

XXV. *The Butterflies of Mauritius and Bourbon.* By  
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[Read October 4th, 1907.]

PLATE XXIX.

It is now more than forty years since Mr. Trimen published his paper on the butterflies of Mauritius in the Transactions of this Society, and as far as I know nothing has been written on the subject in the interval. It is perhaps as well that the list of butterflies occurring in Mauritius should be brought up to date, and if some forty years hence another entomologist should add his experiences, the Society would be in possession of an entomological history extending over a hundred years, and of some valuable facts regarding the constant ebb and flow of butterfly life in that island. In the present paper I add five insects to Trimen's list, namely *Papilio demodocus*, *Cacyreus lingens*, *Zizera antanossa*, *Zizera gaika* and *Nacaduba mandersi*, Druce. The specimen of *Libythea cinyras* still remains unique, and another species, *Salamis augustina*, is extinct or virtually so. One of Trimen's insects, *Catopsilia rhadia*, I have removed as being a synonym of *C. florella*, thus making the total number of Mauritius butterflies thirty. Changes of nomenclature are somewhat frequent, and I have mostly followed Aurivillius ("Rhopalocera Æthiopica," 1898). I have at the same time given the names and the number of the insects used by Trimen in the above mentioned paper, as it is still used by local entomologists who might otherwise be puzzled by my list. Trimen's list was admittedly incomplete, as his stay in the island was short and quite at the most unfavourable season of the year for collecting; it is therefore a matter of surprise that he managed to obtain as many species as he did. The investigations of the last forty years show conclusively that the whole of the butterfly-fauna of these islands is entirely African, and probably mostly derived, as we should expect, from Madagascar.

As Mauritius, and even more so Bourbon (or Réunion, as it is invariably called by the inhabitants), are but little

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known to English entomologists, I may perhaps give a few details, which may not prove uninteresting, regarding their physical characteristics in which they differ very materially. Mauritius is about the size of the county of Dorset, being about thirty-six miles from north to south and almost the same from east to west. It is comparatively flat, the large plateau known as Plain Wilhems at the approximate elevation of 700 feet, occupying the whole central portion of the island, and gradually spreading outwards towards the north at a decreasing elevation. The whole of this plain was covered with forest at the beginning of the last century, so thick in parts that on one occasion the Governor of the island and his party were lost for four days before making their exit. Now the forest has entirely disappeared, its place being taken by sugar-cane, which is of not much interest to an entomologist. The hills, which nowhere exceed 2,300 feet in elevation, are of volcanic origin, and mostly the remains of the walls of extinct craters. Their sides are consequently steep, frequently precipitous, and are usually covered with jungle, portions of it no doubt being the remains of the original forest. The only extensive tract of the primeval forest remaining is in the south-west portion of the island; this covers the sides and summits of the hills overlooking the sea, and spreads northwards to join the central plain in the neighbourhood of Curepipe, 1,800 feet, becoming more open and of smaller growth as it approaches the more inhabited districts. It is difficult of access and disappointingly unproductive. I have found no butterflies peculiar to it, and in fact butterflies are very distinctly scarce in it. For a considerable portion of the year it is subject to deluges of rain, the ground becomes water-logged, and immediately off the few narrow paths increasingly difficult or impassable. It is interesting, profoundly so, to a naturalist, as it is the final refuge of the few remaining indigenous birds. The climate varies, but is usually considered to be six months cool and dry from June to November, and hot and moist from December to May. Unlike Bourbon, Mauritius is entirely surrounded by a coral reef, which at places comes within a few hundred yards of the shore, at others is two or even three miles out. It is a paradise for the marine zoologist, and for those with no natural history tendencies, its calm seas, transparent water, and lovely bays with their glorious sands, can scarcely be surpassed for exquisite beauty in



any tropical island. Bourbon is altogether different, deep water and heavy breakers come straight on to the beach without any natural breakwater, and the shore is covered with huge water-worn boulders and rounded pebbles, with an entire absence of marine life. In the one case we have quiet seas and intense natural beauty, in the other the whole coast, so far as I saw it, is subject to the full and eternal swell of the Indian Ocean.

In physical features Bourbon is also different to Mauritius; though very much of the same size or rather smaller, it is distinctly mountainous, and evidences of volcanic action are even more marked. One can get a good idea of the country by placing three circles in a triangle and touching each other, with the base to the west. These three circles, each about five miles in diameter, represent three extinct volcanoes; place another circle to the south of these but separated from them and this will mark the position of the present active crater which is on the coast. The centre of the easternmost crater is exactly the centre of the island, and the part where the three circles meet forms the main mountain range running north and south, the highest point, the Piton des Niéges, being over 10,000 feet above the level of the sea and covered with snow for a considerable portion of the year. This trend of the hills gives a very different character to the climate on either side of it. The trade-winds striking the cold eastern flanks of these mountains deposit their moisture in heavy rain, the western portion only receiving occasional showers on their hill-sides, the coast rarely receiving any rain at all. It is a country where I fully hoped to find species of *Teracolus* and *Acræa*, if illness had not put a very decided veto on any exploration I had contemplated. The chief villages, I cannot call them towns, are built at the bottom of the aforesaid three craters, the eastern one being Salazie, the western Cilaos, and the northern Mafitte. It is a peculiar experience living in such a situation, and though very beautiful from the verdure of the numerous smaller hills scattered over the floor of the crater, and the fantastic appearance of the cliffs forming its edge, one's view is limited to the surrounding rugged cliffs, and after a short residence I had an almost irresistible desire to climb up and peep over the other side, much like a kitten at the bottom of a basket. There is but one road to each of these craters, that up the

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gorge of Salazie being a good coach road for some twenty miles. This is the finest gorge it has been my good fortune to visit in any part of the world. It is a rift in the crater, and a geologist would have no difficulty in tracing the course of the erupting lava from the volcano to the sea. Now a river occupies the bottom of the rift, and the jungle-covered precipices, mostly almost perpendicular, with innumerable waterfalls of over a thousand feet in height, makes the drive out of great interest and beauty. I did not notice many butterflies here. The gorge is so extremely narrow that there is very little sunshine, and I was disappointed, as, although I did not expect many species, I fully anticipated a great number of individuals.

