THE COMMON BUTTERFLIES OF THE PLAINS OF INDIA (INCLUDING THOSE MET WITH IN THE HILL STATIONS OF THE BOMBAY PRESIDENCY).

BY

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(*Continued from page 717 of this Volume.*)

PART XXXI.

Family—HESPERIIDÆ—*continued.*

Genus 7.—SARANGESA.

This genus is characterised as under in the *Lepidoptera Indica* Vol. X, p. 88 :—

Antennæ.—Very slender, about two-thirds lengths of costa of fore wing ; club moderate, slightly recurved.

Palpi.—Porrect, third joint short, bluntly conical.

Hind tibiæ.—With two pairs of spurs. In the male with tuft of hairs attached to proximal end.

Fore wing.—Vein 12 ends on costa a little before end of the cell ; discocellulars suberect, the lower the longer ; vein 3 from close below lower end of cell, 2 from about one-third from base ; median vein slightly curved up between bases of 2 and 3. Cell less than two-thirds length of costa; costa gently arched with outer margin convex, shorter than the hinder margin as a rule (in *dan* it is equal to it) ; hinder margin straight.

Hind wing.—Discocellulars very faint, apparently in one quite straight line, of about equal length ; vein 3 from very close to lower end of cell, 2 from a little beyond the middle; costa slightly arched, apex rounded, outer margin somewhat sinuous ; wing about as broad as long.

Egg.—Dome-shaped, the height about two-thirds the breadth, very slightly constricted at the base, the top very slightly depressed ; green or yellowish in colour ; shining, the surface sculptured by 14 or 15 meridional ribs that are somewhat coarse, minutely beaded.

Larva.—Spindle-shaped, fattest in the middle, somewhat narrowed in the anal end, broader in the fore end where the neck is narrow compared to the somewhat bullet-shaped, bilobed, dark-brown head with a rugose surface. The surface of the larva covered with tiny feathered hairs only visible under a lens. The colour olive-green of a darkish shade, sometimes brownish with always a white collar consisting of nearly the whole of segment 2.

Pupa.—Not very stout, fattest in middle, pointed at anal end, rather broad and square in front, the frons convex but not actually beaked ; with a triangular cremaster, prominent spiracular expansions to segment 2 and the proboscis produced free beyond the ends of wings. The colour green or yellowish brown with a greyish " bloom " caused by a copious clothing of minute, erect hairs all over the body.

Habits.—The eggs are laid on the top or underside of a leaf, on a leaf-bud or stalk. The larva makes a cell by turning over a small portion from the edge on to the top, the shape of this " lid " being triangular ; it is fixed lightly down and coated on the inside or underside with a carpet of white silks upon which the larva lies with its back towards the main leaf-surface, its head turned round on its side. Later on it continues this mode of living but, often, makes a cell out of a hanging or caught up withered leaf with no particular

shape. The pupation takes place in such a cell as a very general rule. The pupa is attached by the tail strongly. The butterfly flies near the earth, is active, quick, resting on the upper surface of leaves, close to the ground; flies strongly but not for any length of time at a flight, returning to the same perch again and again; basks with the wings horizontally outspread in the sun, sometimes even on the bare ground or on a stone and generally rests in that position, although at night it sits on the underside of leaves but always keeping the wings spread. The larva feed upon dicotyledonous plants of the families *Acanthaceæ* and *Amarantaceæ*.

207. Sarangesa dan, (*Fabricius*).—Male. *Upperside.*—Rufous-brown. Fore wing, with three small, semihyaline, subapical dots from near costa in interspaces 6, 7, 8, the middle one the smallest and most innermost; in some specimens one or both the lower absent; a large semihyaline spot in end of cell, its inner side straight, its outer side deeply excavated and sometimes this excavation dividing it into two, of which then the upper is only half the length of the lower which is elongated; a small spot between this cell-spot and costa; a small square or round spot near base of interspace 3; a much larger one inside this last in interspace 2 touching it with its outer, upper side; and a minute spot, sometimes two below them in interspace 1, one above the other; all these spots slightly tinged with ochreous, brilliantly golden-ochreous in one incidence of light, all varying much in size in different examples; some brownish, indistinct marks on the wing decipherable as a subbasal transverse band, a post discal band highly excurved towards apex with the subapical dots on its upper part and a submarginal band; base of wing with ochreous hairs; the inner margin with a short fringe of similar hairs. Hind wing with a basal, indistinct brown transverse band; a subbasal similar band including a spot in cell; a medial curved similar one con-joining the subbasal at costa and a very slight marginal brown one. Cilia of both wings brown, those of the hind wing chequered faintly in some specimens; the fore wing with a light area just above tornus. *Underside.*—Like the upperside but duller; both wings with the markings of the upperside. The hind wing has a clothing of long, ochreous hairs from base outwards, reaching the outer margin on hinder half of wing and the abdominal margin has a fringe of shorter ones. *Female.*—Similar to male but with the hyaline spots, on the whole, always smaller, and always silvery-looking. Antennæ with the shaft brown, ochreous above, clearer ochreous below the club; club black, the upperside greyish; palpi light-ochreous above and below as well as the head and the underside of body; the legs have the tarsi with pinkish tinge. The tuft on hind legs of male is more orange.

Larva.—The larva is in shape a fat one, fining towards both ends which are comparatively narrow; the anal flap is semielliptical, slightly longer than a semicircle, sloping at an angle of 30°; segment 13 a little broader rather than one-third its length in the middle, for this 13th segment is curved convexly backwards, being thus broadest in the dorsal line; segment 12 broader again than this latter and only a little more than twice the length in dorsal line; segment 11 twice the length of segment 12 and again slightly broader than it. The body comes to a distinct neck at front margin of segment 2 and the head is, as usual with skippers, a large one compared to this neck; the legs are all well tucked under the body; the whole larva generally sits humped up in the middle with its head turned round on its side. The *head* is perfectly heart-shaped, the dorsal line being considerably depressed below the rounded lobe-summits though not broadly, less depressed of course down the face; the clypeus is triangular

and not small, also depressed ; the surface is very rugose in irregular raised longitudinal broken, uneven lines and is clothed with silky appressed hairs though not very densely ; the surface is shining ; the labrum and ligula are, like the whole head, dark chocolate or brown, the eyes, jaws and antennal second joint the same, the basal joint also. The *spiracles* are very broadly oval, nearly round, whitish in colour, small, those of segments 11,12 slightly larger, that of segment 2 the largest. The *surface* of the body is covered all over with minute, short hairs to the extent of about 4 or 5 to the linear millimetre, each with a thickened, rounded top, those round the margin of the anal flap being comparatively long ; each hair rising from a little white dot : they are white themselves, these hairs ; there is a longer, simple hair sticking out backwards from the edge of the anal flap-margin in the lateral region on each side ; the prolegs, claspers and true legs have also longer, simple hairs on them. The *colour* of the larva is, when full grown, olive-green with an indigo-coloured, narrow, dorsal, pulsating line or band ; the front half of segment 2 whitish and shining. In the earlier stages the tint is much browner, approaching in some cases rusty, the white colour very conspicuous then. L : 20 mm. ; B : 4·5 mm. at middle ; half that at segment 13. There is an indistinct lateral and spiracular white line, very thin and inconspicuous.

Pupa.—The chrysalis is light green, slightly covered with a white "bloom," covered with fine, more or less erect, fairly densely arranged hairs with shortly curved points except on wings ; stout, with a humped thorax and spiracles of segment 2 with a semicircular, prominent small, furred, chocolate-coloured expansion behind each. It is of the ordinary *shape*, that is of transverse circular section, slightly constricted somewhat shallowly and broadly laterally at middle, more conspicuously dorsally because of the humped thorax ; the cremaster has a very short and transverse base, the suspensory portion oblong, somewhat bend down, the suspensory hooklets arranged along truncated extremity, the whole member rather stout, the edges or margins thickened leaving the dorsal line broadly depressed, ventral extensor ridges slight and produced forwards, at first diverging, then curving round towards each other but not meeting ; segment 13 transverse, half the length of the whole cremastral segment; 12 somewhat longer than 13, though not much ; 11 than 12. *Head* rather small, bowed, the frons prominently convex between the prominent eyes, in a plane perpendicular to the longitudinal axis of pupa ; the vertex nearly square between the bases of antennæ, in a plane at an angle of 30° to that axis ; the eyes bulging, longer than broad with a depressed, broad, shining, smooth band across middle perpendicular to the length of eye. Segment 2 about the same length as head-vertex and, like it, somewhat convex dorsally (in sense of length) ; thorax at first ascending from segment 2 in the same plane, then curving broadly up to apex and down again to hinder margin, the apical point being about two-third its whole length from front margin ; its hinder margin elliptically curved towards segment 4, meeting the wing-margins in a very broadly-curved, open angle of about 90° ; segment 4, therefore, long laterally, half the length in dorsal line ; abdominal dorsal line straight thence to segment 12 ; ventral line slightly convex in extreme half of wings then gently curved to cremaster ; the proboscis produced free beyond ends of wings to hinder margin of segment 9, the pupal surface somewhat depressed to receive it. *Spiracles* of segment 2 indicated by a linear, short, brown line on common margin of segments 2 and 3, with a semicircular (slightly higher however than broad) lappet or expansion behind it and immediately contiguous to it and perpendicular to the pupal surface, thickest at base, facing forwards, the surface of this little body being silky-plush-like and deep chocolate in colour ; the other spiracles of ordinary size, broadly oval, slightly raised, brown. The *surface* of pupa is shining, though not excessively so, the wings have the veins thinly(gradually) raised, the whole surface

with the exception of these wings and a fairly broad hinder (bevilled) margin to segments 8-10 and front margin to segments 9-11 covered with the fine, erect straight hairs with little curved tips mentioned above, like a sort of down, that on dorsum being perhaps slightly inclined backwards, that on head, eyes (with the exception of the band across them which is smooth) being longer than rest slightly, each hair-proceeding from a tiny brown spot. *Colour* green with a white " bloom " dotted with brown. L : 16 mm. ; B : slightly over 4mm. at middle.

