The third division I have made in the Indian *Lycænidæ* I have called the *Lycæna* group. Superficially at any rate it is a well-marked one, and contains a considerable assemblage of genera, none of which (except some specimens of the genus *Megisba*, Moore, and the genus *Lycænesthes*, Moore) are furnished with a distinct tail to the hindwing. The two last genera of the group are certainly aberrant; they are much more strongly built than any of the others, have more robust bodies, thicker wings, and, instead of a slow jerky weak flight, are very strong and swift on the wing. These two genera (*Lycænesthes* and *Niphanda*, both described by Moore), are obviously closely allied, indeed Distant considers them to be one genus, but I think it well to keep them distinct, as *Lycænesthes* has three small ciliated tails to the hindwing (a unique feature in the *Lycænidæ*, as far as I know), which *Niphanda* entirely lack. The coloration and markings of the two genera also differ considerably. The *Lycæna* group is obviously very closely allied to the next, which I call the *Polyommatus* group, and the two together comprise the true "Blues." The genus *Megisba*, Moore, of the *Lycæna* group, is aberrant, as noted above, as some species, or forms, or individuals, have a single delicate short filamentous tail. There is considerable variation in the neuration of the group; one genus having two subcostal nervules to the forewing, and the rest three. In three genera, *Pithecops*, Horsfield, *Azanus*, Moore, and *Orthomiella*, mihi, the first subcostal nervule is entirely anastomosed with the costal nervure for a part of its length, in *Pithecops* not again freeing itself, but in *Azanus* and *Orthomiella* its apical portion again becomes free and reaches the costa. Speaking broadly, the first six genera of the group are blackish on the upperside of both wings, the other eight are of some shade of blue or purple in the male, often blackish in the female. All the genera of the *Lycæna* group lack secondary sexual characters in the male.

In the first subgroup I place four genera, *Pithecops*, Horsfield, *Neopithecops*, Distant, *Spalgis*, Moore, and *Taraka*, Doherty MS. Mr. Doherty writes (Journ. A. S. B., vol. lviii, pt. 2, p. 1889) that the *Lycæninæ*, which comprises my *Lycæna* and *Polyommatus* groups "are distinguished by their decidedly concave eggs, broadest above the middle, the reticulations often irregular, and vary greatly on different parts of the surface. Those on the sides consist of small white knobs constricted at the base, from which spring either four of six elevated lines, forming quadrangles or triangles. In *Catapœcilma*, Butler [I place this genus in the *Horaga* group, owing to its possessing three short tails, the middle one the longest, to the hindwing] the spaces are hexagonal, and in *Semanga*, Distant [a Malayan genus allied to *Catapœcilma*] irregular; I include these genera here with much doubt. The typical *Lycæna* group, containing the great majority of the subfamily, have hairy eyes (the hairs few and scattered in *Castalius*, Hubner, and *Zizera*, Moore). The *Pithecops* group consists of naked-eyed genera, of which the eggs of *Megisba*, Moore, and *Pithecops*, Horsfield, have tetragonal spaces, and *Neopithecops*, Distant, triangular spaces." As far as the imago goes, I should hardly have thought that *Megisba* could be morphologically allied to what I call the *Pithecops* subgroup, as in the imago it differs widely in structure, appearance, and habits from the genera *Pithecops* and *Neopithecops* with which Mr. Doherty associates it.

Genus 102.—PITHECOPS, Horsfield. (PLATE XXVI).

Pithecops, Horsfield, Cat. Lep E. I. C., p. 66 (1828).

FOREWING, elongated, narrow; *costa* regularly arched throughout, *apex* rounded, *outer margin* very convex, *inner angle* rounded, *inner margin* slightly sinuous; *costal nervure* short, terminating before the apex of the discoidal cell; *first subcostal nervule* emitted at about the middle of the cell, very short, directed obliquely upwards to the costal nervure, with which it is completely anastomosed in its entire length except a short portion of the base; *second* subcostal long, emitted nearer to the base of the first than to the base of the upper discoidal nervule; *third* subcostal very short, emitted from the costal nervure at about opposite the apex of the second subcostal; *discoidal cell* long, narrow, extending to the middle of the wing; *upper disco-cellular nervule* wanting, *middle* and *lower* disco-cellulars of about equal length, concave; *lower discoidal* nervule from the point of junction of the disco-cellulars; *second*

median nervule emitted some little distance before the lower end of the cell; *submedian nervure* sinuous, following the shape of the inner margin. HINDWING, elongated, oval; *costa* very straight, *outer* and *abdominal* margins sweeping round in an even curve; *costal nervure* not much arched at base, then straight, reaching the apex of the wing; *first subcostal nervule* emitted far before the apex of the cell; *upper disco-cellular* nervule short, outwardly oblique, straight, *lower* disco-cellular longer, upright, concave; *second median* nervule emitted some short distance before the lower end of the cell *Antennæ* with a well-formed, spatulate club. *Eyes* naked. *Body* long.

Pithecops contains but two described species in the Indian region, one of which (*P. hylax*, Fabricius) occurs in Sikkim, the Chittagong Hill Tracts, Sandoway, Arakan, Bassein, Burma, Province Wellesley, Perak, Nias Island, Sumatra, Java, Borneo, and Celebes. Its coloration is brownish-black on the upperside The other species, *P fulgens*, Doherty, has been found in Upper Assam only; the male has a patch of brilliant iridescent blue on each wing on the disc and base above; the female is coloured like *P. hylax* Both sexes of *P. hylax* and the female of *P. fulgens* are very similar in appearance to *Neopithecops zalmora*, Butler, but an examination of their structure shews that they differ considerably in the shape of the forewing, and also in nervation, from any species of that genus. The underside of both species of *Pithecops* is white, the forewing with two small brown spots on the middle of the costa, and some brown and black marginal markings; the hindwing with a very large round black spot at the apex, marginal markings as in the forewing. The transformations of *P. hylax* are described under that species Herr J Rober (Iris, vol i, p. 61, pl iv, fig. 26 (1886) appears to have described a new species of *Pithecops* from Eastern Celebes under the name of *Plebeius phonix*, it is figured in Dr. Staudinger's "Exotische Schmetterlinge" These are all the species known to me of the genus, which appears to be strictly confined to the Indo-Malayan region. I am unable to identify the '*Polyommatus*" *hylax*, figured in Donovan's "Insects of India," pl. xlvi., fig 2, and referred by Kirby in his "Synonymic Catalogue," p. 346 (1871) to this genus as *Pithecops donovani*

Key to the Indian species of Pithecops.

A. Both sexes upperside both wings deep blackish brown
639 P HYLAX Sikkim, Burma, Malay Peninsula and Archipelago

B. Male, upperside, both wings with the disc resplendent cyaneous blue, female, upperside, both wings blackish.
640. P FULGENS, Upper Assam.

639. Pithecops hylax, Fabricius (PLATE XXVI, FIG. 1G)

Papilio hylax, Fabricius, Syst. Ent, p 526, n 351 (1775), idem, id, Sp Ins, vol ii, p 124, n 559 (1781); idem, id, Mant. Ins, vol ii, p 77, n 709 (1787), *Hesperia Rurales hylax*, id, Ent Syst, vol iii, pt. i, p 304, r 152 (1793), *Polyommatus hylax*, Godart, Enc Méth, vol ix, p 701, n 241 (1823), *Pithecops hylax*, Horsfield, Cat Lep E I C, p 66, n 1, pl i, figs *a*, *an*, *imago*, *ab*, *pupa* (1828), id, Moore Proc. Zool. Soc. Lond, 1865, p 772, id, Butler, Cat Fab. Lep B M, p 161, n 1 (1869), id, de Nicéville, Journ A S B, vol li, pt 2, p 61, n 167 (1882), *Lycæna hylax*, Hopffer, Stett Ent Zeit, vol. xxxv, p. 87, n 50 (1874), Id., Staudinger, Ex Schmett, p 472, pl. xciv, *male* (1888)

HABITAT: Sikkim, Chittagong Hill Tracts, Sandoway, Arakan, Bassein, Burma, Province Wellesley, Perak, Nias Island, Sumatra, Java, Borneo, Celebes.

EXPANSE: ♂ ♀, ·95 to 1 1 inches.

DESCRIPTION: "MALE. UPPERSIDE, *both wings* deep blackish-brown, the colour being uniformly spread over the whole surface to the border of the hindwing which is silvery-white. [*Forewing* with an oval patch of paler brown on the middle of the disc.] A very delicate gray *cilia* interrupted with brown bounds the forewing. UNDERSIDE, *both wings* white with a greyish-silvery gloss inclining to blue, and the scales covering their surface large and rough; sometimes beyond the disc both wings are traversed by a delicate, undulated, interrupted striga of reddish-brown, exterior of this by a broader continued fascia of the same colour, undulated at its outer edge; next follows an interrupted series of oblong [black] spots, and finally a regular narrow marginal line of intense black, exterior to which the

wings are bounded by a silvery *cilia*. *Forewing* marked near the costa with two small irregular dots of an intense black. *Hindwing* at the posterior angle [apex] with a large regularly circumscribed spot of the same colour, a minute dot is in some individuals obscurely perceptible near the anal angle. *Legs* covered with lax villi of silvery-white, *tarsi* surrounded by a black ring. *Body* brown above and white underneath *Eyes* uncommonly prominent, and bordered with white. *Antennæ* brown, annulated with white. FEMALE. Wings somewhat broader. UPPERSIDE, *forewing*, disc marked with a rhomboidal white patch more intensely coloured exteriorly." (*Horsfield*, l. c.) I am nearly sure Horsfield has mistaken a *Neopithecops* for the female of his *Pithecops hylax*, the markings of both sexes of the latter being alike

Dr. Horsfield notes that the LARVA in Java feeds on a leguminous plant. The PUPA as figured by him is very short and thick, pale ochreous-brown marked with dark brown, and as delineated these markings on the thorax assume the appearance of the face of a monkey, eyes, nose, nostrils and mouth. Dr. Horsfield states that he has "given the name of *Pithecops** from the peculiar aspect of the chrysalis."

Occurs in Sikkim in March and October. It is found in heavy forest only, and has a weak fluttering flight, settling on the leaves of shrubs and plants. As has been noted in the habitat above, this species has a very wide range Except Sikkim, Nias Island and Java, Mr. Doherty is responsible for all the other localities, in which he has personally met with it.

The figure shews both sides of an example from Sikkim in my collection.

640. **Pithecops fulgens,** Doherty.

P. fulgens Doherty, J. A. S. B., vol. lviii, pt. 2, p (1889).

HABITAT: Margherita, Upper Assam.

EXPANSE: ♂ ♀, 1·0 to 1·1 inches.

DESCRIPTION: "MALE. UPPERSIDE, *both wings* black. *Forewing* with the discoidal cell, the interno-median interspace, and the disc of the lower discoidal interspace, resplendent cyaneous blue in some lights, dull violet in others, the black border wide, extending one-third towards the base. *Hindwing* similarly blue from the lower subcostal nervule to the submedian nervure, the black border somewhat narrower, especially towards the anal angle; *cilia* of the hindwing whitish, except at the ends of the veins. UNDERSIDE, *both wings* pure white; a very slender dark marginal line, a narrow submarginal white band containing a line of six minute dark transverse streaks in the forewing and five [usually six] in the hindwing, within which is a narrow transverse ochreous-brown fascia very clearly defined (in the hindwing by an obscure dark line on its inner border), extending across the whole breadth of the forewing, and on the hindwing from the first subcostal nervule to the submedian nervure; traces of slender discal streaks in the forewing near the lower angle within the ochreous band. *Forewing* with the apex obscured with black scales; [two small costal black spots]. *Hindwing* with a large and conspicuous subapical black spot extending from the costa to the lower subcostal nervule FEMALE. UPPERSIDE, *both wings* blackish. *Forewing* with the costa and outer margin darker; *cilia* of the forewing pale, of the hindwing white. UNDERSIDE, *both wings* as in the male."

"Margherita, where it perhaps takes the place of *P. hylax*, Fabricius. According to Mr de Nicéville that species is in Sikkim much commoner than *Neopithecops*, which I did not see in Assam at all. But in the Chittagong Hill Tracts, at Sandoway and Bassein in Burma, and in the Malay Peninsula, *Pithecops* is the rarer form. In Java it is *Neopithecops* that is rare, another instance of its close faunal resemblance to the Himalayas In Celebes I did not observe any *Neopithecops*, but a large protected *Pithecops* (*P. phœnix*, Rober)† is very common and conspicuous. On the other hand, *Neopithecops* seems to occur alone in Malabar (where I found it as far north as the Gersapa Falls in North Kanara), and Ceylon, and also as far as my experience goes, in the islands of Lombok, Sambawa and Sumba east of Java."

"The genera differ in many important points. As regards prehensores, the clasp (harpago) of *Neopithecops*, seen from the side, is simply clavate at the tip, while that of *Pithecops* is long

* PITHECIUM, a little ape.

† *Plebeius phœnix*, Röber, Iris, vol. I, p. 61, pl. iv, fig 26 (1886).

and slender and ends in two opposing points like a pair of pincers. As to the egg, in that of *Neopithecops* the raised lines form triangles laterally, in that of *Pithecops* quadrangles. Both genera are apparently more or less protected, and are mimiced by certain rare species of *Logania* (*Geydinæ*) and *Cyaniris* (*Lycæninæ*)." (*Doherty*, l. c.)

P. fulgens is a very beautiful little species, of which Mr Doherty has kindly given me two pairs. It is perhaps one of the most interesting new species that he has hitherto discovered.

I give below* a description of the genus *Una*, mihi, which contains a single species occurring in the Malay Peninsula. The male sex of *U. usta*, Distant, is alone known up to the present. On the upperside it has a strong superficial resemblance to the tailless form of *Nacaduba ardates*, Moore, the outline, as also the colour, being much the same; it also agrees in size and shape with *Megisba*, Moore. The coloration and markings of the underside are however, quite different from either of these genera, and are unlike those of any Indian butterfly.

Neopithecops, Distant, is a very remarkable little genus which has a strong superficial likeness to *Pithecops*, Horsfield, and moreover similar habits and flight in the perfect state. It has the costa of the forewing more strongly arched than in any other genus of this group, thus permitting of the wide separation of the costal nervure and first and second subcostal nervules. The males have no secondary sexual characters. The genus occurs in India, Ceylon, the Andaman Isles, Burma, and the Malay Peninsula and Archipelago.

Genus 103.—NEOPITHECOPS, Distant (PLATE XXVI).

Neopithecops, Distant, Rhop. Malay., p. 209 (1884), *Parapithecops* Moore, Journ. A. S. B., vol. liii. pt. 2, p. 20 (1884), *Pithecops*, id. (*nec* Horsfield), Lep. Cey., vol. i., p. 72 (1881).

"FOREWING, small, very broad, elliptical; [*costa*] much arched from the base, *exterior margin* convex, *posterior* margin of equal length with the anterior, [sinuous], *costal nervure* extending to less than half length of the margin; *subcostal nervules* very short, *first* subcostal emitted at one half before the end of the discoidal cell, *second* at one-third before its end, *third* at one-sixth before its end, *fourth* at one half beyond the cell and terminating on the costa.

* Genus UNA, nov.

Outline of wings almost exactly as in *Azanus ubaldus*, Cramer. FOREWING triangular; *costa* nearly straight, *apex* acute, *outer margin* very slightly convex, *inner* margin straight, *costal nervure* terminating beyond the apex of the discoidal cell; *first subcostal nervule* immediately after its origin anastomosed completely with the costal nervure as in the genus *Pithecops*, Horsfield, and not again becoming free; *second* subcostal nervule with its origin half as far from that of the first as that of the second from that of the upper discoidal; *third* subcostal nervule with its origin a little nearer to the apex of the wing than to the apex of the cell; *middle disco-cellular* nervule arising from the upper discoidal some distance beyond its base, concave, upright; *lower* disco cellular as long as the middle, also concave and upright; *second median* nervule originating some little distance before the lower end of the cell; *submedian nervure* nearly straight. HINDWING, *costa* slightly arched, *outer margin* convex, *apex* rounded, *anal angle* rather acute, *abdominal margin* nearly straight; *costal* nervure strongly arched at base, thence straight to apex; *first subcostal nervule* originating some little distance before apex of cell; *upper disco-cellular* nervule slightly outwardly oblique and slightly concave, *lower* disco cellular upright, slightly concave; *second median* nervule rising a little before the lower end of the cell; *submedian nervure* straight; *internal* nervure recurved, short. *Palpi* with the first and second joints furnished with long bristly hairs, third joint long, naked, acicular. *Eyes* hairy. *Antennæ* about half the length of the costa of the forewing, distinctly annulated with white, with a large spatulate club. *Body* rather robust, not quite reaching to anal angle of hindwing.

It is very difficult to say to what genus *Una* is nearest allied. In neuration it is very close to *Pithecops*, as it has the costal nervure and first subcostal nervule anastomosed in the same way, but it differs widely from *Pithecops* in outline and *facies*. On the upperside *U. usta* is nearest to the tailless form of *Nacaduba ardates*, Moore, and to *N. hampsoni*, mihi. In outline it agrees with *Azanus ubaldus*, Cramer. On the whole it is perhaps nearest to *Nacaduba*, but the spotted underside of the type species reminds one more of the genus *Zizera*, Moore, than anything else. On account of its neuration, I place it next following *Pithecops*.

Una usta, Distant, *Zizera? usta*, Distant, Ann. and Mag. of Nat. Hist., fifth series, vol. xvii., p. 531 (1886), idem, id., Rhop. Malay., p. 454, n. 4, pl. xlv., fig. 8 (1886). HABITAT Malacca. EXPANSE 1 inch 2 inches. DESCRIPTION. *Upperside, both wings* violaceous brown. *Underside, both wings* greyish-ochraceous. *Forewing* with two contiguous fuscous spots in the middle of the cell, a fuscous disco-cellular spot at the end of the cell, and five spots of the same colour in a curved submarginal series. *Hindwing* with two large black spots near the costal margin, the outermost with a small fuscous spot beneath it, a small fuscous spot in the cell, and a disco cellular streak of the same colour at the end of the cell, and with the following blackish spots in the same beneath and near the base of the cell, two near the abdominal margin, one near the anal angle, and four in a curved series beyond the cell, and with a double series of pale fuscous, linear, submarginal spots [which are continued on to the forewing]. *Cilia* of both wings fuscous. *Body* and *legs* more or less concolorous with wings.

"I place this species provisionally in the genus *Zizera*, from which it differs by having the first subcostal nervule completely anastomosed with the costal nervure [except a short free basal portion]. The typical specimen, however, is not only unique, but also not my own property, thus preventing that detailed structural examination which is necessary for exact generic determination, but which is liable at the same time to injure the specimen." (*Distant*, l. c. in Rhop. Malay.)

The sex of the type specimen is not stated, it is probably a male.

before the apex, *fifth* [upper discoidal] from the end of the cell; *disco-cellular* nervules very slender, *middle* disco-cellular slightly longest, nearly straight, *discoidal cell* long, broad; *second median nervule* emitted at one-sixth before the end of the cell, *first* median at nearly one-half before its end; *submedian nervure* straight. HINDWING, small, very broad, oval; *exterior margin* very convex; *costal nervure* arched at the base, extending to the apex; *first subcostal nervule* emitted at one-fourth before the end of the cell; *disco-cellular* nervules very slender, *upper* disco-cellular curved outwards, *lower* disco-cellular curved inwards; *discoidal cell* broad; *third* and *second median nervules* emitted from the end of the cell, *first* median at one-third before its end; *submedian* and *internal nervures* straight. BODY slender: *palpi* porrect, slender, clothed with short lax scales, second joint laterally compressed, long, projecting half its length beyond the head, third joint about half its length, longer in the female, slightly clavate at the tip in the male and cylindrical in the female; *legs* slender, fore tarsi composed of five joints, laterally spined, and in the male with a terminal bifid claw and in the female with a blunt claw; *antennæ* with a well-formed lengthened spatular club." (*Moore*, l. c. in Lep. Cey.)

In the forewing the costal nervure terminates before the end of the cell, the first subcostal nervule terminates just beyond its end, the base of the second subcostal is rather nearer to the base of the first than to that of the upper discoidal, the third subcostal is emitted about midway between the base of the upper discoidal and the apex of the wing; the eyes are naked.

"This genus is quite distinct from *Pithecops*, Horsfield, (of which the type is the Javan species *P. hylax*, Fabricius), although similarity in colouring and markings has led to considerable confusion. In *Pithecops* the first subcostal nervule is distinctly and strongly anastomosed with the costal nervure, in *Neopithecops* that nervule is quite free and situated some clear distance from the costal nervure." (*Distant*, l c.)

As far as I am aware, *Neopithecops* occurs only in India, Ceylon, the Andaman Isles, in Burma, and the Malay Peninsula, though Herr Rober has described what is probably a species of this genus (Iris, vol. i, p. 61, pl. iv, fig 5 (1886) from the Aru and Key Islands under the name of *Plebeius lucifer*. Mr. Doherty notes that "*N. salmora* is commoner than *Pithecops hylax*, Fabricius, at Mergui and Myitta, Burma, and occurs in Java and Sumba, but is rare in both It is common from the Chittagong Hill Tracts to South-Eastern Borneo." With regard to the described species from the Indian region, I recognise only one as distinct. Mr. Distant says that there is an undescribed form from the Andaman Isles, Mr. Moore proposes to name the form occurring in the Nilgiri Hills *N. todara*, which with the four already described makes six in all, All these species appear to me to owe their origin to the want of appreciation of the great extent of the seasonal dimorphism which obtains in them, at any rate in those districts where there are two well-marked seasons, a dry and a wet. The darkest of all is *N. horsfieldi*, Distant, described from a single male specimen from Singapore; this form has no white whatever on the upperside, and may be constant in the Malay Peninsula, where it rains, I believe, almost throughout the year, so that there is no distinct dry-season. This form is found in Calcutta, in the Malda district, and doubtless elsewhere during the rains. *N. salmora* is said to have a small white patch on the disc of the forewing, none on the hindwing, as also have *N. lucifer*, Rober, and the form which occurs in the Andamans. *N. dharma* has small patches on both wings. Mr. Butler in naming the former species gave no habitat for it, but Mr. Moore has recorded it from the N.-W. Himalayas (not improbably these specimens were some from Calcutta I sent Mr. Hocking, and which he omitted to label), and writes me that it occurs in the Calcutta district; *N. dharma* comes from Ceylon. *N. gaura* has the white patches the largest of all, occupying more than half the upper surface of the wings. Mr. Moore described it from Calcutta and Assam, but it occurs in the Malda district and in Orissa as well, and doubtless elsewhere. It is found in the middle of the dry-season in Calcutta, and also differs from the wet-season form in having all the markings of the underside more or less obliterated. The MS. species *todara* from the Nilgiris has the patches of moderate size as in *N. dharma*. The Andaman form might perhaps be considered distinct

as it always, as far as I know, has a moderate-sized white patch on the upperside of the forewing, none whatever on the hindwing; the entirely dark hindwing combined with a white-patched forewing occurs however in some specimens from Calcutta, and has been described by Mr. Moore as characteristic of the female sex of *N. dharma* from Ceylon. These are the features by which typical *N. salmora* and *N. lucifer* may be known. Mr. Doherty informs me that he observed no species of the genus in Upper Assam, but that one occurs rarely in East Java. The females are apparently marked much as are the males. The transformations of the genus are unknown.

641. **Neopithecops salmora,** Butler. (PLATE XXVI, FIG. 162 ♀).

Pithecops salmora, Butler, Cat. Fab. Lep. B. M., p. 161 (1869); id., Moore, Proc. Zool. Soc. Lond., 1882, p 244, id., Doherty, Journ. A. S. B., vol lv, pt 2, p. 134, n. 188 (1886); *Neopithecops salmora*, de Nicéville, Journ A. S. B., vol. liv, pt. 2, p. 46, n 58 (1885), *Lycæna hylax*, Doubleday and Hewitson (*nec* Fabricius), Gen. Diurn. Lep., vol. ii, p 496, n. 198, pl lxxvi, fig. 8 (1852), *Pithecops hylax*, Moore (*nec* Fabricius), Proc. Zool. Soc. Lond., 1877, p. 587; *Pithecops dharma*, Moore, Lep Cey., vol. i, p. 72, pl. xxxiv, fig. 4, *male* (1881); *Parapithecops gaura*, id, Journ. A S. B, vol liii, pt. 2, p. 20 (1884); *Neopithecops horsfieldi*, Distant, Rhop. Malay., p. 210, n. 1, pl xxii, fig. 15, *male* (1884).

HABITAT: N.-W. Himálayas? Kumaon, Malda district, Calcutta district, Sikkim, Assam, Burma, Orissa, Nilgiris, Cannanore, Ceylon, Malay Peninsula, Kankaret (Burma) and Padang in Sumatra *(Elwes)*; Java, Sumba, Sambawa, South-Eastern Borneo *(Doherty)*.

EXPANSE: ♂ ♀, ·8 to 1·1 inches.

Wet-season form.

DESCRIPTION: "MALE. UPPERSIDE, *both wings* dark purplish. *Forewing* with the apex and outer margin distinctly and broadly darker. *Cilia* dark on the forewing, greyish-white on the hindwing. UNDERSIDE. *both wings* greyish-white. *Forewing* with the following brownish markings:—an oblique line extending from the costa to the upper discoidal nervule, followed by a broken transverse linear fascia, a more continuous submarginal linear fascia, between which and the outer margin are a series of linear spots, and an outer marginal line. *Hindwing* with a large blackish spot near the apex, and brownish markings as on the forewing. *Body* above and beneath more or less concolorous with the wings; *tegs* greyish-white, more or less annulated with brownish" (*Distant*, l. c)

This form, the darkest of all, occurs in Calcutta in the middle of the rains (July and August), in the Malda district, and doubtless in other parts of India, and was described from Singapore by Mr. Distant under the name of *N. horsfieldi*.

Dry-season form.

DESCRIPTION: "MALE and FEMALE. UPPERSIDE, *both wings* brown. *Forewing* with a large white medial longitudinally-oval patch, occupying the middle of the wing from the middle of the disc to near the base; a small brown dentate spot at the upper end of the cell. *Hindwing* with the apical and upper discal areas broadly white, and traversed by pale brown veins; a slender brown submarginal line enclosing a marginal row of brown spots. *Cilia* of forewing whitish posteriorly, of hindwing entirely white. UNDERSIDE, *both wings* greyish-white. *Forewing* with a submarginal line composed of slender waved brown lunules, and a marginal line enclosing a row of small linear spots; a slender indistinct brown streak at the end of the cell, and three or four dots along the costal edge. *Hindwing* with an irregular submarginal row of brown lunules, a marginal line enclosing a row of darker spots; a black spot at the upper end of the submarginal line, and a subbasal row of three smaller more or less distinct black spots; a slender brown streak at the end of the cell. *Antennæ* black, ringed with white. [*Palpi*] pale white beneath, third joint and tip of second black. *Legs* white, banded with black." (*Moore*, l. c.)

This form was described by Mr. Moore under the name of *Parapithecops gaura* from Calcutta and Assam, to which I add Bholahát in the Malda district and Orissa. It occurs in the height of the dry-season in Calcutta.

