

The Butterflies of Nigeria

By E. F. G. Haig

THE aim of this series of articles is to enable members to identify the less uncommon butterflies found throughout this country, to introduce members to some of the attractive features of Nigerian butterfly lore, and to encourage interest in this branch of nature study. The butterflies of Nigeria, with their imposing array of 1,200 odd different species, forms and aberrations, constitute a fascinating field for study and research: there are whole genera of which none of the early stages are known, and dozens of species of which the mutual relationships are still very obscure.

From a lepidopteral viewpoint, of course, "Nigeria"—which for the purpose of these articles includes the Cameroons—is an entirely artificial area of study. But one has to set some limits, and since this is the *Nigerian Field* and the writer has but little acquaintance with the lepidoptera of the remainder of West Africa, it seemed best to concentrate on the butterflies of Nigeria.

These articles owe an enormous debt to Dr. Seitz's Macro-lepidoptera of the world, Volume XIII. (African Butterflies); I am also much indebted to Mr. D. R. Rosevear, both for general assistance and advice on lepidoptera and for the use of his "Keys to the Butterflies of Nigeria," which are themselves founded on Dr. Seitz's work.

In the classificatory keys accompanying each article I omit aberrations and the male or female forms of polymorphic species, such as *Papilio dardanus* and *Charaxes etheocles*. In practically no case, so far as aberrations and forms are concerned, have I any information additional to that found in Seitz, and with that information I shall be glad to supply any members who are interested and to whom the work of Seitz is not accessible.

A certain amount of new information, mainly in the form of field notes as to the eggs, larvæ, pupæ, and food plants of various species will be found in these articles. The series will owe a great deal of whatever worth it may possess to the illustrations done by my wife. I am also indebted to Messrs. A. J. Carpenter, C. P. Thompson, and D. R. Rosevear for the identification of sundry food plants, and to the last named and my wife for helping me to choose a number of the English names which, for the first time, are suggested for the commoner insects.

As regards the actual ranges of species, these have had to be founded on Dr. Seitz's work, and since he does not differentiate between the British and French areas of the Cameroons, it is probable that a few of the species included here do not actually occur in our particular area, namely Nigeria and British Cameroons. This cannot be helped: should these articles later appear in book or pamphlet form, it is hoped that the ranges of species may by then have been revised after a careful study of the British Museum collections.

Technical terms have been avoided as far as possible, but a certain number are indispensable, and a glossary is therefore appended to each article giving paraphrases of words that may be unfamiliar.

The aim—not always achieved, owing to the large size of some families—is that each article shall cover a single family. Structurally, each article consists of the following divisions:—

A. A general description of the family and how to distinguish it from other families previously dealt with, and notes on any features of peculiar interest found in the family.

B. Classificatory key to the imagines, or perfect insects, of all the genera and species, by the help of which any given specimen may be traced. Aberrations and sub-specific variant forms are omitted.

C. Tabulated account of the eggs, larvæ, pupæ and food plants of the family so far as these are known.

D. Brief descriptions of, and proposed English names for, certain selected species which, by reason of familiarity or special interest seem entitled to fuller treatment than is given in the key.

E. Glossary, the words paraphrased being indicated where they occur in the text by consecutive numbers.

The description of some of the larvæ and pupæ may possibly appear unduly detailed. The reason is that, although most of the butterflies themselves are fully described in the work of Dr. Seitz, there is to the best of my knowledge no work available for English readers which gives more than a very cursory description of West African larvæ and pupæ. This, coupled with the fact that some of them have not been previously described at all, appears to justify detailed treatment.

The following articles dealing with Nigerian butterflies have already appeared in *The Nigerian Field*:—

“The collection of Butterflies and Moths.” By Osmeterium.

No. 1 (July, 1931), pp. 10—13.

No. 2 (December, 1931), pp. 14—19.

“The Breeding of Butterflies and Moths.” By E.F.G.H.

No. 4 (July, 1932), pp. 13—18.