Cilaos is at a higher elevation, 4,000 feet, and access is difficult. One is usually carried up in a chair on the shoulders of a succession of stalwart porters, for a distance of something like thirty miles. The road or rather track is cut out of the steep hill-side, which being composed of shale is constantly slipping down, with the result that it is not at all uncommon for large portions of it to be carried away. It is far too narrow for wheeled traffic, and indeed one's chair frequently overhangs a clear drop of several hundred feet in a manner distinctly alarming. Consequently in Cilaos horses and cattle are unknown, life is primitive and I should think deadly monotonous, the only diversion so far as I could judge being a stroll to the neighbouring chalybeate spring for a draught of water. The forests, once so extensive as to cover the whole central area, are being rapidly destroyed. Dr. Jacob, who has resided in the island for fifty years, told me that he remembered when the whole of the Salazie district was a beautiful forest, and when the Bourbon starling (*Fregilupus varius*) was quite common. This bird has now been extinct for five and twenty years, and the forests are following it. The flora is in many respects different from that of Mauritius, and I should say that a Microlepidopterist would make most interesting discoveries at the higher elevations. Unfortunately illness almost entirely ruined any chances I had in this direction.

The late Dr. Vinson, Curator of the Natural History Museum, St. Denys, made two lists of the butterflies of Bourbon, one in 1891, the other in 1896; both are out of print and difficult to obtain. They contain many interesting notes, and I have made them the basis of the present



list. The number of butterflies recorded is twenty-two, but there are probably a few more species remaining to be discovered.

*Danaida chrysippus*, L.

8. *Danaïs Chrysippus*, Linn.

MAURITIUS. Common in the low country and sometimes abundant, scarcer above 1,000 feet. It has been noticed as being particularly common after a cyclone, the rain and consequent dampness probably bringing the pupa to rapid maturity. The form *alcippus*, Cram., has not been hitherto recorded. It is exceedingly rare, and I believe I am the only individual who has noticed it; this was at Curepipe 1,860 ft., March 12th, 1907. *D. dorippus*, Klug., does not occur, and this is the more interesting as *H. misippus*, form *inaria*, does occasionally appear. Flies I–XII.

BOURBON. I found this common at St. Denys, and saw in the museum specimens of *alcippus* which had been taken in the neighbourhood. The transformations are well known.

*Amauris phædon*, Fabr.

7. *Danaïs Phædone*, Fabr.

Peculiar to Mauritius and Madagascar (Mabille) and locally known as the "Banyan butterfly." Rare in the higher elevations, locally abundant on the coast, congregating in numbers after the manner of the Danaids, usually under the shelter of "filao" trees (*Casuarina equisetifolia*). Frequently it flies high among the trees and is then difficult to take; at other times it flies low and is easily captured. I found it abundant at Morne Brabant in the extreme south-west corner of the island, in August; also at Blue Bay on the east coast and elsewhere. Flies nearly all the year round. The female is distinctly uncommon; the male is variable more particularly on the fore-wing, all variation can be found from a well-developed spot in the cell to a complete absence; the spot also in the first median interspace is very variable in size; the band on the hind-wing varies also in breadth. The larva is unknown.



*Euplœa euphone*, Fabr.6. *Euplœa Euphone*, Fabr.

Abundant everywhere, except in the cold weather. Of slow flight and easily captured. I have frequently found the eggs of this and the following species on "*Alamanda*" (*Alamanda cathartica*), but have never succeeded in rearing the larva on this plant, neither have I found the full-grown larva at large on it, though I have frequently found and reared it on *Ficus repens*. On *Alamanda* the larva invariably dies when quite small, apparently from starvation, and I am rather under the impression that the female mistakes the food plant. The egg is undistinguishable from *E. goudoti*, it is of the usual Euplœid shape, pale yellow with perpendicular ridges. It is laid on the under margin of the smaller leaves, the young larva spins a slightly woven silken pad, and eats the under surface of the leaf in a semi-circular manner round it. The full-grown larva is pale grey with narrow black lines dividing the segments. Flies I-V.; VI-VIII, scarce; IX, becomes common; X-XII, abundant. It does not occur in Bourbon.

*Euplœa goudoti*, Boisd. (Pl. XXIX, fig. 1).

Not a Mauritius butterfly; but I have one specimen, the only one recorded, which was captured by Mr. J. A. de Gaye, at Post de Flacq on the north-east side of the island in August 1905. The specimen, which is in very bad condition, was probably conveyed from Bourbon by a favouring wind. Through the kindness of Mr. de Gaye this specimen is now in my collection. See "Entomologist," vol. xl, p. 185. BOURBON. Abundant on the coast, preferring hot steamy shade, where it flies slowly and is captured with ease. I found it common at St. Denys in the Botanical Gardens, and it was by no means rare in the town itself. It scarcely extends above 1,000 feet elevation. At Hell-Bourg, 3,000 feet, I saw only one specimen, evidently a straggler. The insect in its manner of flight and general appearance reminds one very much of the Indian *Euplœa core*.

Its transformations have been described. The typical species has on the forewing a small white spot on the costa at the end of the cell and another in the second



median interspace. Some specimens have the wings entirely unspotted and others with an additional spot in the first median interspace, and I have one specimen with faint but decided indications of a submarginal row; the number and size of the spots also vary on the underside.

*Melanitis leda*, L.

16. *Cyllo Leda*, Linn.

Abundant everywhere, particularly at sunset in leafy lanes and at the corner of cane-fields. The peculiar habit of its near Indian ally *M. ismene*, of tilting to one side after settling and thus reducing the tell-tale shadow was, if I remember correctly, first brought to notice by Mr. Ernest Green. The same habit is also adopted by this insect, but it is by no means confined to the hours of sunshine, it frequently performs thus after sunset. The transformations are in all respects similar to those of *M. ismene*, and, judging by a written description of the larva, it would appear that the two are indistinguishable. I have given an account of its seasonal changes as they occur in Mauritius. (Bomb. Nat. Hist. Soc., Feb. 1905.) Flies I–XII.