Intermediate between these two extremes are typical *N. salmora*, Butler, and *N. dharma*, Moore, the former described without locality, the latter from Ceylon. They are found wherever

the dry- and wet-season forms of *N. zalmora* occur, probably a moderate amount of moisture being required for their development I give below the description of these two pseudo-species.*

I am surprised to find that *N zalmora* has not been recorded from the Bombay presidency, though the moist climate of the coast seems to me to be eminently suited to it. Mr. W. Doherty obtained it at Jhulaghat, Kali Valley, Kumaon, at 2,000 feet, Mr W. H Irvine has sent me a very fine series, showing its great variation, and embracing all the forms of the species, from Bholahât in the Malda district, it occurs throughout the year, and in all forms, in Calcutta; Mr. W C Taylor also has sent me all forms from Orissa; it is common on the lower slopes of the Nilgiris, writes Mr G F Hampson, who adds "*N zalmora*, Butler, and *N todara*, Moore, MS are probably seasonal forms of one species," I have it from Cannanore, in Ceylon it occurs in the 'Eastern Province, in beds of dry rivers in forest land Taken in August on road to Trincomalee in damp places in beds of streams in abundance" (*Hutchison*); "Kandy" (*Wade*), it occurs also in Sikkim and Assam, probably throughout Burma, in the Andaman Isles, and at Singapore It has a weak fluttering flight, and in Calcutta is almost always found under the shade of trees and bushes, on which it settle, and not on the ground

The figure shews both sides of a female specimen of the dry season form from Calcutta This specimen is Mr Moore's type of '*Parapithecops*" *gaura*, and is deposited in the collection of the Indian Museum, Calcutta.

The next two genera are remarkable in having extremely short antennæ a little more than one-third the length of the costal margin of the forewing, the third subcostal nervule is also unusually long *Spalgis*, Moore occurs in India, Ceylon the Andamans, Nias Island, Amboina, Celebes, and in the isle of Hainan *Taraka*, Doherty, MS, occurs in North Eastern India, Burma, the Malay Peninsula and probably in some at any rate of the Malay Islands, and again in China and Japan (Since the above was written, Mr Doherty has recorded it from Eastern Java) Neither genus possesses secondary sexual characters in the male

Genus 104.—SPALGIS, Moore (PLATE XXVI)

Spalgis, Moore Proc Zool Soc Lond, 1879 p 137, idem, id, Lep Cey, vol i, p 70 (1881), *Lucia* (*part*) Westwood Gen Diurn Lep, vol ii p 501 (1852)

"Allied to *Gerydus* [=*Gerydus*], type *symethus*, Horsfield MAIE, with the FOREWING more trigonal the *costa* straighter, the *third subcostal nervule* bifid, the *fifth* [upper discoidal] starting from the end of the cell HINDWING also more trigonal in the male, the *exterior margin* even in both sexes *Antennæ* short club thickish' (*Moore*, l c in Proc Zool Soc Lond.)

"WINGS small *exterior margins* even. MALE FOREWING, triangular, *costa** scarcely arched at the base, *apex* somewhat acute, *exterior margin* oblique, almost straight, *posterior* margin rather long, *costal nervure* at some distance from the margin, extending to half its

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* *Neopithecops* (*Pithecops*) *zalmora*, Butler Cat Lep B M, p 161 (1869), *Neopithecops zalmora*, de Nicéville Journ A S B, vol liv pt 2 p 46 n 58 (1885) HABITAT Not given EXPANSE Not given. DESCRIPTION 'More robust than *Pithecops aylax* Fabricius, marked above with white, and with more brown lines below (*Butler*, l c)

"This species has never been properly characterized and I am unable to say in what particulars it is supposed to differ from *N gaura* Moore At any rate the species of *Neopithecops* occurring in Calcutta are exceedingly variable, some specimens are entirely black on the upperside others have the costal and outer margins of the fore and hindwings black, all the rest of the surface white and there is every gradation between these extremes Mr Moore writes to me — *N gaura* can be distinguished by its broad white discal area in both wings of both sexes *N zalmora* has a small discal white patch on the forewing only I have both from the Calcutta district' (*de Nicéville*, l c)

Neopithecops (*Pithecops*) *dharma*, Moore, Lep Cey p 72 pl xxxiv, fig 4, *male* (1881) HABITAT Ceylon. EXPANSE *Male* 75 *female*, 1 00 inch DESCRIPTION MALE UPPERSIDE *both wings* vinous brown *Forewing* with the middle of the discal area slightly white speckled costal edge white streaked *Hindwing* with the outer upper area broadly white, a marginal row of brown oval spots, each encircled by a white border *Cilia* white UNDERSIDE, *both wings* bluish white *Forewing* with brown streaks on the edge of the costa, a brown curved streak at the end of the cell, an outer discal transverse curved row of six short waved streaks and a marginal row of narrow spots bordered within by a slender line, and outwardly by the marginal line *Hindwing* with three transverse subbasal black spots another on the middle of the abdominal margin and a larger one on the costal margin near the apex a brown disco cellular streak, a discal zigzag series of six narrow brown streaks, and a marginal row of small blackish spots bordered inwardly by a narrow brown line and outwardly by the marginal line *Body* brown, white beneath *Palpi* black above *Legs* with black bands *Antennæ* black with white annulations FEMALE UPPERSIDE, *both wings* more intense brown the discal white speckled patch on the *forewing* more distinct *Hindwing* entirely brown. UNDERSIDE *both wings* with the markings more prominent than in the male (*Moore* l c)

length; *first* and *second subcostal nervules* short, first emitted at nearly one-half before the end of the cell, second at one-fourth before the end, *third* at one-third beyond the cell, *fourth* terminating at the apex, *fifth* (or upper radial) from the end of the cell; *disco-cellular* nervules slender, almost straight, the *radial* [lower discoidal nervule] from their middle; *discoidal cell* long, extending fully to half the wing; *second median nervule* emitted at a short distance before the end of the cell, *first* median at one-half before its end; *submedian nervure* straight. HINDWING, ovate, short; *costal nervure* very convex from the base, extending to the apex; *first subcostal nervule* emitted at one-fourth before the end of the cell; *disco-cellular* nervules very slender, the *radial* from their middle; *third* and *second median* nervules from the end of the cell, *first* median at half distance before the end; *submedian nervure* straight; *internal* nervure recurved, [long]. FEMALE. FOREWING, less triangular, *exterior margin* convex, *posterior* margin long. HINDWING, convex externally. BODY slender, *abdomen* long; [*eyes* naked]; *palpi* long, slender, clothed with very short hairy scales, second joint projecting half its length beyond the head, third joint half its length; *legs* short, *femora* delicately pilose beneath, fore *tarsi* of the male minutely spinous at the side; *antennæ* short, with a thickened club." (Moore, l. c. in Lep. Cey.)

Mr Moore, from Dr. Thwaites' observations in Ceylon, figures the larva of this species with elongated divergent pointed processes or tubercles. Mr. E. E. Green has sent me drawings of quite a different larva, which entirely lacks these processes, being covered instead with minute dark bristles, and furnished with a lateral fringe of hairs. Mr Moore gives the food-plant as *Euphorbiaceæ*. Mr. Green says the larva is carnivorous. Mr. Moore shows the pupa hanging down free and at right angles to a horizontal leaf stalk, a most unusual position to be assumed by a pupa of this family, though the pupa of *Poritia hasseltii*, Doherty, hangs free, but in a different position. Mr. Green has not informed me of the position assumed by his pupæ.

The genus *Spalgis* is a very small one, containing only five or six described species. It occurs in India, Ceylon, the Andamans, in Nias Island (*S. fangola*, Kheil), in Amboina (*S. pharnus*, Felder), in Celebes (*S. substrigata*, Snellen), and the Island of Hainan off the south coast of China (*S. dilama*, Moore). All the species are very closely allied, are small, on the upperside of a dark brown colour slightly tinged with violet, with a small pale patch in the male, usually with a larger one in the female; the underside is grey, crossed by numerous very fine zigzag dark brown lines, with a prominent whitish oval spot at the end of the cell in the forewing; this spot is sometimes seen in the hindwing also. The sexes differ a good deal in shape, the outer margin of the forewing being very straight and the apex acute in the male, the outer margin highly convex and the apex rounded in the female. Mr. Doherty notes that "the egg of *Spalgis* is flattened above and delicately reticulated with irregular hexagons. Its position can hardly be understood till the insects of tropical Africa, the great storehouse of low forms of *Lycænidæ*, are better known." (Journ. A. S. B., vol. lviii, pt. 2, p (1889).

Key to the Indian species of Spalgis.

A. Forewing, upperside in the male with a prominent white discal spot, in the female with a broad white discal area
642. S. EPIUS, India, Ceylon, Burma.

B. Forewing, upperside in both sexes with inconspicuous discal spots
643 S. NUBILUS, South Andaman Isles, Borneo.

642. Spalgis epius, Westwood (PLATE XXVI, FIG. 163 ♂).

Lucia epius, Westwood, Gen Diurn Lep., vol. ii, p 502, n. 2; *Geridus epeus*, Doubleday and Hewitson, l. c., pl. lxxvi, fig. 5, *female* (1852); *Spalgis epius*, Moore, Proc. Zool Soc Lond., 1879, p. 137; idem, id., Lep. Cey., vol. i, p. 71, pl xxxiv, figs 1, *male*; 1a, *female*, 1b, *larvæ* and *pupæ* (1881).

HABITAT: Malda, Sikkim, Calcutta, South India, Ceylon, Burma.

EXPANSE: 9 to 1·2 inches.

DESCRIPTION: "On the UNDERSIDE, *both wings* of this species are dirty whitish coloured, with a number of very slender equidistant irregular undulating brown lines, without ocelli; and the discoidal cell of the *forewing* with a small brown dot near the base, and another oval and transverse in the middle." (*Westwood*, l. c.)

"MALE. UPPERSIDE, *both wings* violet-brown. *Forewing* with a white quadrate spot from the end of the cell. UNDERSIDE, *both wings* greyish-white, with indistinct pale brown oval basal

marks, and several outer transverse interrupted zigzag lines. FEMALE. UPPERSIDE, *both wings* paler. *Forewing* with a broader diffused white discal space, and a blackish disco-cellular lunular mark. *Cilia* whitish. UNDERSIDE, *both wings* whiter, markings bolder. *Antennæ* reddish, with black and white basal articulations. *Legs* banded with brown."

"LARVA, pale green, the segments armed with elongated divergent pointed processes. Feeds on *Euphorbiaceæ*. PUPA, small, dilated in the middle." (*Moore*, l. c. in Lep. Cey.)

The male of *S. epius* appears to be very constant in its markings, but the female varies considerably. In one extreme the upperside of the forewing has a diffused whitish patch on the disc as small as in the male, in the other extreme this patch occupies the whole surface except a costal and outer even border of the ground-colour, and the hindwing has much whitish diffused over the disc. The larva, as figured by Mr. Moore, is a most extraordinary object, and, as far as I know, quite unique amongst the *Lycænidæ*. It possesses numerous long diverging fleshy processes or tubercles, some of which are coloured green and others deep red. One of the figures of the pupa as shown in the "Lepidoptera of Ceylon" is suspended head downwards by the tail like a Nymphalid pupa; this is probably incorrect It also is pale green marked with deep red like the larva, and has a large hump on the middle of the back. Mr. E. E. Green, of Pundul-oya, Ceylon, has sent me drawings of the larva and pupa of this species which are quite different from those given by Mr. Moore. Mr. Green writes: "I have several times reared an insect indistinguishable from *S. epius* from a carnivorous larva that associates with and feeds upon *Dactylopius adonidum* (the "mealy-bug" of planters). Mr. Moore, however, figures a quite distinct larva for this species in his 'Lepidoptera of Ceylon,' and quotes *Euphorbiaceæ* as its food. Either there must be some error in Moore's figure, or we have two distinct species or even genera, which are indistinguishable as imagines. My larvæ were dull olive-green above with numerous minute dark bristles and a lateral fringe of brown hairs, beneath pale green, slightly suffused with pink on anterior segments. It partially covers and conceals itself with the mealy secretion from the *Dactylopius*. Pupa various shades of brown, wing-cases pale."

The observations of Mr. Green's are of very great interest, and I trust he will confirm them, though, as he has "several times" reared the larvæ, there can hardly be any mistake on his part. It would be most desirable to rediscover the larva and pupa that Dr. Thwaites reared; the peculiarities regarding it are many, and it appears possible that some mistake has occurred in his observations. The discovery of a carnivorous butterfly larva in India is particularly interesting; as far as I am aware only one other is known, *Feniseca tarquinius*, Fabricius, of the family *Lycænidæ*, but placed by Mr. W. H. Edwards in the *Nemeobiinæ*, and described fully by him in the Canadian Entomologist, vol. xviii, p. 141, *et seq.* (1886).

S. epius has been taken at Bholahât, Malda; it occurs in Sikkim in May, June, and October somewhat rarely; in Calcutta I took it twice in the Botanical Gardens on a bush named *Randia dumetorum*, Lamk., in August, 1882, and again in September, 1883; it occurs also in Orissa in January, March, August and December; in Ganjam; at Bangalore in August and September; on Karanja, Bombay, in February, August and September; in the Nilgiris on the lower slopes; in Travancore; in the "Central Provinces, Ceylon, about flower-gardens, at 3,000 feet elevation, during February, very local" (*Hutchison*); "Kandy; Kottawa forest, Galle, very common and easy to capture, likes shady places and high jungle" (*Wade*) and at Mergui, December. Everywhere but in Ceylon *S. epius* appears to be a somewhat rare species, never occurring in large numbers.

The figure shows both sides of a male specimen from Ceylon in the collections of the Indian Museum, Calcutta.

643. **Spalgis nubilus**, Moore.

S. nubilus, Moore, Proc. Zool. Soc. Lond., 1883, p. 522; id., Distant and Pryer, Ann. and Mag. of Nat. Hist., fifth series, vol. xix, p. 266, n. 207 (1887).

HABITAT: South Andaman Isles, Borneo.

EXPANSE: 1·0 inch.

DESCRIPTION. "MALE. UPPERSIDE, *both wings* violet-brown. *Forewing* with a slightly darker disco-cellular lunule UNDERSIDE, *both wings* greyish-white, with waved transverse blackish lines, and basal marks. FEMALE. UPPERSIDE, *both wings* paler than in the male. *Forewing* with a very small indistinct paler space beyond the cell."

"Distinguished from *S epius*, Westwood, by the absence in the male of the prominent white discal spot, and the broad white discal area in the female; the markings beneath are more numerous and waved. It is also distinct from *S dilana*, Moore,* from Hainan." (*Moore*, l c.)

I possess but a single female of this species, taken in the Andamans by Mr R. Wimberley. It differs from that sex of *S. epius*, Westwood, in having a small ochreous discal patch on the upperside of the forewing instead of a large whitish one. The markings of the underside seem to be much the same in the two species.

Genus 105.—TARAKA, nov., Doherty, MS. (PLATE XXVI).

Differs from *Spalgis*, Moore, in the FOREWING having the *third subcostal nervule* shorter, as it is emitted from the subcostal nervure considerably further from the apex of the discoidal cell than it is in *Spalgis*; the *disco-cellular nervules*, instead of being in one straight line and perpendicular, are differently arranged; the middle one is slightly concave and nearly perpendicular, the lower straight but inwardly oblique: in the male the *apex* of the wing is less acute, and the *outer margin* slightly convex instead of straight. In the HINDWING the *outer margin* in the male is more rounded, the *anal angle* less produced, the *internal nervure* is short, in *Spalgis* it is unusually long, nearly reaching the anal angle, and is very much longer than in *Taraka*. The style of markings on the underside is quite different, in *Spalgis* the entire surface is crossed by numerous fine zigzag dark brown lines, with a somewhat prominent whitish oval spot in the discoidal cell of the forewing; in *Taraka* there are numerous more or less rounded large black spots arranged evenly over the entire surface placed on a white ground; the *cilia* checkered instead of being concolorous. Type, *T. hamada*, Druce. Two species only are known, one of which is found in Sikkim, Assam, Burma, Eastern Java, China and Japan; the other in Perak.

I append as a footnote a very full diagnosis of this genus drawn up by Mr. W. Doherty about two years ago, but which was not published.† It was founded on his new species *T. mahanetra*. He has also recorded the following observations on the genus: "Next to *Spalgis* I place the singular genus *Taraka*, of which the type is *Miletus hamada*, Druce. This genus greatly resembles *Neopithecops*, and like it is probably protected. It may be separated from it by the narrower discoidal cell of the forewing placed nearer the costa, and the

* *Lucia dilana*, Moore, Proc. Zool. Soc. Lond., 1878, p 701.

† Wings remarkably fragile and thin. FOREWING, *costa* regularly rounded, *apex* rather acute, *outer margin* convex, *inner* margin concave; *costal nervure* not touching the first subcostal nervule, a little swollen at the base; *first subcostal nervule* originates two-fifths before the end of the discoidal cell, *second* subcostal arising twice the distance from the base of the first as from the base of the upper discoidal, *third* subcostal arises midway between the apex of the cell and of the wing; *disco-cellular* nervules slightly produced outwardly, *lower* disco-cellular longer than the middle one and very slender, meeting the median nervule just beyond its last forking HINDWING, long and narrow, *costa* long, *outer margin* rounded, composed of two curves meeting at the end of the second subcostal nervule, *inner* margin convex for most of its length, *costal nervure* long, extending to the apex, running close to the margin; *discoidal cell* abruptly truncate; *disco-cellular nervules* meeting the subcostal nervure just beyond its bifurcation, and the median nervure opposite its last bifurcation. *Eyes* naked *Antennæ* with thirty joints or more (I counted thirty in *hamada* and thirty-two in *mahanetra*, but I find it very hard to be accurate in this particular), slender the last ten (approximately) gradually forming a moderate club, abruptly truncate at the tip the last joint elongate *Palpi*, last joint covered with long appressed scales, rather short, less than half as long as the preceding joint, fusiform, pointed, not clavate. *Legs* covered with very long white hairs, the middle and hind femora longer than the tibiæ which are greatly swollen in the middle, the tarsi as long as the tibiæ, the first joint nearly twice as long as the others united, the last joint with simple claws and paronychia. Fore-tarsi of the male slender, equal in length to the tibiæ, without spines or articulations, the claws united for most of their length, diverging at the end. Fore-tarsi of the female longer than the tibiæ, without spines, the claws as in the male, no distinct articulations; the separation of the last joint is slightly indicated but is quite immovable"

"This genus belongs to the naked-eyed division of the *Lycænidæ*. So far as I know, the species of this genus occur in the low-country, they are found in forest, and are very weak and moth-like in flight, and amongst the smallest and most delicate of butterflies. From *Neopithecops*, Distant, this genus differs in the remarkable structure of the fore tarsi, which in *both* sexes are without articulations, and have the claws united at the base This also distinguishes it from *Pithecops*, Horsfield, as well as by the free costal nervure of the forewing." (*Doherty*, MS.)

oblique disco-cellular nervules. From *Spalgis* it differs in the antennæ, which are much as in the *Pithecops* group, slender, annulated, with a short distinct terminal club, while *Spalgis* has short thick antennæ, gradually thickened. The prehensores of *Taraka* are wholly Lycæniform. The egg is remarkable, and bears a decided resemblance to those of the *Gerydinæ*, with which Mr Druce first placed it The apex is flattened, a little concave, irregularly reticulate, with a strong crenulated carina projecting both upwards and outwards around the margin Seen from the side, it is irregularly quadrate, a little widest at base, the sides smooth. The egg obviously shows a relationship with that of *Liphyra*, Westwood, and the older and more generalized forms of the *Gerydinæ* included in the genus *Logania*, Distant "

"I have made a careful description of *T. mahanetra*, mihi, a very rare Malayan species somewhat resembling *Castalius elna*, Hewitson, in colouring I caught but a single pair of this species, and both I believe are now lost Generally, they agreed with *T. hamada* in structure, but the fore foot of the female (as well as that of the male) was imperfect, and the joints of the tarsi immovable As it is just possible that this peculiarity may have been due to gynandromorphism, I merely mention it, and reserve *hamada* as the type of the genus. The egg of *T. mahanetra* I unluckily do not know " (*Doherty*, Journ A S B, vol lvii, part 2, p. (1889).

644. **Taraka hamada**, Druce (Plate XXVI, Fig 164 ♀).

Miletus hamada Druce List Ent vol i, p 361 (1873) id, Elwes, Proc Zool Soc Lond, 1881, p. 882, id, de Nicéville, Journ A S B vol lii pt 2 p 76 n 15 pl i fig 16 *female* (1883), id, Doherty, Journ A S B, vol lv, pt 2, p 132 (1886) id, Leech Proc Zoo So Lond, 1887, p 409, n 27, id, Fryer, Rhop Nihonica, p 10, n 24, pl ii fig 12 *female* (1886), *Neopithecops hamada*, Elwes, Trans. Ent Soc. Lond, 1888, p 374, n 237, pl xi, fig 2, *female*

Habitat : Sikkim, Cachar, Shillong, Chittagong Hill Tracts, Tenasserim, Eastern Java, China, Japan

Expanse. ♂ ♀, 75 to 1·35 inches.

Description : "Male. Upperside, *both wings* dark brown, lightest in the middle of the forewing Underside, *both wings* white crossed from the costal margin of the forewing to the inner margin of the hindwing by five rows of large black spots, a fine black line round the outer margin. *Cilia* alternately black and white Female Upperside, *both wings* differ slightly from those of the male in being paler in colour Underside, *both wings* have all the black spots smaller than in the male "

"This species is quite unlike any other with which I am acquainted " (*Druce*, l c)

"A distinct species, unlike anything I have seen from China or Japan, but nearly allied to a specimen in my collection from Darjiling, which differs in having an indistinct whitish patch on the forewing, which may be sexual. I have seen a specimen from Shanghai collected by Christoph, which comes very close to, if it is not identical with, those from Sikkim in Dr. Staudinger's collection There is a single specimen in Pryer's collection, without indication of locality, which differs considerably from *M.* [=*T.*] *hamada* beneath, but agrees with it above " (*Elwes*, l. c. in Proc. Zool Soc. Lond, 1881)

"*T. hamada*, Druce, is very unlike any other member of this group [subfamily *Gerydinæ*, Doherty], if indeed it belongs to it at all From the structure of the prehensores I should rather place it among the *Lycæninæ*. The legs are short and thick, the wings broad and rounded, the third subcostal nervule originates before the end of the cell. I did not succeed in examining its egg." (*Doherty*, l c) Mr. Doherty's third subcostal nervule referred to above is my upper discoidal

"I found this species common all up the west coast of Central Japan ; it also occurs at Nikko. It seems fond of water, and flew about amongst the thick bamboo-grass on the banks of streams in July and August." (*Leech*, l. c)

"About Yokohama this is generally a very local species, being confined to isolated spots. Some specimens are quite black, and others from the mountains have a patch of greyish-white on the forewing " (*Pryer*, l c)

This is a somewhat common species in Sikkim at low elevations, and shows much variation in the extent of the white coloration of the upperside, one extreme being entirely black, while the other has the costa and outer margin of the forewing alone black, the black spots of the underside showing through by transparency on both wings. It occurs in Sikkim at low elevations from April, if not earlier, to December. Mr Doherty records it from Cachar and from the Chittagong Hill Tracts; I possess several specimens taken near Shillong, and presented to me by the Revd. Walter A. Hamilton.

The figure shows both sides of a female specimen from Sikkim in my collection.

I append a description of a second species of the genus, *T. mahanetra*, Doherty, MS., which occurs in the Malay Peninsula.*

The next genus, *Megisba*, Moore, has several peculiarities. According to my views it is monotypic, but other writers have increased the number of species in the genus to six. These additional species seem to mainly owe their origin to the fact that seasonal dimorphism largely obtains in the genus. Wherever there are two strongly marked seasons, a wet and a dry, the butterflies shew marked variations in coloration and markings, the individuals which are on the wing in the wet-season are very dark, have little or no white on the upperside of both wings, and all the markings of the underside very large and prominent; while the individuals which fly in the dry-season, on the contrary, usually have a large patch of white on the upperside of both wings (in some examples it is so large as to occupy more than half the surface), and the markings of the underside are small, inconspicuous, and many of them obliterated altogether. The second peculiarity of this genus is that its single species, *M. malaya*, Horsfield, shares with *Nacaduba ardates*, Moore, the very unusual character of possessing tailed and tailless forms, and on these two forms two genera have been based, *Megisba*, Moore, without tails, and *Pathalia*, Moore, with tails. Whether these forms represent distinct species or not no one can, I think, say with certainty; a fuller knowledge of their earlier stages is required to settle the matter. The tailed forms have been named *Pathalia malaya*, Horsfield, *P. sikkima*, Moore, and *P. albidisca*, Moore; the tailless forms have been named *Megisba thwaitesi*, Moore, *M. gunga*, Swinhoe, and *M. hampsoni*, Moore, MS. I have assumed here that Mr. Moore considers that the presence or absence of the tail to be of generic importance, though, as will be noted below, he has done much to stultify this view by mixing up the tailed and tailless forms in the two genera.

The single species which I admit in the genus, *P. malaya*, Horsfield, is a small butterfly, averaging about an inch in expanse; it is dark fuscous on the upperside, sometimes with,

* *Taraka mahanetra*, n. sp., Doherty, MS. HABITAT: Padang Rangas, Perak. EXPANSE: *Male*, ·67 of an inch; *female* over one inch. DESCRIPTION: "MALE and FEMALE. UPPERSIDE, *both wings* black, with a band across the wings, grey on the forewing, white on the hindwing, with its edge undefined; on the forewing it extends from the inner margin, where it is widest, to the second median nervule, the upper part projecting outwards. *Forewing*, discoidal cell crossed by two slightly paler bands, one medial, one terminal. *Hindwing* white over half its area, the extreme base and all the outer part black, a transverse dark streak across the end of the cell, and two or three similar ones on the disc; *costa* white from the base to the apex, hind margin whitish, the submedian nervure and first median nervule defined with grey. *Cilia* chiefly white, except apically on the forewing. UNDERSIDE, *both wings* pure white, curiously marbled with black and grey of various shades of intensity. *Forewing* with three spots in the cell, the basal one black, the outer two grey, three placed above these on the costa, and one black and conspicuous, in the interno-median interspace opposite the middle one in the cell; the transverse discal band characteristic of the *Lycænidæ* is very irregular composed of quadrate dusky spots it is confused apically forming a large mass of black and grey extending some distance along the costa, and reaching the extreme apex, but not the outer margin; between the second and third median nervules in the male (the second and first in the female), it is discal, but in the next space below submarginal; beyond the transverse band is a regular submarginal series of five black lunules, concave outwardly, the lowest large and diffused; the margin is broadly white, interrupted by a dark spot between the second and third median nervules *Hindwing* white, with a number of black basal spots, a grey one across the end of the cell, one above the cell extending to the costa, a dot medially in the cell; transverse band with the three upper spots joined in an oblique series, united with a large dark apical mass, in which are the two upper submarginal lunules enlarged and black; below this the transverse band is composed of quadrate spots placed irregularly and wholly separated; beyond these the marginal and submarginal areas are in the male suffused uniformly with grey, but in the female they are white; the submarginal lunules small but well-defined. *Antennæ* annulated with black and white, the club dark. *Remora* and *tibiæ* clothed with very long white hairs, the last three joints of all the *tarsi* black PREHENSORES very simple. Seen from the side the *uncus* is tapering and acute at the apex, the upper edge horizontal, the lower sinuous, ascending to the apex. The *clasp* resembles the head of a bird, the crown high and rounded, the beak bent down at the tip. In *T. kamada*, Druce, the uncus has the lower edge horizontal, the upper rounded and sloping to the acute apex; the clasps are rounded, with a hirsute projecting tubercle at the apex. In neither species have I observed any branches to the apex."