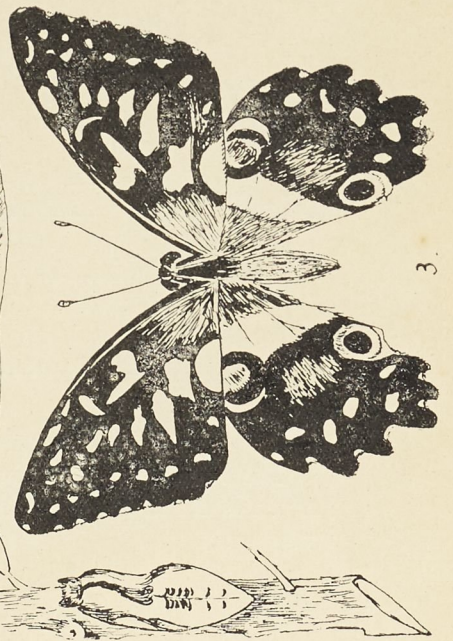
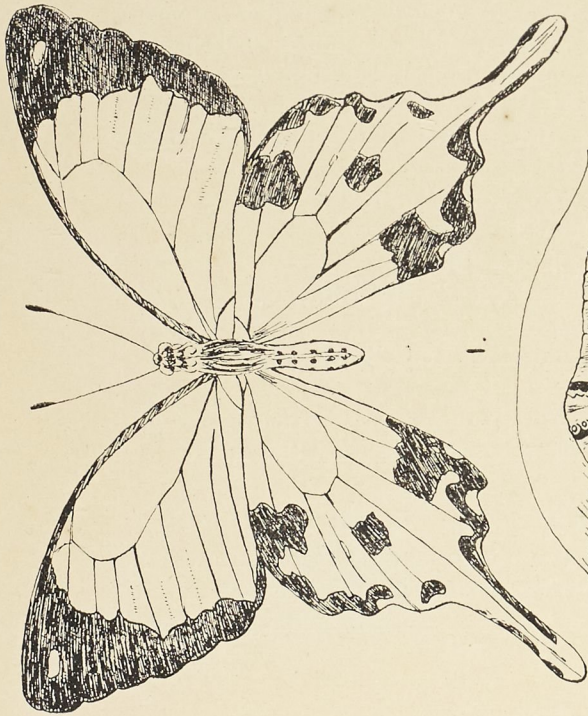
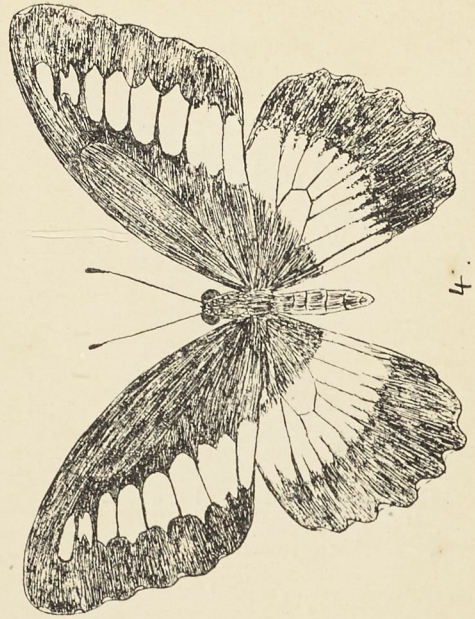
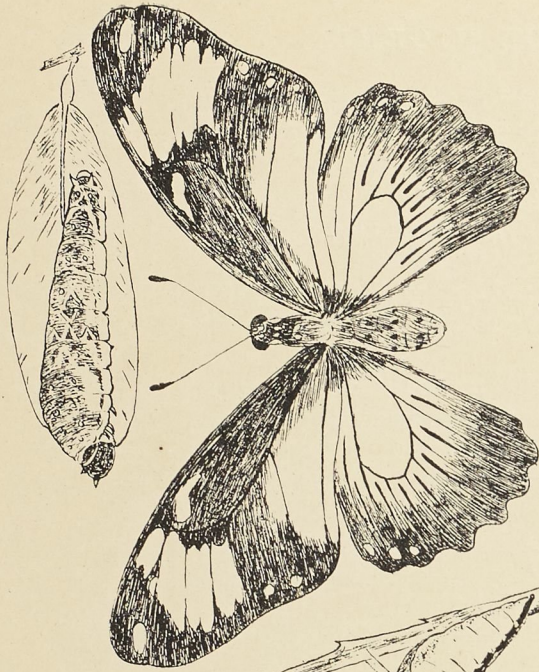
“Some Nigerian Swallowtails and their larvæ.” By E.F.G.H.

No. 6 (January, 1933), pp. 12—17.

Members will probably find that re-perusal of the articles referred to above will increase the interest of the series starting with this issue.