BOURBON. The same remarks apply. It is described by Vinson as *C. fulvescens*, Guenée.

*Mycalesis (Henotesia) narcissus*, Fabr.

17. *Mycalesis Narcissus*, Fabr.

Abundant everywhere, and perhaps the commonest butterfly in the island. It is very partial to shady lanes and bamboo hedges, and is on the wing, fluttering close to the ground, even in the drenching rain and heavy squalls which are the forerunners of a cyclone. Seasonal dimorphism is decidedly noticeable in the colour of the under surface of both fore and hind wings, which changes from the light yellowish-brown of the hot and dry weather to a deep purplish-grey in the cold and wet; the size of the ocelli are not markedly affected. The species is equally abundant in Bourbon. Flies I–XII. The life history has not, so far as I can ascertain, been recorded. The female I observed ovipositing was in cabinet condition; she basked for a few minutes in the sun, and then fluttered on to the smaller leaves of the bamboo growing close to the ground; on the under-surface of these she deposited a



single egg. She then flew off and basked again, returning in a few minutes to almost the same leaf, where she again went through the egg-laying process.

The egg laid 27. x. '06 is globular, pale yellow and slightly pitted and is distinctly large for the size of the butterfly.

The larva hatched 3. xi. and on emergence was very pale yellowish-green with shiny black head, tail bifid, no other markings could be made out. 12. xi. length 6 mm., head black, body pale glistening green, under a lens two small prominences on either side of the top of the head can be made out, also a green dorsal line and yellowish spiracular lines; with a bifid tail, of the same colour on the last segment. 20. xi. length 10 mm., head brown, body rather glistening greenish-white; dorsal line well-marked posteriorly, greenish-red; sub-dorsal and spiracular lines yellowish; all the legs same colour as the body. Under a lens the whole body and head is seen to be covered with short whitish hairs, and to be minutely transversely striated. The bifid tail beneath, and its base above, the same colour as the body, remainder reddish-brown. 10. xii. Full fed, length 26 mm.; pale pinkish-brown tinged with green, head darker. A dorsal catenulated line, much more pronounced posteriorly, brown, fading to greenish-brown towards the head. A waved sub-dorsal line and straight sub-spiracular line, light brown. Spiracles black, legs and prolegs the same colour as the body.

Pupa, light green with straight narrow black transverse line across the mouth parts, another similar line at base of wing-covers. Of the usual Satyrid shape.

The transformations of this insect take longer for their completion than those of the much larger *Melanitis leda*, though both are very sensitive to meteorological conditions.

*Atella phalanta*, Drury.

9. *Atella Phalanta*, Dru.

This is another abundant butterfly both in Mauritius and Bourbon, particularly on the sea-coast, where it sometimes swarms among the food-plant (*Flacourtia*). The life-history is well known.

Flies I-VII, abundant; VI, scarce; VIII-XII, abundant.

I have observed on more than one occasion that for twenty-four hours after shedding the larval skin the pupa hangs free like that of *Vanessa*, and afterwards by a contraction of the abdominal segments it appresses itself along



the twig from which it is suspended, and becomes attached to it by I presume some glutinous material. The usual plan, however, is for it to assume this position immediately after its release from the larval skin.

*Antanartia mauritiana*, Manders, s. sp. n. (Pl. XXIX, fig. 2).

### 11. *Pyrameis Hippomene*, Boisd.

With the exception of *Salamis augustina*, quite the rarest butterfly in Mauritius and verging on extinction. It is probably a local race of the continental *A. hippomene*, Hübn., but is quite distinct from that insect. It is, however, very close to *A. borbonica*, Oberth., which is also a well-marked race of *A. hippomene*. The distinctions between the Mauritian and Bourbon races, though slight, are sufficiently defined to justify a separation of the insects. The difference, as M. Charles Oberthür has remarked to me, is more in the general facies than in any marked character, *A. borbonica* being a larger and far more robust-looking butterfly than *A. mauritiana*.

Expanse 47 mm., average of 20 specimens (*A. borbonica* 55 mm., average of 4 specimens), the females rather larger than the males. Forewing.—The tranverse orange band on its inner edge is outwardly angled or waved at the median nervure forming the lower portion of the cell. In *A. borbonica* this is always straight. The outer edge of the band is also more distinctly angled or waved at the same place than is *A. borbonica*. Hindwing. There is a great diminution, generally an almost total absence, of the blue scales between the angle and the tail; this deficiency is particularly noticeable below the ocellus. Hindwing under side. The green scaling between the anal angle and the tail and below the ocellus is confined to a narrow marginal line. In *A. borbonica* this area of the wing is thickly sprinkled with green scales on a black ground, and these scales also cover the adjoining portion of the space beyond this.

The difference in size, and more particularly the greater robustness of the Bourbon insect, is, I believe, primarily due to climatic conditions. *A. borbonica* is never found below 2,000 feet. *A. mauritiana* maintains a precarious existence at 1,800 feet, there being very little of the island of this elevation and only a few hills rising above 2,000 feet. The climate is not favourable to the development of the butterfly, and what is probably more important, is too



hot for the food plant. I was much struck in Bourbon with the far greater luxuriance, larger leaves and stronger growth of the *Pilea urticefolia* and its great abundance. In Mauritius all the plants I have seen, and it is not a particularly common one, are more slender, straggly and the leaves noticeably thinner and less juicy; and this diminished growth would tend to the production of a smaller and weaker insect. Consequently in Bourbon the butterfly is large, strong and abundant; in Mauritius, small, weak and very rare. I endeavoured to prove this by feeding Mauritius larvæ on Bourbon plants, but I had only two larvæ to experiment with, and it is not surprising that the results were unsatisfactory; but it is probable that investigations on a larger scale would yield interesting results.

The only known locality is Curepipe, 1,800 feet. Personally I have only once seen it on the wing, this was a dilapidated female which flew into the verandah of my house. Captain Tulloch has taken it on the summit of the Trou-aux-cerfs, where it flies between 9 a.m. and 11 a.m. I have, however, for three consecutive years found eggs, larvæ and pupæ on the same plant in the Botanic Gardens, Curepipe. There appears to be a succession of broods during the hot weather; in some seasons the butterfly appears as early as the end of September and occasionally lasts until May; but the usual months are February and March. I have found the eggs in October and March and the larvæ in October, January, March, and May.