"A male and a female taken in deep forest near Padang Rangas, Perak, Malay Peninsula" (*Doherty*, MS.)

sometimes without, a patch of white on the disc, this patch moreover being very variable in size; the wings also are glossed obscurely with purple in some lights The underside is greyish, marked with very numerous fuscous and black spots; these in the forewing of the rains form are so numerous, being so thickly sprinkled over the disc of the wing that it would be difficult to count them; a large proportion of them have, however, entirely disappeared in the dry-season form. The opposite sexes are very similarly marked, but the female has more white on the upper-side in the dry-season form than the male. As noted on page 48, Mr Doherty is of opinion that this genus is closely allied to the genera *Pithecops*, Horsfield, and *Neopithecops*, Distant, owing to the similar construction of the egg To judge from the imago alone, I certainly think that it is much more closely allied to the true *Lycænas*; in habits and flight it almost exactly resembles *Nacaduba ardates*, Moore. The male has no secondary sexual characters. The genus is probably strictly confined to the Indo-Malayan region

Genus 106.—MEGISBA, Moore (PLATE XXVI).

Megisba, Moore, Lep Cey., vol i, p 71 (1881), id, Distant, Rhop. Malay., p 457 (1886). *Pathalia*, Moore, Journ. A. S. B., vol lvi, pt 2, p 21 (1884)

"Allied to *Pithecops* [= *Neopithecops*, Distant]. FOREWING, differs in its triangular form; *first subcostal nervule* emitted at nearly one-half length before the end of the discoidal cell, *second* subcostal at one-third before its end, *third* subcostal at one-eighth, *fourth* subcostal at one-half beyond and terminating before the apex; *disco-cellular* nervules very slender, *second median* nervule emitted immediately before the end of the cell, *first* median at one-half before its end; *submedian nervure* straight. HINDWING, *apex* convex, *outer margin* oblique towards anal angle, *abdominal* margin long; *first subcostal nervule* emitted at one-fifth before the end of the cell; *second* and *third median* nervules from a short distance beyond the end of the cell. *Abdomen* long, reaching to the anal angle of the hindwing; *antennæ* with a shorter spatular club" than in *Neopithecops*; no tail to hindwing. *Eyes* naked (*Moore*, l. c. in Lep Cey.)

Megisba has the costa of the forewing almost straight, the apex acute, the outer margin nearly straight in the male, slightly convex in the female. *Neopithecops* has the costa strongly arched, the apex rounded, the outer margin very convex in both sexes. In *Megisba* the costal nervure terminates about opposite to the apex of the cell; the first subcostal nervule is bent upwards not far from its base towards the costal nervure, the costal nervure having the appearance of being bent down to meet it, but the two veins are free, though they approach towards each other very closely in the male, not quite so closely in the female; the second subcostal nervule has its base midway between the bases of the first subcostal and the upper discoidal; the third subcostal originates about midway between the base of the upper discoidal and the apex of the wing; the middle and lower disco-cellular nervules are of about equal length, the middle outwardly, the lower inwardly, oblique; the second median nervule originates a little before the lower end of the cell.

Mr. Moore has described as follows a genus which he has named *Pathalia*: "Closely allied to *Megisba*. FOREWING, comparatively longer and less regularly triangular in form. HINDWING, somewhat narrower, and with a slender tail at the end of the first median nervule. *Venation* similar. Second joint of *palpi* shorter, the third joint longer and more slender. Type, *P. albidisca*, Moore." It might have been assumed that Mr. Moore intended that the presence of the tail in *Pathalia* should be the distinguishing character between it and *Megisba*, no other characters of any value being given or stated with any precision, but this view is negatived by his having placed in the genus *Megisba* a species (*sikkima*) which has tails, and by his having named for the Indian Museum, Calcutta, certain tailed specimens from the Andaman Isles, Bholahât, and Sikkim, "*Megisba thwaitesi*," that species not possessing those appendages typically. The genus *Pathalia* has therefore no *locus standi*, and but one genus only can be recognized for these insects: moreover it would seem that they really form but one species only, as the presence or absence of the tail is not even of specific value, and there is evidently so much seasonal variation, at any rate in Sikkim, in this one species, that that phenomenon can satisfactorily account for the entire absence of white on the upperside in one form of the species which appears in

the rains, and in the presence of an area of white larger than the black ground-colour, and the more or less obliteration of the markings of the underside, in the extreme of the other form which occurs in the middle of the dry-season, on which characters the various species described appear to have been based.

In general appearance *Megisba malaya*, Horsfield, is very similar to *Neopithecops salmora*, Butler, but, as indicated above, the outline of the forewing is very different. In markings the two species are almost identical, the four black dots along the costa of the forewing on the underside being a feature common to both, and absent I think from every other Indian butterfly except *Taraka hamada*, Druce. With regard to its distribution it occurs in the N.-W. Himalayas, and thence eastwards to Assam, in the Malda district, Calcutta, Orissa, Ganjam, Poona, the Nilgiris, Ceylon, the Andaman and Nicobar Islands, Burma, the Malay Peninsula, Java, Borneo, Sumba, and Sambawa. The sexes are much alike, the female having rather broader wings, and the apex of the forewing more rounded, the outer margin is more convex than in the male. The transformations of the Ceylon form of the species are given under the description of *M. malaya*.

645. **Megisba malaya**, Horsfield. (PLATE XXVI, FIG. 165 ♂).

Lycæna malaya, Horsfield, Cat. Lep. E. I. C, p. 70, n. 4 (1828); *Lampides malaya*, de Nicéville, Journ. A. S. B., vol. l, pt. 2, p. 58, n. 101 (1881); id., Wood-Mason and de Nicéville, l. c., p. 249, n. 55; *Pathalia malaya*, Moore, l. c., vol. lii, pt. 2, p. 22 (1884); id., Doherty, l. c., vol. lv, pt. 2, p. 134, n. 189 (1886); *P. f malaya*, Wood-Mason and de Nicéville, l. c., p. 364, n. 108, *Megisba malaya*, Elwes, Trans. Ent. Soc. Lond., 1888, p. 375, n. 239, pl. xi, fig. 1, *male*; *Megisba thwaitesi*, Moore, Lep. Cey., vol. 1, p. 71, pl. xxxiv, figs. 3, 3a, *imago*; 3b, *larva* and *pupa* (1881), id., de Nicéville, Journ. A. S. B., vol. liv, pt. 2, p. 46, n. 56, (1885); id., Distant, Rhop Malay., p. 457, n. 1, pl xliv, fig. 4 (1886); *Megisba sikkima*, Moore, Journ. A. S. B., vol. lii, pt. 2, p. 21 (1884), *Pathalia albidisca*, id., l. c; *Megisba gunga*, Swinhoe, Proc. Zool. Soc., Lond., 1885, p. 133, n. 66, pl. ix, fig 7, *Megisba hampsoni*, Moore, MS.

HABITAT: N.-W. Himalayas, Kumaon, Malda District, Sikkim, Cachar, Calcutta, Orissa, Ganjam, Poona, the Nilgiris, Ceylon, the Andaman and Nicobar Isles, Burma, the Malay Peninsula, Sumatra, Java, Borneo, Sumba, Sambawa.

EXPANSE: ♂ ♀, ·8 to 1·2 inches.

DESCRIPTION: FEMALE. "UPPERSIDE, *both wings* blackish-brown, with a large white medial area, extending obliquely from the middle of the fore- to the disc of the hind wing; colour more intense on the *forewing*, the posterior margin of which is surrounded with a delicate white *cilia*, which is continued along the inner border of the hindwing by a series of elongated silky hairs. *Tail* black, tipped with white. UNDERSIDE, *both wings* pure satin white. *Forewing*, near the costa, marked with four regular, equidistant, minute brown dots, and on the disc with a short curved line; towards the posterior margin follows a curved striga, consisting of short lineolæ or arcs, not touching each other, but disposed obliquely between the nervures; then, parallel with the margin, two narrow strigæ, the interior one being undulated, including a series of oblong, attenuated, dark brown spots. *Hindwing* has these strigæ and dots continued uniformly through it to the anal angle; anterior to these is an interrupted macular fascia, resembling the curved band of the forewing, but with broader lineolæ; then a short, transverse, discoidal arc; with five intensely black spots, two marginal and three basal, the former are large, regularly round, of an intense black tint, one is placed near the outer, the other near the inner apical angle, opposite to the caudal appendage, being separated from the anal angle by two small dots; near the base are three transversely disposed equidistant dots of an intensely black tint." (*Horsfield*, l. c.) This description applies exactly to the dry-season form of the species.

"LARVA [of the tailless Ceylon form *thwaitesi*] light green, vermiform, middle segments swollen. Feeds on *Sapindaceæ*. PUPA, thick, blunt at the ends." (*Moore*, l. c. in Lep. Cey.)

Mr. Doherty states that "all my Kumaon specimens, as well as those taken by me in Burma and Chittagong, are tailed, while in Orissa, Ceylon, and the Eastern and Western Ghâts, their place seems to be taken by a tailless form. Of this last, those from Ceylon and the Western Ghâts are apparently *Megisba thwaitesi*, Moore, but those from Orissa and the Eastern

Ghâts seem to me identical with *P. malaya*, except in the absence of the tail. The occurrence likewise of the tailless form of *Nacaduba ardates*, Moore, in those districts is worthy of remark." (*Doherty*, l. c.)

"One male, Irangmara, Cachar, 18th July. This specimen possesses tails, going therefore into Mr. Moore's genus *Pathalia*; and it is entirely black on the upperside. A complete gradation can be made from this black form [named *M. sikkima*, Moore] to one with the white area on the upperside of both wings more extensive than the black ground-colour, which latter form has been described by Mr. Moore as *P. albidisca*. In Mr. Moore's genus *Megisba*, which has no tails, the same variation occurs: *M. thwaitesi* from Ceylon has a small patch of white on the upperside of the forewing only, *M sikkima* is entirely black, but there are other specimens from Sikkim which have the white area above of greater extent than the black. The type of *M. sikkima* is in the Indian Museum, Calcutta, and has tails; so perhaps Mr. Moore does not consider the presence or absence of the tails to be of generic consequence. He has also named for the Indian Museum, Calcutta, some Andaman specimens of this group with tails "*Megisba thwaitesi*," still further showing that he considers the tails of no importance. In this we quite agree with him, but would carry the matter still further and treat *Pathalia malaya*, *P. albidisca*, *Megisba thwaitesi*, and *M. sikkima* as one variable tailed or tailless species." (*Wood-Mason* and *de Nicéville*, l. c. in Journ A. S B, vol. lv, pt. 2, p. 364, n. 108 (1887).

There is one interesting fact as regards the distribution of the tailed and tailless form of this species which should be noted. I possess both forms from one locality only, *i.e.*, Sikkim, and indeed possess but two specimens only of the tailless form from that district, the tailed form being very common there at low elevations, occurring in July, October and November at any rate, probably throughout the year. The tailed form also occurs in the N.-W. Himalayas, in Kumaon, the Malda district, Cachar, Chittagong, Malacca, the Andaman and Nicobar Isles, Java, Borneo, Sumba, and Sambawa. The tailless form occurs in Sikkim, Calcutta, the Eastern and Western Ghâts, Orissa, Ganjam, the Nilgiris, and in Ceylon.

As regards variability of markings, as noted before, Sikkim shows every possible gradation from an entirely black form to one with the white area greater than the black. From Bholahât, in the Malda district, I possess specimens quite black, some with a small patch of white on the forewing, none on the hindwing, and others with much white on both wings. From Orissa I have variations similar to those from Bholahât. From the Nilgiris I have almost quite black specimens, others with a moderate-sized white patch on the forewing. Specimens from the Andaman Isles are quite constant, having a moderate-sizedwhite patch on the forewing only. Examples from Kamorta and Great Nicobar are equally constant, being entirely black above.

I propose to give below* for reference the original descriptions of all the species which have been described in the genera *Megisba* and *Pathalia*, fitting in as far as I can my extensive

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* *Megisba thwaitesi*, Moore, Lep. Cey., vol. i. p. 71, pl xxxiv, figs. 3, 3*a*, *imago*, 3*b*, *larva* and *pupa* (1881); id., de Nicéville, Journ. A. S. B., vol. liv, pt. 2, p. 46, n. 56 (1885); id., Distant, Khop. Malay., p. 457, n. 2, pl. xliv, fig. 4 (1886). HABITAT: Without tails, Ceylon; with tails, Bholahât, Sikkim, Andaman Isles (*Moore*); with tails, Malacca (*Distant*); without tails, Calcutta, Orissa, Ganjam, Ootacamund (*de Nicéville*). EXPANSE *Male*, ·9; *female*, 1·0 inch. DESCRIPTION: "MALE and FEMALE. UPPERSIDE, *both wings* dark violet-brown. *Forewing* with an oblique lower discal white-speckled patch. *Cilia* whitish. UNDERSIDE, *both wings* bluish-white. *Forewing* with four blackish spots on the middle of the costal border, one within the cell, a brown disco-cellular streak, an outer discal transverse curved series of five brown streaks, a marginal row of blackish spots bordered inwardly by a narrow sinuous line and outwardly by a linear marginal line. *Hindwing* with three black subbasal transverse spots, one on the middle of the abdominal margin, and a larger one on the costal border near the apex; a narrow brown disco-cellular streak, and a discal series of irregular-shaped spots; a marginal row of blackish spots bordered within by a sinuous line, and outwardly by a linear marginal line, the third spot from the anal angle large and blackest. *Palpi* black above. *Legs* with prominent black bands. *Antennæ* black with white annular bands."

"LARVA, light green, vermiform, middle segments swollen. Feeds on *Sapindaceæ*. PUPA, thick, blunt at the ends." (*Moore*, l. c.)

"Kandy, Ceylon. Very common and easy to capture." (*Wade*).

"A single [male] specimen taken in February in Calcutta. It probably is often overlooked owing to its close general resemblance to the species of the genus *Neopithecops*, which often actually swarm amongst bushes in shade." (*de Nicéville*, l. c.)

Megisba hampsoni, Moore, MS., which must be very close to *M. thwaitesi* judging from the Nilgiri specimens I have seen, is "found on the lower slopes" of the Nilgiris, "and is fairly common." (*G. F. Hampson*).

Mr. Distant evidently disregards the tail as of generic importance, as he distinctly says his Malacca specimen of *M. thwaitesi* has tails, while Mr. Moore as distinctly describes *Megisba* as without them. No tail, however, is shown in Mr. Distant's figure of his specimen.

series of specimens from various localities. To do this I have been guided by the extent of white coloration on the upperside of the wings only. A study of these localities will, I think, tend to bring conviction to the mind that all these so-called species are but various forms of a very variable species, and are not even geographical varieties; much of this variation being due also to seasonal causes. I should add that Mr. Moore considers the true *P. malaya* to be confined to Java; that Mr. Doherty records it from Ranibagh, Bagheswar, Kapkot, Jhulaghât, Dharchula, 1–5,000 feet, all in Kumaon; and that Colonel A. M. Lang, R.E., notes that he has "only seen two or three specimens of this species in October at Ranibagh, 1,000 feet, in Kumaon."

The figure shows both sides of a male specimen of the tailed wet-season form from Sikkim, in the Indian Museum, Calcutta. This specimen is the type of Mr. Moore's *Megisba sikkima*.

We now come to the true "Blues," to the typical genera of the *Lycæna* group. The first genus *Neolycæna*, mihi, I know very little about; it is unique in the group in possessing but two subcostal nervules to the forewing, and in being fuscous on the upperside in the male instead of blue or purple. The markings of the underside are very obscure. The next genus, *Lycæna*, Fabricius, contains the "Blues" *par excellence*, and is, I believe, strictly confined to the Palæarctic region. In Europe it is particularly well represented, Dr. Lang in his "Butterflies of Europe" enumerating over forty tailless species as belonging to it, but this number includes several species which should strictly be placed in the genera *Chilades*, Moore, *Cyaniris*, Dalman, and *Zizera*, Moore; besides several tailed species, which belong to the genera *Everes*, Hubner, *Tarucus*, Moore, and *Polyommatus*, Latreille. The true *Lycænæ* are meadow-frequenting butterflies, no single species I believe frequenting woods or forests (except wide pathways or glades through them), or ever settling on trees. The next genus, *Chilades*, Moore, hardly differs structurally from *Lycæna*, and up to the present has had but two

Megisba sikkima, Moore, Journ A S B., vol. lvi, pt 2, p 21 (1884). HABITAT: Sikkim (*Moore*); Bhotahât, Cachar, Nilgiris, and the Nicobar Isles (*de Nicéville*) EXPANSE: *Male*, 9 inch. DESCRIPTION: "MALE UPPERSIDE, *both wings* differ from *M. thwaitesi*, Moore, in being of a darker violet brown. *Forewing* differs in the absence of the short oblique posterior white band. UNDERSIDE, *both wings* similarly marked to *M. thwaitesi*, except that on the *forewing* the black spot in the middle of the cell is very minute, and there is a spot below the end of the cell between the second and first median nervules in addition to the two dots, which are here placed beneath the first median nervule, whereas in *M. thwaitesi* the two latter dots, when present, are situated between the second and first median nervules. *Hindwing* with the three transverse subbasal black spots comparatively larger, the upper one with two contiguous black dots in front, the cell-spot is prolonged upwards to the costal nervure, and also has some black dots below it, the apical black spot is of an elongated form, and the discal macular band is composed of broader quadrate spots." (*Moore*, l. c.)

The minute description of the spots of the underside is in my opinion useless, as from my long series of specimens not only do I find them when present exceedingly variable, but they are often more or less wanting in specimens which occur in the middle of the dry season. My examples from the Nicobars are also very sparsely marked on the underside

Pathalia albidisca, Moore, Journ A. S B, vol lvi, pt. 2, p 21 (1884). HABITAT: N.-W Himalayas; Chittagong, Khurda, Orissa (*Moore*), Bombay Presidency (*Aitken*), Sikkim, Bholahât (*de Nicéville*). EXPANSE. *Male*, 9; *female*, 1·1 inches DESCRIPTION: "MALE and FEMALE UPPERSIDE, *both wings* dark violet-brown. *Forewing* with a broad medial connal white patch, which extends obliquely from the middle of the disc to the posterior margin. *Hindwing* with a broad white band crossing from the costal edge to near the middle of the abdominal margin, an indistinct marginal row of pale bordered brown spots UNDERSIDE, *both wings* greyish-white *Forewing* with some black spots along the costal edge, a brown streak at the end of the cell, a discal transverse row of short, oblique, slender interrupted lunules, a submarginal sinuous line enclosing a marginal row of indistinct spots. *Hindwing* with a similar brown cell streak, a discal zigzag series of broader lunules a sinuous submarginal line enclosing the marginal row of spots, of which the penultimate is large and black; three equidistant subbasal black spots, a black spot on the abdominal margin above the lower subbasal, and a larger black spot at the apex *Tail* in both sexes black tipped with white *Cilia* edged with white. *Body* above black. *Antennæ* black, annulated with white. *Palpi* white, tip black *Legs* white with black bands." (*Moore*, l. c.)

Mr Aitken records a few specimens of this species from different parts of the Bombay Presidency. (Journ. Bombay Nat. Hist Soc., vol 1, p 216, n 67 (1886)

Mr. Moore has made a specimen from the Chittagong district and now in the Indian Museum, Calcutta, the type It was taken on the 18th February, 1883, and represents the normal dry-season form of the species. This specimen has tails as it should have, being of the genus *Pathalia*. At the same time he named a tailless Orissa specimen *P. albidisca*.

Megisba gunga, Swinhoe, Proc. Zool. Soc Lond 1885, p 133, n. 66, pl ix, fig. 7 HABITAT: Poona, March. EXPANSE: 1·1 inches DESCRIPTION: "UPPERSIDE, *both wings* black. *Cilia* white. *Forewing* with a white patch in the middle, extending from below the cell to the hinder margin *Hindwing* with an apical and anal underneath-spot showing through, otherwise unmarked. UNDERSIDE, *both wings* milk-white, a streak at the end of each cell, marginal lines, a row of submarginal marks, then another line and a row of discal streaks. *Forewing* with a few marks on the costa. *Hindwing* with a black subcostal spot, a spot on the middle of the anal margin, a spot between these spots, one near the apex, and another near the anal angle." (*Swinhoe*, l. c.)

This description is utterly unsatisfactory and useless; the figure shews the upperside only, the rounded forewing suggesting that it is a female, the white patch indistinguishable from Ceylon specimens of *M. thwaitesi*. The sex of the specimens described is not stated, nor is any comparative description given.

species placed in it, which have a wide range in the old world. *C. lajus*, Cramer, usually frequents bushes, while *C. trochilus*, Freyer, is a grass-loving species. The next genus, *Cyaniris*, Dalman, differs structurally but slightly from the two genera which precede it, but the species of these three genera to an experienced eye have a peculiar *facies* of their own, which as a rule render them easily recognisable. *Cyaniris* has an immense range in the Palæarctic region, and also occurs in the tropics in the Indo-Malayan region. All the species of the genus known to me frequent trees and bushes, they never settle on grass or live in open fields, but the males of many species are especially fond of sucking up moisture from damp spots on roads or paths, or by the sides of streams. The next genus, *Zizera*, Moore, differs structurally but slightly from the genera which precede it, but has a well-marked *facies*. It contains the smallest known butterflies, and probably occurs almost everywhere in the old world except in the Polar regions. It frequents open country, never I believe settling on trees or bushes. The two following genera, *Azanus*, Moore, and *Orthomiella*, mihi, differ considerably in structure from the four genera which come before them, as the middle portion of the first subcostal nervule of the forewing is entirely anastomosed with the costal nervure. As few writers have attempted to split up the old genus *Lycæna* in the way that is done in this work, it is difficult for me to give the distribution, even approximately, of any of these new genera. However as far as I know, *Azanus* appears to be confined to Eastern Africa, Syria, Aden, Biluchistan, and occurs almost throughout India to Ceylon. It is probable that the genus is found all over Africa. *Orthomiella* is a monotypic genus, its single species having as yet been recorded from Sikkim only. I know nothing of the habits of these two last-named genera. None of the above-mentioned genera possess secondary sexual characters.

Genus 107.—NEOLYCÆNA, nov. (Plate XXVI).

Forewing, *costa* nearly straight, a little arched at base; *apex* rather acute; *outer margin* evenly convex; *inner* margin slightly sinuous; *costal nervure* ending opposite the apex of the discoidal cell; *first subcostal nervule* originating a little beyond half the length of the cell from the base, well separated from the costal nervure; *second* subcostal originating twice as far from the base of the first subcostal as from the base of the upper discoidal; *middle disco-cellular* nervule originating from upper discoidal just beyond its origin, inwardly oblique; *lower* disco-cellular in the same straight line and the same length as the middle disco-cellular, both slightly concave; *second median* nervule originating some distance before the lower end of the discoidal cell. Hindwing, very broad, almost as broad as the forewing; *costa* nearly straight, arched at base; *apex* truncated; *outer margin* slightly convex, almost straight; *abdominal margin* straight; *costal nervure* rather short; *first subcostal nervule* originating some little distance before the apex of the cell, arched; *upper disco-cellular* nervule outwardly oblique, concave; *lower* disco-cellular a little shorter than the upper, straight, upright; *second median* nervule originating just before the lower end of the cell; *internal nervure* recurved. *Palpi* rather long, porrect, clothed with closely appressed scales. *Palpi* exactly half the length of the costa of the forewing, distinctly annulated with white, with a gradually-formed, moderate, rounded, rather long club. Type, *Lycæna sinensis*, Alphéraky.

The type species* of *Neolycæna* is abundantly distinct from the next genus, *Lycæna*, Fabricius. In the forewing it has a subcostal nervule the less; the second subcostal nervule originates much further from the base of the first subcostal than it does in *Lycæna*, the middle disco-cellular nervule originates nearer the base of the upper discoidal, the disco-cellular nervules are inwardly oblique instead of upright; in the hindwing the costal nervure is very much shorter, and the whole wing is proportionally broader. The genus should be easily recognisable, as it is the only one of the Indian *Lycænidæ* with two subcostal nervules to the forewing which has no tail to the hindwing. It probably contains more species than the single one here placed in it.* *N. sinensis*, Alphéraky, is a sooty-brown insect on the upperside, without any markings

* M. Oberthür in Études d' Entomologie, vol. vi, p. 13, n. 4 (1881) states of the female of *Lycæna tengstræmi* Frschoff, which occurs at Jaxartes, in Turkestan, and it most certainly belongs to this genus, that it has a

in either sex, on the underside it is grey, with some very obscure linear white macular bands. It is only known at present from Kouldja on the western border of China, and from Biluchistan.

646. **Neolycæna sinensis**, Alphéraky. (PLATE XXVI, FIG. 166).

Lycæna sinensis, Alphéraky, Hor. Soc. Ent. Ross., vol. xvi, p. 383, n. 39, pl. xiv, fig. 7 (1881).

HABITAT : Kouldja (*Alphéraky*), Biluchistan.

EXPANSE : 1·2 inches.

DESCRIPTION : "MALE and FEMALE. UPPERSIDE, *both wings* fuscous-brown ; *cilia* interrupted with white. UNDERSIDE, *both wings* greyish-brown, with a very slender white marginal line. *Forewing* with an interrupted exterior series composed of irregular white short streaks. *Hindwing* with the disc irregularly marked with white lunules and short streaks, and with a series of submarginal dots, interiorly margined with white."

"MALE and FEMALE. UPPERSIDE, *both wings* blackish-brown ; *cilia* of the same colour, but spotted with white at the end of the veins ; but this is only very narrowly so on the fore- and more broadly on the hindwing, the cilia is similar on the underside. UNDERSIDE, *both wings* of a greyish-brown tint, very much lighter [than above]. An extremely fine bordering line runs along the exterior margin of both wings, sometimes very indistinct in the forewing. *Forewing* traversed at nearly three millimetres from the outer margin by an interrupted series of white, irregular, small streaks (lunules), with one whitish lunule placed above the first nervure and placed more towards the interior of the wing. This last [lunule] disappears entirely in some specimens. A small streak, or rather a small whitish dot, is found generally in the discoidal cell. *Hindwing* faintly dusted with white scales near its first half [the base of the wing]. The disc is sprinkled with more or less large lunules, concave towards the base, and generally shaded with blackish interiorly, and also with some white streaks not far from the base ; but the whole is so irregular and so different in each individual specimen that a figure alone could give a sufficiently exact idea of it. All along the exterior margin of both wings there is a submarginal series of small black dots, which are round and bordered with white on their interior side. These dots are very distinct on the hindwing, but on the forewing they are more or less obliterated, and sometimes they completely disappear."

"The species appears to be thoroughly isolated in the genus *Lycæna*, and must take its place in the small group formed by some very heterogeneous species : *I. rhymnus*, Eversmann, *L. tengstræmi*, Erschoff, and *L. anthracias*, Christoph."