I. The Papilionidæ or Swallowtails

The Swallowtails, or Papilionidæ, are in some ways the most interesting butterflies in Africa. They are also the most familiar and conspicuous to the average observer by reason of their large size, their strikingly beautiful



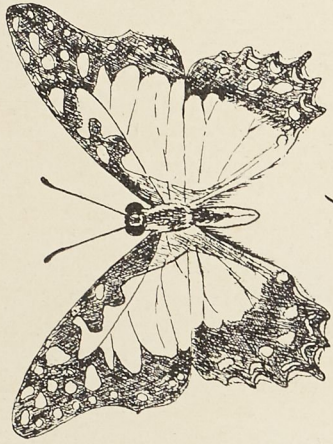
colour schemes and wing shapes, and the comparatively domesticated habits of several of the species. This last trait is present because their larvæ breed on lime, orange, grapefruit and Tangerine trees, while the butterflies themselves are fond of sucking the nectar from garden flowers.

Papilio butterflies may be identified in the field by the following characteristics. Firstly, they are in physical size and wing span the largest butterflies in Africa. (*Papilio pylades* and one or two other less common species are exceptions to this rule.) Secondly, the flight is rapid and erratic, but is performed with regular beats of the wings, which are large in proportion to the size of the body. The Papilio seldom or never "sails" with motionless wings as most of the large Nymphalids do. Thirdly, the body is long, slender, and noticeably deeper than it is wide, and the legs are long and well-developed, with a tibial spur on the inside of each foreleg. The forewing is narrow, sharp at the apex, and has great length from apex to base. The antennæ are usually slightly curved near the clubs and at the base.

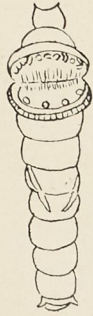
The eggs are spherical, smooth, unmarked, greenish-white, creamy, or pure white in colour, about one millimetre in diameter. They are laid singly, usually—though by no means always—on the fresh young leaves of the food plant.

With regard to Papilionid and other larvæ dealt with in this series, the following data will make clear the meaning of the terms employed. (a) The larval body consists of thirteen segments, number one being directly behind the head and containing the neck and first pair of thoracic legs, number thirteen bearing the anal claspers. Twelve of these segments are plain enough, but number thirteen is often hard to distinguish. (b) The larval stages, between periodical moults or skin-sheddings, are known as instars. Thus the first instar is the stage between emergence from the egg and the first moult, and the final instar is the stage between the last moult and the change into the chrysalis. The latter part of the final instar is sometimes known as the pre-pupal instar. (c) I have called the weak, short, fleshy and inconspicuous spines characteristic of Papilio larvæ "spinelets," to distinguish them from the stiffer and more virile spines of other lepidopterous larvæ.

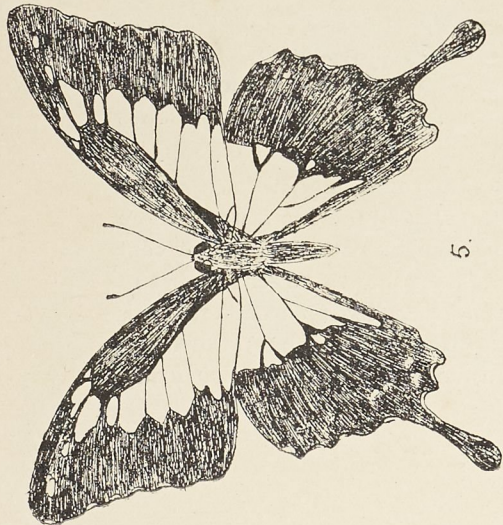
In Papilionid larvæ segments 3—5 are thickened and elevated. The body thus tapers both ways from the thorax, gradually to the tail and more sharply to the head. In the final instar the body is smooth or downy except for two or three pairs of spinelets. Earlier instars show a larger number of spinelets. An elastic, two-pronged warning fork, called an osmeterium, is present. When the larva is threatened the osmeterium is protruded and brandished from a slit just behind the head, accompanied by a rich fruity odour.



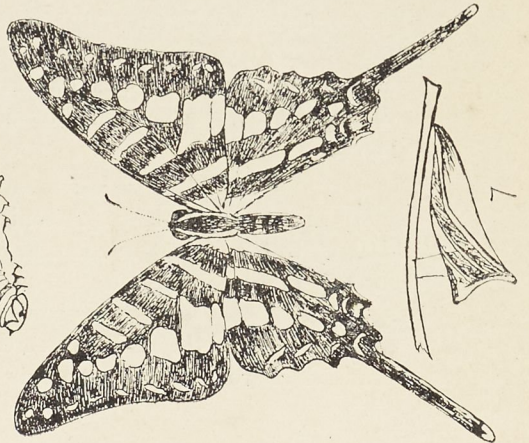
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7.