The egg is laid on the under surface of the larger leaves of *Pilea urticefolia*. It is smooth, conical, dark olive-green with flattened top and base. The segments are marked with narrow but distinct perpendicular yellow lines, nine in number, converging towards the summit but not meeting. It has an exact resemblance to a water-melon. Egg laid ? hatched 8. x. '05; larva full-fed 28. x.; suspended before 7 a.m. 5. xi.; shed its larval skin 4 p.m. 5. xi.; emerged 16. xi. When first hatched the larva is uniform yellowish-green, with black spines and shining black head. When half-grown, it is uniformly black with a glistening appearance, with spines bright yellow or sometimes white. The full-grown larva is very variable and its colour is influenced by its surroundings. I have given a description of this in the "Entomologist."



None of the larvæ I have seen agree with Dr. Vinson's figure and description of the larva of *A. borbonica* (Oberth. "Etud d'Ent." 12, p. 17, t. 4, 1888), except that the spines are yellow with black points, set on bright yellow or dull ochreous bases. The pupæ are similar in shape, but, as I have shown elsewhere,\* the colour is markedly influenced by its environment.

The larva is very easily detected by its habit of forming a tent for itself by making two scimitar-shaped incisions in a leaf right down to the mid-rib, and then bending over the tip and attaching it to the under surface of the leaf with a few silken threads. The full-fed larvæ frequently discard this method of concealment and feed openly, but invariably rest on the under surface of the leaf. I have found eggs, larvæ and pupæ on the same plant at the same time.

*Antanartia borbonica*, Oberth.

Common in Bourbon above 2,000 feet, abundant at Hell-bourg, Salazie, 3,000 feet. I never saw the perfect insect, but evidences of the larva were everywhere abundant on the food-plants. My only captures were one empty egg-shell and one cast larval skin, which was aggravating, but illness was responsible for my non-success. It was considered to be peculiar to Bourbon, but Mabilie has lately recorded it from the interior of Madagascar.

*Pyrameis cardui*, L.

10. *Pyrameis Cardui*, Linn.

MAURITIUS. Rare and local. Its chief and almost only locality is the Trou-aux-cerfs, 2,000 ft. where I have occasionally found it in December, though it occurs sparingly in other months. It differs in no way from European specimens.

BOURBON. Rare, and only in the hill districts. I saw a beautifully fresh specimen at Hell-Bourg, 3,000 ft. in April.

*Precis rhadama*, Boisd.

12. *Junonia Rhadama*, Boisd.

MAURITIUS. Common everywhere and frequently abundant on the coast. It is perhaps the most strikingly

\* "Entomologist," vol. xxxix, p. 41.



beautiful butterfly in Mauritius, the brilliant sapphire-blue of the freshly emerged male being exquisite. I have noticed dozens at a time on the steep hill-side at Port Louis leading up to the Citadel. It has the habits of our small Tortoiseshell, and its gorgeous colouring can easily be watched and admired. Pairing takes place in the hottest sunshine, all the females being freshly emerged. It was introduced into the island about the year 1857 or 1858, and soon established itself (Trimen). The species is very constant on the upper wings, though the female is slightly prone to vary in the amount of blue, which is sometimes partially replaced by fuscous; but on the under surface it varies much in accordance with the climate, the under surface of those from the Black River district on the western portion of the island which is very dry, have all the markings indistinct and blurred, and the ground colour varying shades of grey.

Flies I—VI, abundant; VII—IX, scarce; X—XII, common.

BOURBON. The same remarks apply generally. Vinson, 1891, says "that it is a recent importation due to chance." It would appear to have been introduced some thirty years later than into Mauritius, and this may be due to more irregular and infrequent communication with the outside world in the case of Bourbon. The larva feeds on *Barleria*, and is well figured and described by Vinson ("Études d'Ent." Oberthür, 1888).

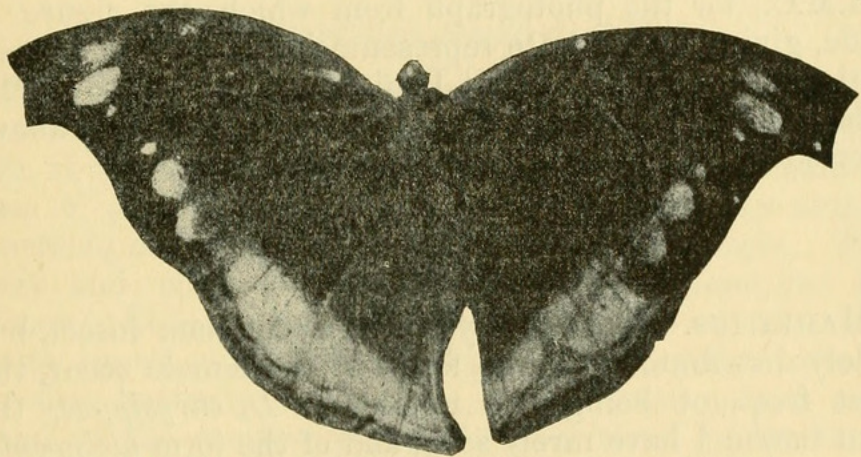
*Salamis augustina*, Boisd. (Pl. XXIX, fig. 3).

13. *Junonia Augustina*, Boisd.