"It was on 13th May that I took some very old and worn specimens at an altitude of about 3,500 [feet] on one of the out-jutting spurs of the Tian-Chan."

"The species was flying about a bush which looked like a *Carpinus*, but which was certainly different from that genus."

"It is very probable that my description would be more detailed and more exact if I had some fresher specimens. Out of the twelve specimens which I brought away with me, I could make use of only three for the purpose of description, and even these were not very good." (*Alphéraky*, l. c.)

My knowledge of this species is confined to a single specimen taken by Lieutenant E. Y. Watson on 21st June, 1885, at Gunduk, which is situated in the Baiakola Pass, to the N.-E. of Quetta, Biluchistan. Half of this specimen has been bleached and mounted for examination of the neuration. The figure shows both sides of this specimen, which is in my own collection.

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bunch of fine black hairs arranged compactly at the end of the abdomen as in the female of *Thecla acaciæ*, Fabricius (which occurs in South Europe and Asia Minor), and some other *Lycænidæ*. This most curious feature is found also in *Chætoprocta adsita*, Hewitson, described further on in this work. I think it highly probable that *L. tengstræmi* belongs to the genus *Neolycæna*, although Dr Lang in his "Butterflies of Europe," p. 147, suggests that it should "probably be referred to the genus *Læosopis*, Rambur." In this I think Dr. Lang is wrong. The type and only known species of *Læosopis* is the *L. roboris*, Esper, which is a very different looking insect to *Lycæna tengstræmi*, and is said to differ from the genus *Thecla*, Fabricius, in having smooth instead of hairy eyes, and no tail to the hindwing. As figured by Dr. Lang it has three subcostal nervules to the forewing, while *Thecla* has but two, in this respect differing also from *Neolycæna sinensis* and probably from *N. tengstræmi*.

Genus 108.—LYCÆNA, Fabricius. (Plate XXVI).

Lycæna, sect. 3 (part), Fabricius, Ill. Mag., vol. vi, p. 285, n. 32 (1807); id. (part), Boisduval, Gen et Ind. Meth., p. 10 (1840); id., Herrich-Schäffer, Syst. Bearb. Schmett. Eur., vol. i, p. 111 (1843); id. (part), Westwood, Gen. Diurn. Lep., vol. ii, p. 488 (1852); id. (part), Trimen, Rhop. Af. Aus., p. 233 (1862-66); idem, id., South-Afr. Butt., vol. ii, p. 11 (1887); *Lycæides*, Hübner, Verz. bek. Schmett., p. 69 (1816); *Plebeii*, Linnæus, Syst. Nat., vol. i, pt. 2, p. 744 (1767); id., Cuvier, Tabl. Elém., p. 591 (1799); *Plebeius*, Kirby, Syn. Cat. Diurn. Lep., p. 653 (1871); *Cupido*, sect. B, Schrank, Fauna Boica, vol. ii, pt. 1, pp. 133, 209 (1801); id., Kirby, Syn. Cat. Diurn. Lep., p. 345 (1871); *Polyommatus* (part), Latreille, Hist Nat. Crust. Ins., vol. xiv, p. 111 (1805); idem, id., Enc. Méth., vol. ix, p. 11 (1819); *Rusticus*, Hubner, Tentamen, p. 1 (1806); *Scolitantides*, Hubner, Verz. bek. Schmett., p. 68 (1816); id., Butler, Cat. Fab. Lep. B. M., p. 167 (1869); *Argus*, Boisduval and Leconte, Lep. Am Sept., p. 113 (1833).

"Body, small, slender, and compressed. Wings, generally large, and of a delicate texture; in the majority of the species blue on the upperside (at least in the males) and grey or greyish-white beneath, and more or less ocellated, [as restricted by me all the species are ocellated]; the majority having a small black transverse spot at the extremity of the discoidal cell of the forewing [all the Indian species have this spot on the underside]. Head, small, hairy, the hairs often forming a small tuft on the forehead; *eyes* moderate-sized, naked; *palpi* moderately elongated, compressed, scaly; the middle joint also furnished beneath with detached bristly hairs; terminal joint shorter than half the length of the second joint, and scarcely varying in length in the opposite sexes, slender, nearly naked, acute at the tip; *antennæ* of moderate length, very slender, with long joints ringed with white, the club distinct, suddenly-formed, oblong-ovate, depressed, and sometimes spoon-shaped in dried specimens, the joints of the club very short. Forewing, generally elongate, subtriangularly ovate, with the *costal margin* moderately arched, *outer* margin always more or less convex, *inner* margin rather short; *costal nervure* short, *subcostal* nervure wide apart from the costa, with two branches preceding the extremity of the discoidal cell, and with a third short branch about [less than] half-way between the cell and the tip of the wing; *discoidal cell* closed by extremely slender middle and lower disco-cellular nervules, which are transverse, the latter uniting with the third median nervule at a moderate distance beyond its origin; *upper disco-cellular nervule* very oblique, or almost longitudinal, forming, in fact, the base of the upper discoidal nervule." Hindwing, elongate-ovate, entire; *costal margin* straight, *apex* rounded, *outer margin* very convex, *anal angle* rounded, *abdominal margin* nearly straight; *costal nervure* extending to apex of wing, first *subcostal nervule* given off some distance before apex of discoidal cell, *disco-cellular* nervules very concave, of about equal length, the *upper* disco-cellular outwardly, and the *inner* disco-cellular inwardly oblique; *discoidal* nervule from their point of junction, *discoidal cell* very short, much less than half the length of the wing, *second median* nervule originating just before the end of the cell. "Forelegs, of the *male* slender, *tibia* in most species terminated by a short curved horny point; in others simple; *tarsus* slender, exarticulate, elongate, slightly curved and attenuated at the tip, which is terminated by a horny curved point, and armed beneath with short spines. Of the *female* similar in size and shape to those of the male, except that the *tarsus* is articulated and unguiculated like those of the four hindlegs. Hindlegs, short, slender."

"Larva, onisciform, gibbo-scutate or oblongo-scutate, with the head and feet small and scarcely perceptible; the body laciniate, and the back convex and generally beautifully coloured. Pupa, oblong, very convex, smooth, obtuse at each end, and marked with obscure spots; in a few species armed with short acute tubercles." (*Westwood*, l. c.)

The above diagnosis of the genus *Lycæna* follows generally that given by Westwood in the "Genera," but it has been modified somewhat so as to suit the genus as now restricted in this work, and so as to exclude species which are now referred to several separate genera established in late years.

With reference to the synonymy of this genus, it will be noted that the *Plebeii* of Linnæus is the oldest name used for it. Mr. Kirby in the later portion of his "Synonymic Catalogue of Diurnal Lepidoptera" gives the singular form to the word and uses it for the genus. As

Linnæus used the names *Plebeii*, *Nymphales*, &c, in a divisional sense, I agree with Mr. Scudder (Historical Sketch of the Generic Names proposed for Butterflies, in the Proc. Am. Acad. of Arts and Sciences, vol x, p. 93), that those names cannot be used in a generic sense. I also prefer to retain the well-known name *Lycæna* for this group of butterflies, which is the reason why I do not adopt Schiank's name *Cupido* for it, though the latter has six years' priority over the former. *Cupido* is used by Mr. Butler for the species here placed in *Lycæna* in his later writings, while at the present day many German writers adopt *Plebeius* in the sense proposed by Mr. Kirby.

The genus *Lycæna*, as formerly established, is one of the largest in the family, and indeed amongst butterflies. When Professor Westwood dealt with it in 1852 he enumerated 199 species (of which about 40 were recorded from Indian limits), and included many which have since been placed in separate genera by subsequent authors. Mr. Kirby in his genus *Plebeius*, equivalent to Westwood's *Lycæna*, enumerated 420 species in 1877. As lately as 1887 Mr. R. Trimen also in his "South African Butterflies" placed in the genus *Lycæna* many species which I have separated from it, as he finds that, if structural characters are alone considered and used in a generic sense, it separates species which in their coloration, pattern of markings, and general appearance are allied superficially; thus, if a tail to the hindwing is taken as a generic character, this places in juxtaposition most dissimilarly-marked species, and, similarly, if the presence or absence of a third subcostal nervule, the anastomosis of the first subcostal nervule with the costal nervure, or the complete separation of these veins, naked or hairy eyes, or variations in the structure of the legs, be adopted as a basis for classifying these insects, the result is found to be equally unnatural and unsatisfactory: in fact he had to fall back upon an arrangement based upon the coloration and pattern of the wings. Although I have not followed this course exactly, I have endeavoured to form a really natural group by restricting *Lycæna* to species with smooth eyes, no tail to the hindwing, and a certain well-marked general appearance. Of course other genera also have smooth eyes and a tailless hindwing, but their type of coloration and markings is different; and the genus as adopted in this work contains a very distinct series of "blues" naturally and closely allied.

As restricted by me, the genus *Lycæna* occurs within our limits almost exclusively in the Western Himalayas and the countries to the north and west, and contains about twenty-four species. *Lycænæ* of the same *facies* as the Indian species occur throughout the Palæarctic region, and are particularly abundant in the European Alps. If the genus is considered in its unrestricted sense, *i. e.*, as including species which I place in the genera *Megisba*, *Neolycæna*, *Chilades*, *Cyaniris*, *Zizera*, *Azanus*, *Orthomiella*, *Talicada*, *Lycides*, *Nacaduba*, *Jamides*, *Lampides*, *Catochrysops*, *Tarucus*, *Castalius*, *Polyommatus*, and others, it may be said to occur throughout the world, and in 1877, the date of the Supplement to Kirby's "Synonymic Catalogue," contained over four hundred species, to which many have been since added. With the one exception of *L. medon*, Hufnagel, all the Indian species of *Lycæna* are more or less blue on the upperside in the male, though the coloration of *L. jaloka*, Moore, *L. ellisi*, Marshall, and *L. leela*, mihi, is rather green than blue. The females are usually black or smoky brown on the upperside, some species have more or less blue towards the base of the wings. The colour of the ground on the underside of both sexes is usually pale brown, grey, or white, but in one small group the underside of the hindwing and the apex of the forewing is a beautiful metallic green, very similar to *Chrysophanus kasyapa*, Moore; and it is remarkable that these groups of the two genera appear to be confined to India and the adjoining countries to the north-west. The late Mr. H. Pryer, in his "Rhopalocera Nihonica," has described and figured a "blue" which may be distantly related to this group, with the underside of the hindwing shining green, but this colour does not extend to the apex of the forewing, as it often does in *L. galathea*, Blanchard, and allies. He called it *Lycæna (?) ogasawaraensis*. It occurs in the Ogasawara islands, off the coast of Japan. It has very long antennæ, considerably longer than half the length of the costa of the forewing. All the species of the genus have a spot closing the cell and a discal series of spots to both wings, and many species

have also some marginal series of spots; and three or four spots arranged in a subbasal series on the hindwing. These spots are usually black encircled with white, but in a few species are entirely white. The cilia are almost always long, pure white, and prominent, in only two Indian species is it spotted with black. The *Lycænæ* frequent open ground almost entirely, settling on turf and on the flowers and foliage of low herbage, not a single species, as far as I know, frequenting trees or bushes. In India but few species occur on the outer ranges of the Himalayas, by far the greater number being to be found on the inner ranges and in Kashmir. To render identification easier, I have placed a few remarks before each group.

Key to the Indian species of Lycæna.

A. Both sexes, upperside, both wings smoky-brown without any trace of blue, usually with a series of marginal red lunules.

647. L. MEDON, parts of Europe, North Africa, parts of Asia, Western Himalayas.

B. Male, upperside, both wings blue, never with marginal red lunules.

a. Both sexes, underside, hindwing never with prominent series of orange lunules; cilia of both wings not prominently spotted with black.

a^1. Both sexes, underside, hindwing, ground-colour greyish or brownish.

a^2. Both sexes, underside, hindwing, spots black, ringed with white.

a^3. Male, upperside, both wings with blue coloration confined to the basal two-thirds; cilia of both wings obscurely spotted with black.

648. L. DEVANICA, Ladak.

b^3. Male, upperside, both wings with blue coloration extending to near outer margin; cilia of both wings entirely white.

a^4. Both sexes, underside, hindwing with marginal spots never sprinkled with metallic green scales.

a^5. Male, upperside, both wings violet-blue.

a^6. Both sexes, underside, hindwing with a white discal streak.

649. L. ARIANA, Western Himalayas.

650. L. STOLICZKANA, Ladak.

651. L. SUTLEJA, Kangra district, Kashmir

b^6. *Both sexes, underside, hindwing without a* white discal streak.

a^7. Discal spots on underside of forewing small.

a^8. Underside with marginal orange spots inconspicuous or obsolete.

652 L. FUGITIVA, Biluchistan.

653. L. PERSICA, Afghanistan, Persia.

654. L. KASHGHARENSIS, Kashghar.

b^8. Underside with marginal orange spots prominent.

655. L. YARKUNDENSIS, Yarkand.

b^7. Discal spots on underside of forewing large.

656 L. NADIRA, Kabul.

b^5. Male, upperside, both wings smalt-blue

657. L. DILUCHA, Biluchistan.

658. L. PSRUDEROS, Kashmir.

b^4. Both sexes, underside, hindwing with marginal spots *sprinkled* with metallic green scales.

a^9. Underside, hindwing with a complete series of marginal black spots sprinkled with metallic greenish scales.

a^4. Male, upperside, both wings bright dark blue; cilia very broad and pure white.

659. L. BRACTEATA, Afghanistan.

b^5. Male, upperside, both wings pale lavender-blue; cilia narrow and grey.

660. L. SAMUDRA, Ladak, Baltistan.

b^9. Underside, hindwing with two or three anal black spots only sprinkled with metallic greenish scales

a^2. Of small size ; male, upperside lavender-blue.

661. L. CHAMANICA, Biluchistan.

b^2. Of larger size ; male, upperside smalt blue.

669. L. LORWII, Taurus, Biluchistan.

b^1. Male, underside, hindwing, spots entirely white, female unknown.

663. L. LEHANA, Ladak.

664. L. PHERETES, var. ASIATICA, Native Sikkim.

b^1. Both sexes, underside, hindwing, ground-colour metallic greenish.

a^2. Male, upperside, blue coloration extending to outer margin.

665. L. GALATHEA, Western Himalayas.

b^2. Male, upperside, blue coloration confined to basal two-thirds of wings.

a^3. Male, of small size, blue coloration of upperside inclined to greenish, shining.

666. L. METALLICA, Lahoul, Ladak.

b^3. Male, of larger size, blue coloration of upperside inclined to purple, dull.

667. L. OMPHISSA, Ladak.

b. Both sexes, underside, hindwing with prominent series of orange lunules ; cilia of both wings prominently spotted with black.

668. L. HYLAS, Europe, Western Asia, Afghanistan, Western Himalayas.

C. Both sexes above fuscous, irrorated with metallic greenish scales at base.

a. Both sexes, underside, hindwing with no regular discal series of white spots.

669. L. JALOKA, Kashmir.

b. Both sexes, underside, hindwing with a discal series of white spots.

a^1. Both sexes, underside, forewing with discal spots entirely white.

670. L. ELLISI, Pangi.

b^1. Both sexes, underside, forewing with discal spots white, prominently centred with black.

671. L. LEELA, Ladak.

The first group consists of a single species only, *L. medon*, Hufnagel, which has a wide range in the old world. Both sexes are dark smoky brown on the upperside, forewing with a black disco-cellular spot, both wings with a submarginal series of orange lunules, often more or less absent. Underside, both wings pale brown, usually with the orange spots very prominent, the rest of the markings black surrounded with white ; discal white streak on the hindwing not prominent ; sexes alike.

647. **Lycæna medon,** Hufnagel.

Papilio medon, Hufnagel, Berl. Mag., vol. ii, p. 78, n. 41 (1766) ; id., Rottenburg, Naturf., vol. vi, p. 10, (1775) ; id., Esper, Schmett., vol. i, pt. 1, pl. xxxii, fig. 1 (1778), pt. 2, pl. lv, fig. 7 (1780) ; *Papilio agestis*, Wien. Verz., p. 184, n. 13 (1776) ; id., Hübner, Eur. Schmett., vol. i, figs. 303—305 (1798—1803) ; *Polyommatus agestis*, Godart, Enc. Méth., vol. ix, p. 689, n. 220 (1823) ; *Papilio astrarche*, Bergsträsser, Nomencl., vol. iii, p. 4, pl. xlix, figs. 7, 8 (1779) ; *Lycæna astrarche*, Staudinger, Hor. Soc. Ent. Ross., vol. xiv, p. 240 (1878) ; id., Elwes, Proc. Zool. Soc. Lond., 1881, p. 889 ; id., Lang, Butt. Eur., p. 114, n. 21, pl. xxiv, fig. 9, *male* and *female* (1884) ; id., Alphéraky, Hor. Soc Ent. Ross., vol. xvi, p. 386, n. 42 (1881) ; id. Doherty, Journ. A. S. B., vol. lv, pt. 2, p. 133, n. 180 (1886) ; *Papilio idas*, Lewin, Ins. Brit., vol. i, p. 82, pl. xxxix, figs. 1, 2 (1795) ; *Papilio allous*, Hübner, Eur. Schmett., vol. i, figs 988—992 (1827—1841) ; *Lycæna astrarche*, var. *a*, *allous*, Lang, Butt. Eur., p. 115 (1884) ; *Polyommatus nazira*, Moore, Proc. Zool Soc. Lond., 1865, p. 504, n. 102, pl. xxxi, fig. 4 ; *Lycæna nazira*, id., l. c., 1882, p. 246 ; *Cupido nazira*, Butler, l. c, 1886, p. 368, n. 49.

HABITAT : Throughout Europe, except the Polar regions ; North Africa (*Lang*) ; Asia Minor (*Staudinger*) ; Kouldja (*Alphéraky*) ; Askold, Amurland (*Elwes*) ; Western Himalayas.

EXPANSE : ·9 to 1·3 (Indian specimens).

DESCRIPTION : MALE and FEMALE. "UPPERSIDE, *both wings* satin-brown ; a marginal series of blackish dots, bordered inwardly with a submarginal row of deep red lunules. *Forewing* with a black spot closing the discoidal cell. UNDERSIDE, *both wings* purplish cream-colour ; with a submarginal red band, bordered exteriorly with black dots, internally with blackish lunules, and margined on both sides with white lunules. *Forewing* with a spot closing the cell, five and a germinated sixth irregularly across the disc. *Hindwing* with eight spots also irregularly across the disc, three basal and one closing the cell black, each encircled with white ; a dash of white longitudinally on the disc. *Cilia* broad, white, with black spots." (*Moore*, l. c)

The above description is that given by Mr. Moore in 1865 of a series of specimens taken in Kunawar by Colonel A. M. Lang, R.E., and described as a new species under the name of *P. nasira*. As, however, the Kunawar insects differ in no respect from the European *L. medon*, and from others of the same species occurring elsewhere in the Himalayas and neighbouring mountains, the name of *nasira* cannot be retained, and *medon* will include all the insects of this type within our limits.

"LARVA, pale green, with a brownish-purple medio-dorsal stripe and faint pale lateral stripes; each segment has two small wart-like eminences with projecting white bristles. The ventral surface is pale green, with whitish bristles. The claspers are semi-transparent and pale yellow in colour; the legs are spotted with black. The larva when full grown is about half an inch in length, and has the usual *Lycæna* shape. Its food-plant is the stork-bill (*Erodium cicutarium*). PUPA, has the usual *Lycæna* form, pale yellow in colour, with a green tinge, with a dorsal stripe of reddish purple. It is spun up among the dry leaves of *Erodium* and *Artemisia*." (*Lang*, l. c.) An interesting account by the late Professor P. C. Zeller of the transformations of this species will be found in the Ent. Month. Mag., vol. iv, p. 73 (1867), also still fuller details by the late William Buckler in "The Larvæ of the British Butterflies and Moths," vol. i, pp. 116, 121, pl. xvi, figs. 1, 1*a*—*g* (1886). Mr. Buckler fed the larvæ on *Helianthemum vulgare*.

This species is almost always referred to by modern writers under its synonymic name *astrarche*, Bergstrasser, but I follow Mr. Kirby in so far as to give *medon* the preference, though in his "Synonymic Catalogue" he gives *alexis*, variety 1 of Scopoli (1763), as the oldest name of this species. As, however, *alexis*, Scopoli, is by some authors used as the name for the "Common Blue" of England, and as *icarus*, Rottenburg, which Mr. Kirby says is the older name for the latter species, is not universally adopted for that species, I prefer to take the second oldest name for it; especially as 'var. 1 of *alexis*' and not actually '*alexis*' is the name as strictly applied to our *medon* by Scopoli in 1763.

L. medon is unique amongst the Indian species of the genus in being similarly marked in both sexes, and having no trace of blue coloration on the upperside. The female differs from the male only in having the marginal series of red spots usually larger and more prominent, the apex of the forewing more rounded, and the wings rather broader. The ground-colour of the underside in the female appears to be much darker than in the male. It may be known from the females of the *ariana* group, which usually have no blue above, by its smaller size. As regards its variations, I have taken in Simla specimens with no red spots whatever on the upperside, this variety being the *allous* of Hubner, which Dr. Lang (l. c.) says occurs "as a varietal form of the summer brood [of *L. medon*] in Central and Southern Europe and North Africa." Alphéraky also records this aberration from Kouldja and the Tian-Chian, in Western China. I have also taken specimens in Simla with a few red spots only on the hindwing, none on the forewing, and others with a complete series on the hindwing and three, four, five, and the full number of six on the forewing. Another variety, *salmacis*, Stephens, which occurs only in the British Isles, has no orange band on the forewing in the male above, the black spots of the underside very small, and a white discoidal spot on the upperside of the forewing in the female. Still another variety, *artaxerxes*, Fabricius, occurs only in Scotland, and often has no orange bands above in the male, and a white discoidal spot on the upperside of the forewing in both sexes. In India, *C. medon* occurs in the Western Himalayas on both the outer and inner ranges, and in Kashmir and Ladak, also as far east as Kumaon, which is perhaps its eastern limit, where Colonel Lang states that it is "not common in Naini Tal; occurring from 5,600 feet to the top of Cheena, 8,600 feet." Mr. Doherty also records it from Naini Tal and Dhankuri, Kumaon, 6,000 to 10,000 feet.

The second group has the males more or less blue on the upperside, the females brown, sometimes with irrorated blue scales at the base of the wings. The underside of both sexes in all the species is greyish-brown or greyish, with black spots surrounded with white; in a few species there is a prominent white discal streak on the hindwing. The first species,

L. devanica, Moore, has the blue coloration of the male confined to the basal area of the wings, the underside is darker than in any other species of the group. So far it has been found in Ladak only. The second species, *L. ariana*, Moore, is much larger than any which follow except *L. kashgharensis*, Moore, and *L. yarkundensis*, Moore, from both of which it may be at once distinguished by the prominent white discal streak on the underside of the hindwing The male is a beautiful bright blue—very like the English *L. adonis* (=*bellargus*)—on the upperside, with a narrow black border and broad white cilia, the underside grey, sprinkled with greenish scales at the base, the markings less prominent than in *L. devanica*. It is one of the commonest species of the genus, occurring on the outer ranges of the Himalayas at Murree, Dalhousie, and Naini Tal, but, strangely enough, not at the intermediate stations Simla and Masuri. It is very common in Kashmir and in many parts of Ladak and the neighbouring countries. The third species, *L. stoliczkana*, Felder, if I have identified it correctly, is merely a dwarfed form of *L. ariana* occurring in the dry country of Ladak. The fourth species, *L. sutleja*, Moore, is probably nothing but *L. ariana*, and occurs in the localities where that species is certainly met with *L. fugitiva*, Butler, is of small size, the discal white streak on the underside of the hindwing is absent, and all the markings very small and compact; it occurs in Biluchistan and Afghanistan, where I believe none of the previously mentioned species occur. The sixth species, *L. persica*, Butler, occurs in Persia, Afghanistan, and Biluchistan. It is probably not separable from *L. fugitiva*, though the male on the upperside has the antecellary black line less prominent, and the cilia apparently shorter than in that species. The seventh species, *L. kashgharensis*, Moore, is of the size and colouring of *L. ariana*, but all the markings of the underside are very small and obscure, and there is no white streak to the hindwing It hardly occurs within our region, the type specimen is from Kashghar The eighth species, *L. yarkundensis*, Moore, agrees with the preceding species in size, but is differently marked both above and below, it also does not occur in strictly Indian limits The ninth species, *L. nadira*, Moore, has the spots on the underside of the forewing very large, it is a small insect, the female only is known; it comes from Kabul The tenth species, *L. bilucha*, Moore, differs in the colour of the upperside in the male from any of the previously mentioned species; it is described as cobalt blue, but smalt-blue would be a better description, it has no white streak on the hindwing below It occurs in Biluchistan. The eleventh species, *L. pendetos*, Moore, is probably very close to *L. bilucha*, and from the description I cannot distinguish between them It occurs in Kashmir.

648. **Lycæna devanica**, Moore.

Polyommatus devanica, Moore, Proc Zool Soc Lond, 1874, p 573, pl lxvi, fig 4, *male*

HABITAT. Dras Valley, Ladak.

EXPANSE. ♂, 1 25 to 1 55, ♀, 1 00 to 1 45 inches

DESCRIPTION. "Allied to *P* [=*L*] *alexis*, Scopoli [which occurs throughout Europe, in Northern and Western Asia, and in North Africa, and is sometimes known under the name of *L. icarus*, Rottenburg] MALE UPPERSIDE, *both wings* dark purplish-blue, basally dashed with clear blue; disco-cellular black spot of underside visible above. *Cilia* white, alternating with brown. UNDERSIDE, *both wings* pale fawn colour. *Forewing* with a white-bordered prominent black disco-cellular spot and a transverse discal row of five spots; a marginal row of white rings with dark centres, the space between which and the discal spots clouded with black. *Hindwing* with four prominent white bordered black subbasal spots, and a discal series of seven spots, the five lower spots being disposed in a straight row, the two upper spots proceeding at right angles to anterior margin; a marginal row of pale-bordered dark spots surmounted by a submarginal black lunular line, the lower marginal spots slightly bordered with orange and speckled with metallic-green, a triangular disco-cellular white spot centred with a slight black dentate mark; space between the discal and submarginal spots streaked with white" (*Moore*, l c) FEMALE. UPPERSIDE, *both wings* with the blue coloration confined to the immediate base of the wing, otherwise as in the male.

This is a very distinct species and cannot be mistaken for any hitherto recorded from Indian limits. In the male the blue coloration is very dusky and confined to the basal two-thirds of the wings on the upperside, the black disco-cellular spot on the forewing being very prominent. The dark colour of the ground on the underside is also very distinctive. It is also remarkable for having the anal black spots on the underside of the hindwing sprinkled with metallic greenish scales, a feature of the fourth group, and the cilia spotted with black, as in one other Indian species only, *L. hylas*, Wiener Verzeichniss, which comes into my sixth group. I have taken this species on two occasions very commonly in the Dras Valley, Ladak, in the beginning of July, and as far as I know the species is confined to this valley. Mr. H. J. Elwes informs me that *L. devanica* is nearest to *L. phryxis*, Staudinger, MS., described by Dr. Lang in his "Butterflies of Europe," p. 372. It occurs at Samarkand in Turkestan.

649. **Lycæna ariana**, Moore.