The Swallowtail pupa is coloured according to the background, but is usually either brown or green. It is markedly angular and has one or two points on the head and points dorsally or laterally on the thorax. The larva pupates horizontally or with head uppermost, attaching its tail to the support with a silk pad and securing itself by a silk girth passing round its back and attached to the support in front of its abdomen. It very frequently pupates on a twig or the stem of the foodplant.

KEY TO THE NIGERIAN SPECIES OF THE PAPILIO GENUS

- A. Vein¹ 11 of the forewing runs free to the costal² margin : the inner margin of the hindwing is flat or fluted. 1. *Fluted Papilios*.
 B. Vein 11 of the forewing runs into vein 12 soon after its origin : the inner margin of the hindwing is turned over upwards forming a fold. 2. *Kite Papilios*.

I. FLUTED PAPILIOS

- A. Cell³ of the hindwing pure white, yellow or reddish, or with only the slightest of black markings basally. 1. Dardanus Group.
 B. Cell of the hindwing above blue, green, or substantially marked with black.
 i. Very large wing span (male about 200 mm.) : forewing long and narrow, coloured black and reddish-yellow. 2. Antimachus Group.
 ii. Not as above.
 a. Wings above light blue, with black veins and black streaks parallel to the veins. 3. Zalmoxis Group.
 b. Wings :
 * Hindwing with two black, blue and red eye-spots. 4. Demodocus Group.
 ** Hindwing without eye-spots.
 § Hindwing club-tailed or squarely angled at vein 4.
 † Wings above marked with white or yellowish : the tail of the hindwing pure black. 5. Hesperus Group.
 †† Wings above marked with green or blue, or if with yellow then with two yellow marginal spots on the black tail.
 ‡ Cell of the Hindwing above pure green or if yellow and black then the tail has two yellow marginal spots. 6. Phorcus Group.
 ‡‡ Hindwing tailless and with cell black at the base. 7. Nireus Group.
 §§ Hindwing rounded, without tail or angle at vein 4, but sometimes with scalloped margins. 8. Zenobia Group.

Fagora xanthoxylodes.



9.

1. Dardanus Group.
Papilio dardanus only.
2. Antimachus Group.
Papilio antimachus only.
3. Zalmoxis Group.
Papilio zalmoxis only.
4. Demodocus Group.
 - A. Hindwing not tailed. *P. demodocus*.
 - B. Hindwing club-tailed. *P. menestheus*.
5. Hesperus Group.
Papilio hesperus only.
6. Phorcas Group.
Papilio phorcas only.
7. Nireus Group.
 - A. Hindwing club-tailed. *P. charopus*.
 - B. Hindwing tailless but lobed at vein 4.
 - i. The green median band of the hindwing broad, distinctly widened behind, reaching to beyond the end of the cell: hindwing reddish beneath at the base of the costal margin *P. bromius*.
 - ii. The green median band of the hindwing narrow, not widened much behind, not reaching beyond the end of the cell: no reddish colour on the hindwing beneath.
 - a. Forewing above with 1 or 2 submarginal spots at apex
P. nireus.
 - b. Forewing above with 7 or 8 submarginal spots, in cellules 1b-8 *P. sosia*.
8. Zenobia Group.
 - A. Hindwing beneath with 2 black spots in cellule 7.
 - i. Wings without submarginal spots.
 - a. Median band of forewing continuous to vein 6, proximal⁴ edge straight, distal edge dentate⁵, spots 2-4 being pointed
P. zenobia.



10. -

Uvaria Chamae.

- b. Median band not continuous to vein 6, or if so, the distal edge is not distinctly dentate.

* Forewing with median band.

P. cynorta ♂

- ** Forewing with a hindmarginal spot and subapical⁶ band

P. cynorta ♀

- ii. Hindwing at least with submarginal⁷ spots *P. zoroastres*.

- B. Hindwing beneath with a continuous black line in cellule 7.

- i. Markings above pure white.

- a. Forewing with an apical white spot but no spot in the cell

P. andronicus ♂

- b. Forewing with an apical white spot and another in the cell

P. andronicus ♀

- ii. Markings above yellowish *P. cypræofila*.

