracolus celimene*, Lucas

70*a*. *Papilio antheus nyassae*, Butl.
71*a*. *Sarangesa plistonicus*, Ploetz.
71*b*. *Sarangesa pertusa*, Mab.
71*c*. *Caprona adelica kordofani*, B.-B.
72*a*. *Gegenes obumbrata*, Trim.
72*b*. *Hesperia mafa*, Trim.

B. Species in the White Nile list but not in Captain Wilson's collection.

3. *Yphthima asterope*, Klug. D
4. *Pyrameis cardui*, Linn. D
8. *Hypolimnas misippus*, Linn. D?
13. *Atella phalantha*, Drury.

16. *Acraea natalica*, Boisd.
18. *Acraea abdera*, Hew.
23. *Castalius usemia*, Neave.
24. *Cupido cretosus*, Butl.
25. *Catochrysops eleusis*, Dem. D
27. *Zizera lysimon*, Hüb. D
29. *Lycaenesthes amarah*, Guér. D
30. *Lycaenesthes otacilia*, Trim.
32. *Azanus ubaldus*, Cram. D
33. *Deudorix livia*, Klug. D
35. *Hypolycaena philippus*, Fab.
41. *Calopieris eulimene*, Klug. D
42. *Teracolus calais*, Klug. D
43. *Teracolus phisadia*, Klug. D
44. *Teracolus castalis*, Stdgr. D
45. *Teracolus chrysonome*, Klug. D
46. *Teracolus vesta*, Reiche
50. *Teracolus pleione*, Klug. D
52. *Teracolus hetaera*, Gerst.
56. *Teracolus evippe*, Linn.
[*f. epigone*, Feld.] D
59. *Teracolus ephyia*, Klug. D
60 *Teracolus liagore*, Klug. D
64. *Leuceronia buquetii*, Boisd. D
[*f. arabica*, Hopff.]
66. *Terias senegalensis*, Boisd. D
68. *Colias hyale marnoana*, Rogers D?
69. *Papilio demodocus*, Esp. D?
71. *Sarangesa eliminata*, Holl.
72. *Gegenes nostradamus*, Fab.
73. *Parnara mathias*, Fab. D?
74. *Parnara fatuellus*, Hopff.
75. *Rhopalocampta forestan*, Cram.

These lists may be analysed by dividing A and B into sub-families.

	A	B
Satyrines	1	1
Nymphalines	2	3
Acraeines	3	2
Lycaenids	6	9
Pierines	2	14
Papilionines	1	1
Hesperids	5	5

* It is not improbable that Capt. Wilson was so familiar with the typical form of *D. chrysippus* and with *P. cardui*, *H. misippus*, and *A. phalantha* that he did not think it worth while keeping specimens of those species.

Obviously the only really notable difference between them from this point of view is the very small number of new Pierines that Capt. Wilson collected. This may be in part explained—but only in part—by the fact that when on the White Nile I paid special attention to that group and sent home long series.

The extreme scarcity of Satyrines in the White Nile basin is very remarkable. To my *single specimen* of *Yphthima asterope* Capt. Wilson adds *two Mycalesis milyas*. In the nature of things positive observations have much more value than negative, and it is quite probable that a collector working throughout the year might find many more. My own observations in Cape Colony suggest that when Satyrines are scarcest Pierines are most abundant and *vice versâ*.

In the lists, I have marked with a D all the butterflies that I consider to be "desert" insects; this, of course, by no means implies that the species so marked are confined to "desert" areas; far from it. The D indicates that butterflies so marked—however extensive their distribution may be—are such as can live where "desert" conditions prevail.

Deserts differ *inter se*; some are much more barren than others, in some the prevailing surface is sand, in others rock, while some are shingly. Their common characteristic is aridity, an absence of rain for sufficiently long periods to stunt vegetation. Much depends upon season; Col. Yerbury says graphically: "Few . . . have any idea of the effect on 'the barren rocks of Aden' of a few heavy showers; how almost immediately, as if by magic, vegetation springs up in every ravine and watercourse, accompanied by a tolerably abundant insect fauna." * Under such circumstances the desert literally rejoices and blossoms as the rose.

The sand-dunes on our British coasts are true deserts, small though they be; on them *C. pamphilus*, *P. cardui*, *A. aglaia*, *C. phlaeas*, *L. icarus* and *astrarche* may generally be found among the bents, while now and then a *Colias* may be seen coursing over the sand; such are desert butterflies, though they may all be found inland living under very different conditions.

Looked at in this way, we see that whereas among

* Journal Bombay Nat. Hist. Soc., 1892, p. 208.

Capt. Wilson's twenty added species *four* only bear the D, no fewer than twenty-two of the White Nile species that he did *not* send home bear that mark.

Undoubtedly the fauna of Southern Kordofan has not the very marked desert character of that found nearer the river, but at the same time it can scarcely be deemed to be a forest fauna.

It is curious that of the ten Skippers not one is common to the two lists.

Capt. Wilson may be congratulated on having taken one species and two varieties new to science.