Polyommatus ariana, Moore, Proc. Zool Soc Lond., 1865, p. 504, n. 103, pl xxxi, fig 2, *male*; idem, id., l. c., 1874, p. 271 n. 65, idem, id, Scien Res. Second Yarkand Mission, Lep., p. 6, n 22 (1879); *Lycæna ariana*, id., Proc. Zool. Soc. Lond., 1882, p 246; id., Doherty, Journ. A. S. B., vol. lv, pt. 2, p. 33, n. 179 (1886); *Cupido ariana*, Butler, Proc Zool. Soc. Lond., 1886, p. 368, n. 48; idem, id., Ann. and Mag. of Nat. Hist., sixth series, vol. i, p. 149, n. 55 (1888).

HABITAT: Kunawar; Mataian, Dras Valley (11,200 feet); Leh; Kashmir (*Moore*); Murree, August and September; Thundiani, August and September (*Butler*); Naini Tal, 4,000 to 8,000 feet (*Doherty*).

EXPANSE: ♂, 1·2 to 1·6; ♀, 1·1 to 1·6 inches.

DESCRIPTION: "MALE. UPPERSIDE, *both wings* brilliant blue. *Hindwing* with the anterior margin black, inner margin whitish. *Cilia* broad, white. UNDERSIDE, *both wings* purple-grey. *Hindwing* suffused with metallic greenish-grey at base. *Forewing* with a small spot within discoidal cell [often wanting], another closing the cell; a submarginal discal series of six spots (the posterior, sixth, geminated), black, each encircled with white; a marginal series of ill-defined double whitish spots, the posterior having slight dark centres. *Hindwing* with two basal and a submarginal discal series of seven black spots encircled with white; a marginal row of whitish spots, each centred exteriorly with a dark, and interiorly with a reddish spot; a triangular spot in the middle of the wing, and a streak from middle of exterior margin, whitish. *Body* white. FEMALE. UPPERSIDE, *both wings* duller lilac-blue, with the exterior margins brownish. UNDERSIDE as in male." (*Moore*, l. c.)

"An abundant species, frequenting pasture- and meadow land in the summer months, at altitudes of 8,000 to 10,000 feet, alighting on the gentians which stud the green turf." (*Note by Colonel A. M. Lang, R.E.*)

"The female appears to vary almost as much as in *C. icarus* of Europe." (*Butler*, l. c. in Ann. and Mag. of Nat. Hist.)

L. ariana is the commonest and most widely distributed species of the genus in India, occurring to the eastwards as far as Naini Tal at any rate, and to the westwards throughout Kashmir, Ladak, and Baltistan. Both sexes are variable; the male, as described by Mr. Moore from Kunawar, has on the upperside of both wings no outer black border; this is so also in some specimens which I have from Chini and parts of Kashmir; in others moreover from Pangi, Lahoul, some parts of Kashmir, and Ladak, there is a distinct black border, which is very variable in width; in one Pangi specimen, in which it is at its maximum, it is over one-tenth of an inch wide. The underside of the male varies in the shade of the ground-colour, some specimens being much darker than others, in the prominence of all the markings, and in the total absence in some examples of the marginal reddish spots. The female too is very variable; most frequently the upperside is entirely smoky brown with no trace of blue coloration; sometimes there is a complete series of six orange marginal spots on the hindwing and five on the forewing; these are sometimes almost obsolete, and every gradation occurs between these extremes. The underside is always much darker than in the male, all the

spots are more prominent, usually there is a conspicuous series of submarginal orange spots to both wings, and the discal white streak on the hindwing is frequently less prominent than in the male.

650 **Lycæna stoliczkana**, Felder.

L. stoliczkana, Felder, Reise Novara, Lep., vol. ii, p. 283, n. 360, pl. xxxv, figs. 10, 11, *male* (1865).

HABITAT: Ladak (*Felder*).

EXPANSE: ♂, 1·25 inches (from figure).

DESCRIPTION: "MALE. UPPERSIDE, *both wings* pale metallic-cyaneous, the external margin fuscous, the *cilia* whitish. UNDERSIDE, *both wings* pale hoary-brownish, at the base (especially in the hindwing) black and powdered with metallic greenish, a whitish diffused disco-cellular spot, in the forewing divided by a brown litura, in the hindwing connected hindwardly with a whitish vittula, with whitish subcuneate spots before the margin, interrupted in the middle with fuscous spots; on the hindwing the two last but one marked with a minute fulvous spot in each inwardly powdered with black, a striga inwardly hoary-, outwardly blackish fuscous, and another inwardly somewhat silvery, outwardly hoary brownish before the cilia. FEMALE. UPPERSIDE, *both wings* pale smoky-fuscous, darker at the base and powdered with bluish. *Hindwing* with whitish external evanescent spots. UNDERSIDE, *both wings* as in the male, but *forewing*, with the whitish exterior spots obsolete more or less dotted with black, and the intramarginal spots of *both wings* adorned inwardly with minute increasing golden fulvous spots sprinkled with black."

"Very distinct from the allied *L. aurylas*, Wiener Verzeichniss, by the considerably shorter hindwing." (*Felder*, l. c.)

I took several specimens of what appears to be this species at Zara in Ladak at the end of June, 1879. They agree in size exactly with the figure of *L. stoliczkana*. They seem, however, to be but dwarfed specimens of *L. ariana*, Moore, with some specimens of which they agree absolutely, except in size. *L. aurylas*, Wiener Verzeichniss, from the European Alps, appears to me to be precisely similar in coloration and markings to both *L. ariana* and the specimens I identify as *L. stoliczkana*, and just intermediate between them in size. As figured, *L. stoliczkana* appears to be quite unique in this genus, as the markings of the underside are reduced to a disco-cellular spot, and some obscure marginal markings, the prominent discal series of spots to both wings and the basal spots to the hindwing, which are characteristic of all true *Lycænæ*, being entirely wanting in Felder's figure, though present in the specimens I doubtfully identify as *L. stoliczkana*.

651. **Lycæna sutleja**, Moore.

L. sutleja, Moore, Proc. Zool. Soc. Lond., 1882, p. 246.

HABITAT: Kangra District (*Moore*); Sinde Valley, Kashmir.

EXPANSE: 1·4 inches (*Moore*); 1·1 to 1·2 inches.

DESCRIPTION: "Near to *L. boisduvalii*, Herrich-Schaffer, and to *L. ariana*, Moore. UPPERSIDE, *both wings* darker glossy blue, the marginal band narrower; no dusky streaks ascending the veins. *Hindwing* with the marginal spots less prominent. UNDERSIDE, *both wings* lilacine ochreous-grey, darkest on the hindwing. *Forewing*, markings similar to *L. boisduvalii*, except that the spot within the cell is further from the disco-cellular lunule, this spot being situated inward of the end of the first median nervule, the discal row of spots are more linearly disposed, the marginal spots having their red inner borders more slenderly black-lined. *Hindwing* with a black centre to the disco-cellular lunule; upper discal spots nearer together, thus giving a wider space between the upper one and the basal spot; the red borders to marginal spots are somewhat broader and more slenderly black-streaked." (*Moore*, l. c.)

I possess a male of this species taken by me in the Sinde Valley, Kashmir, in June, 1879, which has been named *L. sutleja* by Mr. Moore. It is smaller than the dimensions given by Mr. Moore for this species, and is very near indeed to *L. stoliczkana*, Felder, differing only, as far as I can see, in the colour of the ground on the underside, which is browner, with the orange lunules on the outer margins, especially on the hindwing, much more prominent. Mr.

Moore makes a point of the black spot in the cell of the forewing on the underside being situated inward of the end of the lower median nervule; in the specimen he has named for me this is not the case; it is placed distinctly exterior to the base of the first median nervule The presence of this spot is of no importance, however, in *L. ariana*, Moore, *L. stoliczkana*, Felder, and other species, as it seems to be as often absent altogether as present.

652 **Lycæna fugitiva**, Butler.

L. fugitiva, Butler, Proc Zool Soc Lond, 1881, p. 606, n 21 idem, id, Ann and Mag of Nat Hist., fifth series, vol ix, p 207, n 8 (1882) id, Swinhoe, Trans Ent Soc Lond, 1885, p 340, n 29

HABITAT Quetta, North Biluchistan, March, April, and May.

EXPANSE. 1 2 inches

DESCRIPTION: 'Intermediate in character between *L. persica*, Butler, and *L. zephyrus*, Frivaldsky, [the latter found in the mountains of Greece, Turkey, Asia Minor and Armenia, according to Dr Lang] but nearer to the latter UPPERSIDE of the MALE bright lilacine blue, with a black marginal line, *cilia* with the basal half grey, the external half white, of the FEMALE smoky brown, more or less washed with blue towards the base, a submarginal series of small lunate orange spots, outer border broadly blackish *Cilia* as in the male UNDERSIDE of *both wings* whity brown, greyer and paler in the male than in the female; the black spots arranged exactly as in *L. zephyrus*, but all smaller and with less conspicuously white zones; the double series of submarginal spots on the *forewing* grey and without connecting orange spots in the male, paler in the female; submarginal spots on the *hindwing* less distinctly black, the orange spots paler, not relieved by a pure white border as in *L. zephyrus*, base of the *hindwing* rather more broadly washed with bluish green" (*Butler*, l. c. in Proc Zool Soc Lond.)

'A female taken at Quetta in May, 1881. It is larger than a female previously received, and more brightly coloured, but agrees in its markings" (*Butler*, l. c. in Ann. and Mag. of Nat Hist)

I possess a male specimen named *L. fugitiva* Butler, by Mr. Moore, taken at Quetta, where it appears to be a common species and occurs from early spring to midsummer I also possess others taken in October in the Hanna Valley at 6,500 feet elevation. In Colonel Swinhoe's collection is a considerable series of males of this species from Quetta and one from Chaman He records it from "Chaman, May; Gwal May, Sheerog June; Quetta, March to May Very common" He records *L. persica* from Quetta from April to June and in August and September and from Kasian and the Lora Valley in June These specimens of *L. fugitiva* appear to differ only from the next species, *L. persica*, Butler, in having apparently longer cilia and a more prominent black antecilliary line, the markings in *L. persica* below are perhaps smaller and the ground-colour paler than in *L. fugitiva* I think that the dry and bare mountainous regions of Biluchistan and South Afghanistan possess a distinct specialized form of their own of *L. icarus* (= *L. alexis*), distinguished by a much paler, greyer tint below than the more warmly tinted typical form prevailing in Europe, and by the markings below being much smaller and less distinct It must be remembered, however, that *L. icarus* occurs all over Persia and Turkestan, and I have not seen specimens from these countries, and that they are probably intermediate between European *L. icarus* and *L. fugitiva*. The two forms, *L. fugitiva* and *L. persica*, are extremely closely allied, and if they are really separable may be seasonal broods of one species or of one variety of *L. icarus*. As however they have been accepted as distinct species by such eminent entomologists as Messrs. Moore and Butler and by Colonel Swinhoe, they have been included, with specific rank, in this work The reader, with the descriptions before him, will judge for himself as to whether he can distribute his specimens, should he have any, into two distinct species.

653 **Lycæna persica**, Butler.

Lycæna icarus, var. *persica*, Bienert, Lep Ergebn, p 29 (1870), *L. persica*, Butler, Proc Zool Soc. Lond, 1880 p 407, n 11, idem, id, Ann and Mag of Nat. Hist., fifth series, vol ix, p 207, n. 9 (1882) id, Swinhoe, Trans Ent Soc. Lond 1885 p 340, n 15

HABITAT Kandahar, Biluchistan, Persia.

EXPANSE ♂, 1 2 , ♀, 1 3 inches

DESCRIPTION : " Allied to, but distinct from, *L. icarus*, Rottenburg ; the *cilia* shorter, the *hindwing* more produced at apex MALE UNDERSIDE, *both wings* chalky white, all the black spots extremely small, the marginal ocelloid spots scarcely visible, those of the *forewing* showing no trace of orange, those of the *hindwing* with small pale orange lunules along their inner margins FEMALE with greyish costal border on the UPPERSIDE of the *forewing*, and with the greater part of the wing behind this washed with blue, the *hindwing* broadly washed with blue in the same manner ; the orange submarginal spots well-separated on both *fore-* and *hindwing*. UNDERSIDE, *both wings* whitty-brown with all the black spots smaller. *Forewing* with two additional spots towards the base ; the orange on the submarginal spots very pale and restricted. MALE and FEMALE with very little blue or green at the base of the wings on the UNDERSIDE " (*Butler*, l c)

" Abundant at Kandahar in April, May and June." (*Roberts*). " Very common at Kandahar in October and November ; also a very large variety taken at Quetta from April to June and in August and September ; and at Kasian and the Lora Valley in June ; fairly common." (*Swinhoe*)

In Colonel Swinhoe's collection is a good series of males of this species from Quetta and Kandahar. See remarks on *L. fugitiva*, Butler, *ante*.

654 **Lycæna kashgharensis**, Moore.

Polyommatus kashgharensis, Moore, Ann and Mag of N t Hist , fifth series, vol 1, p. 230 (1878) , idem, id , Scient Res. Second Yarkand Mission, Lep , p 5, n 19, pl 1, fig 7, *male* (1879).

HABITAT : Yangihissar (4,320 feet), Yarkand

EXPANSE ♂, 1 25 (*Moore*) ; 1 45 inches.

DESCRIPTION "Allied to *P.* [=*L.*] *semiargus*, Rottenburg. MALE. UPPERSIDE, *both wings* pale blue, with narrow black exterior-marginal line, costal edge white *Cilia* white, with dark inner border UNDERSIDE, *both wings* slightly pearly grey, base of the wings pale metallic green *Forewing* with a white bordered black spot in the middle of the cell, and a curved discal series of five spots , a very indistinct spot at the end of the cell, and a less distinct marginal series of spots *Hindwing* with three subbasal and a curved discal series of six small white-circled black spots, an indistinct spot at the end of the cell and a marginal row of spots with slightly ochreous interspaced upper dentated line." (*Moore*, l c in Scient. Res. Second Yarkand Mission)

The type and only known specimen of this species is in the Indian Museum, Calcutta. It appears to be abundantly distinct from all the Indian species of the genus, by reason of the smallness and obscurity of all the markings of the underside combined with its large size ; but, as above stated, the specimen is unique, and it is possible that were a long series obtained it would be found that the size and distinctness of the markings below (which in number, arrangement, and general pattern are those of *L. icarus*) varied so much as to render it impossible to separate *L. kashgharensis* from *L. persica* and *L. fugitiva* and other allied species, subspecies, or varieties from the parent form.

655. **Lycæna yarkandensis**, Moore.

Polyommatus yarkandensis, Moore, Ann and Mag of Nat Hist , fifth series vol 1, p 229 (1878) , *P. yarkandensis*, id , Scient Res Second Yarkand Mission, Lep , p 6, n 21, pl. 1, fig 8 (1879).

HABITAT : Yarkand (3,923 feet).

EXPANSE : 1·25 (*Moore*) ; 1 45 inches

DESCRIPTION . " Allied to *P* [=*L*] *icarus*, Rottenburg UPPERSIDE, *both wings* dark blue, anterior and exterior borders dusky brown. *Forewing* with an indistinct streak at end of the cell. *Hindwing* with a marginal row of rather indistinct ochreous-bordered black spots. *Cilia* cinereous white. UNDERSIDE, *both wings* ochreous-grey [the base irrorated with pale green scales]. *Forewing* with a white circled black spot in the middle of the cell, another below it, one at end of the cell, and a curved discal series of seven spots ; a marginal row of indistinct spots bordered above by a dentate line with pale ochreous interspaces.

Hindwing with three white circled black subbasal spots, and a curved discal series of seven spots; [a triangular white spot divided in the middle by a fine dark line on the disco-cellular nervules]; a marginal row of prominent spots bordered above by a dentate line with ochreous interspaces." (*Moore*, l. c. in Ann. and Mag. of Nat. Hist.)

The type and only known specimen of this species is in the Indian Museum, Calcutta. Mr. Moore does not state its sex; it appears to me to be a female. Its distinctness from *L. icarus* to my mind is extremely doubtful, especially if it be admitted that the presence or absence of blue or green metallic irrorations at the base of the hindwing below, and the obliteration or obsolescence of the discal white streak on that wing are untrustworthy and unsafe characters for specific distinction. Except in the absence of this streak the Indian Museum specimen differs in no respect from many European examples of *L. icarus*. In any case the establishment of a species on a unique specimen so closely resembling older species is to be deprecated.

656. **Lycæna nadira,** Moore.

L. nadira, Moore, Journ. A. S. B., vol. liii, pt. 2, p. 24 (1884).

HABITAT. Kabul.

EXPANSE: ♀, 1·0 inch (*Moore*); 1·15 inches.

DESCRIPTION: "FEMALE. UPPERSIDE, *both wings* dark olivaceous violet-brown. *Hindwing* with a very faint trace of paler marginal lunules. UNDERSIDE, *both wings* pale olivaceous-ochreous. *Forewing* with an olivaceous white-bordered large black linear spot at end of the cell, and a recurved transverse discal row of six spots, a submarginal row of small blackish dentate spots, and a marginal row of linear spots. *Hindwing* with three subbasal olivaceous white bordered black spots, a lunule at end of the cell, a curved discal row of eight spots, a submarginal row of small blackish dentate spots, and a marginal row of short linear spots. *Cilia* brown, edged with white."

"Quite distinct from *L. fugitiva*, Butler." (*Moore*, l. c.)

The type specimen of this species is in the Indian Museum, Calcutta, and is the only one I have seen. The black pale-encircled spots on the underside of the forewing are arranged thus: the five upper ones form a perfect curve, and including the disco-cellular spot almost a perfect circle (with however a wide gap between this last named spot and the first (costal) spot of the discal series), the sixth spot which is out of the curve being nearer the margin; the fifth spot is the largest. In the hindwing the two lower spots of the discal series are rather larger than the others. It appears certainly very distinct from *L. fugitiva* (and *L. persica*) owing to the wings being shorter and broader and the apex less produced than in those species; and also owing to the large size of the conspicuous black spots below. The fifth spot of the discal series on the forewing is especially large and elongated; but these spots are liable to 'sport' in many species of *Lycænidæ* (notably in the genus *Zizera*, Moore), and too much reliance should not be placed on this peculiarity, especially in the absence of a larger series of this form, which may represent but an occasional sport of a commoner local form.

657. **Lycæna biluchа,** Moore.

L. biluchа, Moore, Journ. A. S. B., vol. liii, pt. 2, p. 24 (1884), id., Swinhoe, Trans. Ent. Soc. Lond., 1885, p. 340, n. 18.

HABITAT: Chaman, S. Biluchistan, April and May; Quetta, May and June.

EXPANSE: ♂, 1·2; ♀, 1·1 inches.

DESCRIPTION: "MALE. UPPERSIDE, *both wings* brilliant, glossy, opalised, lilacine cobalt-blue, the exterior margin with a very slender black border. *Cilia* brown, with a broad white edge. UNDERSIDE, *both wings* pale lilacine ochreous-grey, the base slightly metallic-green. [*Cilia* whitish, with an anteciliary dark fine line.] *Forewing* with a small round white-bordered black spot in the middle of the cell, a prominent streak at the end of the cell, a transverse discal row of seven spots, and a marginal double row of pale brown white-bordered lunules. *Hindwing* with a prominent white-bordered black spot in the middle of the cell, one above it, a less distinct spot below it, and a narrow spot on abdominal margin, a streak at end of the cell, and a discal curved interrupted row of eight spots; a marginal row of white-

bordered narrow black spots, each surmounted by a black-lined reddish lunule." (*Moore*, l. c.) FEMALE. UPPERSIDE, *both wings* smoky-brown, with a submarginal series of indistinct orange lunules, enclosing indistinct blackish spots on the hindwing. *Forewing* with a distinct black disco-cellular spot. UNDERSIDE, *both wings* pale ochreous-brown, all the spots as in the male but larger and more prominent, and with a submarginal series of distinct orange lunules. I possess but a single specimen of this sex from Quetta taken the same day as numerous males.

The type of this species is in the Indian Museum, Calcutta. It is extremely near to Alpine specimens of *L. eros*, Ochsenheimer. the male differs in the forewing being rather broader, the outer black margin to both wings on the upperside a trifle less wide and not at all macular on the hindwing; on the underside of the hindwing the discal white streak which is present, but not prominent, in *L. eros*, is entirely absent in *L. bilucha*, and the orange marginal spots are more obscure. The tint of blue on the upperside is also certainly less smalt and more purple than in *L. eros*. I possess numerous specimens taken at Quetta in May and June by Lieut. E. Y. Watson.

658. **Lycæna pseuderos**, Moore.

Polyommatus pseuderos, Moore, Proc. Zool. Soc. Lond., 1879, p. 138.

HABITAT: Sind Valley, Kashmir.

EXPANSE: ♂, 1·1; ♀, 1·2 inches.

DESCRIPTION. "MALE. UPPERSIDE, *both wings* smalt-blue, with somewhat broad greyish black maculated exterior borders. *Cilia* with a blackish inner line. UNDERSIDE, *both wings* pale ochreous grey. *Forewing* with a white circled black dot in middle of the cell, a streak at its end, a discal series of six spots and a marginal row of less distinct black spots bordered inwardly by a pale ochreous red and black lunule. *Hindwing* speckled with green and black at the base; a transverse subbasal series of four white-circled black spots, a curved discal series of seven similar spots, a paler streak at the end of the cell, a very prominent row of marginal spots bordered by an inner ochreous-red and black lunule and an intervening short longitudinal discal white dash. *Cilia* white. FEMALE. UPPERSIDE, *both wings* brown, with a submarginal series of small ochreous red lunular spots. UNDERSIDE, *both wings* darker-coloured than male; markings the same."

"Allied to *P.* [=*L.*] *eros*, Ochsenheimer differing above in having the outer margins more decidedly maculated with greyish-black, and in the forewing beneath having no spots at the base, the discal row of spots also are disposed in a more linear series, and the ochreous red borders to the marginal spots are less dentated with black on their inner border." (*Moore*, l. c.)

This species is unknown to me, and I have seen nothing in India approaching it except *L. bilucha*, Moore. Though I was all through the Sind Valley, Kashmir, in June, 1879, and again in 1887, I did not come across it, it probably occurs at some other time of the year if it is to be found in that valley at all.

The third group contains but four species, the males of which are blue on the upperside with a narrow outer black border; the undersides are grey, markings prominent, *hindwing with two or three black anal spots, sometimes a complete marginal series, ornated with metallic green scales*; this feature occurs in both sexes, and is peculiar to this group, and to *L. devanica*, Moore, of the first group, which however can be distinguished from all the species of this group by having the cilia of both wings in both sexes spotted with black instead of being white throughout, and the male having the blue coloration of the upperside confined to the basal two-thirds of the wings instead of nearly reaching to the outer margins. The first species, *L. bracteata*, Butler, is of small size, the coloration of the male on the upperside (if it be, as is said, the same as in *L. argus*, Linnæus) is dark blue, the cilia very broad and pure white; the female has a considerable portion of the basal areas of both wings on the upperside also blue. It occurs in Afghanistan. The second species, *L. tamudra*, Moore, is rather larger than *L. bracteata*, the coloration of the male on the upperside is pale

lavender-blue, the cilia much narrower, grey not pure white, the female is dull smoky black, the blue coloration confined to the bases of the wings. It occurs in Ladak and Baltistan. The third species, *L. chamanica*, Moore, is also small, and may perhaps be known from *L. bracteata* and *L. samudra* by having two anal spots only on the underside of the hind-wing sprinkled with metallic-green scales; in *L. bracteata* and *L. amudra* there is a complete marginal series. The fourth species, *L. loewii*, Zeller, is as a rule considerably larger than the preceding; the coloration of the male on the upperside is smalt-blue; all the markings of the underside particularly prominent. It occurs in Biluchistan as well as in Asia Minor.

659 **Lycæna bracteata**, Butler.

L. bracteata, Butler, Proc. Zool. Soc. Lond., 1880, p. 407, n. 12, pl. xxix, fig. 4, *male*.

HABITAT. Kandahar.

EXPANSE. ♂, 1·1; ♀, 1·1 inches.

DESCRIPTION. "MALE. Allied to *L. argus*, Linnæus, with which it agrees on the upperside. UNDERSIDE, *both wings* considerably paler, with all the black spots much smaller and distinctly white-bordered, the orange spots wholly absent from the *forewing*, and the orange borders of the *hindwing* only represented by small ochreous lunules above the metallic spots, the latter silvery green with black centres instead of margins, extremely small towards the apex, but increasing in size towards the anal angle. FEMALE. UPPERSIDE, *both wings* of a more pinky lilac colour than the male. *Forewing* with a considerably broader, but brown instead of black, border, a well-defined black discocellular stigma. *Hindwing* with brown costal border, outer margin black, preceded by five or six rounded blackish spots. UNDERSIDE, *both wings* altogether paler than in the male, but the example is evidently not a fresh one, so that this character may be due to fading."

"The female is utterly unlike that sex of *L. argus* on both surfaces, being in coloration almost like a male insect." (*Butler*, l. c.)

"Found in May, and common in June." (*Roberts*.)

I have not seen a specimen of this species, it may perhaps be known by having a complete marginal series of metallic green spots on the underside of the hindwing.

I append a description of *L. argus*, Linnæus, with which Mr. Butler compares *L. bracteata*.*

660. **Lycæna samudra**, Moore.

Polyommatus samudra, Moore, Proc. Zool. Soc. Lond., 1874, p. 574, pl. lxvii, fig. 2, *male*.

HABITAT. Gol and Skardo, Baltistan.

EXPANSE. ♂, 1·12 to 1·35, ♀, 1·25 to 1·40 inches.

DESCRIPTION. "MALE. UPPERSIDE, *both wings* pale lavender blue, exterior margins and end of veins slightly fuliginous. *Hindwing* with the anterior border slightly fuliginous, costal edge white, abdominal margin greyish white. UNDERSIDE, *both wings* greyish-white, slightly greenish at the base of the hindwing. *Forewing* with a discal transverse recurved row of black spots, each with a white border; a narrow white bordered black streak at end of the cell, and a submarginal series of blackish lunules. *Hindwing* with a series of eight small white bordered black spots, two being near anterior margin towards the base, five on the disc, and one on abdominal margin; a pale bordered short black streak

* *Lycæna argus*, Linnæus, *Papilio argus* Linnæus, Syst. Nat., ed. x, vol. i. pt. 2, p. 483, n. 152 (1758). HABITAT. Greater part of Europe, Asia Minor, and Armenia. EXPANSE. *Male* and *female*, 1·0 to 1·1 inches. DESCRIPTION. "MALE. UPPERSIDE, *both wings* dark blue nearly the same colour as *L. ægon*, Wiener Verzeichniss, which it altogether greatly resembles, the hind marginal border however, is narrower and more defined, the hind marginal spots of the hindwing are more distinct, and the white marginal *ciliæ* are very narrow, not broad, as in *L. ægon*. UNDERSIDE, *both wings*, ground colour uniform brownish grey, the medial row of spots on the *forewing* is more even, the last spot but one from the inner margin being more in a line with the rest, and not, as it were thrust inwards, as in *L. ægon*; the silvery spots of the *hindwing* on the hind margin are much more distinct than in *L. ægon*. The anterior tibiæ are not provided with spines. FEMALE. UPPERSIDE, *both wings* almost entirely resemble those of the female of *L. ægon*, but the orange hind marginal spots are rather more distinct. UNDERSIDE, *both wings*, as in the male. (*Lang*, Butt. of Europe, p. 105, n. 6, p. xxiii, figs. 2, *male* and *female* (1884).

at end and a dot within the cell; a submarginal series of narrow black lunules with inner white borders, and a marginal row of small metallic silvery spots which are slightly bordered within with red. FEMALE. UPPERSIDE *both wings* differ from the male in being anteriorly and the veins broadly fuliginous. UNDERSIDE, *hindwing* differs from the male in the partial absence of the discal series of spots. *Cilia* white, slightly brown at the ends of the veins. *Antennæ* black, ringed with white" (*Moore*, l. c.)