2. KITE PAPILIOS.

- A. Hindwing with a long narrow tail of uniform width.

- i. Wings above with a narrow continuous white or yellow median band.

- a. Median band yellow, curved inwards at the fore end *P. illyris*.

- b. Median band whitish, curved outwards at the hind end

P. kirbyi.

- ii. Wings above with a discontinuous band of green spots.

- a. The three distal transverse bands in the cell of the forewing curved in S-shape : the hindmost spot of the median band on the hindwing about 8 mm. long *P. antheus*.

- b. Transverse bands in the cell of the forewing almost straight : the hindmost spot of the median band on the hindwing about 2 mm. long *P. pollicenes*.

- B. Hindwing tailless.

- i. Wings above black and red *P. ridleyanus* (or *zidora*).

- ii. Wings above not black and red.

- a. Hindwing acutely angled at the end of each vein, with white lunules⁸ between the angles *P. pylades*.

- b. Hindwing less acutely angled, without marginal lunules.

* Hindwing above without submarginal spots or streaks

P. ucalegon.

- ** Hindwing above with submarginal spots or streaks.
- † Wings above black with scattered green spots, without median band *P. leonidas*.
- †† Wings above with a discontinuous median band.
- ‡ Wings above with some or all markings green.
- § Hindwing above with large irregular submarginal spots *P. tynderæus*.
- §§ Hindwing above with narrow submarginal streaks *P. latreillianus*.
- ‡‡ Wings above without green markings.
- § Markings light yellow: hindwing with three discal dots above *P. fulleri*.
- §§ Markings white: hindwing without discal dots.
- || Cell of the forewing with an apical spot *P. almansor*.
- ||| Cell of the forewing without an apical spot *P. charcedonius*.

Early Stages of Papilio Species

SPECIES	FOOD PLANT	DESCRIPTION OF LARVA	DESCRIPTION OF PUPA
<i>P. dardanus</i> .	Citrus species. A forest shrub not identified.	First instar black with a white speck at each end. Middle instar shiny greenish brown, slimy looking, with white markings behind the thickened thoracic segments, and on the two penultimate segments. A pair of white curved horns, pointing outwards, on segment 1, and a pair of similar appendages on each of the two penultimate segments. Head black. <i>Final instar</i> . Slug-like, the segment junctions nowhere conspicuous. Two short horns on the first and last segment. A white line down each side of the frons, ¹⁰ which is green. Body dull green, marked dorsally with small round blue spots. A white low-lateral ¹¹ line, above which is a white lateral patch on segments 3 and 4 and white oblique marks on segments 11 and 12. The middle segments bear V-shaped white markings. All the white markings tend to merge into the green. (Seitz mentions an "eye-spot" on segment 3: I have not observed this.)	Green, attached by the tail and by a median girth. The abdominal or upper surface is keeled and forms one convex curve from tail to head. Laterally the pupa has a brown keel each side and tapers unevenly to a point at the head. The dorsal or under surface shows a distinct brown mediodorsal ⁹ line, the thickest part of which ends at a short thornlike spine on the slightly prominent thorax. On each side of the dorsum there are some irregular brown markings.