Habits.—The young larva cuts a piece out of the centre of a leaf, either young or mature, turns it over on to the top—it is often triangular in shape—and fixes it down with silks all round, leaving an opening for emergence and entrance ; it coats this piece with silk and lives upside-down on the piece ; lying always humped and contracted with its head turned round on its side it is always sluggish. Afterwards, in the second stage, it turns over a larger piece; after that it lives in folded leaves which wither, and it attaches them to the plant to prevent them falling to the ground. It pupates in such leaves which it does not cover with silk inside to any extent. The pupa is attached strongly by the tail and by a rather loose body-band which in its turn is fastened by the middle by a silk to the top of the cell, the body band being fastened to the sides, one on each side of the pupa. The pupa moves lazily from side to side when disturbed, the motion being from the segment margins, or in the intersegmental membranes of segments 8, 9 ; 9, 10 and 10, 11. A lot of larvæ were obtained in the Chandwadi evergreen, in North Kanara and round it at Christmas, in the Supa Petha, at 1,500′ elevation. The butterfly is not uncommon in the District above Ghats and frequents the big jungles where there is a heavy monsoon rainfall and where the ground-vegetation practically never dries up. It keeps altogether to the underwood where it may be seen on leaves close to the ground, its wings outstretched horizontally, basking in the sun-patches that come through the overhead leaf-canopy. It rests generally on the undersides of leaves and is not commonly to be seen although the larvæ are plentiful enough. The flight is very similar to that of the insects *Sarangesa dasahara* and *purendra;* the larva is also extremely like those of that genus. All the specimens of the imago that occur in Kanara District in Bombay are golden-brown in colour and much brighter than those figured by Colonel Swinhoe in *Lepidoptera Indica*, vol. x, pl. 773, figs 2 to 2d; the male, also, invariably has the larger hyaline spots on the fore wing. The foodplant of the larva is *amarantaceus* (of the family *Amarantaceæ*) and is known by the natives as Agadha. Its scientific name is *Achyranthes aspera* and it may be known by its very elongated spikes of small, sessile, hooked fruits that stick to the clothes as one walks through it—it is often gregarious; the flowers are very small and inconspicuous, the leaves rather large and obovate with soft pubescence. Colonel Swinhoe, in his book says " Habitat : Southern India, Burma, Siam,

Malay Peninsula. Distribution ; the type came from Tranquebar in S. India ; we took it at Mahableshwar and in several parts of the Bombay District and we have it from Coorg, Ootacamund in the Nilgiris, Rangoon, the Meplay Valley and Siam; Distant records it from Perak, Manders from the Shan States, Elwes from the Karen Hills, Moulmein and Tenasserim, Watson from the Chin Hills, Moore from Mergui, Wood-Mason and de Nicéville from Cachar, Davidson, Bell and Aitken from Kanara, Evans from the Palni Hills and Fergusson from Travancore. We give figures of the two extreme forms ; they may be seasonal but we have no evidence to prove it. Unfortunately Davidson, Bell and Aitken did not figure the larva and pupa." This omission has been remedied long ago but the figures have not been published ; they are still waiting.

208. Sarangesa purendra, (*Moore*).—Pl. N. figs. 83♂, 83a♀.—Male. *Upperside* dark vinaceous blackish-brown. Fore wing with three subapical dots of equal size in a curve from near costa, a bar across the cell near its end, its outer side deeply excavated ; a small spot between it and costa ; another immediately outside its lower end with a short linear spot below it ; all whitish and semihyaline. Hind wing with a spot at end of cell with a discal and marginal band all very little darker than the ground colour and very indistinct. Cilia of both wings brown alternated with grey, touched with a little whitish above the tornal angle of fore wing. *Underside* : —Paler than the upperside with the markings similar ; an additional, whitish, indistinct spot on the fore wing towards the base of the internomedial interspace. Antennæ black with white dots on the shaft and a whitish streak on the underside below the club ; palpi, head and body above blackish-brown ; on the underside the palpi are grey ; pectus and legs with grey hairs.—Female. *Upperside.*—Similar to the male, the semi-hyaline spots on the fore wing a little larger. *Underside* :—paler than in the male. Forewing with the whitish spots larger. Hind wing with a whitish spot at end of cell, a discal series of whitish, lunular spots and a few more indistinct whitish spots inside the wing. Expanse : 32mm. to 35mm. (Swinhoe, *Lepidoptera Indica,* vol. X, p. 89.)

It is probable that all the specimens from which Colonel Swinhoe described the species were caught insects and that none of them were bred. The following description is from a series of fifty bred specimens from Kanara :—

Male. Fore wing. *Upperside* with white, short, decumbent hairs sparsely disposed from base to middle of wing, stopping before the discal markings ; the outer half beyond discal markings similarly clothed, sometimes more densely but always leaving a broad terminal border more or less without them ; this white hair-scaling giving a distinct greyish look to the portions having it ; the usual short fringe of brown-black hair along inner margin. Cilia brown broadly at ends of veins, leaving the intervals narrowly white sullied with brown ; the cilia at apex and above tornal angle rather prominently white. There are the three semihyaline, subapical spots mentioned in Swinhoe's description above ; the bar at end of cell which is, however, not excavated on the outside, sometimes shallowly and widely ; the spot above the bar on costa ; a spot below the bar in interspace 2 outside end of bar, about as broad as that bar and filling the whole breadth of interspace ; a small spot outside the upper, outside corner of this last in interspace 3 ; besides : a small spot or dot, joined to the inside lower corner of the spot in interspace 2, in the upper part of interspace 1 with another dot inside and under in the lower part of the same interspace 1 ; often, also,

finally, another similar spot or dot inwards half way towards base of wing from this last and in the same interspace 1. All these spots and dots are shaded with black, discal markings on their inside borders, the subbasal spot (the last mentioned) on its outside edge,the subapical also on the outside. Beyond the grey hair-scaling the outer part of the wing is, as said above, broadly dark-blackish with pale dots showing through by transparency so to speak from the underside in a submarginal series in interspaces 1 (two in this) to 8 and even 9 (the 9 spot then above the top preapical series of three semihyaline white spots), those in interspace 1 quite marginal as also those in 2 and 3; those in 4 and 5 a little in from margin, those in 6, 7, 8 still further in; parallel to this submarginal series there is a faint postdiscal series of four of which two are in interspace 1 and one each in 2 and 3. All these submarginal and post discal spots are very faint but the submarginal ones of interspace 1 are generally a little clearer than the others as are also those in interspaces 4, 5 while the post discal dots are always blurred. The basal third of the cilia is always brown. Hind wing clothed sparsely with much longer white hairs, those in the inside area longest, standing away from the surface; the fringe along abdominal margin-edge short and brown with white tips. The wing is of the same ground colour exactly as the fore wing and has a subbasal series of three blackish, rather large, very indistinct spots of which the central one is in the cell, the top one in interspace 7, the bottom one in 1; a postmedial series of similar dark spots but rather elongated and quite complete; all the white spots of underside showing through obscurely-pale except the one in the middle of cell which is more or less distinct but small. Cilia exactly as on fore wing except that the white intervals are more extensive, their bases brown. *Underside*:—Much paler than the upperside, the black borders to the spots showing darker against the ground colour and slightly extended-suffused. Forewing with the subapical three dots confluent, the cell-bar confluent with the spot above it; all the other semihyaline white spots similar to those of the upperside; the four white spots in interspaces 1 (two in this), 2 and 3 of the postdiscal series blurred-white or yellowish but distinct; those of the submarginal series on the whole better defined also, those in interspace 1 and 4, 5 quite distinct but very small, white, the upper occasionally yellowish as are the apical ones of the series—the dots in interspaces 2, 3 are nearly absent or very feebly expressed in all cases; there is a white streak from the origin of vein 2 inwards along the vein to base of wing often reduced to a spot at end (below origin of vein 2); the internomedian interspace is very pale brown throughout; the base of wing with a clothing of sparse, longish decumbent white hairs and a few white scales. Hind wing of the same shade as fore wing with similar white hairs at base and white scales in posterior part as far as anal angle; with the following white or yellowish-white spots: a subbasal or antemedial series of three, one in interspace 7 one in the upper part of cell and an obscure one in interspace 1; a postmedial series in a curve parallel to outer margin, quite complete, the first or uppermost in interspace 7, one in each of the interspaces 6, 5, 4, 3, 2 and a pair in 1; between these two series there is a thin white bar on the discocellulars with a streak-spot beyond in interspaces 4 and 5 with a slight blurred spot above them in 6 and a series of three more below in interspaces 2 and 1; so that there is really a sequence of three transverse bands of spots; antemedial, medial and postmedial; there is always an attempt at a fourth series, marginal, also, but it is nearly always limited to two in interspace 1 and one in interspace 2; the margin thinly darker. The "streak-spots" are elongated spots in interspaces 4, 5, and, curiously enough, on the underside of the fore wing, the same interspaces are often whitish postmedially resembling two streaks corresponding to those on the hind wing. Antennæ the same colour as wings, ringed with white all up the shaft, the club black with the ventral side of its base extending a short way down shaft ochreous-whitish head, palpi, body concolorous with wings above; below the palpi, pectus or breast and abdomen are white. The long fringe—it is

hardly a tuft—on the tibia of the hind legs is light-ochreous in colour.—Female. Very like the male in colour but darker on the upperside, with a slight russet tinge on the underside. Markings identical; also antennæ, &c. Expanse: 30 mm.