The only Indian species with which *L. samudra* can be confounded is *L. bracteata*, Butler, a species which I have not seen unfortunately. I have pointed out in the notes on this group (p. 77) how, as far as I know, these two species differ; they occur in quite different localities and are probably quite distinct, though in this genus particularly it is often very difficult in words to define the minute but quite perceptible differences that exist in coloration and markings. *L. samudra* is very close to, if indeed really separable from, *L. christophi*, Staudinger, from Turkestan and Persia.* Mr. H. J. Elwes has sent me a single female specimen of this species, which differs from females of *L. samudra* in being smaller, the upperside is blue not fuliginous, the blue colour in *L. samudra* is almost confined to the base of the wings, in *L. christophi* it occupies nearly the entire surface; the underside of the latter species is rather paler. Both species were described in the same year. *L. samudra* is a common species in Ladak and Baltistan wherever a certain small grey-leaved prickly bush occurs, on which its larva probably feeds.

661. **Lycæna chamanica**, Moore

L. chamanica, Moore, Journ. A. S. B., vol. liii, pt. 2, p. 23 (1884), id., Swinhoe, Trans. Ent. Soc. Lond., 1885, p. 340, n. 17.

HABITAT: Chaman, S. Biluchistan, April.

EXPANSE: ♂, 1·0 inch.

DESCRIPTION. "MALE [*nec* female]. UPPERSIDE, *both wings* lavender blue. *Forewing* with the extreme outer margin pale dusky brown. *Hindwing* with pale dusky brown costal and marginal border, the latter traversed by an outer row of whitish lunules. UNDERSIDE, *both wings* lilacine ochreous grey. *Forewing* with a large white bordered black lunule at end of the cell, a discal transverse row of six spots, and a marginal row of white-bordered dark brown spots, the transverse interspace between the discal and marginal spots also dark brown. *Hindwing* with three straightly-disposed transverse subbasal white bordered black spots, a lunule at end of the cell, and a curved discal interrupted row of eight spots; a marginal row of rounded dark brown spots, bordered by an inner dark brown lunular line, the anal and penultimate spot is black, specked with metallic-blue scales, and surmounted by orange-yellow. *Cilia* dusky brown, edged with white."

"This species is quite distinct from *L. bracteata*, Butler" (*Moore*, l. c.) Unfortunately I have not seen the latter species, so am unable to compare one with the other, but they are evidently very closely allied. See remarks on the next species.

The type and only known specimen of this species is in the Indian Museum, Calcutta. It was taken at Chaman, which, though occupied by us, politically, as part of Biluchistan, is really, geographically, in South Afghanistan; being at the western (Afghan) foot of the slopes of the Khojak Amran range, which separates Peshin from the Kandahar provinces. Colonel Swinhoe (l. c.) records this species from "Kandahar, November, Quetta, August and September." I have seen these specimens, they certainly are not *L. chamanica*, but appear to me to be *L. persica*, Butler.

662. **Lycæna loewii**, Zeller. (PLATE XXVI, FIG 167 ♂).

L. loewii, Zeller, Isis, 1847, p. 9, n. 35, id., Herrich Schaffer, Schmett. Eur., vol. i, figs. 434-437, (1849), id., Lang, Butt. of Eur., p. 141 (1884), *L. empyrea*, Freyer, Neuere Beitr., vol. vi, pl. dlxxiii, fig. 1 (1852); id., Gerhard, Mon. *Lyc.*, pl. xiii, figs. 2, *a—c* (1853).

HABITAT: Asia Minor; Biluchistan.

EXPANSE: ♂, 1·2 to 1·4; ♀, 1·25 to 1·35 inches.

* *Lycæna christophi*, Staudinger, Stettin Ent. Zeit., vol. xxxv, p. 87 (1874).

DESCRIPTION: MALE UPPERSIDE, *both wings* brilliant shining light "*adonis*" blue, much the same as in *L. bilucida*, Moore, but a little darker. *Forewing* with the costa very narrowly black, the outer margin broadly black, that colour ascending the veins on to the disc. *Hindwing* with the costal margin broadly fuscous, a distinct anteciliary black line of the same width as the cilia, inwardly defined by a whitish line between the veins, with black spots between the veins placed against the white line, the outer portions of the veins black. UNDERSIDE, *both wings* grey. *Forewing* with a prominent disco-cellular and discal series of six spots, the lower spot often geminated, all deep black, surrounded with a whitish ring; an anteciliary regular black line, then a series of oval black spots surrounded with whitish, beyond this a somewhat broad dark increasing fascia defined on both sides with whitish. *Hindwing* with a small spot on the abdominal margin near the base of the wing, four subbasal spots arranged across the wing nearly in a straight line, an elongated prominent disco-cellular spot, and an irregular discal series of seven spots, all large, black, prominent, and surrounded by a whitish line; a prominent anteciliary even narrow black line; a submarginal series of round black spots between the veins, the large one in the first median interspace, the two conjoined ones in the submedian interspace, and a minute one in the internal interspace on the abdominal margin sprinkled with metallic blue scales, and crowned broadly with orange; between the submarginal and discal series of spots is a lunulated black line. *Cilia* on both wings on both sides long and pure white. FEMALE. UPPERSIDE, *both wings* fuscous. *Forewing* with a submarginal and discal series of whitish spots placed in very regular order between the veins parallel with the outer margin. *Hindwing* with a discal series of whitish lunulated spots and a series of round black spots between the veins near the margin surrounded by a whitish ring, the two divided by the second median nervule the largest, and inwardly broadly crowned with orange. UNDERSIDE, *both wings* as in the male, but the ground-colour is darker, and all the markings are more prominent.

The above description is taken from the most prominently marked specimens out of a long series of this species taken by Lieut. E. Y Watson at Quetta and Gundak, Biluchistan, the latter place being in the Sarakola Pass, about ten miles to the south-east of Quetta. Colonel Swinhoe also possesses a pair taken at Gundak. All were taken in June. This species was also taken by the late Lieut Harvey, R E, in June, 1888, on the summit of the Khojak. Other specimens have the blue coloration of the upperside more purple in shade and less "*adonis*-" like, the cilia dusky, and all the markings smaller and less prominent below. There is every gradation between these extremes. Dr. O Staudinger has separated off a variety of *L. loewii* in his Catalogue of Palæarctic Lepidoptera, and referred to it in his Monograph of Asia Minor Lepidoptera (Hor Soc Ent Ross, vol. xiv, p 234, 1878), calling it *gigas*; this variety may also occur in Biluchistan. It is briefly described in Lang's Butt. of Eur, p 371, from the Taurus.

With reference to the preceding species *L. chamanica*, Moore, I have carefully examined the prehensores, and find that the type specimen is a male, not a female, as stated by Mr. Moore. There is a slight difference between it and *L. loewii* in the shade of blue of the upperside, which is the only character which I can find to separate them. The markings of the underside in this species are very characteristic, they agree exactly in *L. chamanica* and *L. loewii*. They are almost certainly one species.

The figure shows both sides of a male specimen from Quetta in my collection.

The fourth group contains two species only, one of which I have not seen. They may be known from all which precede them by having the spots on the underside of the hindwing white without black centres; this character obtains in the fifth group also, but that group has the ground-colour of the hindwing on the underside metallic green, while *L. lehana*, Moore, and *L. phereles*, var. *asiatica*, Elwes, have it grey. In the seventh group also the spots of the hindwing on the underside are often white, but on the upperside of the males the wings are fuscous with the base sprinkled with metallic green scales, while in the species of this group the wings are blue. The first species, *L. lehana*, occurs in Ladak, the second species, *L. phereles*, var. *asiatica*, in Native Sikkim.

663. **Lycæna lehana,** Moore.

Polyommatus lehanus, Moore, Ann. and Mag. of Nat. Hist., fifth series, vol. i, p. 230 (1878); idem, id. Scient. Res. Second Yarkand Mission, Lep., p. 6, n. 20, pl. i, fig. 6, *male* (1879).

HABITAT: Leh (11,538 feet), Ladak.

EXPANSE: ·9 to 1·0 inch.

DESCRIPTION "Allied to *P.* [=*L.*] *pheretes*, Hübner [found in Norway, Sweden, Lapland, the Swiss Alps, Pyrenees, and South Siberia]. MALE. UPPERSIDE, *both wings* violet-blue, somewhat brownish-blue at the margins. *Cilia* white. UNDERSIDE, *both wings* leaden grey, palest at the apex and on the hindwing. *Forewing* with a white-bordered black spot at end of the cell, and a transverse discal oblique series of five spots. *Hindwing* with a large triangular greyish-white spot at end of the cell, and a series of eight small round spots recurving from near base of costa across the disc to anal angle." (*Moore*, l. c. in Ann. and Mag. of Nat. Hist.)

The type of this species, now in the Indian Museum, Calcutta, was taken by the late Dr. F. Stoliczka at Leh on 8th September, 1873. I took another male at Zara, on the Leh Road, Ladak, on 13th July, 1879. These are the only two specimens known. They differ chiefly from *L. pheretes* in their much smaller size, 1·00 inch as against 1·25 inches. The shade of blue on the upperside and the black marginal line being blurred are slight points of difference between the type specimen and *L. pheretes*, but the specimen I took is of precisely the same shade of blue, and the marginal black line is not blurred, though not quite as sharply defined as in *L. pheretes*. The markings of the underside are very similar. It is doubtful if *L. lehana* will ultimately survive as a species distinct from *L. pheretes*.

664. **Lycæna pheretes,** Hübner, var. **asiatica,** Elwes.

L. pheretes, Hübner, var. *asiatica*, Elwes, Proc. Zool. Soc. Lond., 1882, p. 402; idem, id., Trans. Ent. Soc. Lond., 1888, p. 382, n. 225.

HABITAT: Native Sikkim.

EXPANSE: ♂, 1·1 inches.

DESCRIPTION: "MALE and FEMALE. Differs from *L. pheretes*, Hübner, in the narrower and more pointed *forewing*, and in having much more green gloss on the UNDERSIDE."

"I was at first disposed to consider this a new species, but noticing that Dr. Staudinger, in his list of the Lepidoptera of Tarbagatai in Central Asia (Stett. Ent. Zeit., 1881, p. 263), mentions that *L. pheretes*, Hübner, has the same difference of colour there, I do not think the small number of specimens I have received (four females and two males) justify me in separating the species at present, though the difference, if constant, is considerable. I know no *Lycæna* at all like it in the Himalayas, though *L. ellisi*, Marshall, which occurs at high elevations in the N.-W. Himalayas, seems allied to, though very distinct from, it." (*Elwes*, l. c. in Proc. Zool. Soc. Lond.)

"Since writing the above description I have received no more of this form from Sikkim, but have three specimens agreeing with them from Ladak, and also three pairs from Mongolia and Turkestan, which are like the European insect. These confirm my opinion that the Himalayan form of *pheretes* is distinguishable from others by its more pointed forewing and a somewhat deeper shade of blue." (*Elwes*, l. c. in Trans. Ent. Soc. Lond.)

I know nothing of this species but what is given above. It is the only species of the genus that has been recorded east of Kumaon within Indian limits. *L. ellisi* belongs to quite a different group, Mr. Elwes' species being allied to *pheretes* and not to *orbitulus*, Esper, which is the type of the group to which *L. ellisi* belongs. As Mr. Elwes says that his Sikkim specimens agree with Ladak ones, his varietal name *asiatica* will have to make way for Moore's older name *lehana*, but in my opinion neither name will ultimately stand.

The fifth group contains three species, and as far as I know is confined to India. In the males the upperside is more or less blue, the underside of the hindwing metallic-greenish with indistinct white spots, and in this respect differs from all the Indian species of the genus. The

first species, *L. galathea*, Blanchard, has the blue coloration extending nearly up to the margin of the forewing in the male, the margin is narrowly black. The second species, *L. metallica*, Felder, is considerably smaller than *L. galathea*, and has the blue coloration of the upperside of the forewing confined to the basal two-thirds of the wing, leaving a well-defined black border beyond. The third species, *L. omphissa*, Moore, has the blue colora ion of the male on the upperside still more confined to the base of the forewing, leaving a black border beyond, but ill-defined; it is also a larger species than *L. metallica*, and the blue colour is of a much more purple shade and is less shining.

665. **Lycæna galathea**, Blanchard.

L galathea, Blanchard, Jacquemont's Voy. dans l'Inde, vol iv, Zoologie Insectes, p 21, n 17, pl i Insectes, figs. 5, 6, *male* (1844), *Polyommatus galathea*, Moore, Proc. Zool Soc Lond., 1874, p 271, n 66; idem, id., Scien. Res Second Yarkand Mission, Lep., p 6, n 23 (1879), *Polyommatus nycula*, Moore, Proc Zool. Soc. Lond., 1865, p 503, n 101, pl xxxi, fig 3, *male*, id., Lang, Ent Month Mag., vol v, p. 37 (1868), *Lycæna nycula*, Staudinger, Ex Schmett., p. 272, pl xciv, *male* (1888).

HABITAT: Pangi, *Kashmir*, *Kunawar*, *Kulu*, *Narkunda*.

EXPANSE: ♂, 1·4 (*Blanchard*), 1·3 to 1·6; ♀, 1·3 to 1·6 inches.

DESCRIPTION MALE "UPPERSIDE, *both wings* deep cerulean blue, with the margin black UNDERSIDE, *forewing* cinereous with a fascia of black dots circled with white. *Hindwing* pale greenish adorned with white dots"

"This butterfly is of a beautiful azure slightly violaceous-blue on the UPPERSIDE of *both wings*, with a broad black border. *Cilia* white with a single greyish border. UNDERSIDE, *forewing* cinder-grey, darker towards the margins than at the base, a black spot bordered with white at the end of the discoidal cell, and between this spot and the margin is a transverse series of dots or small spots more or less rounded, black and circled with white; these spots are six in number. *Hindwing* very pale green, a little coppery, with a small white crescent-spot towards the end of the discoidal cell, and beyond a transverse very sinuous series of small rounded spots, to the number of seven, of a whitish colour, and ill-defined. *Body* covered with bluish-grey hairs on the upperside, with white hairs on the underside." FEMALE. UPPERSIDE, *both wings* smoky black. *Cilia* white. *Forewing* with three increasing quadrate orange spots towards the anal angle *Hindwing* with three, four or five very large almost quadrate (their anterior ends rounded) orange spots on the outer margin UNDERSIDE, *forewing* marked like the male, but with two orange spots (the lower one germinated) at the anal angle. *Hindwing* marked like the male. The orange spots on the upperside are larger than in any species of *Lycæna* known to me.

"This *Lycæna* is near to *L. cyllarus*, Fabricius, [? Rottenburg, which occurs in parts of Europe, Northern and Western Asia and Amurland], but can easily be distinguished by the spots on the outer margin of both wings, also by the green coppery colour which is spread over the entire surface of the hindwing. Mr. Jacquemont collected a single male specimen in Kashmir." (*Blanchard*, l. c.)

This very beautiful species is by no means common in Kashmir, where it has been taken by Mr. J. H. Leech and myself in June and July in several places; Mr. Robert Ellis has taken it in Pangi in considerable numbers in July; it has been taken by Dr T. C. Jerdon at Goolmerg in July and August, 1867, and Dr. F. Stoliczka obtained it as late as August 10th at Sonamerg, Kashmir. Mr. Ellis obtained a rather curious aberration at Pangi, in which the blue coloration of the upperside (of a male) is much darker than usual, and is confined to the basal two-thirds of the wings In many specimens the metallic green of the hindwing on the underside is found on the apex and less broadly on the outer margin of the forewing also. Typical *L. galathea* is confined apparently to the damp richly-wooded portions of Kashmir and the neighbouring states at from 7,000 to 12,000 feet elevation. I am, however, obliged to include *L. nycula*, Moore, with this species, a step which considerably adds to its easterly range: this form has been taken within 40 miles of Simla, and by Mr. P. W Mackinnon plentifully in

July and August in Tehri Gurhwal. A description of *L. nycula* with my remarks on it is given below. *

666. **Lycæna metallica**, Felder.

L. metallica (*female only*), Felder, Reise Novara, Lep., vol. ii, p. 283, n. 361, pl. xxxv, fig. 9, *male* (*nec figs.* 7 and 8), (1865); id., Moore, Proc. Zool. Soc. Lond., 1882, p. 247.

HABITAT: Lahoul, Ladak.

EXPANSE: ♂, ♀, 1·2 inches.

DESCRIPTION: MALE (*nec* female). "UPPERSIDE, *both wings* hoary-fuscous. *Forewing* with the basal two-thirds, *hindwing* with the interior area metallic bluish. UNDERSIDE, *forewing* more palely hoary-brownish, near the base above the costal nervure bluish-greenish, a narrow disco-cellular spot, and seven others exterior rounded in a bent series blackish-fuscous circled with whitish. *Hindwing* green palely bronzed, with the veins outwardly, and the margin narrowly within the anteciliar line hoary-brownish, the disco-cellular litura and small dots beyond it in an angulated series whitish, badly defined."

"This beautiful insect is most closely allied to *L. cyllarus*, Fabricius." (*Felder*, l. c.)

The above description exactly applies to the males of a species of *Lycæna* of which large series have been taken in Lahoul and Ladak, and of which the female is brown above, and the underside resembles that of the male. As these insects have not been described under any other name, it will be both right and convenient to retain for them the name *metallica* given by Dr. Felder to the male shewn in his figure 9 under the misapprehension that it was the female of an entirely distinct insect, which he also named *metallica*, but which is distinct from his other *metallica*, and which if it be not *L. galathea*, Blanchard, has not apparently been since taken or recorded. It may be accepted as an invariable rule that in this and allied groups the females on the underside resemble the males almost exactly; but in this case the assumed male of Felder's supposed female *metallica* differs considerably on the underside from the insect mated with it. The above description may therefore stand for *metallica* male: while the FEMALE is smoky-black on the UPPERSIDE of *both wings*, the base irrorated more or less with blue scales; no orange markings whatever; the UNDERSIDE of *both wings* as in the male

I append as a footnote† below Felder's description of the male shewn in the figs 7 and 8 of his plate xxxv. It may apply to males of the *nycula* form of *L. galathea*, Blanchard In

* *Lycæna nycula*, Moore, *Polyommatus nycula*, Moore, Proc. Zool. Soc. Lond., 1865, p. 503, n. 101, pl. xxxi, fig. 3, *male*. HABITAT: Kunawur, Kashmir, Narkunda. EXPANSE: *Male*, 1·25 inches (*Moore*), actual measurement of type specimen, 1·4; *male*, 1·25 to 1·60, *female*, 1·3 to 1·6 inches. DESCRIPTION: MALE, "UPPERSIDE, *both wings* dark lilac-blue, *cilia* and inner margin of *hindwing* whitish. UNDERSIDE, *forewing* pale purplish cream-colour, bluish-grey along exterior margin; a spot closing the discoidal cell, and a linear series of five spots medially across the disc, white. *Hindwing* metallic bluish-grey. *Body* white." (*Moore*, l. c.)

"This species is not common. It frequents the beautiful flower-carpeted pasture-lands on mountain-sides in Kunawar, at 11,000 to 12,000 feet—those smiling 'alps' where the villagers drive their herds when the early summer has set in, and the melting snow leaves this gay carpet of flowers on spots which for many months had remained hidden beneath a thick snowy mantle." (*Note by Colonel A. M. Lang, R.E.*)

The type of this species, a male, labelled by Colonel Lang himself "Kunawar, N.-W Himalayas," and by Mr. Moore "*Polyommatus nycula*, male (type), Moore," is in the Indian Museum, Calcutta. It differs from typical *L. galathea*, Blanchard, in having all the spots of the forewing on the underside white. There is a similar specimen taken by Mr. A. Grahame Young at 9,000 feet in September also in the Museum. In Colonel Lang's collection there are four males and three females taken by him in "Middle Kunawar (Kazhang Valley, 12,000 feet, 10th July, 1865; Wungur Valley, 11,000 feet"); one male and one female "Upper Kunawar (below Runang pass, 13,000 feet)"; and three males "Narkunda, near Simla, 9,000 feet." These specimens show great variation; in some of them the white spots on the underside of the forewing are immaculate, others are slightly marked with black in the middle, others again are black spots with white outer rings, in fact, are *L. galathea*. In my opinion the two species cannot be separated; there is every gradation between them. The female is exactly like that sex of *L. galathea*; all the four specimens in Colonel Lang's collection have the white spots above-mentioned centred with black. Every variation occurs also in the specimens from Tehri Gurhwal.

† *Lycæna*—(*male* only), Felder, Reise Novara, Lep., vol. ii, p. 283, n. 361, pl. xxxv, figs. 7, 8, *male* (1865). HABITAT: Ladak. EXPANSE: *Male*, 1·3 inches. DESCRIPTION: "MALE. UPPERSIDE, *both wings* dilute violaceous-cyaneous, a whitish striga before the cilia, outwardly powdered with fuscous. *Forewing with* the tips of the veins and the margin increasingly hindward, *hindwing* with the costal border and the external margin fuscous. UNDERSIDE. *Forewing* very pale hoary-brownish, at the base and at the apex, the *hindwing* entirely metallic bluish-greenish. *Forewing* with a rounded spot, *hindwing* with a litura on the disco-cellulars and a bent fascia of rounded spots beyond the disc whitish, broader in the forewing and in the hindwing joined to a fuscous shadow." (*Felder*, l. c.) It may be noted that in the text Dr. Felder does not refer at all to his fig. 9, which I have taken as typical of the species.

any case it applies to insects distinct from those shewn in his figure 9, which I here retain as *metallica*: and if hereafter his figs. 7 and 8 are proved to denote a distinct species, it will need to be renamed.

I possess seventeen males and five females of *L. metallica* taken in the Chandra Valley, Lahoul, at 10,300, 10,400, 10,500, 11,000, and 11,300 feet at different dates in July and August by Mr. A. Grahame Young; and at Sakti village, south side of the Chang La, Ladak, 13,000 feet, in July, by Mr. R. D Oldham. *L. metallica* may be known from *L. galathea*, Blanchard, and *L. omphissa*, Moore, by its uniformly smaller size; the male on the upperside having the blue coloration of a different shade, being bluish-green, the forewing with the blue area sharply defined, leaving the outer third of the wing black, the veins crossing the blue area also black.

667. **Lycæna omphissa,** Moore

Polyommatus omphissa, Moore, Proc. Zool. Soc. Lond., 1874, p. 573, pl. lxvi, fig. 2, *male*.

HABITAT: Dras Valley, Ladak.

EXPANSE: ♂, 1·2 to 1·5; ♀, 1·25 to 1·40 inches.

DESCRIPTION: "Allied to *P* [=*L.*] *galathea*, Blanchard. MALE. UPPERSIDE, *both wings* very dark purple, the base only suffused with blue. UNDERSIDE, *forewing* pale greyish fawn-colour, disc suffused with fuliginous, a prominent disco-cellular white-bordered black streak and transverse discal row of six spots. *Hindwing* metallic golden green, a distinct white disco-cellular spot, and angular discal series of white spots. FEMALE. UPPERSIDE, *both wings* glossy vinous purple, with indistinct dull orange marginal spots. *Cilia* white, with brown inner line." Otherwise as in the male. (*Moore*, l. c.)

This is a very distinct species, and separable at a glance from *L. galathea*; in the male the blue of the upperside is of a much deeper shade and restricted to the base of the wing. The markings of the underside do not differ. The female may be known by the marginal orange spots of the upperside being obsolete, instead of large and prominent. It is very near to *L. metallica*, Felder; the males can be distinguished by their larger size, the more restricted blue area of the upperside, and the purplish tinge of the blue, which is greenish in *L. metallica*. The females of the two species are exactly alike. I took numerous specimens in the Dras Valley, Ladak, in June, 1879 and 1887.

The sixth group contains but a single species in India, which, according to Mr. Butler, belongs to the genus *Scolitantides*, Hubner, all the species of which "have a peculiar type of coloration, the fringe of the wings being alternated with black and white, and the spots of the under surface large and black."* Dr. Lang gives three species of this group as occurring in Europe, *L. bavius*, Eversmann, which is found in South Russia, Asia Minor, and Syria; *L. orion*, Pallas, which occurs in Central and Southern Europe, Asia Minor, Armenia, South Siberia, and Amurland, and is a larger and much darker species than the third species, *L. hylas*, Wiener Verzeichniss, which occurs in Central and South-Eastern Europe, and Western Asia including Kashmir and Ladak. On the upperside the male is greyish-blue; on the underside white, the black spots very prominent, and the two marginal series on the hindwing enclosing a series of orange lunules. The female is smoky-black on the upperside, the base of the wings irrorated with purplish scales, and with a distinct disco-cellular black spot on the forewing, and indistinct marginal lunules on the hindwing, sometimes with the orange band below showing through obscurely; the underside is like the male. The prominence of the black-spotting of the cilia is a marked characteristic of this group, and is only found slightly in *L. medon*, Hufnagel, and *L. devanica*, Moore, of the first and second groups.

668. **Lycæna hylas,** Wiener Verzeichniss.

Papilio hylax,† Wiener Verzeichniss, p. 185, n. 16 (1776); id., Hübner, Eur. Schmett., vol. i, figs. 325—327 (1798-1803); *Polyommatus hylax*, Godart, Enc. Méth., vol. ix, p. 687, n. 216 (1823); *Papilio hylus*, Fabricius,

* Butler, Cat. Fab. Lep. B. M., p. 167 (1869).

† Dr. Lang in his "Butterflies of Europe" calls this species by Bergsträsser's name *baton*, but I follow Mr. Kirby in giving precedence to the name *hylax* of the Wiener Verzeichniss. Dr. Lang uses the name *hylax* of Esper (not the *hylax* of the Wiener Verzeichniss) for the species generally known as *dorylas*, Wiener Verzeichniss and Hübner.

Mant. Ins., vol ii, p 75, n. 696 (1787), *Hesperia kylus*, id., Ent. Syst., vol. iii, pt., 1, p. 300, n. 136 (1793) *Scolitantides kylus*, Butler, Cat Fab Lep B M, p, 167, n 1 (1869), *Papilio baton*, Bergsträsser, Nomencl, vol. ii, p 18, vol iii, pl lx, figs 6—8 (1779) *Lycæna baton*, Elwes, Proc. Zool Soc Lond, 1882, p. 889, id, Lang, Butt of Eur, p 109, n 14, pl xxiv, figs 2, *male* and *female* (1884), *Papilio kylactor*, Bergsträsser, l. c., vol. ii, pl xlvii, figs 7, 8 (1779), *Papilio amphion*, Esper, Schmett, vol i, pt 2, pl liii, fig 1 (1780), pl. lxxix, fig 3 (1782), *Polyommatus vicrama*, Moore, Proc Zool Soc. Lond, 1865 p 505, n 105, pl. xxxi, fig. 6, *female*, *Scolitantides cashmirensis*, Moore, l c, 1874, p 272 n 69, id, Butler, l c, 1880, p 408, n. 13.