SPECIES	FOOD PLANT	DESCRIPTION OF LARVA	DESCRIPTION OF PUPA
<i>P. demodocus</i> .	Citrus species. <i>Fagara Xanthoxyloides</i> (Rutaceæ) or near species.	<i>Final instar.</i> Head yellow-brown. Segments 1 and 12 bear dorsally 2 very small prominences each. Segments 3 and 4 humped and flattened dorsally. Dorsal ground colour apple-green. In front of segment 3 and behind segment 4 are yellow bands containing speck-like dark markings of various designs. In front of segment 5 a black transdorsal ¹² band. On segments 7-9 are oblique lateral and paradorsal ¹³ markings of black, brown or yellowish. A white low-lateral band. Rump greyish white. Underside and abdominal legs grey-white, thoracic legs dull orange. Osmeterium red. The early instars are black and white, changing into black, yellow and brown colour schemes.	Similar to that of <i>P. nireus</i> described below, but (a) more slender, (b) the points on the head closer together, (c) blades on the flanks much less prominent. Usual colours: biscuit-brown and grey.
<i>P. menestheus</i> .	<i>Fagara xanthoxyloides</i> (Rutaceæ) or near species.	First instar black, middle instars black and white, closely resembling a bird dropping. The final instar is green with dark brown and grey markings, very like the larva of <i>P. demodocus</i> .	Resembles pupa of <i>P. demodocus</i> , but is dark brown and grey with a black median girth and looks exactly like a piece of rotten stick.
<i>P. nireus</i> .	Citrus species. <i>Fagara xanthoxyloides</i> (Rutaceæ) or near species.	First instar black, with two spinelets on each segment. Second instar dark brown. In the third and fourth instar the larva is strikingly marked with green, yellow, black, and white, and bears dorsally sundry spinelets. <i>Final instar.</i> Head small, pale dull green. Upperside rich velvety green, underside pale green. Segment 2 and 3 bear laterally a yellow-green band bordered beneath with a thin black line dividing dark green upperside from pale green underside. Segment 4 is widened, humped and dorsally flattened, grey-green with white dots posteriorly. This hump is bounded in front by a curved green line containing thin black curves and rings and ending in a black spot bisected by a yellow line. Segment 8 bears an oblique white marking. Segment 12 bears dorsally a transverse white line running into a branched spinelet. Thoracic and abdominal legs dull greenish-white. Osmeterium red.	Colour grey, brown, or green according to background, generally with a large reddish area on the dorsum. Abdominally strongly convex, dorsally somewhat concave. Head two-pointed like a fish-tail. Thorax peaked dorsally. Flanks below thoracic peak produced laterally into pointed blades. Dorsum keeled. Attached caudally and by a median girth.

SPECIES	FOOD PLANT	DESCRIPTION OF LARVA	DESCRIPTION OF PUPA
<i>P. policens.</i>	<i>Uvaria chamae</i> <i>Uvaria caffra</i> A species of <i>Artabotrys</i> (All Anonaceæ)	<i>Final instar.</i> Head dull green. Dorsum green, with a conspicuous dark purple transverse band between segments 2 and 3 and with tinges of purple between segments 1 and 2 and on segments 11—13. Each of segments 1, 2, and 3 bears dorsally two widely separated black spinelets. Legs and underside pale green, as also two spinelets on segment 12. In earlier instars the green on the dorsum is relieved by transverse stripes of red, brown, and yellow.	Resembles that of <i>P. leonidas</i> , but (a) the head prominences are not so blunt, (b) two additional keels or prominent veins run diagonally to the body plane between the lateral keel and the head. Colour brown or green.
<i>P. leonidas.</i>	<i>Uvaria chamae</i> (Anonaceæ)	Head small, pale dull green. Dorsum bright green, shading away laterally to a whitish line along each flank. Segment 1 bears a flat plate projecting over the head, two-pointed in front, and covered in dense short brown hair with a lighter median line. Each of segments 2 and 3 bears a pair of erectible yellowish spinelets. Segments 2—5 are covered dorsally by a lozenge-shaped area of darker green bounded with whitish and containing an H-shaped brown marking, the cross-bar of which is produced behind in a light mediodorsal line as far as segment 12. Thoracic legs pale brown, abdominal legs and claspers green with brownish "feet." Segment 12 dark green, bearing two spinelets. Flanks green with some weak oblique markings. Underside pale green. Dorsum and flanks covered with fine greenish or whitish down. Prongs of osmeterium sooty black, root greenish.	Green. Underside straight except for slight convexity of abdomen. The head bears two blunt prominences. The dorsal thoracic peak is produced forwards to a fine point level with the head. Four brown curved keels run from the cremaster ¹⁴ to the thoracic peak. The dorsum has no median keel.
<i>P. pylades.</i>	<i>Anona senegalensis</i> (Anonaceæ).	Early instars (a) yellow with dark brown markings, (b) green with narrow blue, yellow and black transdorsal stripes. <i>Final instar.</i> Body tapers from segment 3, which is slightly humped to head and tail. Colour apple-green. The segment junctions conspicuous. On segment 1, a pair of short black spines with a short black transdorsal line behind them. A pair of longer black spines, each springing from a red spot, on each of segments 2 and 3. Two yellowish spinelets on last segment. A white low-lateral line edged with yellowish above and purplish below. Below this are the spiracles ¹⁵ dark blue enclosing white. The early part of this instar shows some purple transdorsal lines.	Coloured green. Head two-pointed thorax produced into a long point. Flanks keeled. A red-brown marking between head and thorax. The pupa tapers evenly from thorax to the cremaster.