This butterfly is one of exceptional interest, as it is almost certainly extinct, no specimen having been taken for twelve years. So far as I can ascertain from extensive inquiries in this country and abroad, there are only two specimens extant; one in Mr. Trimen's collection given to him in the year 1865 by the late Mr. Colville Barclay taken in the Moka district and the other, here figured, in the Port Louis Museum. It is well therefore to put on record all that I have learnt regarding the latest captures of this rare insect. It was getting very scarce when Mr. Trimen was in the island in 1865, and it is strange that an insect whose larva feeds on the sugar-cane which covers the greater portion of Mauritius should not rather be over-



abundant than otherwise. I attribute its disappearance to the depredations of the Indian Mynah\* (*Acridotheres tristis*), which was introduced some hundred years ago for the purpose of keeping in check the field-cricket and other insects which were destroying the canes. The bird is protected and is consequently over-abundant, flying in small flocks of twenty to thirty all over the country, and making themselves a general nuisance. The bird was also brought into Bourbon, but fortunately for *S. augustina* so frequently finds its way into the cooking-pots of the natives, that the butterfly survives though in greatly diminished numbers. In Madagascar where the "Mynah" is unknown, *S. augustina* is not uncommon. Man therefore



*Salamis augustina*; the specimen in the Port Louis Museum.

is responsible for the extinction of the butterfly. The Port Louis specimen came from the collection of the late M. Réynard, who some five-and-twenty years ago bred some half dozen specimens from larvæ found in his garden on Trianon estate in the Moka district. At his death they came into the possession of the Port Louis Museum authorities, but only the one specimen could be preserved, the remainder being in fragments. In August 1895 Dr. Bolton captured two within a few minutes of each other, at Souillac on the east coast. He tells me that he had no difficulty in catching them, as they were hovering over some vanilla plants. Unfortunately during his absence in England his collection became mouldy, and offending the æsthetic tastes of his relations was cast into the dust-heap. This is the last capture I have been able to ascertain. I

\* By destroying the larvæ.



almost hesitate to record that at 9.30 a.m. March 19th, 1906 (I am particular as to the date) at Curepipe Railway Station, a butterfly flew past me which I am satisfied in my own mind was this particular insect. I was near enough to see distinctly the peculiar shape of the forewings—but I refrain from further harrowing details! let it suffice I did not capture it.

BOURBON. In this island it is becoming very rare; I saw five specimens in the museum at St. Denys, which seemed to be slightly different from the Mauritius form. Dr. Vinson says that it flies between 9 a.m. and 10 a.m., in April and May and again in September. Unfortunately M. Réynard's coloured drawings of the larvæ have been lost. I am greatly indebted to Captain Stammers, R.A.M.C., for the photograph from which the figure is made, giving an accurate representation of the appearance of the specimen in the Port Louis Museum. Also to Mr. Roland Trimen, F.R.S., for the loan of his specimen above referred to, and figured on Plate XXIX.

*Hypolimnias misippus*, L.

15. *Diadema Bolina*, Linn.

MAURITIUS. Not by any means a common insect, but widely distributed. Three forms of the female occur, the most frequent being the mimic of *D. chrysippus*, the form *inaria* I have rarely seen, and of the form *alcippoides* one specimen only in the Port Louis Museum. I have found it at Curepipe, Quatre Bornes, 500 feet, and at Mahébourg on the coast. It occurs also at Pamplémousses and in the Moka district it Flies IX–XI.

BOURBON. Rare, and only found on the coast. I saw either this or the next species in April settled on the flowers of the *Lantana* in an inaccessible spot in the bed of the river at St. Denys.

*Hypolimnias bolina*, L.

I have only seen two specimens of this insect in Mauritius, one, a female, in the Port Louis Museum, which was captured somewhere in the Moka district about five miles from Port Louis, and the other, a male, taken near the harbour of Port Louis by Mr. de Gaye in February 1906.\* This specimen is now in my collection; it is in

\* There is a third specimen in the British Museum collection captured by Capt. Tulloch.



very bad condition, and I have little doubt it was imported. Vinson records this from Bourbon, but I have no doubt he has misnamed the species, the insect occurring in Bourbon being *H. misippus*.

*Neptis (Rahinda) frobenia*, Fabr.

14. *Neptis Frobenia*, Fabr.

Usually common in the more wooded parts of the island, but difficult to take in good condition as it soon tatters itself from its habit of flying in and out of the bushes. It has a floating flight very similar to *L. sibylla*. I have never found the larva. Flies, I–VI, common; VII, VIII, scarce; IX, uncommon; X–XII, common.

*Neptis (Rahinda) dumetorum*, Boisd.

This differs from the above chiefly by the presence of several small dots of white on the fore wings which give it a speckled appearance. It is far more common than *N. frobenia*, being very abundant, sometimes almost swarming on the loquat trees. It feeds on *Tragia*. The larva and pupa have been figured and described by Vinson ("Études d'Ent." Oberth. 1888). It is an extremely pretty insect, with a most elegant flight, and is almost the first butterfly one notices in the woods. It is only found in the moister portion of the island where there is plenty of forest. Mabile reports it from Madagascar also; but for many years it was considered one of the few butterflies peculiar to Bourbon.

14. *Libythea cinyras*, Trimen (Plate XXIX, fig. 4).

I am unable to add anything to Mr. Trimen's remarks on this species. His specimen was given to him by the late Mr. Barclay, who informed him that the insect came from the Moka district, and was "very scarce in Mauritius," which implies that Mr. Barclay knew of other specimens. If it were not for this remark I should have been inclined to look upon Mr. Trimen's specimen as a casual importation. The whole of the Moka district is now under sugar cultivation, and no species of this genus is now known to occur in Mauritius; it is also absent from Bourbon. Mr. Trimen has very kindly lent me his single example for figuring.



*Cupido (Cacyreus) lingens*, Cram.

Not hitherto recorded, and quite a recent introduction. I found it commonly in the Botanical Gardens, Curepipe on *Coleus hybrida*, on which the larva feeds. The Superintendent told me that these plants came from Madagascar, and there is no doubt the insect was brought with them. It was not captured by Captain Tulloch up to the year 1902, though he was constantly in the gardens for two or three years. It is now quite common, but seldom wanders far from the food plant. The males are by no means so numerous as the females. It is quite one of the most confidential butterflies I know, I have frequently boxed them off the food plant. It is of enormously wide distribution, being recorded from Sierra Leone to Delagoa Bay and Madagascar, and now still further east to Bourbon and Mauritius. The transformations do not appear to have been recorded.