Egg.—Dome-shaped, broadest just above the base, slightly flattened on top round the micropyle. Surface divided into sections by fifteen longitudinal ribs of 0.05 mm width and 0.03 in height, rounded, rough; none of these ridges reach further than the edge of the concave area surrounding the micropyle which is only very slightly depressed and is 0.1 mm in diameter, circular; every alternate rib finished well short of the others; besides this the surface is shining, cross-rayed between the ribs with little, parallel, equally-spaced lines which are 0.05 mm. apart and about 0·0125 mm. in width, very low; all these ribs and cross-rays become more or less obsolescent towards the base of the egg; the distance between the ribs at the broadest part is 0.1 mm and between the cross-rays of two adjacent ribs 0.175 mm. Colour is light-green when laid, turning red before the larva emerges; the ribs are all white, the cross-rays green like the ground-colour. B: 0.7 5mm; H: 0.5 mm.

Larva.—The *shape* of the larva is that of a spindle, the transverse section of segments 2 to 12 is circular, the body is much fattest in the middle, the ventrum is, however, somewhat flattened, the ventral surface separated from the dorsal half-segments by a slight ridge or fold immediately below the spiracular line; the anal segment is rather long, in shape a parabola, the end rounded; segment 13 well-developed; segment 2 is rosey-whitish, shining, the front margin straight, as long as segment 3 but narrower; there is a distinct neck and the *head* is comparatively very large, round in shape with a distinct though narrow, shallow sinus on the vertex in dorsal line dividing it into two, well-defined broadly rounded (on the vertex of each) lobes, the surface shining, rugose and covered with minute, decumbent, fan-shaped bunches of short, translucent-white hairs, each fan being made up of five or six rays or hairs all pointing downwards; it is really broadly heart-shaped; the true clypeus is equilateral, triangular, the apex acute, the length about half the height of face, the sides slightly convex outwards; the false clypeus outside reaches three-quarters the height of the head, similarly triangular, a broad stripe rather difficult to make out; labrum transverse, shining red-brown, one-third the length of the true clypeus; ligula the same length as labrum, red-brown with a wide, frontal, triangular sinus or emargination set with a few stiff, short, rusty-red hairs on the edge; antennal basal joint blackish red-brown as also the second joint; mandibles dark red-brown broad, strong and with their cutting-edges obscurely toothed; the eyes are arranged numbers 1, 2 close together, 3 a little further apart, 4 still further away, 6 about as far from 4 as 4 is from 3, number 5 behind and somewhat nearer 6 than 4, forming a triangle with these two, numbers 1 to 6 in a slight curve convex forwards, all blackish; colour of head deep red-brown; the small fans are really cup-shaped bodies with thin, hair like rays from a small conical tubercle surmounted by a thin stem, about 0.05 mm in height or length, the fan 0.05mm. in diameter, the space between two ray-ends being about 0.15 mm. all translucent-white; *surface* of body is minutely pitted and covered with small, short, transparent-looking star-topped hairs as above described; the segments all well-marked and thin, parallel, impressed lines transversely across body in front of the hinder margin of each segment, 3 or 4 to each, the free margin of anal segment set with some 8 or 10 longish, simple hairs as well as having some longer-stemmed (than the rest of the body) star-topped ones; bases of prolegs and true legs also with fine, simple hairs. *Spiracles* oval, small but well defined slightly raised, yellow-brownish. *Colour* of body a dark, blackish olive-green with a dark, dorsal, pulsating line and a fine, rather faint, lateral longitudinal line; segment 2 rosey-whitish; ventrum a shade or two lighter. L: 21 mm.; B: 4.5 mm. at middle.

Pupa.—This is, in *shape*, like that of *Sarangesa dasahara*: eyes prominent, square in front and broad, the frons of the head slightly "bossed" with a small, round, hemispherical swelling; the breadth of the pupa at the eyes is broader than that at the shoulders or, at any rate, quite as broad; the lateral outline behind the shoulder parallel-sided as far as ends of wings with a slight dorsal constriction at segment 5 and a slighter, longer, lateral one between those points; *head* bowed, the frons prominent strongly between the eyes, in a plane perpendicular to the longitudinal axis of the body; vertex inclined at an angle of 30° to that axis with the dorsal ascents of segment 2 and the front of thorax, the hinder margin straight, the length rather greater than that of segment 2; this latter segment a transverse piece with straight hinder margin, as long as segment 4; the thorax broadly humped, the apex close to the hinder margin, the same height more or less from about one-quarter behind front margin to one-quarter before the hinder margin, the falling to the slight constrictions, the hinder margin a short parabolic curve meeting the wing in an open, well-rounded angle of something under 90°; segment 4 is one-fifth the length of thorax in the dorsal line; 5 slightly shorter; segment 6 quite twice as long as 4 (this segment has the hinder margin broadly curved backwards, that of segment 5 less curved); segment 6 has the hinder margin straight; the portions of segments 9, 10 not included in the bevilled margins are short, the bevilled margins are smooth; 11 behind the bevilled front margin is also short; 12 has the dorsal line inclined to the axis of pupa at an angle of about 30°; 13 inclined at 45°; segments 11, 12, 13 coequal in length but narrowing backwards of course; 14 is composed of an anterior, broad, triangular portion and a much narrower, oblong, equally long, terminal moiety. *Surface* covered with erect, fine, light hairs all over, the end-halves strongly curved but without branchings, about 0.2 mm. in length, some form minute, dark depressions or dots; the wings shining, the rest covered with a blue-glaucous "bloom"; proboscis free after ends of wings as far as segment 11, fore legs reaching one-third of length of wings towards their ends, mid legs about two-thirds, antennæ between the two; there are no signs of any inserted parts between the two halves of proboscis near base or between it and fore legs; the clypeus is small, diamond-shaped and longer than broad; the extensor ridges of cremaster ventrally meet forwards making a completely enclosed circular space round the scars of the claspers; the suspensory hooked shaftlets are bunched at extremity of cremaster and orange in colour, short; the segments are all well-marked and the wing-veins are obtusely prominent. *Spiracles* of segment 2 are very prominent semicircular processes, dark-brown and spongy-looking, facing forwards with a diameter quite as great as half the length of segment 2; the other spiracles are small, broadly oval, prominent, with central, depressed slits, soiled, dull orange in colour. The *colour* of the pupa is rather dark yellowish-brown with the bloom above mentioned; thorax and head darker. L: 14 mm.; B: somewhat over 4 mm.

Habits.—The eggs are laid singly anywhere on a leaf or leaf-stalk, the larva, emerging, immediately makes itself a house, turning over a triangular part of the leaf from the edge. It does not eat the shell of the egg and emerges through a hole towards the apex which it eats through from inside. Later on, as it grows larger it makes new cells which are always only lightly fixed down round the edges; in the last stage, when full-grown, it prefers making its home in the middle of two or three withered leaves which it binds together strongly with silks, often choosing a dead leaf and a couple of green ones; it pupates in this, fixing itself by the tail firmly and throwing a band round the body in the usual position; the inside of the cell or house is generally

lined thinly with web or silks. This skipper has the same habits exactly as *Sarangesa dasahara* frequenting similar places and flying in a similar manner, resting in the same positions and generally occurring in similar numbers together with that species. Many specimens were bred in the Kanara District in Bombay on species of *Asystasia* (*Acanthaceae*) both in the dry weather as well as in the monsoon. It is found there from sea level up to 2,000′ in the Ghats.

This species is most similar to the *Sarangesa purendra* figured by Swinhoe in plate 778, figures 3, 3a and 3b in *Lepidoptera Indica*, volume X. Fresh specimens are, however, much blacker and the undersides of the hind wings are dotted with white more like his *S. sati* on the following plate. These butterflies (*Sarangesa dasahara* when fresh is just as black) fade very much with time and become earthen coloured. Swinhoe says *purendra* is a common species all over India ; " Moore records it from Bombay, Umballa, Kasaoli and Kangra; we took it at Bombay, Poona, Mhow, Karachi and Hyderabad, Sind; we have it also from Ranikhet, Dehra Dun, Pachmari and Karwar where Davidson, Bell and Aitken bred it ; de Rhé-Philipe records it from Masuri, Betham from Matheran, Hannyngton from Kumaon, Doherty from Kunawar. It does not appear to extend into Burma or Ceylon." (Swinhoe, *Lepidoptera indica*, vol. x, p. 90).

The male and female butterflies are represented on plate N, figures 83 and 83a respectively. While the female is a good colour in the picture, the male is far too red although it has, in nature, a slight tint of the red in the brown, as compared to the female, on the underside. The actual insects from which the paintings were made were certainly not Kanara specimens and came most probably from the neighbourhood of Bombay or north of that.