NOTES ON THE COMMONER SPECIES

Papilio dardanus. The Cream Swallowtail. The male of this butterfly may be recognised by the cream colour, marked with black, on his wings, and by the clubbed tails of the hindwings, which give the insect a rather floppy appearance in flight. The male is an active creature and is a familiar sight in or near high forest or citrus plantations, but is seldom seen in more open types of country. The polymorphic female, however, is much less easily recognised. All the specimens I have seen in Nigeria have been black and white, fairly closely resembling that illustrated here, but it is possible that seven different forms of the female, some of them having reddish markings, occur within our limits. The common female form is one of the so-called mimetic butterflies, and it undoubtedly bears a very striking general resemblance to certain quite unrelated butterflies of the *Danaida*, *Hypolimnas*, and *Planema* genera. The female is less often seen than the male, and has much less vitality, displaying a weaker flight and often remaining quiescent even during midday sunshine.

The larva, which lives on several strains of citrus, is a sluggish and slug-like creature. In its early instars it bears a passable resemblance to a bird-dropping, and when approaching full size its prevailing dull green hue and infrequency of movement presumably give it protection. It uses its osmeterium very sparingly.

Papilio antimachus. The Giant Black and Red Papilio. The Nigerian forests are within the range of this huge butterfly, but I have never seen it, nor have I heard from others of its occurrence in Nigeria. The colouring of both wings is black and reddish-yellow. The male has a wing span of 8 or 9 inches, but the female—a very rare insect—falls short of this span by two or three inches.

Papilio zalmoxis. The Black-veined Blue Papilio. This is perhaps the most magnificent butterfly commonly encountered in Nigeria. It is, to the best of my belief, confined in our area to the rain forest belt of South-eastern Nigeria and South Cameroon, and within those limits is not very rare. *Zalmoxis* is a large insect with strong and rapid flight, the prevailing colour impression in flight being one of iridescent greenish-blue. The brownish-yellow body, spotted with black, and the red-brown colour on the under surface of the hindwing are also conspicuous. I have not seen this species more than six or eight times and consider myself lucky to possess a couple of perfect specimens. The larva and pupa are unknown.

Papilio demodocus. The Common Papilio. This medium-sized black and yellow insect is by far the most widely distributed Papilio in Africa, and in Nigeria may be found breeding wherever any variety of citrus occurs.

The larva in its early stages is a conspicuous creature with black, brown and green markings.

Papilio menestheus. The Black and Yellow Swallowtail. This butterfly closely resembles the Common Papilio, from which it is distinguished by the possession of a pair of clubbed tails, and a more powerful and rapid flight. Although a fairly close relation of *demodocus* it does not appear to have contracted the habit of breeding on citrus, and it is seldom seen away from the forest. Like *demodocus*, it can always be identified by the black, blue and red eyespots on the hindwing. A smaller form, with white instead of yellow markings, has been found in the Cameroons.

Papilio hesperus. The Evening Star Swallowtail. This is a lovely creature, with cream or greenish-yellow markings on a black ground, and clubbed tails. I have never seen it away from high forest, and my impression is that this species and *Papilio phorcas* are commoner in Uganda than in Nigeria.

Papilio phorcas. The Titania Swallowtail. This beautiful butterfly, with its daintily sculptured wings—jet black with a brilliantly luminous blue-green stripe—is never seen away from high forest. I have found it rare in the forests on the Nigeria-Cameroons border, but common in the high forest area north of Lagos.

Papilio nireus. The Green-banded Papilio. This is the last of the three "domestic" Papilios—*dardanus*, *demodocus*, *nireus*—which breed commonly on lime, orange and grapefruit trees. *Nireus* is a handsome creature, resembling *phorcas* with its brilliant blue-green band on the upper sides of the black wings, but larger, tailless, and with beautifully scalloped hindwings. The female may be easily distinguished from the male by the pale cloudy markings of her underwings, which contrast strongly with the small well defined and conspicuous coppery spots on the male underwings. The early instars of the larvæ, with their black and yellow and green markings, are very conspicuous. A thorough examination of the young citrus beds at Moor Plantation suggested that *nireus* was there about ten times as numerous as *dardanus* and *demodocus* combined. There are in Nigeria two other species, namely, *sosia* and *bromius*, which resemble *nireus* very closely.