The egg is laid in bright sunshine during the hottest hours of the day ; it is of the usual echinoid shape, pale whitish green, and usually laid on its edge at the base of a flower on a spike of *Coleus*. The full-fed larva is shaped like a wood-louse, length 12 mm., pale pinkish-green with pink dorsal line and deeper pink spiracular line ; between the two are two diagonal pink lines, the upper and shorter passing from before backwards and downwards, the other backwards and upwards. Body covered sparingly with short whitish hairs bending forwards. Head very small and black.

Pupa same colour as the larva but paler, covered with minute scattered hairs ; dorsal and spiracular lines light reddish-brown, a row of minute dots, the posterior the larger, between the two. A conspicuous black mark of irregular shape on either side of dorsal line at the base of the wing covers.

The larva usually feeds on the flowers, and is admirably protected when resting on the similarly coloured stem of the food plant. It usually pupates head downwards on the stem of the *Coleus*, but sometimes on the upperside and centre of the leaf. I have frequently seen ants crawling over the larva, but they appeared to pay no particular attention to it. Flies I-XII.

BOURBON. Not hitherto recorded, though I found it quite common in the Museum Gardens fluttering about the food plants, which were I believe brought from



Madagascar. I believe its advent to be quite recent, as I can scarcely credit such an excellent observer as the late Dr. Vinson overlooking it.

*Cupido (Tarucus) telicanus*, Lang.

20. *Lycæna Telicanus*, Herbst.

Very abundant in both islands. Flies, I–V, abundant; VI–VIII, none; IX–XII, abundant. All my specimens appear to me to be remarkably dark.

*Cupido (Lampides) bæticus*, L.

19. *Lycæna Bætica*, Linn.

More common in some years than in others, sometimes abundant. The larva feeds in the interior of pea-pods, and not unfrequently gets cooked and brought to table, on which occasions it may be regarded as a nuisance. I have known it to be so abundant as to cause a serious diminution in the pea crop, and in some seasons to be quite scarce. In Bourbon it is likewise of irregular occurrence. Flies all the year round. The larva and pupa have been described frequently.

*Cupido (Zizera) gaika*, Trimen.

Not recorded hitherto from Mauritius, but widely distributed and usually very common, fluttering about short herbage or settled on the flowers of *Lantana*. It varies greatly in size, and the female, as is so frequently the case in this genus, varies very much in the amount of blue on the upperside. Flies, I–IV, common; VI, scarce; VII, VIII, scarce or absent; IX–XII, very common at all elevations.

BOURBON. Not previously recorded, but I found it very common on the racecourse at St. Denys, and it doubtless occurs elsewhere. The transformations have been described.

*Cupido (Zizera) lysimon*, Hübner.

21. *Lycæna Lysimon*, Godt.

Very abundant both in Mauritius and Bourbon. The specimens are usually very fine, and larger than the general run of Indian specimens. It is found in more



or less profusion all the year round in gardens and waste lands. The transformations are well known. *Lycæna mylica* has been recorded by Guenée from Bourbon and is incorporated in Vinson's list without remark. By the figure given in Melville it is very close to and perhaps identical with *lysimon*.

*Cupido (Zizera) antanossa*, Mabille.

Mabille, "Bull de la Soc. Ent. de France" (1877), p. 101. Not previously recorded from Mauritius, and apparently absent from Bourbon. I think it is a recent arrival, as it was not taken by Captain Tulloch, who collected in the island until three or four years ago. It is widely distributed and not uncommon, but is quite likely to be overlooked, as it flies with *gaika* and *lysimon* and might be readily mistaken for either. It has a great resemblance to the Indian *Z. maha*, and undergoes the same seasonal changes. It has the same habits as the rest of the genus, flying low about the herbage and never resorting to bushes or trees. I give the various localities where I have taken it. I first took it at Quatre Bornes in November 1905, when it was worn. In the following month (3rd and 11th) it was in good condition and more common. On Trianon estate one specimen, XII. At Le Réduit in the Governor's Garden, iv. '06, a few. At the Citadel, Port Louis, 7. xi. '06, numerous, and one specimen in the garden of my house at Curepipe. It occurs therefore at all elevations from the coast to 1,800 feet. It is rare in Madagascar, but has a wide range in Natal and Central Africa.

*Nacaduba mandersi*, Druce (Plate XXIX, figs. 5, 5a).

Described and named from specimens collected by me by Mr. Hamilton H. Druce, ("Ann. and Mag. Nat. Hist." Ser. 7, vol. xx, p. 219, September 1907).

It is surprising that it has not been previously discovered in Mauritius, as it is abundant at Blue Bay, Mahéburg, a noted place for picnics; but it is never found away from the food-plant, which being of an abominably prickly nature is naturally avoided. The manner of flight is quite different from any other Lycænid found in the island, and it was this peculiarity which first attracted my attention. It flies very much like the "Holly-blue," well above the ground and sometimes to a considerable height, and indulges in



frantic combats with others of its kind. With few exceptions all the other Lycænids belong to the genus *Zizera* which never fly far from the ground, and usually within a few inches of it.

There is a certain amount of seasonal dimorphism observable, the specimens in the cold weather having a more or less well-marked submarginal band on the under-side of the hind-wing, pale grey or whitish. It is probably abundant wherever the food-plant occurs. I found it at Blue Bay commonly, at Morne Brabant in the extreme south-west of the island also commonly, and it occurs also at Flacq on the north-east coast. It is never found above the seacoast.

The female lays her eggs during the hottest hours of the day on the under surface of the young leaves of *Cæsalpinia bonducella*, called Cadoque by the natives. The egg is of the usual Lycænid shape, but flatter, pale green. The larva when first hatched is uniform greenish-white, head black, under a lens the body is seen to be covered with white hairs. During the day it rests concealed beneath the leaves of the food plant. When half-grown it is pale apple-green with a yellowish line on either side of dorsum and a spiracular line of the same colour. Full fed length 10 mm. varies from pale green to brownish-green with a pink tinge. On either side of the dorsum, which is darker than the ground colour, is a pale pink line and a spiracular line of the same colour; each segment is further marked by short diagonal lines rather darker than the ground colour. Legs same colour as the body, which under a lens is seen to be covered with white hairs five-rayed. Head black.