209. Sarangesa dasahara. (*Moore*).—Male. *Upperside.*—Coloured like *S. purendra*, a little darker. Fore wing with three similar subapical dots ; a small dot at the upper end of the cell with another above it ; a very indistinct, discal band and a similar middle band both slightly darker than the ground colour. Hind wing with indications of a discal and marginal band. *Underside :*- Much paler, the bands consequently more pronounced, the hind wing with some grey suffusion between the band and along the abdominal area, caused by minute, greyish-white scaling. Cilia as in *S. purendra.*—Female. Similar to the male but, in the fore wing, there is an additional dot below the cell, all three being in a line and a dot in the interspace 3 a little before its middle. *Underside :*—Similarly marked, the coloration and bands as in the male. Expanse up to 35mm.

The above is Swinhoe's descripti n. In *Lepidoptera Indica*, Vol. X, p. 90, he says that the types came from Bengal and that the species seems to be common all over India but, apparently, by his enumeration of localities from which he has seen specimens, he has not had it from anywhere in Peninsular India except Ganjam on the east coast and Travancore south of Bombay Presidency on the west coast. His above description is meagre and, judging by bred specimens of

which we have half a hundred available, based upon inadequate numbers. He has erected a species, the one following *S. dasahara* in the book, which he has named *S. davidsoni* from Mahableshwar and Karwar (this latter in Kanara) and gives descriptions of the larva, pupa and habits from "Davidson, Bell and Aitken in the Journal of the Bombay Natural History Society, Vol. XI, 1897, p. 34." Davidson, Bell and Aitken called it *S. dasahara* and it is difficult to say how the mistake arose, for mistake there certainly is. The insect that occurs in Kanara is certainly not *S. davidsoni*, Swinh. A description of it is as follows, taken from the fifty specimens ; if it is not *S. dasahara*, then it must be a new species and *dasahara* does not exist in the District of Kanara.

Male. Fore wing. *Upperside*-Vinaceous—blackish-brown, certainly darker than in *S. purendra* because there are no grey hair-scales on either wing ; they are replaced by much fewer yellow hair-scales on the fore wing and by brown hairs on the hind wing. Fore wing with the three subapical, semihyaline spots, two spots towards end of cell, the upper triangular, and sometimes joined to the lower by its lower angle, the two then forming one spot deeply excavated on the outer side ; a somewhat smaller spot between these and the costa ; a white, semihyaline dot towards the base of interspace 3 half way between the cell-spots and the subapical spots, on a level with the lower of the former ; another in the middle of interspace 2 about half way between the cell spot and the one in 3 ; a transverse medial (or very nearly) band from inside the cell-spots to inner margin appearing somewhat macular and a similar transverse, postmedial band somewhat oblique, beginning rather broad inside the subapical spots, including the dots in interspaces 2 and 3, to inner margin before tornal angle, the inner margin in continuation and a marginal band up again to apex in further continuation, all darker than the ground colour ; the interval between the postmedial and marginal bands often lighter than the ground colour because of ochreous scales ; a fringe of short, dark hairs along inner margin. Hind wing with the following dark transverse bands: an antemedial, much excurved one, consisting of a large spot in interspace 7, another at end of cell and filling it, a third in median interspace by abdominal fold ; a postmedial series of spots beginning with one in interspace 7 below middle of costa, excurved in the middle of wing, with a spot in each interspace 6, 5, 4, 3, 2 and two spots in interspace 1, the band practically continuous and somewhat irregular—that is not always exactly symmetrical in two specimens ; the abdominal margin fringed on its edge with white hairs. *Underside* : Paler on the fore wing with some ochreous hairs at base, the semihyaline, white spots as on upperside, the dark, transverse bands rather more obscure ; with a pale streak from origin of vein 2 inwards under the vein to base. On the hind wing much paler ochreous-greyish because of a plentiful sprinkling of hairs and scales, omitting always the dark bands which, therefore, stand out much more boldly than on upperside ; the costa narrowly with apex broadly dark. Cilia of fore wing brown practically with apex tipped white and interval between veins 1 and 2 above tornus also white-tipped ; on the hind wing broadly yellowish-white with the bases brown.—Female. Like the male in every respect, perhaps a wee bit lighter in colour, the markings similar. Antennæ in both sexes concolorous with upperside of wings, ringed with white, the club black with the tip whitish below and the shaft also at its distal end ; palpi ochraceous below as also the pectus, the third joint and upperside of palpi and the head concolourous with upperside of wings ; body and abdomen also concolorous with upperside of wings above ; below ochreous but with, in the male, grey

black hairs on the thorax; the legs brownish; the tuft of hairs on the hind tibia of male black amongst the ochreous fringe. Expanse: 30mm., the same for both sexes.

In small specimens the two cell-spots are well separated and the dots in interspaces 2 and 3 on the fore wing are entirely wanting both above and below. All these specimens, from which the above description is taken, unfortunately, were bred in the rains. In the dry weather, doubtless the colour would be lighter, possibly the spots smaller (or larger ?) and some of them might possibly be wanting.

Egg.—The egg is in *shape* a dome, circular, the base as broad as the diameter further up the sides. The *surface* is shining, minutely tuberculate generally and sculptured by 14 meridional ridges of which 7 reach a flat, circular surface that forms the apex and is likewise tuberculate in the same way as the rest; these ridges coarse and high, 0·025 mm. in breadth by 0·05 mm. in height, separated by an interspace of 0·2 mm. in the middle of the sides of the egg; the surface is also cross-rayed by low, paralleled rays between these ridges in the top one-third, not cross-rayed on the rest of the surface; the ridges are all rough-tuberculate; the longer ridges are 0·15mm. longer than the shorter and, as a rule, between these; the flat—it is slightly concave—space on apex is between 0·1 nd 0·075mm. in diameter. The colour of the egg is a soiled, light yellowish or extremely light brown all over. H. 0·9mm.; B. 0·65mm. with the meridion-prominence, the B. without them is 0·055mm.

Larva.—This is of exactly the same *shape* and type as the larva of *Coladenia dan.* The body is fattest in the middle, circular in transverse section from segment 2 to segment 12-end, the anal end rather fine, the neck or segment 2 about the same width as segment 11; segment 13 a transverse distinct piece little shorter in the dorsal line than segment 12 but having a curved hinder margin, convexly produced in a curve towards anal segment from the spiracular region on one side to the same on the other; the anal segment slightly narrower, as long as 13 and 12 together, consisting of a basal transverse, short piece with a semicircular longer piece in continuation, this semicircular piece convex transversely with four longish reddish hairs directed horizontally out backwards from its margin, one on each side dorsolateral, one spiracular, the hairs as long as segment 13; segment 11 one third as long again as segment 12; segment 10 longer still; the prolegs and true legs all short, the ventral surface flattened as usual so that the " transverse section " of the larva is not really circular as stated above—in larval descriptions we have generally called it so, however. *Head* as broad as segment 3 at front margin and as high, higher and broader than segment 2; more or less quadrate in shape though slightly broader above than at mouth, with a very gradual, shallow sinus on vertex leaving each lobe broadly rounded there; the surface is shining, rather coarsely cellular-rugose, the dividing lines or ridges rather broad, each depression between them set with a single, decumbent, longly feathered, white, shining hair which is about as long as the depression and the feathers about half as long in the middle of the hair, getting smaller towards the tip; the clypeus is triangular, equilateral about one-third the height of the face; the false clypeus about two-thirds the height of the face very broad, arc-shaped but longer than broad; the labrum is transverse, narrow, lightish; the ligula small; the antennal joint both dark-brown-reddish, the mandibles the same, the eyes black; a few longer hairs, simple, about mouth-opening. *Surface* of larva is dull, smooth, the skin thin, covered with minute, well-spaced, short, rather long-stemmed, star-topped hairs that are light in colour and have the rays of the stars consisting of many single hair-like processes; some of these hairs being surrounded by a whitish, slightly raised, circular, collapsed tubercle or something like it; those on the extreme segments 13, 14 form redbrown, lowly conical, shining tubercles—few, funny looking, oval, larger, very lowly-convex, glassy turbercles surrounded

by a thin line on segment 14 where the hairs are all longer than anywhere else and where, also, there are 4 much longer hairs pointing backwards—as mentioned already above ; the segments well marked with the usual impressed lines, parallel, in front of hinder margin. *Spiracles* small, oval, nearly flush, whitish ; those of segments 2 and 12 larger. *Colour* of the larva is brownish olive-green with a spiracular, white, thin, somewhat interrupted line and a dark, sometimes interrupted, dorsal line ; the paired bodies between segments 9,10 yellowish, large (in the male) ; the anal segment yellowish, the segments 3, 4 pinkish headed ; segment 2 nearly white ; the sides of the body from spiracular line down lighter as well as the ventrum and legs. L. 20mm. ; B. 4mm.