Papilio cynorta. The White-banded Forest Papilio. This butterfly, which I have never seen away from rain-forest, may be recognised by the whitish or creamy band running longitudinally along the upper side of fore and hindwing, and by the absence of tails. The English name suggested above would equally well describe the males, at least, of several other species of the *zenobia* group, and I have selected *cynorta* as the form that I have found the commonest in the Ogoja forests. These species are typically

sylvan, of retiring habits and lacking the activity and dashing flight of the butterflies hitherto described. The female of *cynorta* is a black and white insect rather resembling a small form of the female *dardanus*.

Papilio policeses. The Speckled Swordtail. This charming butterfly, whose dainty lines and zigzag flickering flight recall the *Titania* Swallowtail, is easily recognisable at close quarters by the long, narrow black tail on each hindwing. The black wings are speckled with pale sky blue, and the inner margin of the upper side of each hindwing bears a tiny red spot. I have seldom seen this species away from high forest, although one at least of its food plants grows in thickets well into the Savannah belt. The female may be recognised by the much paler blue markings on the wings.

Papilio ridleyanus (or *zidora*). The Dwarf Black and Red Papilio. This small Papilio, with its unusual red markings on the upper surface of the wings, bears a passable resemblance to some of the Acraeid family. I have found it uncommon in Nigeria but encountered it in considerable numbers in the central part of French Equatoria.

Papilio pylades. The Savannah Papilio. This little Papilio is the only species found far and wide throughout the "bush" of the Savannah belt, for *demodocus* seems to confine itself to the neighbourhood of human habitations and citrus trees. The Savannah Papilio is a neat little butterfly with white or pale yellow wings heavily bordered with black. It is a very energetic creature and goes over its native orchard bush at a great pace. I have never seen it in forest, its food plant, *Anona senegalensis*, being a typical Savannah shrub.

Of the remaining species I have no field notes worth putting on paper. They may be identified from the key, but few if any of them appear to be common enough to merit a popular name.

GLOSSARY

1. *Veins*.—A detailed study of venation would be out of place here, but the main points are these. A butterfly's wing is divided by the veins into (a) the cell, (b) a certain number of cellules. On each wing the veins and cellules are numbered from the hind or anal margin of the wing forwards. Veins 11 and 12 run close to the costal or forward margin of the wing. In Figure 1, depicting the male of *P. dardanus*, most of the veins and cellules appear very clearly.
2. *Costal*.—Applied to parts of the wings and means anterior or forward, as opposed to *anal*, meaning hinder or posterior, and *distal*, applied to the outer area or edge of the wing, *i.e.*, that between the costal and the anal.

3. *Cell*.—A conspicuous area of the butterfly's wing which is bounded but not intersected by veins. It is of an elongated egg shape, with the pointed end close to the junction of the wing and the body, and is larger on the forewing than on the hindwing. The cells of the forewing and the hindwing respectively are seen very clearly in Figure 1, the male of *P. dardanus*.
4. *Proximal*.—Nearer to the body, as opposed to *distal*, further away from the body.
5. *Dentate*.—Toothed.
6. *Subapical*.—A little way inside the apex of the wing.
7. *Submarginal*.—A little way inside the outer margin of the wing, as opposed to *marginal*, which means touching the margin.
8. *Lunules*.—Small crescent-shaped markings.
9. *Mediodorsal*. Along the middle of the back.
10. *Frons*.—The "face" of a caterpillar.
11. *Low-lateral*.—Along the lower part of the flank.
12. *Transdorsal*.—Across the back.
13. *Paradorsal*.—Along the top of the back.
14. *Cremaster*.—The hindmost end of a pupa, including the appendages attaching it to the support.
15. *Spiracles*.—The small breathing holes in the flanks of a caterpillar, usually elliptical in shape.

KEY TO FIGURES.

- Fig. 1. Male imago of *Papilio dardanus*.
- Fig. 2. Larva, pupa, and female imago of *Papilio dardanus*.
- Fig. 3. Larva, pupa, and imago of *Papilio demodocus*.
- Fig. 4. Imago of *Papilio zenobia*.
- Fig. 5. Imago of *Papilio phorcas*.
- Fig. 6. Larva, pupa, and imago of *Papilio pylades*.
- Fig. 7. Larva, pupa, and imago of *Papilio policeses*.
- Fig. 8. Larva, pupa, and imago of *Papilio nireus*.
- Fig. 9. Stem, leaves and flowers of *Fagara xanthoxyloides*, a *Papilio* food-plant.
- Fig. 10. Leaves, flower and fruit of *Uvaria chamae*, a *Papilio* foodplant.