Pupa pale greyish-purple with narrow purple dorsal line and a broader but shorter line on either side most prominent on the last two segments; two deep purple circular spots in line with these at the base of the wing covers, and two other much smaller spots on either side between them and the head. Alæ pale green.

Egg hatched, 26. viii; pupa, 14. ix; imago, 24. ix, '05. The butterfly probably flies all the year round.

*Catopsilia florella*, Fabr.

2. *Callidryas Florella*, Fabr.

3. *Callidryas Rhadia*, Boisd.

Introduced into Mauritius probably with the food plant  
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(*Cassia*) which is not a native. It is usually scarce in the hill districts, but common lower down, and would be extremely abundant if it were not for the tremendous destruction of eggs and larvæ. I doubt whether one egg in five hundred ever comes to maturity. I have noticed a plant fairly covered with eggs and two days afterwards they were comparatively scarce. Ants carry them off by hundreds, and the young larvæ are eaten by a small green spider. The larvæ in the last stadium vary considerably. In many, perhaps the majority, the lateral white line is tinged with orange and the black lateral line is continued as a black collar behind the head; the last two or three segments are also more or less crossed by extensions of the black lateral lines. I may say that the sex of the perfect insect is in no way indicated by the different markings of the larva. There are two broods in the hot weather, at the beginning of December, and another in February and March; the pupæ from the majority of this brood remain over the cold weather and emerge the following December.

BOURBON. I did not meet with this insect, and Vinson says it is rare.

*Terias floricola*, Boisd.

5. *Terias Floricola*, Boisd.

MAURITIUS. Scarce above 1,000 feet; common and frequently abundant below this level, and widely distributed. The dry-weather form, *Terias ceres*, Butl., occurs sparingly, but so far as I have observed, in the low country only. Flies all the year round except in the coldest month, July. The same remarks apply to the species in Bourbon.

*Terias pulchella*, Boisd.

4. *Terias Rahel*. Fabr.

If it were not for the opinion expressed by Trimen ("S. Afr. Butt.," 3, p. 18, note 1 [1889]), that this is distinct from *Terias brigitta*, I should certainly consider it to be the same species, as I have specimens from Mauritius which are indistinguishable from *T. brigitta*, or rather *T. zoë*, from Natal.

It can, I think, be considered as at most a geographical race of that species. The wet-season form (*T. zoë*) is far more frequently met with than the dry (*T. brigitta*), and



indeed I have not personally met with the latter, but am under the impression that I have seen one or two specimens in the Port Louis Museum. Its absence can be readily understood in the damp climate of Mauritius. It is not common, but is found at Moka and in the Botanical Gardens at Pamplémousses almost at sea-level, always in the neighbourhood of its food plant *Tephrosia*. It is absent, or very rare (once at Curepipe) above 1,000 feet, and disappears in the cold weather. It is very variable in size, those found in October being usually larger than those captured in April. The transformations of *T. brigitta* are well known, but those of *T. pulchella* have not been described.

The egg laid April 9th; hatched April 11th. Spun up April 19th, and the butterfly emerged May 2nd. The larva when first hatched is uniform pale yellowish-green, and when magnified is seen to be covered with whitish reversed hairs, which, however, disappear when the larva is full grown. The full-fed larva is green, with thin yellow spiracular, and broader purplish-brown dorsal, lines. Pupa pale apple-green, wing covers streaked with purplish-brown; dorsum and sides thickly sprinkled with small spots of the same colour. Spins up on the stem of the food plant. Larva and pupa of the usual Pierine shape.

It does not occur in Bourbon.

*Papilio manlius*, Godt.

1. *Papilio Phorbanta*, Linn.

This beautiful butterfly is common everywhere and excites the admiration of the least observant. It flies all the year round, though the specimens seen in the cold weather are usually tattered individuals of longer life than their fellows. The female can easily be distinguished on the wing by the absence of the white band which is such a conspicuous feature on the undersurface of the hind wing of the male. The larva feeds on citron, but I am unable to say in what respect it differs from the Bourbon species *P. phorbanta*. Dr. Vinson, writing on the butterflies of Bourbon in 1896, makes the following interesting remark. He says that in 1669 the Count of Mont de Vergne arrived with ten vessels and sowed Madagascar and afterwards "Mascareigne" and Mauritius with the seeds of various citrons which he had brought from



Brazil; and he suggests that possibly these green *Papilios*, or more probably their common ancestor, were thus introduced. He inclines to the view, however, that the citron is indigenous to all these islands. I should say that the Madagascar, Bourbon, and Mauritius green *Papilios* are probably derived from some African ancestor closely allied to *P. nereus*.

*Papilio phorbanta*, L. (Pl. XXIX, figs. 6, 6a).

Confined to Bourbon, where it is known as *P. disparilis*, Boisd. Common, not to say abundant, on the coast and up to about 2,000 feet. I never saw a single specimen at 3,000 feet, and its distribution is no doubt determined by the food plant. It feeds on citron, and the larva has been figured and described by Vinson. It is no doubt unpalatable in the larval stage. The female is aberrant, and is an admirable example of what Scudder calls "colourational antigeny" in which it is the female that departs from the normal colouring of the group to which the species belongs. It is presumably a mimic of *Euplœa goudoti*, and in such a small island as Réunion the exciting cause should not be difficult to discover. I may say fairly confidently, that there is no bird now existing which makes any marked ravages among the butterflies. Indeed birds are conspicuous by their absence, and are as rare in Réunion as they are in France and Italy, and for the same reason; affording a marked contrast to Mauritius, where they are protected and consequently abundant.

I was informed, however, by Dr. Jacob, who has resided for some fifty years in Réunion, that at one time the now extinct "starling" (*Fregilupus varius*) was decidedly common, especially in those parts more particularly frequented by *P. phorbanta*, and, judging by the stuffed specimen in the St. Denys Museum, I should say that the bird was entirely insectivorous. I throw out the suggestion that it was this bird that was the main cause of this case of mimicry. We have therefore in these two islands two cases of the marked effect of birds on butterflies. In Mauritius, which had no indigenous starling, the introduction of the Indian starling caused the extinction of *Salamis augustina*, and in Réunion the presence of the Réunion starling gave rise to a remarkable case of mimicry.