Pupa.—This is a normally *shaped* chrysalis, fattest in the middle, blunt and square in front, pointed behind, the *head* with the frons in a plane perpendicular to the longitudinal axis of body, the vertex in the same plane as segment 2 and the front slope of the thorax about 30° to that axis or slightly over, the frons rather prominently convex between the eyes, the eyes prominent rounded, the whole piece, including segment 2, quadrate, somewhat constricted behind the eyes, the margins of head and segment 2 straight ; the thorax humped and broadly convex about 4× the length of segment 2, the apex about half way between front and hinder margin, the dorsal line sloping with segment 4 to segment 5 at a gentle angle ; the pupa constricted shallowly and rather conspicuously dorsally and laterally behind thorax the hinder margin of which is a semicircle curve, slightly produced (though not in the least angled) in dorsal line, meeting the wings in a widely rounded, deep angle of about 60°, this angle limiting the somewhat convex lateral portions of segment 4 laterally and anteriorly ; segment 4 as long as segment 2 in the dorsal line ; segment 5 rather shorter than 4 if anything, segment 6 twice as long ; segment 12 about as long as segment 2; segment 13 little shorter ; segment 11 about equal 12 ; the cremastral (anal segment) a thick triangular piece, the sides concave, the end shortly square, the whole segment 2 × the length of 13, bent down rather strongly, the end set with short, dark-rusty, hooked shaftlets, the hinder margin with a central, quite large, semicircular depression that has its reproduction, though slighter, on the hinder margin of segment 13 ; the dorsal outline behind thorax straight as far as segment 9, then sloping to anal end ; the ventral line straight to near the cremaster then bent down ; the abdomen fattest in the middle of pupa again after the constriction behind the thorax. *Surface* not particularly shining except on thorax, wings and head with segment 2 covered all over with a fairly dense coating of half-erect, very fine, whitish hairs that are as long as segment 13 is long or somewhat less, except on wings and segmental membranes ; the bevilled edges of segments 8-11 sloping, the anterior (segment 9-11) rather steeply, the posterior (segments 8-10) gradually, the former more roughly granulated than the latter though both are very finely so and all are delimited by a rather prominent angle from the rest of the surface ; the venation of the wing well-expressed ; the proboscis produced free beyond the wings to end of segment 12; the hairs on the head are also well developed, those on the eyes being particularly long. *Spiracles* of segment 2 indicated by a broadly semielliptical, convex, dark red-brown, rugose surface with its base on the front margin of segment 3 and lying on the surface of that segment, facing slightly obliquely up and forwards, about as long as half the length of segment 2—not quite; the rest of the spiracles broadly oval, red-brown in colour, very prominent, broadly truncated cones, of moderate size. *Colour* bright emerald-green toned down to glaucous by the clothing of hairs except on thorax, wings, and segments 1, 2 ; the wings whiter as well as the cremaster. L. 14mm. ; B. 4mm. ; H. 4mm.

Habits—The egg, always single, is laid anywhere on the leaf or the leaf stalk. The young larva, when it first emerges, proceeds to the edge of the leaf where it turns over a small, triangular portion of

the leaf on to the top, coating the piece thus turned over with a lax cloth of silk and fastening it down all round by a few strings or threads. It lives on the underside of this piece, lying with its head turned round on its side like the rest of the *Sarangesa* and *Coladenia* tribe that we are acquainted with. In all future stages this position of rest is adhered to. After the second moult it folds a leaf by drawing the two edges together with web, often using withered leaves for the purpose; sometimes, more rarely, even a leaf of another plant that may happen to be lying about or against the foodplant. It is always sluggish in its movements and dislikes the light at all times. The pupa is formed in a roomy cell, coated with silk, made of withered leaves of the foodplant or any other shrub or weed; and is attached by the tail with a loose body-band that is generally attached by an anchoring-thread to the roof of the cell as described for *Badamia exclamationis*. The foodplant is acanthaceous and may be either *Asystasia* or *Blepharis asperrima*, both low, more or less herbaceous, weeds that are common in the jungles and regions of heavy to moderate rainfall from sea-level up to some thousands of feet. The butterfly flies low down amongst the bushes and grasses with a fairly fast, jerky flight and devious path; it settles with the wings spread out horizontally at all times and may be met with at all times of the year but is, of course, most plentiful towards the end of the monsoon in Bombay; it visits flowers frequently but never rises to any height above the ground.

Genus 8.—Tapena.

Colonel Swinhoe gives the following:—

Antennæ.—The club moderately fine, well-hooked, often very much h ooke the tip acuminate.

Palpi.—Porrect, third joint short and obtusely conical.

Hind tibiæ.—With two pairs of spurs, the male with a long tuft of blackish hair lying along its inner side.

Forewing.—Vein 12 ends on costa before end of cell; discocellulars sub-erect, the lower the longer; vein 3 emitted about one-sixth before lower end of cell, 2 one-fourth from the base, cell a little less than two-thirds length of costa, the costa evenly arched, apex acute, outer margin straight to vein 2 and inwardly oblique and slightly concave to tornal angle, hinder margin of similar length, nearly straight; some brown hairs at base—very few—and a short fringe along inner margin.

Hind wing.—Vein 7 from a little before upper end of cell; discocellulars and vein 5 faint, the lower discocellular the longer; vein 3 from close to lower end of cell, vein 2 from very little inwards; costa highly arched in the middle, apex angular, outer margin sinuate and somewhat produced and angled at the end of vein 3, slightly concave above the angling, the wing somewhat square in shape; the base with longish, brown hairs as far out as middle of disc, with much longer hairs reaching little short of termen on hinder half, the abnominal margin with a thin, short fringe of brown hairs. Cilia concolorous with the wings.

Concerning egg, larva, pupa and habits see below. There is only a single species *à propos* of which Colonel Swinhoe notes: Elwes and

Edwardes have erected two species on account of some differences in the genitalia. They were not able to examine the genitalia of any Ceylon specimens, therefore cannot say how they differ from Burmese and Nilgiri examples. We have examined this species from different localities; we find that the size and shade of colour varies much in examples from the same locality and, for purposes of this work, it is impossible to recognise species that can only be differentiated by the examination of the genitalia of such male specimens. (*Lepidoptera Indica*, Vol. X, p. 60.)

210. Tapena thwaitesi, *Moore*.—Male. *Upperside*:—Dark-brown with a purplish tint. Fore wing. With two subapical, semihyaline, white dots near the costa and, sometimes, a very minute dot below them; an indistinct, discal fascia a little darker than the ground colour of the wing. The species varies in the shade of colour; in some examples it is much paler and more brown than in others, showing the fascia more plainly. Hind wing. Also with discal fascia, not visible in the darker specimens; a white semihyaline dot at end of cell, sometimes absent. *Underside*:—Similar but paler. Cilia concolorous with the wings. Antennæ with the upper half of club dull-ochreous on the underside and a whitish streak below on shaft, the two sometimes one, the upperside pinkish; palpi brown above, ochreous below; head, body above and below and the legs concolorous with the wings. Female.—*Upperside*:—Paler with an ochreous tint. Fore wing. With three subapical spots, more linear and larger than in the male; a larger spot at the end of the cell with its inner margin extending upwards and with a dot between the extension and the costa; a spot below it in interspace 2 rather larger and a dot outside at the base of interspace 3 between the large spots. Hind wing. With a prominent white spot at the end of the cell. *Underside*:—Similar. Antennæ as in the male; a white spot on each side of the collar; palpi greyish-white, with short, brown hairs and a white patch on each side below the eyes. Expanse: 40mm. to 45mm.

The Kanara specimens are uniformly smaller, never over 35mm. in expanse. In the fore wing the dark fascia deciphers into a black spot towards base of cell, another outward in base of interspace 2 with a black mark across interspace 1 below it a little inward; the large semihyaline two spots with black inside edges continued as two dark spots to inner margin; their outer borders also blackish-suffused, connected by blackish suffusion with the black-bordered subapical dots; a submarginal black-suffusion forming a band but interrupted broadly in the middle; in very dark, fresh specimens the whole of the outer disc from end of cell to this last submarginal band is suffused blackish. In the hind wing the markings decipher into a subbasal band, a medial band through end of cell and a postmedial band of spotted appearance with the terminal margin darker also than the general colour. The tarsi of all legs are golden-ochreous; the palpi dull-ochreous in the male, ochreous-grey in the female.

Egg.—The general *shape* is that of a dome with 13 or 14 meridional, sharply-defined, tuberculate, white ribs or ridges on the *surface* which are more or less broken at about one-quarter their length from the apex—some 7 or 8 that is thus broken, the other 6 or 7 continue up to the flat, apical, 7 or 8 sided area, the ridges coming in at the angles; this flat space, and for some distance outside it, is punctuated by little raised, white dots (shortened lines): the flat area itself is bounded by a darker shade than the rest of the egg and has a central, white dot on it (the micropyle probably) and is about one-sixth of the whole diameter of egg in width; the surface between the ridges is nearly obscured by many tiny, very short, white, hair-fine, longitudinal, raised lines, about 9 parallel to each other between every two ribs near the top of the egg, just below the "lid," which lid is that portion of the egg above the break in the meridional

ribs—the interspaces between these tiny lines are broader than the lines themselves; hardly shining. *Colour* is green. B. 0· 75mm. H. 0·50mm.