HABITAT. Central and South Eastern Europe, Western Asia (*Lang*); Askold, Vladivostock (*Elwes*); Afghanistan, Baluchistan, Ladak, Kashmir, Lahoul, Kunawur.

EXPANSE: ♂, 83 to 1 2; ♀, 92 to 1 12 inches.

DESCRIPTION "MALE. UPPERSIDE, *both wings* dull greyish blue, exterior margins brown *Cilia* broad, white, with brownish spots. UNDERSIDE, *both wings* greyish cream-colour, exterior margins defined by a black line. *Forewing* with a medial discoidal spot, another closing the cell; a series of spots recurving transversely from costa to posterior margin, and a submarginal row of spots black, each encircled with white *Hindwing* with thirteen white-encircled black spots, and a marginal double row of red interspaced black lunules. *Cilia* as above FEMALE UPPERSIDE *both wings* bluish-purple brown, marked as in male." (*Moore*, l. c of *Polyommatus vicrama*.)

"An uncommon species, to be seen flitting from flower to flower on moist meadow-land fed by streams from melting snow beds Chini in Middle Kunawur, and the Alps above the Chinese village of Shipkee in Thibet, are the localities; May, June, and July the season" (*Note by Colonel A M Lang, R E*)

As far as Indian specimens of *L kylas* are concerned, I find that within rather narrow limits it is a variable species The underside varies slightly from whitish to grey, and consequently the white rings round the black spots are more prominent in some specimens than in others; the spots also vary in number, in some specimens there are two spots close together in the middle of the cell, one below them in the submedian interspace, and the discal series of spots has an additional spot on the costa, in all three more spots than the normal complement; the spots of the discal series on the forewing are sometimes rounded, sometimes somewhat quadrate, and on the upperside the marginal palish lunules on the forewing and the dusky marginal spots on the hindwing are sometimes present, sometimes absent All these differences are but slight, and on the whole I consider *L kylas* to be a fairly constant species. Mr. Moore describes one form of the species under the name *L cashmirensis* as below* This description is not comparative either with his *L vicrama* or the parent form *L kylas* Comparing the descriptions of *L vicrama* and *L. cashmirensis* I find the following differences noted:—

L vicrama	*L cashmirensis*
1. Upperside, both wings, with no disco cellular lunule	Upperside, both wings with a disco cellular lunule.
2. Upperside, forewing, with no marginal whitish lunules, hindwing with no marginal black spots	Upperside forewing, with marginal whitish lunules; hindwing with marginal black spots
3 Upperside, both wings, veins not blackish	Upperside, both wings, veins blackish
4 Underside, both wings, black spots white-encircled	Underside, both wings, black spots not white-encircled
5. Underside, both wings, ground colour greyish cream colour.	Underside, both wings ground-colour pale cream colour

* *Lycæna cashmirensis*, Moore *Scolitantides cashmirensis*, Moore, Proc Zool Soc Lond, 1874, p 272, n 69; id, Butler, Proc Zool Soc. Lond, 1880 p 408, n 13 HABITAT Sonamerg, N E. Kashmir, Kandahar. EXPANSE *Male*, 1 1, *female*, 12 inches DESCRIPTION "MALE. UPPERSIDE, *both wings* pale greyish blue, slightly glossed with purple, veins blackish, a black disco-cellular lunule, and a blackish exterior margin, the latter bordered inwardly by whitish lunules, which are most prominent on the margin of the *hindwing*, where they encircle a series of black spots *Cilia* alternately white and black UNDERSIDE, *both wings* pale cream-colour *Forewing* with a pale black exterior marginal series of narrow spots, a decreasing submarginal series of darker spots, an irregular discal series of quadrate black spots, a disco-cellular spot, two spots within the cell and a small spot below it disposed in a triangle *Hindwing* with a marginal double row of black spots, which are joined together by an intervening parallel series of bright orange spots, a curved discal series of seven rounded black spots, three spots on anterior margin, a disco cellular lunule, and two [or three] small subbasal spots FEMALE UPPERSIDE, *both wings* dark fuliginous black, with a purplish gloss and blue scales scattered from the base"

"Allied to *S* [= *L*] *kylas* Wiener Verzeichniss, and to *S vicrama*, Moore." (*Moore*, l c)

"Very common here [Kandahar] at the end of May and in June, but was rather local in Kashmir." (*Note by Major Howland Roberts.*)

After a careful examination of a very large series of specimens of *L. hylas* obtained in the Western Himalayas, I cannot find that the points of supposed difference between these two species holds good; there are infinite slight gradations which link the two forms together, and these again to the European *L. hylas*.

L. hylas has a wide range in India, occurring to the eastward in Upper Kunawur, where Colonel Lang took it as high as 14,000 feet elevation above Shipkee. To the westward it is found as far as Kandahar. It does not appear to occur on the outer ranges of the Himalayas, though it is fairly common on the inner ranges in Kashmir, Baltistan, Ladak, &c, usually from 6,000 to 10,000 feet elevation, and always where a small-leaved prickly bush grows, on which its larva probably feeds. It differs a good deal in size. Colonel Lang's specimens from Upper Kunawur and Thibet, described as *P. vicrama* by Mr. Moore, and taken at a very great elevation, are very small, but I possess others taken much lower in Pangi and Ladak which are no larger. The markings of the underside are very prominent, and the spots vary in number but slightly. Mr. Moore, however, states that his *L. cashmirensis* has three spots near the base of the forewing on the underside disposed in a triangle. I have been able, out of the large series of this species before me, to discover only one pair, taken by myself in Ladak, which has these three spots; in all the other specimens I possess from very widely-separated localities the upper of the two spots in the cell and the one beneath the cell is absent. This character is evidently a trivial one and may be disregarded.

The seventh and last group contains three Indian species which have quite a distinct *facies* from all the other Indian *Lycænæ*, being fuscous on the upperside in both sexes, irrorated with metallic greenish scales at the base, and with prominent markings. The Indian species are allied to *L. pyrenaica*, Boisduval, a Pyrenees species, and to *L. orbitulus*, De Prunner, which occurs on the Swiss Alps and in the Tyrol, also on the Pyrenees, and has many described local races or allied distinct species from Lapland, the high mountains of Northern and Central Asia; and from Colorado, California, Washington Territory in America, and the Arctic region. As Mr. H. J. Elwes says:—"The distribution of the forms of this species [*L. orbitulus*] at many isolated points in the high alpine and arctic regions of the Palæarctic and Nearctic region is very curious, and worthy of a more detailed study."* Our first species, *L. jaloka*, Moore, occurs in Kashmir. The figure of it is so bad, and the description is insufficiently minute and precise, and is entirely non-comparative, so that I am doubtful even if it belongs to this group. I assume, however, that it does so, differing, as far as I can gather from the description, from the two other species on the underside of the hindwing in having no discal series of white spots, and from *L. leela*, de Nicéville, in having no spot in the middle of the cell on the underside of the forewing. The second species, *L. ellisi*, Marshall, occurs in Pangi and the adjoining Sanch Pass, and has the spots on the underside of the forewing entirely white. The third species, *L. leela*,† de Nicéville, occurs in Ladak, is larger than *L. ellisi*, has the spots on the underside of the forewing centred with black, and an additional spot in the discoidal cell.

669. **Lycæna jaloka,** Moore.

Polyommatus jaloka, Moore, Proc. Zool Soc Lond., 1874, p. 573, pl. lxvi, fig. 3, *male*.

HABITAT: Rajdiangan Pass, Sursungar and Stakpila Passes, and Baltal, Kashmir.

EXPANSE: ♂, ♀, 1·0 inch.

DESCRIPTION: "MALE. UPPERSIDE, *both wings* shining greenish-blue basally, outer margins blueish-purple, with a distinct black pale-bordered disco-cellular spot and a transverse discal row of pale blueish-white spots. UNDERSIDE, *forewing* pale grey, with indistinct pale-bordered disco-cellular spot, and a transverse discal row of blackish spots. *Hindwing* white, the base powdered with metallic blue; a broad irregular discal pale brown band enclosing a disco-cellular and two upper white patches. FEMALE. UPPERSIDE, *both wings* dark purplish-brown, glossed with greenish-blue; disco-cellular spot larger than in the male and

* Trans. Ent Soc. Lond., 1887, p 393.

† Leela is a Hindu god; in Hindustani it also means blue.

very prominent, discal spots whiter than in the male. UNDERSIDE, *forewing* pale fawn-colour, spots prominent, a blackish streak outside the discal spots. *Hindwing* with the irregular discal band tinged with yellow. *Cilia* white, with inner black line on the forewing and black dentate spots on the hindwing" (*Moore*, l. c.)

Mr. Moore in the above description gives no indication to what species his *L. jaloka* is allied, but from the description it appears to be of the *orbitulus* group. The figure of *L. jaloka* shows a very curiously-shaped insect, the wings very long and narrow, the inner margin of the forewing very long, the outer margin very straight, giving the forewing a truncated appearance.

670. **Lycæna ellisi,** Marshall.

Polyommatus ellisi, Marshall, Journ A S B, vol li, pt 2, p 41, n 6, pl iv fig 4, *male* (1882)

HABITAT: Pangi, 12,000 feet, June; Sanch Pass, Pangi, 14,000 feet, August.

EXPANSE ♂, ♀, ·9 to 1·05 inches.

DESCRIPTION: "MALE UPPERSIDE, *both wings* dark greyish black, the basal portions powdered with metallic greenish-golden scales, the outer halves with a bronzed sheen. *Forewing* with a dark-centred white spot at the end of the cell, and a discal series of four prominent white spots sometimes dark-centred. *Hindwing* also with a white spot at the end of the cell, and a small white one above it near the costa; a discal series of four white spots, corresponding with those on the forewing UNDERSIDE, *both wings* creamy-white. *Forewing* brownish on the disc, with the outer margin broadly paler, the spots of the upperside large, indistinct, and paler still *Hindwing* with the base metallic greenish-golden, deepening into brown up to the discal row of spots, the outer margin creamy-white, the spots of the upperside large, indistinct, white FEMALE UPPERSIDE, *both wings* differ from the male in lacking the brilliant metallic scales"

"The type specimen (which has been presented to the Indian Museum, Calcutta) was taken on the Sanch Pass in Pangi, North-West Himalayas, at an elevation of 14,000 feet above the sea in August, by Mr Robert Ellis, after whom I have named it. Several other specimens were taken at the same time all corresponding with the type specimen. Others were taken in Pangi in June at an elevation of 12,000 feet, which have less of the metallic sheen, and have the white spots on the upperside considerably smaller; these latter evidently belong to the same species, but whether they are seasonal or geographical varieties is uncertain" (*Marshall*, l. c.)

671. **Lycæna leela,** de N.

L. ? leela, de Nicéville, Journ A S B, vol lii, pt 2, p 66, n 2, pl 1, figs 3 *male*, 3a, *female* (1883).

HABITAT. Ladak.

EXPANSE: ♂, ♀, 1·1 to 1·2 inches.

DESCRIPTION "MALE UPPERSIDE, *both wings* blackish, powdered up to the discal row of spots with metallic pale green scales. *Forewing* with a prominent black white-encircled spot at the end of the cell, and a discal curved series of five (in one specimen) or six (in two specimens) whitish spots, with indistinct dark centres. *Hindwing* with a spot closing the cell, less prominently black than in the forewing, a white spot placed outwardly above it, and four spots on the disc, whitish UNDERSIDE, *both wings* greyish-white, pale brown on the disc, and the base pale greenish *Forewing* with a spot in the middle of the cell, a large one closing it, a discal series of six or seven spots, of which the two lower ones are smaller than the rest, and (when both are present) geminate, all black with prominent white margins; the outer margin almost pure white with an indistinct series of spots. *Hindwing* with a spot below the costa near the base, a very large spot at the end of the cell, a very irregular discal series of seven spots, and a marginal double series of coalescing lunules, white. *Cilia* very long and white. FEMALE. UPPERSIDE, *both wings* deeper coloured, with a few scattered pale greenish metallic scales at the base only *Forewing* with the discal series of spots prominently centred with black, and variable in number from four to six *Hindwing* with the spots smaller and less prominent than

in the male. UNDERSIDE *both wings* variable in tone of colour, being much darker in some specimens (including the type specimen figured) than in others the discal markings sometimes blurred and running into the pale margin beyond, otherwise much as in the male."

"Closely allied to *Polyommatus ellisi*, Marshall, but the male differing from the type specimen of that species in having the apex and the outer margin of the forewing more rounded; in *P. ellisi* the apex is acute, and the outer margin straight; the upperside of both wings paler in colour and more broadly irrorated with greenish scales, the discal spots more numerous; the markings on the underside throughout more prominent, and with an additional spot in the cell of the forewing. The colouring of the figure of *P. ellisi* is much too vivid, the metallic colouring of the base of the wings and the body is a very pale green."

"*Lycæna wosnesenskii*, Ménétriés (Cat. Mus. Petr. Lep., vol. i, pp. 58, 95, n. 964, pl iv, fig. 6, 1855), is also a closely allied species, the upperside being figured with the apex of the forewing very acute, the figure of the underside shewing it quite rounded. It is recorded from Kamtchatka."

"This species (*L. leela*) was found by me only on passes, the female figured was taken near the top of the Zoji-la on the Ladak side at about 11,000 feet elevation on June 27th, 1879; on July 2nd seven specimens of both sexes on the Mamyika Pass, Ladak, 13,000 feet; and, lastly, on July 3rd, seven more specimens on the Fotu-la, Ladak, at about the same elevation." (*de Nicéville*, l. c.)

The three preceding species are decidedly very closely allied, and are perhaps at best geographical varieties or local races only; hereafter, if larger series be collected from Ladak, Kashmir, Chumba, and intermediate tracts, it may be found that these forms are completely connected by intermediate gradations, and thus compose but one rather variable species. In the meantime they are recorded as distinct species—*L. jaloka* from Kashmir, *L. ellisi* from Pangi, and *L. leela* from Ladak.

Genus 109.—CHILADES, Moore. (PLATE XXVI).

Chiladæ, Moore, Lep. Cey., vol. i, p. 76 (1881).

"FOREWING, elongated, triangular in the female; *costal nervure* extending to nearly half length of the margin; *first subcostal nervule* free from costal nervure but running along its end, emitted beyond one-half before the end of the cell, *second* subcostal at one-third, *third* subcostal at one-sixth, *fourth* subcostal at one-half from third, and terminating before the apex; *fifth* subcostal [upper discoidal] from the end of the cell; *disco-cellular* nervules slightly oblique, nearly straight; *radial* [lower discoidal] nervule from their middle; *discoidal cell* long, extending to more than half the wing; *second median nervule* emitted at one-sixth before the end of the cell; *first* median beyond one-half before the end; *submedian nervure* straight. HINDWING, oval; *exterior margin* very convex; no tail; *costal nervure* arched at base, extending to apex; *first subcostal nervule* emitted at one-third before the end of the cell; *upper disco-cellular* nervule oblique, *lower* disco-cellular erect; *radial* nervule from their middle; *discoidal cell* short, broad; *third* and *second median nervules* emitted from the end of the cell, *first* median at one-half before the end; *submedian* and *internal nervures* straight. BODY small, short; *palpi* slender, porrect, second joint long, projecting two-thirds beyond the head, attenuated at its tip, clothed with long adpressed scales, third joint very long, naked; *legs* slender; *antennæ* with a stout grooved club. Type, *C. lajus*, Cramer" (*Moore*, l. c.)

The neuration of the forewing I should describe as follows: Costal nervure terminating just before the apex of the discoidal cell, slightly bent downwards or bowed just before its termination; first subcostal nervure bent upwards to meet that portion of the costal nervure which is bent downwards; second subcostal with its base a little nearer to the base of the first subcostal than to the base of the upper discoidal; third subcostal emitted from the subcostal nervure nearer the apex of the cell than of the wing; upper disco-cellular nervule wanting; middle disco-cellular emitted from the upper discoidal some little distance beyond its base. In the hindwing the second median nervule is emitted just before the lower end of the cell. The

genus is a very poor one, and can only be maintained for convenience, as, as far as I can discover, it does not differ structurally in the slightest degree from the genus *Lycæna*, Fabricius.

As far as I know, two species only have been placed in this genus One, *C. laius*, Cramer, occurs almost throughout India and Ceylon, but not in the Malay Peninsula, and is found again in Formosa and China In this species seasonal dimorphism of a very marked character obtains, the specimens flying in the winter having a prominent fuscous nebulous patch on the underside of the hindwing, which is entirely absent from the specimens that fly in the rains. The rains form of *C laius* is a very ordinary looking "blue," though the winter form of it is so peculiar from the presence of the patch mentioned above The other species *C trochilus*, Freyer, has a wide range, occurring in South Africa, North and South Tropical Africa, Extra-Tropical North Africa, South East Europe, Asia Minor, Persia, Aden, almost throughout India and Ceylon, but not in the Malay Peninsula, as far as is known, reappearing however in Java, Sumba, Sambawa, and Australia *C trochilus* in both sexes is glossy fuscous above, in the hindwing with a marginal row of round black spots, the anal ones of which are sometimes crowned with orange, and all on the underside very prominently black with greenish silvery metallic scales, and often crowned with orange It is a very small butterfly, perhaps the smallest but one occurring in India

I have been so fortunate as to discover the transformations of both the species of *Chilades*, a description of them will be found under the description of the species The larvæ and pupæ of both species are of the usual Lycænid shape, and the former are attended by ants.

Key to the species of Chilades.

A. Male and female more or less blue on the upperside the marginal spots on the underside of the hindwing never crowned with orange or ochreous or sprinkled with metallic green scales
672 C LAIUS India Ceylon Burma China

B Male and female entirely dull black on the upperside without any blue coloration the marginal spots on the underside of the hindwing crowned with orange or ochreous, and sprinkled with metallic greenish scales
673 C TROCHILUS Europe Africa Asia Minor Arabia Persia, throughout India, Ceylon, Burma Java Sumba Sambawa Australia

672 **Chilades laius,** Cramer (PLATE XXVI, FIGS 168, ♂ WET-SEASON FORM; 169, ♂ DRY SEASON FORM).

Papilio lajus, Cramer, Pap Ex, vol iv, p 62, pl cccxix, figs D, E, *female* (1780), *Polyommatus laius*, Horsfield and Moore, Cat Lep Mus L I C, p 21, n 7, pl xii, figs 1 *larva* 1a, *pupa* (1857), id, Moore Proc Zool Soc. Lond, 1878, p 702 *Lycæna laius*, Butler, Cat Fab Lep B M, p 171, n 19 (1869), *Chilades laius*, Swinhoe, Proc Zool Soc Lond, 1885, p 133, n 62, idem id, l c 1886, p 427, n 52, id, Doherty, Journ A S B, vol lv, pt 2, p 133, n 166 (1886), *Hesperia lajus*, Fabricius, Ent. Syst, vol iii, pt 1, p 296, n 126 (1793), *Polyommatus lajus*, Godart, Enc Méth, vol. ix, p 701, n 242 (1823) *P varunana* Moore, Proc Zool Soc Lond, 1865 p 772 pl xii, fig 6, idem, id, Proc Zool Soc Lond, 1878 p 702 *Chilades varunana*, id, Lep Cey, vol i, p 77, pl xxxv, fig 3, *male* (1881), idem, id, Proc Zool Soc Lond, 1882 p 245 id, Swinhoe, l c 1885, p 133, n. 63, idem, id, l c, 1886, p 427, n 51, id, Wood Mason and de Nicéville, Journ A S B, vol lv, pt. 2, p 365, n 111 (1886), *Polyommatus kandura* Moore, Proc Zool Soc Lond, 1865 p 772, pl xii, fig. 7, *female*, *Zizera kandura*, Swinhoe Trans Ent Soc Lond, 1885 p 341 n 24, *Lycæna brahmina*, Felder, Reise Novara, Lep, vol ii, p 279, n 350, pl xxxv figs 15, 16 *female* (1865)

HABITAT: Coromandel Coast (*Cramer*), Hong Kong, Formosa, China (*Butler*); N.-W. Himalayas; Bengal; Ceylon, Hainan (*Moore*), Quetta; Poona; Mhow (*Swinhoe*); Cachar (*Wood-Mason* and *de Nicéville*); Calcutta (*de Nicéville*), Bengal (*Felder*)

EXPANSE. ♂, 90 to 1 20; ♀, 1 00 to 1·25 inches.*

Wet-season form.

DESCRIPTION: "MALE UPPERSIDE, *both wings* dull purple blue, exterior margins with a slight pale brown border *Hindwing* with two or three ill defined blackish pale bordered

* Mr. Moore gives the expanse of his *P kandura* as 1 5 inches, this must be a mistake, the specimen figured measuring 1 05 only

marginal spots from anal angle. UNDERSIDE, *both wings* grey. *Forewing* with a brown white-bordered spot closing the cell, a transverse row of blackish white-bordered discal spots, and a double row of marginal white-bordered lunules. *Hindwing* with three [four] transverse subbasal jet-black white-bordered round spots, and a fourth [fifth spot] on the middle of the costa; a pale brown streak closing the cell, a discal series of dark brown spots, a submarginal row of brown lunules, and a marginal series of blackish triangular spots, all bordered with white. *Palpi* and *legs* above black, beneath white. FEMALE. UPPERSIDE, *both wings* brown. *Forewing* with a lower basal blue patch, and a narrow black spot closing the cell. *Hindwing* with the black white-bordered marginal spots more defined," a basal blue patch. UNDERSIDE, *both wings* as in the male. (*C. varunana*, Moore, l. c. in Proc. Zool. Soc. Lond., 1865).

Dry-season form.

DESCRIPTION: MALE. UPPERSIDE, *both wings* as in the male of the wet-season form. UNDERSIDE, *both wings* as in the wet-season form, but the *hindwing* with the anal third bearing a blackish nebulous patch. FEMALE. "UPPERSIDE, *both wings* bright purple olive. *Forewing* pale brown on apical and exterior margins. [*Hindwing* with] a row of small rounded darker brown marginal spots. UNDERSIDE, *both wings* white, at the base greyish white. *Forewing* with a dark brown white-bordered spot closing the cell, and a transverse discal series beyond, two marginal rows of dusky lunules. *Hindwing* with a large dark brown patch on the lower exterior quarter of the wing, a marginal and an irregular discal series of dark brown white bordered spots, those crossing the brown patch bordered with darker brown, a double row of marginal dusky lunules." (*C. kandura*, Moore, l. c. in Proc. Zool. Soc. Lond., 1865).

LARVA pale green at all stages, of the shade of the young leaves of the lime and pomolo bushes on which it feeds. When full grown it is about 7/16 of an inch in length, oblong-fusiform as usual, the head black, smooth, and shining, with a somewhat dark green dorsal line down the body, the whole surface but very slightly shagreened, and covered with extremely fine and short downy hairs. The constrictions between the segments slight. There are traces of two pale subdorsal lines, and there is a pale lateral line below the spiracles. The usual extensile organs on the twelfth segment short. This larva has no distinctive markings by which it can be easily recognised, it is altogether a very plainly-coloured and marked insect. I have found it commonly in Calcutta during the rains, the ant which attends it betraying its presence. The latter has been identified by Dr. A. Forel as "*Camponotus rubripes*, Drury (*sylvaticus*, Fabricius), subspecies *compressus*, Fabricius." PUPA green, of the usual Lycænid shape, with a dorsal and lateral series of somewhat obscure conjoined brownish spots on the upperside. Attached to the underside of the leaves of its food-plant in the usual manner. Mr. Moore has figured an entirly different larva, as the larva of this species.

No author except Mr. W. Doherty has placed the two very distinct forms which occur in the rains and dry-season respectively under one specific name. Should it be desired to separate them, *laius* (*lajus*), Cramer, *cajus*, Fabricius and Godart, *kandura*, Moore, and *brahmina*, Felder, represent the dry-season form, with the large black patch on the underside of the hindwing in both sexes; while *varunana*, Moore, represents the rainy-season form which lacks the black patch. Though these extremes are well-marked, I find that every gradation exists between them in the long series of specimens now before me. In every way the species is very variable; not only is the black patch both present and absent, but the other markings are sometimes very prominent, at others very obscure. The female on the upperside is sometimes almost entirely fuscous, just sprinkled with blue scales at the base of the wings, sometimes with almost as much blue as in the male, but of a more metallic sheen.

Colonel Swinhoe records this species from Quetta. I have seen the specimen, which, though very worn, is unquestionably *C. laius*. Quetta is, I think, a rather doubtful locality for it. It occurs, however, in the North-West Provinces and eastwards through Bengal to Upper Assam and Burma; it is found throughout continental and peninsular India and Ceylon; it has not been recorded hitherto from the Andaman and Nicobar Isles, or the Malay Penin-

sula and Archipelago, but it reappears again in Southern China. In India it may be confidently looked for wherever any trees allied to the orange grow.

Figure 168 shows the upper and undersides of a male wet-season form; Fig. 169 shows both sides of a male dry-season form, both from Bholahât, Malda, in my collection.

673. **Chilades trochilus**, Freyer.

Lycæna trochilus, Freyer, Neuere Beiträge Schmett., vol. v, p. 98, pl. cccxl, fig. 1 (1844); id., Herrich-Schäffer, Schmett. Eur., vol i, p. 128, pl. xlviii, figs. 224, 225, *male*; pl. xlix, fig. 226, *female* (1844); id., Wallengren, Kongliga Svenska vet.-akad. Handl., Lep. Rhop. Caffr., second series, vol. ii, p 41, n. 14 (1857); id., Trimen, Rhop. Afr. Aust., vol. ii, p. 256 n. 157 (1866); id., Lang, Butt. of Eur., p. 103, n. 6, pl. xxii, fig. 7 (1884); id., Trimen, South-Afr. Butt., vol. ii, p 52, n. 144 (1887); *Polyommatus trochilus*, Kirby, Eur. Butt., p. 99 (1862). *Plebeius trochilus*, Butler, Proc. Zool. Soc. Lond., 1886, p. 368, n. 50; *Zizera trochilus*, Butler, Proc. Zool. Soc. Lond., 1884, p 484, n. 14; id., Swinhoe, Trans Ent. Soc. Lond., 1885, p. 341, n. 25; idem, id., Journ. Bomb. N. H. Soc., vol. ii, p. 273, n 26 (1887); *Lycæna putli*, Kollar, Hügel's Kaschmir, vol. iv, pt. 2, p. 422, n. 8 (1848); id., Semper, Journ des Mus. Godef., vol. xiv, p. 160, n. 72 (1879). *Chilades putli*, Moore, Lep Cey., vol i, p 77, pl. xxxv, figs. 4, 4*a* (1881); idem, id., Proc. Zool. Soc. Lond., 1882, p 245; id., Swinhoe, Proc. Zool. Soc. Lond., 1884, p. 507, n. 27; idem, id., l. c., 1886, p. 427, n. 50; *Plebeius putli*, Butler, Proc. Zool. Soc Lond., 1886, p. 368, n. 51; idem, id., Ann. and Mag. of Nat. Hist, fifth series, vol. xviii, p 187, n. 30 (1886); *Everes putli*, Doherty, Journ. A. S. B., vol. lviii, pt. 2, p , n. (1889); *Lycæna isophthalma*, Herrich-Schäffer, Stett. Ent. Zeit., vol. xxx, p 73, n. 29 (1869); *Lycæna parva*, Murray, Trans Ent Soc Lond., 1874, p. 526, pl. x, fig. 1; *L. gnoma*, Snellen, Tijd. voor Ent., vol. xix, p. 159, n. 48, pl. vii, fig. 1 (1876).