As habit, manner of flight and so forth is now regarded



as of high importance in deciding questions of mimicry, I put on record my observations regarding *P. phorbanta* and *Euplœa goudoti*.

St. Denys, where I chiefly collected, is a town on the outskirts of which the houses are situated in the midst of gardens of considerable size, and both species are common flying about the roads. I secured all my specimens in the Botanic Gardens, which comprise an area of three or four acres laid out with avenues of palms, and extensive shrubberies of *Alamanda*, *Hibiscus*, and other shrubs growing to a height of ten or fifteen feet. These were intersected by narrow paths, which were consequently shady, and at the same time very hot and steamy from the fountains which were pretty numerous.

In these shady groves the *Euplœa* was abundant, with a more lazy flight than is usual even with an *Euplœa*; many were busy ovipositing on the *Alamanda* shrubs. Other parts of the gardens were laid out in flower-beds and were more open, but *Euplœa* certainly preferred the shade. *P. phorbanta* was also common in the garden. It was not difficult to catch, as it flew about ten feet from the ground across the broader drives. I should not call the flight particularly rapid for a *Papilio*, but when frightened it made off at a considerable pace. Numerous females were flying about in a similar manner to the males. I noticed two or three females at different times in the shrubberies fluttering close to the ground, and from the manner of their flight I think they were contemplating oviposition, but they did not do so, though I followed them assiduously from one citron tree to another. Under these circumstances they were on *Euplœa* ground, and I can imagine an unobservant person passing through the gardens and being under the impression that he had seen only one kind of brown butterfly.

*Papilio (Orpheides) demodocus*, Esp.

This abundant and conspicuous insect could scarcely have escaped Mr. Trimen's notice, so I conclude that it has been introduced into the island since he was there in 1865. It occurs all over the island in every month in the year. The larva is well known.

It is equally abundant in Bourbon, and was introduced into that island some thirty years ago by Dr. Vinson, who



imported larvæ from Madagascar. Unfortunately at the very time of its arrival a Coccid attacked and destroyed large numbers of the orange trees, but the damage was not unnaturally attributed by the natives to the more conspicuous larvæ of *demodocus*, which increased alarmingly and no doubt did considerable mischief. The butterfly was consequently given the name of "Le papillon Vinson," which it still retains, and at the time of my visit the name of Vinson in this connection was still regarded with some feelings of bitterness by the more ignorant.

*Rhopalocampta forestan*, Cram.

25. *Ismene Florestan*, Cram.

Common on the sea-coast, where its food plant *Terminalia* grows. Stragglers may be found pretty constantly at the higher elevation, and it is not at all uncommon at Curepipe, 1,800 feet. It has a quick darting flight, but the conspicuous white band on the undersurface of the hind wing makes it easy to follow. Flies I-IV, IX-XII. The same remarks apply to the insect in Bourbon. Vinson writes in 1896, "Introduced about fifty years ago with some botanical plants into the Botanic Gardens when M. Claude Richard was director."

*Eagris sabadius*, Boisd.

24. *Nisoniades Sabadius*, Boisd.

Widely distributed and not uncommon. It has a wild rapid flight and soon tatters itself. It has a habit of resting with widely-expanded wings on the upper side of a leaf. The upper-surface is variable both in colour of the wings and in the size of the spots; but this is not, so far as I have observed, in any way seasonal. The larva feeds on *Hibiscus*. Flies all the year round except VII and VIII. It is recorded from Bourbon, but I did not myself meet with it.

*Parnara borbonica*, Boisd.

22. *Pamphila Borbonica*, Boisd.

Abundant both in Mauritius and Bourbon near sugarcane and bamboos; the larva feeds on *Panicum*. The insect settles with closed wings, but is quick and active like all *Hesperiidæ* and soon tatters itself. Flies I-VII,



abundant; VIII, scarce; IX–XII, abundant. It is not a variable insect.

*Parnara marchalli*, Boisd.

23. *Pamphila Marchalli*, Boisd.

Known in Mauritius, but erroneously, as *Hesperia poutieri*, a Madagascan species. It is usually very common, and is the most "confidential" skipper of my acquaintance; I have not infrequently captured it in my fingers when basking in the sun. The larva feeds on sugar-cane. Flies I–V, common; VI–VIII, scarce; IX–XII, common. It has not been recorded from Bourbon.

A long series shows considerable variation on the fore wing, the spots, though never more than two in number, are frequently reduced to mere points and in some specimens are completely absent, the entire wing being an uniform yellowish brown. In the female the spots are larger and altogether more pronounced.

NOTE.—*Precis rhadama*. My remark as to the date of its introduction into Bourbon being later than into Mauritius must be modified or withdrawn. Guenée, in Maillard, "Notes sur l'île de la Réunion 1863," states that it was introduced "about twelve years previously," *i.e.* about 1851.

*Catopsilia florella*.—When I wrote that the different markings on this larva were not indicative of the sex of the future butterfly, I was unaware of Vinson's different conclusion quoted by Guenée in the above work. Vinson says that all the caterpillars which produce the yellow variety have the "first segment of the neck" entirely black, while the larvæ without the black collars produce the white butterflies. Guenée adds, "this curious observation ought to be repeated." I do not know whether in this long interval of nearly fifty years any one has carried out Guenée's suggestion, but I append my results which show that Vinson's opinion was founded in error—not an error due to carelessness but to a curious chance.

Two pupæ from larvæ with "black collars" (pupated 22 I, emerged 3 II) were both males, of course white.

Two pupæ from larvæ without "black collars" (pupated 28 I, emerged 4 II) were one male, one yellow female,



One pupa from larva without black collar (emerged 12 II), white female.

Two pupæ from larvæ with incomplete collar (emerged 6 II), two yellow females.

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EXPLANATION OF PLATE XXIX.

*See Explanation facing the PLATE.]*





1907. "The butterflies of Mauritius and Bourbon." *Transactions of the Entomological Society of London* 1907, 429–454.

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