Larva.—The *shape* of this larva is nearly perfectly spindle-shaped; the transverse section circular—except that, as usual, it is somewhat flattened on ventrum—with the anal end narrowly square; the 2nd segment just a trifle broader than the anal extremity, and much narrower than the head which is as broad and high as segment 3 at front margin; segment 13 is half the length of segment 12, a well-defined, transverse piece; the anal segment after it is a perfect trapeze with the extremity about half the width of the anterior margin, the whole segment convex transversely, sloping at about 30° to the longitudinal axis dorsally, overhanging the anal claspers and low on the resting surface; segment 13 has the same dorsal slope; segment 12 is over three-quarters the length of 11; all prolegs and legs are small, short; the body is slightly flanged along the dorsoventral line and is by far fatter in middle than anywhere else. The *head* is large and exceptionally flat, hardly convex on face, very broadly heart-shaped, broader than high, nearly straight across the vertex except for the very slight, shallow, central sinus; surface reticulated all over with comparatively broad, flattened, shining lines, the cells or interspaces being dull, greyish and, of course depressed between the lines; the clypeus is triangular, apex acute, about one-third the height of face; the false clypeus moderately broad outside it from just below the middle, a band with convexly curved (outwards) margins, apex acute, reaching half the height of the face, the surface also reticulated; labrum transverse, rather short, light in colour; ligula broadly kidney-shaped, rusty with darker ends to the broad, deep, frontal sinus; antennal, basal joint light as also the second; mandibles large, strong, broad, light-orange, the ends dark and quite entire (without teeth); the eyes arranged rather abnormally: numbers 2, 3, 4, 6 in a quite straight line, number 1 a little behind, 1 to 4 all equispaced, rather close together, number 6 twice the distance from 4 and number 5 behind 4, on a level with it and further away from it than 4 from 3 for example, all dark coloured; the colour of the whole head soiled orange with a moderately broad, marginal, dark-brown band from the eye-circle up each side and over the vertex, another, less broad, behind limiting the foramen or where the body fits into the head. *Surface* dull and quite destitute of hairs of any description, the segments well marked and the few impressed lines in front of hinder margins punctuate occasionally dorsally. The *spiracles* extremely small, in depressions; those of segments 2, 12 larger; all whitish and broadly oval. *Colour* of the whole larva chalky-white with a slightly bluish shade, opaque, the segment-margins and impressed lines showing thinly dark. L. 24mm. at the most when stretched, and B. 4mm. and slightly over at middle.

Pupa.—The general *aspect* is stout, the anal end pointed, the thorax humped, the head-piece, consisting of segments 1 and 2, quadrate, the vertex of *head* with segment 2 and the front slope of thorax in a plane at about 30° to the longitudinal axis of the pupa; the frons in a plane at right angles to that axis, produced out into a porrect, slightly upturned, conical, rugose-surfaced beak which is as long as the head-vertex; segment 2 a transverse piece not as long as the head and with the front and hinder margins quite straight, parallel to each other; shoulders somewhat prominent but evenly rounded, the dorsal outline of thorax convex, gradually rising from front margin to about one-quarter before hinder margin, then descending to segment 5, including segment 4 in the gradual descent; the hinder margin of thorax a short parabolic curve meeting the wing-lines in a broadly rounded, deepish angle of something over 45°; segment 4 dorsally slightly longer than 5; segment 5 about half segment 6; pupa broadest at middle but very nearly the same breadth there as at shoulders, highest at thoracic apex; dorsal line of abdomen straight, ventral line slightly convex; segment 13 a transverse piece disappearing on the sides of the pupa, convex longitudinally, shorter than segment 12; segments 11, 10, 9 also

about equalling 12; segment 14 with a short, truncate-conical basal portion produced into an equally long, nearly perfectly oblong cremaster with tiny hooked shaftlets as its extremity, the whole segment equal 13 + 12 in length; both 12 and 13 with a slight sinus in the dorsal line on their hinder margins; proboscis reaches just to the ends of wings; the antennæ about three-quarters the way; the cremaster is only very slightly bent down. *Surface* shining, thinly transversely aciculate all over except on wings which might be said to be minutely granulate; the segments all well marked; the bevilled edges of segments 8-11 hardly existing on hinder margins of 8-10, sloping and quite well developed on the front margins of 9-11; both margins of segment 13 rather suddenly raised from 12 and 14, hinder margin of thorax rather suddenly higher also than the adjacent surface. *Spiracles* of segment 2 are slits, linear, between segment margins 2, 3 bordered by dull-white, broadish bands on each side which are differentiated from the surrounding surface only by being dull instead of shining, about as long as segment 2 or only slightly less; the rest of the spiracles small, oval, dull, opaque white. *Colour* waxy looking white with a translucent greenish tinge on wings, thorax and head; the only colour about being the reddish cremastral hooked shaftlets. L. 18 mm.; B. 4·5mm.

Habits.—The eggs are laid singly on the young shoots; the egg larva after emerging turns over a long section of the edge on to the top, parallel to the midrib, the section adhering, by a narrow stalk left at its middle, to the leaf; the larva lives upside down on this turned-over piece coating it with silk. When full grown it places one leaflet over another nibbling pieces out of the edge all round. The change to pupa takes place in such a cell and the chrysalis is attached by the tail and a body-band inside. The cell is always rather laxly lined inside with silk. The larva is sluggish and does not like the light and lies in its cell with the head turned round on the side as often as not. The places chosen for oviposition are generally shady, out of the sun and the leaf is always a young one. The larva lives on young or youngish leaves at all times. Often there are many eggs laid on a single tree or bush and banks and the sides of nallas are favourite places. The imago is a strong flier, rises at times high up in the air, is moderately fond of flowers and has a jerky, devious flight. At all times it rests with the wings horizontally extended, always slightly bent down at the ends. The foodplants are *Dalbergia latifolia*, the Rosewood or Blackwood or Shisam found all over Western India, *Dalbergia tamarindifolia* and *rubiginosa*, both large climbers of the Western Ghats. Sumatra, Borneo, Ceylon, South India are given as the distribution. It is very common in the North Kanara District of Bombay and is met with in the vicinity of Dharwar town so that it is more than probable it is to be found wherever there is a rainfall varying from 300 inches to 30 inches wherever its foodplant is to be found, either at sea-level or 3000′.

Subfamily (2).—Hesperiinæ.

This is a somewhat unsatisfactory subfamily but forms the best intermediary group between the butterflies with horizontally spread

wings when at rest and those with wings held perpendicularly closed over the back, that is between the *Celænorrhinæ* and the *Ismeneinæ*. Colonel Swinhoe characterises it as under :—

Antennæ.—Club robust, more or less straight, curved in *Thanaos* and *Carcharodus*. *Palpi.*—Suberect, the third joint blunt.

Hind tibiæ.—Two pairs of spurs, the upper pair very minute in *Thanaos* and *Carcharodus*.

Fore wing.—Vein 12 ends on the costa before the end of the cell; disco-cellulars suberect; vein 3 arises shortly before the lower end of the cell, 2 from before the middle; the cell is about two-thirds the length of the costa.

Hind wing.—Vein 7 arises just before the upper end of the cell, 3 from just before lower end, 2 from the middle—in *Carcharodus* a little more inwards, in *Thanaos* a little beyond the middle.

And he informs us also (*Lepidoptera Indica*, Vol. X, p. 95) of some interesting facts concerning the group :—

" In this subfamily we put *Hesperia*, Fabricius ; *Spialia*, Swinhoe ; *Pyrgus*, Hübner ; *Caracharodus*, Hübner ; *Thanaos*, Boisduval ; and *Gomalia*, Moore.

" The first three were put by Watson into sections under *Hesperia*, but he himself states that it is a genus that wants splitting up.

" Species of the first three genera are distributed all over the world, except in the Australian region ; *Thanaos* and *Carcharodus* are palæarctic, *Gomalia* is apparently confined to South India and Ceylon.

" Doherty says that the eggs are small, hard, seven-eighths as high as wide or even higher, constricted at base, with wide scalloped anastonosing ribs, remarking that this group is very distinct and includes *Hesperia* and *Gomalia*.

" The life history of typical *Hesperia* is well known, the type *malvæ*, Linnaeus, being a common English species ; for the life history of *galba*, Fabricius, the type of *Spialia*, we are indebted to Davidson, Bell and Aitken ; their habits of life are very different."

We know that the eggs of *Hesperia malvæ* at home in England (The Grizzled Skipper) and those of *Thanaos tages* (The Dingy Skipper) are dome-shaped and strongly ribbed with some 20 smooth-backed ribs with cross-rays between them that are much finer and lower. Those of *Hesperia* (*Spialia*, Swinh.) *galba* are exactly of the same type also. But that of *Gomalia* is very different in sculpture though more or less the same as will be seen if a reference is made to its description below under *Gomalia albofasciata*. The larvæ of *Hesperia* and *Spialia* are very similar, those of *Thanaos* and *Gomalia* have more or less naked heads, thus different from the others which have a clothing of long, more or less erect, blackish hairs ; all the heads are, however, round, rather bullet-shaped. The pupæ of all of them are somewhat alike, having large, spiracular expansions to the spiracles of segment 2, a well-formed, more or less triangular cremaster, the thorax humped, the colour green or yellowish. The habits of the larvæ of *Hesperia*, *Spialia*, *Gomalia* are similar in the matter of manufacture of the cells and the caterpillars' way of lying in them ; the pupation offers no

great difference of method in the various genera—that is in the three that are known in India; *Thanaos tages* at home seems to make a different sort of cell to the other three. In the matter of habits of the butterflies themselves there are important differences in the way the wings are held in repose. *Hesperia* (*Spialia*) hold them perpendicularly over the back as do all the *Ismeneinæ*, *Pamphilinæ*, *Erynninæ*, &c. that come after them in classification. *Thanaos*, according to available information, rests with the wings penthouse-wise like most moths. *Gomalia* assumes both or either of these positions indifferently as will be seen under that insect further on. They all agree in that the larvæ feed only upon dicotyledonous plants. The butterflies are all quick in flight, frequent low herbage and live in the open country and, in India, always, with the exception of *Spialia galba* (*Hesperia galba*), at levels above 2,000 feet above the sea. *H. galba* is found at all heights, even along the sea-shore.