HABITAT: South-Eastern Europe; many parts of Africa; Asia Minor; Syria; Persia; Aden; almost throughout India; Ceylon; Java; Sumba; Sambawa; Australia.

EXPANSE: ♂, ♀, ·6 to 1·0 inch.

DESCRIPTION: "MALE. UPPERSIDE, *both wings* violet-brown. *Hindwing* with indistinct marginal pale-bordered black spots [these spots are sometimes large and prominent, and more or less crowned inwardly with orange, occasionally the black spots are slightly defined inwardly as well as outwardly by a narrow white line, and with a discal series of fine white lunules] *Cilia* cinereous-white. UNDERSIDE, *both wings* cinereous-brown. *Forewing* with a white-bordered brown disco-cellular spot, a transverse discal and a submarginal row of similar spots. *Hindwing* with a white-bordered black costal spot, four transverse subbasal spots, and one near the base of the abdominal margin; a white-bordered brown disco-cellular spot, and a transverse discal row of similar spots, a marginal row of [three, four, five, or] six prominent black conical spots speckled with metallic-green, the outer one at each end less distinct, each bordered by ochreous-yellow and above by a double white lunular line. FEMALE. UPPERSIDE, *both wings* similar. *Hindwing* with the marginal spots slightly [often prominently] bordered with ochreous [or orange] UNDERSIDE, *both wings* with the markings more distinct than in the male." (*Moore*, l. c. in Lep. Cey.)

LARVA when full-grown a little over a quarter of an inch in length, oniciform as usual; the head very small, black and shining, entirely hidden when at rest, being covered by the second segment; the colour of the body grass-green, with a dark green dorsal line from the third to the twelfth segment; two subdorsal series of short parallel streaks, each pair being divided from the next by the segmental constriction, these streaks paler than the ground-colour; an almost pure white lateral line below the spiracles, which is the most conspicuous of all the markings; the segmental constrictions rather deep; the whole surface of the body shagreened, being covered with very small whitish tubercles from which spring very fine short colourless hairs. The usual extensile organs on the twelfth segment. Dr. George King, Superintendent of the Royal Botanical Gardens, Sibpur, near Calcutta, has identified its food-plant as *Heliotropium strigosum*, Willd. Professor A. Forel identifies the ant which attends it as *Pheidole quadrispinosa*, Jerdon. PUPA about $\frac{5}{16}$ of an inch in length, pale green, of the usual Lycænid shape, densely covered everywhere except on the wing-cases with somewhat long white hairs. The transformations of this species are here described for the first time.

Semper has done much in clearing up the synonymy of this species by adding to it the *L. gnoma* of Snellen, Trimen has added the *L. parva* of Murray, and I join to it for the first time the *L. putli* of Kollar. Butler and Swinhoe record the true *C. trochilus* from India, the

former from near Attock on the Khairabad side, taken by Major J. W. Yerbury in November, and the latter from Karachi in June, and the Hubb River, Biluchistan, in September, also from Quetta The only difference between typical *C. trochilus* and *C. putli* is that the former has the orange markings above the marginal black spots on the upperside of the hindwing very prominent; while in the latter this colour is absent altogether or replaced by ochreous. The most typical specimens of true *C trochilus* which I possess are from Aden, but I have a very fine series of the species taken by Mr W. H Irvine at Bholahât, Malda, some of which have almost as much orange as the Aden specimens, while others almost entirely lack that coloration, and all intergrade specimens exist In India *C trochilus* occurs practically almost everywhere, from Karachi in the west, all along the outer Himalayas to Upper Burma in the east, and throughout continental and peninsular India and Ceylon It has not as yet been recorded from the Andaman or Nicobar Isles, or from the Malay Peninsula, but it is almost sure to be found in the latter region hereafter, as it occurs in Java, Sumba, and Sambawa. In Ceylon Wade records it from "Kandy and Trincomalee, found in grass. Rare" The jewelled spots of the hindwing on the underside are quite *sui generis*, and make this species one of the most easily identifiable of the "Blues"

Genus 110.—CYANIRIS, Dalman. (FRONTISPIECE and PLATE XXVI)

Cyaniris, Dalman, Kongl Vetensk Acad Handl, vol xxxviii, pp 63 94 (1816), id, Billberg, Enum Ins, p 80 (1820), id, de Villier and Guénée, Lép d Lur, p 19 (1835), id Moore, Lep Cey, vol i p 74 (1881), id, de Nicéville, Journ A S B, vol lii, pt 2, p 67 (1883), id, Distant, Rhop Malay, p 210 (1884), *Lycænopsis*, Felder, Reise Novara, Lep, vol ii, p 257 (1865)

"FOREWING, elongated, triangular; *exterior margin* slightly oblique and convex, *posterior* margin long; *costal nervure* extending to half length of the margin; *first subcostal nervule* emitted at nearly one half before the end of the cell, free from the costal nervure; *second* subcostal at one third, *third* subcostal at about one-eighth before the end of the cell, *fourth* at one-half from the third and terminating at the apex; *fifth* [upper discoidal] from the end of the cell, *disco cellular nervules* slightly concave; *lower discoidal* nervule from their middle; *discoidal cell* long, somewhat narrow, extending to more than half the wing; *second median nervule* emitted about one-seventh before the end of the cell, *first* median at nearly one-half before the end, *submedian nervure* slightly recurved. HINDWING, oval, *apex* very acute; *costal nervure* curved at the base, extending to the apex; *first subcostal nervule* emitted at one-fourth before the end of the cell; *upper disco-cellular* nervule the shorter, outwardly oblique, *lower* disco-cellular straight, erect, *discoidal* nervule from their middle; *discoidal cell* rather short, *second median nervule* emitted from immediately before the end of the cell, *first* median at one-third before the end; *submedian* and *internal nervures* straight. BODY slender, short; *palpi* porrect, second joint pilose beneath, projecting half beyond the head, third joint slender and about half its length, naked, *legs* slender, femora slightly pilose beneath, *antennæ* with a lengthened spatular club. Type, *C argiolus*,' Linnæus, the "Holly-Blue" of England. (*Moore*, l c)

In the forewing the costal nervure ends exactly opposite the apex of the discoidal cell; the first subcostal nervule in the type species is free from the costal nervure, in a male of *C. transpectus*, Moore, it lies along and touches the costal nervure for some little distance, while in a female of the same species it lies close to but is free from that nervure; second subcostal with its base half as far from the base of the first subcostal as from the base of the upper discoidal; third subcostal rather short, emitted from the subcostal nervure about midway between the apex of the wing and the base of the upper discoidal. The eyes are hairy.

The genus *Cyaniris* is very near to *Lycæna*, Fabricius; as far as neuration goes, it is probable that, if all the species of both genera were examined, no constant character between them would be found. In the specimens of each that I have examined I find that the first subcostal nervule of the forewing is quite free in *Lycæna*, in *Cyaniris* it either touches the costal nervure for a short distance or approaches it very closely; in *Cyaniris* the base of the second subcostal nervule is nearer to the base of the first than it is to the base of the upper discoidal nervule, in *Lycæna* it is just equi-distant between them; lastly, in *Cyaniris* the third subcostal

nervule arises much nearer to the apex of the wing than in *Lycæna*. Although the structural characters of the two genera differ so slightly, there is considerable difference in the *facies*, and also I think in habits, and something in distribution:—in *Lycæna* the spots of the underside usually assume the form of blind ocelli, *i.e.*, are composed of a dark centre and outer pale portion; they are mostly low-flying grass-loving butterflies; and the genus is almost purely a Palæarctic one: while in *Cyaniris* the markings are hardly ever ocellular; the butterflies chiefly affect trees and bushes, though the males may often be found in immense quantities sucking up the moisture on damp spots; and the genus is both Palæarctic and Tropical.

Most writers use the name *Lycæna* for all the butterflies which belong to this genus, so I am quite unable to give either its distribution (though it certainly occurs throughout the Nearctic, Palæarctic and Oriental regions), nor the number of species it contains, but they are certainly very numerous. In India it is found almost everywhere except in the desert regions of Sind, and occurs at considerable elevations in the Himalayas; Mr. W. Doherty records *C. huegelii*, Moore, in Kumaon from 3,500 to 12,000 feet; and I have met with some species even at a greater elevation. In the outer Himalayas one species or another is more plentiful in individuals than any other of the *Lycænidæ*. In Sikkim not only do many species actually swarm, but the number of distinct species occurring there is very great. In the plains of India proper *C. puspa* is the only species commonly met with, but wherever hills occur there will several species be found. The males of most of the different species can with a little study be made out satisfactorily, but in the case of three common species occurring in Sikkim, *C. marginata*, de Nicéville, *C. placida*, de Nicéville, and *C. dilectus*, Moore, though literally hundreds of females have passed through my hands, I have quite failed to pair them with their respective males. Messrs. Moore and Doherty have described the female of *C. marginata*, but from these descriptions I am unable to distinguish that sex from the female of *C. puspa*, Horsfield.

In North America Mr. W. H. Edwards has proved by careful breeding that one species, *Lycæna* (= *Cyaniris*) *pseudargiolus*, Boisduval and Leconte, exhibits seasonal dimorphism to a wonderful extent, and in his "Butterflies of North America" has devoted several plates to these different forms and to the transformations of the species. It was in the larva of this species that he first noticed the peculiar organs affected by ants, and he has given very beautiful drawings of them various parts. In India, although it has not been proved by breeding as it has been in North America, seasonal dimorphism almost certainly occurs to a considerable extent. This is especially marked in *C. marginata* and *C. transpectus*, less so in *C. puspa*, *C. lynceana*, *C. placida* and *C. dilectus*. The dimorphism takes the usual form of darkening the coloration and markings in the rains lightening the coloration and reducing the size and distinctness of the markings in the dry-season. All these species occur in the Eastern Himalayas. Whether or not this dimorphism occurs in the species of the Western Himalayas I cannot say, but it certainly would not be of so marked a nature, as the rainy season is shorter and not so severe there as it is to the eastward.

The transformations of only one Indian species are known. Dr. Lang in his "Butterflies of Europe," p. 128, describes the larva of the type species of the genus (*C. argiolus*, Linnæus) as "dark greenish-grey, with a dark green dorsal line. Feeds on the flowers of *Ilex*, *Hedera* and *Rhamnus* in June, and again in the autumn." I should expect to find the larvæ of *C. huegelii* and *C. cœlestina* feeding on the Barberry in the Western Himalayas, as the imagines seem always to affect those bushes.

Key to the Indian species of Cyaniris.

A. Male, upperside, both wings white, with base black, irrorated with metallic blue; female with no blue on upperside whatever.

674. C. AKASA, South India, Ceylon, Java, Sambawa.

B. Male, upperside, both wings blue, sometimes with white patches, female (except *C. transpectus*) with more or less iridescent blue on the disc and base.

a. Of large size; both sexes with outer third of forewing on upperside black, a prominent disco-cellular spot; underside with markings few in number, extremely prominent on forewing.

675. C. VARUHANA, Western Himalayas.

b. Of smaller size (except *C. huegelii*); male with costal margin of forewing broadly black, occupying half of discoidal cell on upperside.

*a*¹. Male, upperside, both wings with a discal white patch

676 C. MARGINATA, Kumaon, Nepal, Sikkim, Burma

*b*¹. Male, upperside, both wings with no discal white patch.

677. C. MELÆNA, Burma

c. Males with costal area of forewing, except at apex, blue on upperside

*a*¹. Males with black area on upperside of forewing at apex, occupying outer one fourth.

*a*² Male with outer black border to forewing on upperside reduced to a fine line at anal angle, markings on underside small, but all equally prominent.

678 C. ALBOCÆRULEUS, Himalayas

*b*². Male with outer black border to forewing on upperside broad at anal angle.

*a*³. Underside with markings large and placed irregularly

*a*⁴. Male, upperside dull blue, with hardly any iridescent gloss, female with no blue on upperside

679 C. TRANSPECTUS, Sikkim, Assam, Burma.

680 C. LATIMARGO, N E Bengal, Sikkim

*b*⁴ Male, upperside rich bright iridescent purplish blue

681 C. PUSIA, India, Ceylon, Andamans, Burma, Java

*b*³ Underside with markings small and placed regularly

682 C. CHENNELLII, Shillong

*b*¹. Males with black area at apex of forewing on upperside occupying less than outer one fourth, widest at the apex

*a*² Male with prominent white well defined patches on upperside

683 C. ALBIDISCA, Nilgiri, Annamalai, and Pulni Hills

*b*² Male never with prominent white well defined patches on upperside (in dry season form of *C. jynteana* there are irrorated whitish patches)

*a*³. Markings on underside large and irregularly placed

*a*⁴ Male, upperside brilliant iridescent blue

684 C. CYANESCENS, Nicobars

*b*⁴ Male, upperside dull non iridescent purplish blue

685 C. PLACIDA, Sikkim, Assam, Burma, Penang

*b*³ Markings on underside small and evenly placed

*a*⁴ Male, upperside, hindwing with marginal series of black spots.

686 C. JYNTEANA, Sikkim, Assam, ? Malacca

687 C. SIKKIMA, Sikkim

*b*⁴ Male, upperside, hindwing with no marginal series of black spots

688 C. CŒLESTINA, Western Himalayas

*c*¹. Male with black area of forewing on upperside reduced to a fine marginal line of equal width throughout

*a*² Males pale blue on upperside

*a*³ Of small size, male usually with white irrorated patches on upperside of both wings

689 C. DILECTUS, Himalayas, Assam, Upper Burma

*b*³ Of larger size, male never with white irrorated patches on upperside of both wings

*a*⁴ Both sexes, underside, forewing with submarginal lunulated band usually widened out posteriorly into prominent quadrate spots, these spots further from the margin than in the next species.

690 C. HUEGELII, Western Himalayas

*b*⁴. Both sexes, underside, forewing with submarginal lunulated band of equal width throughout, these spots nearer the margin than in *C. huegelii*.

691 C. SINGALENSIS. Nilgiris, Ceylon.

*b*². Males dark blue on upperside.

*a*³. Discal series of spots on underside of forewing arranged regularly, forming almost a straight line

692 C. LANKA, Ceylon

*b*³ Discal series of spots on underside of forewing arranged irregularly, not almost forming a straight line

693 C. LIMBATUS, Assam, Parisnath, Nilgiris, Travancore, Ceylon.

674. **Cyaniris akasa,** Horsfield

Polyommatus akasa, Horsfield, Cat Lep Mus. E I Co., p 67, n 2, pl i, figs. 1, 1*a*, *male* (1828); *Cyaniris akasa*, Moore, Lep Cey., vol i, p 75, pl xxxiv, fig 5, *male* (1881)

HABITAT: Shevaroy, Nilgiri, Annamalai and Pulni Hills; Ceylon; Java; Sambawa.

EXPANSE: ♂, 1·0 to 1·1; ♀, 1·25 inches.

DESCRIPTION: MALE "UPPERSIDE, *both wings* with the base blackish-brown, covered from the base to the disc with an azure irroration, (and in one of our specimens the disc is marked with an obscure curved fascia of brown). *Forewing* with the disc white, a broad belt along the anterior and posterior margins blackish brown. *Hindwing* with almost the whole surface white, marked with a few scattered dots of blackish-brown and surrounded by a streak of the some colour, interior to which is an interrupted series of delicate brown lines. UNDERSIDE, *both wings* milky white. *Forewing* with a series of five short brown lines disposed in an interrupted curve towards the posterior margin, exterior to which are a few faint marginal dots, and a short transverse streak arises near the costa and extends to the middle of the disc. *Hindwing* has the marginal dots of a more intense tint and continued in a regular series along the posterior margin, the disc is pervaded by a very irregularly curved series of about seven dots, commencing near the anterior margin, the first being disposed in pairs, three solitary distant dots are placed in the order of a transverse line towards the base. About eighteen dots, in all, may be counted on the underside of the hindwing. *Antennæ* banded with white; they depart in a small degree from the regular type, and give the butterfly a peculiar aspect; the club is strongly compressed and semi contorted at its base, in consequence of which a swelling appears at the point of union with the filiform portion, which is not usual in this genus. *Thorax* and *abdomen* agreeing with the adjoining tint of the wings on both surfaces."

"In its physiognomy and in the distribution of the markings of the lower surface, it resembles the *P* [= *C*] *argiolus*, Linnæus, of the British Fauna" (*Horsfield*, l. c.)

Dr Horsfield does not give the sex of the two specimens he described, they appear to have been males, however, as he mentions the blue gloss on the upperside. Mr. Moore seems to take the opposite view, as in his "Lepidoptera of Ceylon" he describes the female as blue-glossed, but says nothing about that colour in the male. I append his description * I have only seen two specimens of what I take to be females in Colonel Swinhoe's collection, one from the Annamalai Hills, Travancore, one from Ceylon; the latter is marked "*Cyaniris akasa*, Horsfield, ♂" in Mr Moore's handwriting. These specimens have broader wings than the males, the white area on the upperside of both wings more extensive, no blue gloss, and the marginal blackish dots on the hindwing obsolete. In both sexes the broad outer black margin to the forewing on the upperside ends in the middle of the submedian interspace, being continued to the anal angle by a narrow black antecilliary line, exactly as in the male of *C. albocæruleus*. *C. akasa*, as far as is known at present, has a very restricted range, being confined to the hills of South India, to Ceylon, Java, and Sambawa. On the Nilgiris Mr. G. F. Hampson says it is confined to the plateau where it is very common at 6,000 to 8,000 feet.

675. **Cyaniris vardhana,** Moore.

Polyommatus vardhana, Moore, Proc. Zool. Soc. Lond., 1874, p 572, pl lxvi, fig 5, *male*, *Cyaniris vardhana*, id., l. c., 1882, p 244, id., Butler, l. c., 1886, p 367, n 44, idem, id. Ann and Mag. of Nat. Hist., sixth series, vol i, p 147, n 49 (1888)

HABITAT: Western Himalayas.

EXPANSE: ♂, 1·5 to 1·6; ♀, 1·4 to 1·7 inches.

* "MALE. UPPERSIDE, *both wings* white. *Forewing* with the base costal and exterior borders to near the posterior angle broadly dusky brown, and a very faintly indicated slender disco cellular streak. *Hindwing* with the base of costal border brown, base of abdominal border brownish grey, a delicate brown outer marginal line and a row of very smal indistinct spots. UNDERSIDE, *both wings* white. *Forewing* with a slender blackish disco-cellular streak, a curved discal series of five or six waved short linear streaks, and a marginal row of indistinct small spots. *Hindwing* with three subbasal black spots, and a discal curved series of irregular-shaped spots. FEMALE. UPPERSIDE, *forewing* with the brown marginal band diffused along the posterior border, where it is slightly glossed with blue, the white disc also being blue glossed. *Hindwing* with the brown costal band and exterior marginal line and spots more distinct, the abdominal border also more distinctly glossed with blue. *Legs* with black bands, *palpi* black above and fringed with black beneath." (*Moore*, l. c.)

DESCRIPTION: "MALE. UPPERSIDE, *both wings* greyish-blue, with a pinkish gloss, veins exteriorly, and marginal line black, a narrow black disco-cellular streak very prominent on the forewing, a broad band of dark bluish-purple along anterior and exterior margins of forewing and anterior margin of hindwing *Cilia* white, alternating with black on the forewing. UNDERSIDE, *both wings* bluish-white. *Forewing* with a prominent black disco-cellular streak, and a curved discal series of five spots, the upper spots small and disposed obliquely before the apex, the three lower spots large. *Hindwing* slightly powdered with blue at the base, a discal series of black dots, a dot within the cell, and a more prominent spot near base of anterior margin, a small black lunule on anal margin. FEMALE. UPPERSIDE, *forewing* with the disc pale bluish-white. *Hindwing* with indistinct dusky spots on the margin." Otherwise as in the male, but the spots of the underside more prominent. Both wings are much broader, and the outer margin of the forewing is much more convex than in the male. (*Moore*, l. c.)

C. vardhana is one of the largest, most beautiful, and easiest recognised species of the genus. It has no near ally, and it can be compared to no species known to me. The paucity of markings on the underside of the forewing and their great prominence is a very remarkable feature. It seems to be common nowhere. I have taken it sparingly at Mashobra near Simla. Dr. E. R. Johnson has taken it on Jakko in Simla itself; it was originally described from Jako, valley of the Rupin river, in Busahir; Major Yerbury has taken it at Murree in August and September, at Thundiani on 6th September, at Kah Pani on 11th October; Mr. W. Doherty records it from Jagheswar, 7,500 feet, Kumaon, rare; and Colonel Lang states that it occurs at Naini Tal from 5,500 to 8,500 feet (Cheena) in May and June and again in September. Murree may be taken as its westernmost and Naini Tal its easternmost range as far as is at present known.

676. **Cyaniris marginata**, de N.

C. marginata, de Nicéville, Journ. A. S. B., vol. lii, pt. 2, p. 70, n. 7, pl. i, fig. 9, *male* (1883); id., Moore, Proc. Zool. Soc. Lond., 1883, p. 523, pl. xlviii, fig. 6, *male*; id., Doherty, Journ. A. S. B., vol. lv, pt. 2, p. 134, n. 186 (1886).

HABITAT: Naini Tal; Dhankuri, Khati, 7,000 to 10,000 feet, Kumaon; Nepal; Sikkim; Upper Burma.

EXPANSE: ♂, 1·37 to 1·45 inches.

DESCRIPTION: "MALE. UPPERSIDE, *both wings* highly iridescent deep lavender-blue. *Forewing* with the costal margin, including the upper half of the cell, and the outer margin, widely, especially at the apex, black; a patch of pure white scales on the disc outside the cell between the lower discoidal and first median nervules; a black disco-cellular streak. *Hindwing* with the costal and outer margins broadly black, including a submarginal lunular series of bluish marks, obsolete in some specimens except at the anal angle; a patch of pure white scales above the discoidal nervule. UNDERSIDE, *both wings* white, slightly tinted with blue. *Forewing* with a disco-cellular blackish streak, a discal series of six large very irregularly shaped and placed spots, a submarginal lunular line and marginal linear spots blackish; a black anteciliary line. *Hindwing* with three subbasal spots, a disco-cellular streak, and an irregular discal series of eight to ten spots; marginal markings as in the forewing. *Cilia* white on both wings on both sides." (*de Nicéville*, l. c.) "FEMALE. UPPERSIDE, *both wings* chiefly black. *Forewing* with the white area larger and clearer than in the male, extending from the first median to the lower discoidal nervule, and into the end of the cell, where it is indented from above; extreme base from cell to hind margin dull greenish-blue. *Hindwing* with a subapical white patch over three interspaces, a black spot between the third median and discoidal nervules, sometimes a streak across the end of the cell, a line of obscure whitish submarginal lunules; part of the disc between the white area and the abdominal margin dull bluish. UNDERSIDE, *both wings* like the male." (*Doherty*, l. c.)

The form of this species, which I have above described and figured, is the very dark one which occurs in Sikkim in the middle of the rains; the one which occurs in the dry-

season (spring and autumn) differs very considerably: the white area on the upperside of both wings is of greater extent, the black costal, apical and outer margins are about half as wide, the hindwing has the costal area alone black, the outer margin with a series of connected lunules, a series of small black dots beneath these, and a fine anteciliary black line. All the black spots on the underside of both wings are very much less prominent and smaller than in the wet-season form. In Sikkim there is a fresh brood on the wing at the end of February, and perfect specimens are to be met with throughout the rest of the year. Mr. Doherty has described the female as above, but I can find no character by which to distinguish it from that of *C. puspa*, Horsfield. Mr Moore has also described the female, but, I am unable to identify it from his description. The male of *C. marginata* is easily distinguished, as, except *C. akasa*, Horsfield, *C. vardhana*, Moore, and *C. melæna*, Doherty, it is the only species which has the costal area on the upperside of the forewing in the male broadly black.

Colonel Lang states that *C. marginata* occurs "rarely in Naini Tal from 5,500 to 6,500 feet, June, August, and September." The species has a very limited range, occurring in the Himalayas from Kumaon to Sikkim, reappearing in Upper Burma. In the Phayre Museum, Rangoon, is a male from Fort Stedman.

As both Mr. Moore and I described this species about the same time, I append his description for reference.*

677. Cyaniris melæna, Doherty.

C. melæna, Doherty, Journ. A. S. B., vol. lvii, pt. 2, p. (1889).

HABITAT: Tenasserim Valley, Burma.

EXPANSE: ♂, 1·1 to 1·2 inches.

DESCRIPTION: "MALE. UPPERSIDE, *both wings* dark dull blue, resplendent in some lights; no whitish patch. *Forewing* has the blue extending over less than half the surface, sometimes extending above the upper discoidal nervule beyond the cell, the black area very large, occupying the upper part of the cell, widening at the anal angle, and extending over more than a third of the inner margin. *Hindwing*, the blue occupies hardly more than a third of the surface, and does not approach either the costal or abdominal margin. *Cilia* whitish. UNDERSIDE, *both wings* grey-white, with a slight silvery lustre. *Forewing* with a streak across the end of the cell; a curved discal line of six dark streaks set in paler rings, the second, third, fourth, and fifth outwardly oblique, the fifth and sixth removed inwardly; a submarginal row of joined ocellus-like spots, consisting of a dark lunule, enclosing a pale dark pupilled spot; a marginal dark line. *Hindwing* with three distinct basal spots, a streak across the end of the cell, a very irregular series of discal spots, the first very large and black near the costa, the second minute near the first but more basal, the next four forming an oblique crescent (the fifth small, the sixth larger, nearest the base), the seventh large, removed outwardly, the eighth (between the submedian and the internal nervures) smaller and nearer the base; the submarginal ocelli are as in the forewing, the inner lunular line more serrate. FEMALE unknown."

"This species, which is the darkest *Cyaniris* known, was taken in the Tenasserim Valley in February, but in the rains it is perhaps confined to higher lands. An apparently identical species is found in the Malay Peninsula at a considerable height, and seems to be *C. jynteana*, Distant (*nec* de Niceville)." Mr. Doherty may be correct in identifying his *C. melæna* with the specimen described and figured by Mr. Distant as *C. jynteana*, and judging by the markings of the underside and the width of the black border of the forewing on the upperside in Distant's figure, I think he is right; to set against this is the fact that Mr. Moore identified Mr. Distant's specimen for him, recognised it as his own species, which he is hardly likely to have done

* "Allied to *C. puspa*, Horsfield. MALE. UPPERSIDE, *both wings* with the black margin. I bordem twice the width of those in *C. puspa*, the upper discal area also more prominently white. *Forewing* with the black costal border extending its width half across the cell. FEMALE. UPPERSIDE, *both wings* darker than in the same sex of *C. puspa*, the pale discal area of less width. UNDERSIDE, *both wings* similarly marked." (*Moore*, l. c.) The above description evidently applies to the rains form of this species.