Genus 9.—Hesperia.

Quoted as under, following Swinhoe in *Lepidoptera Indica*, Vol. X:—

Antennæ.—Less than half the length of costa of fore wing, the club robust arcuate, blunt at tip, with no terminal crook.

Palpi—Suberect, second joint laxly clothed with longish scales, third joint slender, blunt, almost concealed by the scaling of the second.

Hind tibiæ.—With two pairs of spurs; no tuft of hairs in male.

Fore wing.—Vein 12 not straight but slightly recurved before bending up to the costa, ending there some distance before the end of cell; discocelluars suberect, the lower the longer, vein 3 emitted a little before lower end of cell, 2 from a little before middle; cell a little less than two-thirds length of wing; costa arched at base, then nearly straight to apex, the apex and outer margin evenly rounded; no costal fold.

Hind wing.—Vein 6 emitted quite close to the upper end of cell; discocellulars and vein 5 very faint; vein 3 from immediately before lower end of cell, 2 from a little beyond the middle.

Swinhoe has the following genera, based mostly on male characters of wings and legs:—

A. Male with no costal fold to fore wing ..... *Pyrgus.*
B. Male with a costal fold to fore wing.
  a. Male with a pair of scabbard-shaped, scaly and hairy appendages springing from the breast posteriorly at base of hind legs and about one-third the length of the abdomen ..... *Hesperia.*
  b. Male without these appendages.
    a^{1} Antennæ with the club absolutely blunt in both sexes.
      a^{11} Wings on the upperside spotted all over with numerous white spots ..... *Spialia.*
      b^{11} Not so.
        a^{111} Hind wing dark-brown, immaculate ..... *Thanaos.*
        b^{111} Hind wing with white band ..... *Gomalia.*
    b^{1} Antennæ with club minutely apiculate ..... *Carcharodus.*

Only *Spialia*—Which will be called *Hesperia*—and *Gomalia* need trouble us here. But it is interesting to know from Colonel Swinhoe that "Lang says that the position of the wings of *Hesperia*

cashmirensis during repose is different from that of the butterflies of any of the other families, the hind wings being held in a horizontal position, the fore wings only half erect ; the wings are never closed perpendicularly over the trunk, the inner margin of the hind wing is not deflected but is thrown into a slight fold, so that there is no canal for the reception of the abdomen." This gives another position for the wings in the family. Of course *Hesperia* (*Spialia*) *galba* often parts the wings too *when basking* in the sun, keeping the hind wing nearly horizontal while the fore wings are half opened; it has never been observed that the hind wing was anything but quite horizontal although the fact that it was may have been taken for granted. It may possibly be held as for *Hesperia cashmirensis*.

211. Hesperia galba, *Fabricius*—Pl.M., figs. 80 ♂, 80a ♀.—Male. *Upperside*—Black with slight olive tint, spotted with white. Fore wing with three spots in the cell, subbasal, medial and terminal ; a spot on the submedian vein below the subbasal spot ; a discal series of eight spots commencing with three that are subapical and close together from near costa in interspaces 6, 7, 8, then two together in 3 and 4, the lower the larger followed by two larger and more or less conjugated a little inwards in interspaces 2 and 1 and one still further in on the submedian vein ; a complete submarginal series of small spots, one in each interspace 7 to 2 and two in 1; four short, white streaks on costa between middle and apex; there are a few white scales at base of the wing spreading along costa and inner marginal area for some way ; inner margin with short brown hair fringe. Hind wing with a subbasal white spot in cell, a large, somewhat quadrate white spot at the end of the cell with a smaller one below it in interspace 2 and a still smaller one above it interspace 6 ; a submarginal series of small spots from anal angle becoming obsolete upwards; some longish grey-whitish hairs on hinder part of wing and a short, white fringe on abdominal edge. Cilia of both wings checkered black and white. *Underside* :—Grey of a shade variable with the locality and with a certain area of fore wing nearly always brown ; the hind wing always very much greyer. Fore wing with the spots as above but larger, the apex, inner margin and costa rather broadly grey, the rest of discvery much lighter brown than the upperside, all the spots similar, perhaps a little larger. Hind wing with the abdominal fold bluish-white ; three subbasal spots in cell, interspace 1 and interspace 7, this last with even a further one indicated in 8 ; the spot at the end of the cell forming part of medial, transverse whitish band with irregular margins from costa to abdominal fold ; submarginal spots as on upperside; the ground colour of the hind wing is often ochreous brown of a greyish shade due to a thick overlaying of the brown ground colour with very light brownish-ochreous scales ; the edge of abdominal margin with a fringe of white hair. Antennæ brown above spotted with white, the club sometimes tipped chestnut but pure white below with most of the club chestnut; palpi, head and body above concolorous with wings, the abdomen banded with intersegmental, narrow bands of grey ; beneath everything white including legs. Female. Usually darker than the male, markings similar, the spots of upperside often smaller. Expanse up to 25mm.

Egg.—Dome-shaped, perfectly rounded on top where, centrally, is a depressed micropyle. Surface shining and covered with small, 0·0.5mm. × high tubercles, irregularly hemispherical in shape and arranged in meridional lines : 20 or 21 such lines all round the egg, only about 8 actually reaching the circumference of the micropyle-depression, all the others shorter. Colour pale grass-green with the tubercles whitish ; on the whole the meridions are very regular though not quite. B.0·7mm. ; H. 0·5mm.

Larva.—The body is in *shape* somewhat like a spindle, the anal end somewhat narrowly rounded and held rather high off the surface, the claspers being perpendicular beneath it, short; fattest in the middle decreasing in width to both ends about equally, segment 2 much narrower and lower than head, orange-brown of a light shade with a transverse, narrow, black collar nearer hinder margin broken by a light, thin, dorsal line ; legs and true legs short ; *head* comparatively very large, round, deep, rugose, shining black, covered with fine, close, light yellowish fur on the face and set with very long (comparatively), erect, black and white hairs (some are longer than the head is broad) some of the black ones being longest and stout, thickening to their extremities ; the front of the face has only short, white hairs, longest about the mouth-opening ; clypeus hidden by the fur ; labrum and ligula orange-brown ; mandibles black. *Surface* of body covered fairly closely with tiny, white, truncated-concal tubercles (say 26 to each transverse row from the dorsoventral margin on one side, to that of the other side) each of which bears a long, white or brown, erect hair, the brown ones confined to the front part of the body ; the segments are well-marked and there are the usual, transverse, parallel, depressed, fine lines to each segment, in front of and parallel to the hinder margins. *Spiracles* broadly oval, small, brown-yellow in colour, flush ; those of segments 2 and 12 much larger. *Colour* glaucous-green with a darkish, dorsal, pulsating line and a whitish, spiracular line. L. 16mm. ; B. 4mm.

Pupa.—Stout, in *shape* more or less cylindrical from shoulders to end of wings, then conical to end ; the head-piece square broader than long, slightly " bossed" between the eyes which are themselves prominent, the vertex convex; segment 2 long, convex ; thorax slightly humped and evenly convex; shoulders evenly rounded ; a slight constriction behind thorax ; the body is fattest at middle and slightly broader there than at shoulders ; the abdomen curved down : cremaster transversely convex, short, square, hollowed out ventrally, narrow, set with a dense tuft of hooked shaftlets at extremity ; from fore-end to end of wings is about two-thirds the total length of pupa ; hinder margin of thorax nearly a semicircle meeting the wings in a broadly-rounded, deep angle of about 80 . *Surface*, all except the wings, covered with long, white, fine hairs, densest about eyes and on head ; all the segments well-marked; the hairs are all about as long as segment 2, appressed more or less to surface ; the proboscis reaches free beyond the wings only very slightly. *Spiracles* of segment 2 have large expansions oval, convex, transverse, standing out from surface of the thorax, dark chocolate-brown in colour with a slit down the middle; the other spiracles small, oval, light-brown in colour, more or less flush with the surface. *Colour* of body greenish-yellow or light yellowish-green ; of thorax, wings and head, green ; of cremaster, brown ; suspensory hairs or shafts bright golden. L. 12·5mm. ; B. 5mm. H. nearly equals breadth.

Habits.—The larva doubles up part of a leaf on top or underneath, fastening it down tightly all round and lining the inside thickly with silk ; before turning into the pupa makes a strong cell by lining the inside still more thickly. Of course it changes the cell as often as necessary during growth to suit its size—it always fits the body fairly closely. The pupa is covered all over with a white, creous powder excreted by the larva. The pupa is attached by the tail very strongly and seems to have no body-band. The larva rests inside with its head turned round on its side. The egg is laid on leaves, stalks, shoots or grasses near at hand. The foodplant is *Waltheria indica* (*Sterculiaceæ*), a low, often inconspicuous weed, growing flat against the ground amongst the grass ; although it does grow erect

where opportunity offers. It is common throughout the country from the sands of the sea-coast to the open plains of the Deccan, fields, grass-lands, all places. The little larva is very sluggish in its movements and does not like the light although inhabiting the sunniest, openest situations. The butterfly flies fast and keeps to the ground, being fond of flowers and the sunlight. It basks on the ground or leaves close to the ground and, when doing so, keeps the wings open half-way, the fore wings in a different plane to the hinder ones which are generally held nearly horizontal. At night it rests on grasses, flower-heads, &c. with the wings closed over the back and may be caught with the fingers in the early misty and dewy mornings when numbed with the cold. When flying it is very difficult to see as the checkered grey and black blends well with the sunny ground and grass-shadows: besides, it is very small and quick, although it never flies very far. It is more difficult to see, even, than the smallest of the Indian skippers, *Aeromachus* which is dark-coloured and not nearly so marked—indeed it is not at all protectively marked. The habitat is India, Ceylon and Burma, and it is found in regions of heavy rain and in the driest places where the rain is slight; in hills and plains, in forest or open country at all elevations. Swinhoe says "Recorded from the Chin Hills by Watson, and Pungadaw, Upper Burma; by Manders from Fort Stedman in the Shan States; it is a common species throughout India and Ceylon and has been recorded from many localities; we took it at Poona, Bombay, Mhow, Karachi and have it from Ranikhet, Kurnal, Raipur, Madras, Kandy and the Khasia Hills and it is in the British Museum also from Barrackpur near Calcutta, Ganjam, Ootacamund, the Shan States and Burma. We cannot separate *Pyrgus evanidus*, Butler (Swinhoe places this insect in the genus *Pyrgus*), from *galba;* his type from the Habb River, just outside the Sind border, was taken by us: it only varies from *galba* in its smaller size and in having the white, discal band of the hind wing on the underside more or less broken up; in *galba* it is complete; we took many examples of both sexes of *evanidus* in Sind, all in mid-winter; it is undoubtedly the extreme cold-weather form of *galba*. Yerbury took it at Campbellpur in the cold weather. Our figures of the larva and pupa are from Davidson's original drawings, bred at Karwar."

The insects are represented on Plate M, figures 80 and 80a, male and female respectively. They are fairly good but the female is too red on the underside as usual. The red dot at base of fore wing at inner margin should not be there. The abdomen of the male is too black.

Genus 10.—Gomalia.

According to Swinhoe characterised as under:—

Antennæ.—With a somewhat slender club, blunt at the end, no terminal crook or sign of one, not half the length of costa of fore wing.

Palpi.—Suberect, second joint clothed with longish scales, the third blunt, more or less concealed by the hairs of the second.

Hind tibiæ.—With two pairs of spurs, more or less of equal size, the terminal ones thicker; fringed lightly with longish, white hairs in both sexes on the outside.

Fore wing.—Vein 12 ends on costa well before end of cell, 11 at end, level with it; discocellulars suberect, the lower very slightly the longer; vein 3 emitted before lower end of the cell at a distance from and about equal to lower discocellular; 2 from before middle; cell a little more than two-thirds the length of costa, costa slightly arched, apex subacute, outer margin evenly convex, shorter than the inner margin which is nearly straight. The surface of wing covered with decumbent, white hairs fairly closely, the inner margin with a short fringe of them. Male with a costal fold.

Hind wing.—Vein 7 from close to upper end of cell, 3 close to lower end; discocellulars and 5 very faint; costa lightly arched at base, outer margin evenly rounded; hinder half of wing clothed with long, greyish-white hairs and fringe of similar, shorter ones on edge of abdominal margin.

There is only one species; descriptions of *egg*, *larva*, *pupa* and *habits* will be found below.

212. Gomalia albofasciata, *Moore.*—Male. *Upperside.* With the ground colour brownish olive-grey. Fore wing with a basal blackish-brown band and an antemedial darker band, the latter with its outer margin limited by a thick, black line which extends from the subcostal vein to the submedian vein in an outward curve, the portion in the cell edged by a semihyaline somewhat lunular mark closing the cell; a semihyaline, yellowish-white spot at the base of interspace 3, another inwards below it in interspace 2, almost touching the one in 3; a curved series of three contiguous, subapical, semihyaline similar small spots in interspaces 6, 7, 8 and, sometimes one still smaller below in 5 with a rather large dark, quadrate patch on costa limiting the series inwards; a similar, but smaller patch at apex of wing; a larger dark patch at middle of outer margin extending triangularly inwards to the spots in interspaces 2 and 3 and bordered by a whitish shade; another brown patch at tornal angle, longer, extended along inner margin then along outer, also bordered whitish above; the hair-covering and fringe along inner margin as for genus. Hind wing darker than the fore wing, brown with a broad, white, medial band from vein 7 to the abdominal fold and a white subbasal mark in the cell on the nearly quite black basal third of the wing; a black band bordering the white, medial one outside, narrowing upwards, bordered in its turn by a whitish shade beyond which the terminal portion of surface is black with a grey wash at tornal area and a white, terminal patch at end of vein 5; longish grey hairs clothing the hinder half of wing, the abdominal margin-edge fringed white. Cilia of fore wings brown with some grey scales; of hind wings nearly pure white except at anal angle where they are brown and grey. *Underside*: grey. Fore wing really brown overlaid with grey scales which become brown outside the cell and below it except for the internomedian interspace along the inner margin which is white extending somewhat up into the submedian interspace, right up to vein 2 in a quadrate patch under the semihyaline spot in interspace 2, a bit inwards of it; the semihyaline spots as on upperside, silvery; but none of the other markings. Hind wing; also brown overlaid with whitish scales and with white hairs in the cell; the subbasal cell-spot and broad medial, white band present, the latter extending right up to the costa, the cell-spot joined to another white spot, a bit outwards of it, in interspace 7; the abdominal fold blue-greyish, the anal angle with a short, white submarginal band running up from it and the white patch on outer margin between veins 4 and 6

just indicated. Female. Larger, lighter in colour above and below. Fore wing above is similar to that of male, the hind wing also. *Underside*: With grey decumbent hairs in cell and along costa above cell not found in male; markings similar to male, larger in both fore and hind wing. Antennæ concolorous with wings above, speckled with white on the shaft but with the club black, white below; body and abdomen concolorous with wings, above, white below, the abdomen with light intersegmental bands; palpi with third joint concolorous with wings, white below.

Egg.—Is peculiar in the sculpture. It is dome-shaped, somewhat depressed rather less than twice as high as broad. The surface is rather dull and occupied by coarse, somewhat irregularly-rounded prominences, or knobs of considerable size; occupying the top of dome is a lid, circular in shape, quite half the diameter of the whole which opens to allow the little larva to emerge; this lid is composed of six very broadly-club-shaped convex prominences surrounding the micropyle-surface in the centre which is also circular and takes up the central third of the lid, the narrow ends of the club shaped prominences touching each other round this surface; surrounding this lid is a series of circular (more or less) prominences to the number of twelve, the series not quite regular, very nearly touching the lid prominences; outside this is another series of rather more knobs and beyond that another, three in all. When the larva is ready to come out it eats away the intervals between the clubs, leaving them quite intact and connected by the micropyle-surface; this lid, then a star-shaped piece with six broad rays, comes away, allowing free egress. The colour of the egg is white when first laid becoming reddish-orange later on with the rays and knobs always white and concealing most of the ground colour. B. about 0·90mm.; H. about 0·5mm. B. of lid about O. 3mm.

Larva.—Shape is more or less the usual shape of all skippers: the transverse section a circle flattened on the ventrum; the anal end is narrowed from behind the middle of body to extremity, the 13th segment being apparent, as along as half the 12th and divided into two parts by a line transverse to the body; the anal segment is nearly semicircular in outline and overhangs the anal prolegs slightly: the curve is very even and the edge thin, the dorsal slope being about 308 to the longitudinal axis of the larva; the thickest part of body is just before the middle whence it thins gradually to segment 3, segment 2 being still narrower, the head about the same diameter—perhaps slightly less, the neck short but distinct, the head being certainly broader and higher than it; the prolegs and anal claspers are short and held well beneath the body as in all butterflies, the true legs also rather short. The *head* is rather broader than high, otherwise nearly circular and has a shallow, very broad and gradual vertical sinus or curve dividing the two lobes; the clypeus is triangular but hardly noticeable, being one with the rest; face rather flattened; surface of head hexagonal-celled rugose minutely, hardly shining, covered all over fairly densely with erect, plumose, brownish, short hairs, nearly wanting on the vertex of the head and simple on clypeus; the labrum is shining, short, transverse, the ligula also short, broad, shallowly sinuate in middle anteriorly, both the same colour as the whole head though the labrum in some lights looks lighter; the colour of head, antennal joints, eyes, all very dark red-brown, nearly black. *Surface* of body dull, transversely thinly lined near margins of segments, the segments not at all constricted; the whole covered all over with small, densely disposed (not enough to hide the skin in any way), fine, white translucent, erect hairs which are branched into 2 and 3 short branches at their extremities; besides a fringe of longer, soft, erect also moderately plentiful hairs along dorsoventral margin, densest and longest on anal segment; all quite distinct under a lens and each rising from a minute colourless tubercle. *Spiracles* very small, roundly oval, light soiled yellow, those of segments 2 and 12 much larger. *Colour* soft villous.

looking white with a greenish shade and indications of a slightly darker dorsal line ; ventrum, legs and prolegs light green ; segment 2 is nearly smooth except for the lateral posterior portions. L. 20mm.; B : 4mm.

The penultimate stage is the same ; the antepenultimate has a thin, black collar across middle of segment 2, transverse ; the one before that has the whole of segment 2 black ; the egg-caterpillar, again, has the thin, black collar.

Pupa.—Is an ordinarily *shaped* little chrysalis broadest just at shoulders, the same breadth practically continued to segment 7 middle, after which it decreases gradually to segment 9 and more rapidly afterwards to the pointed cremastral end ; circular in transverse section in all that portion (from shoulders to segment 13) ; segment 12 equalling 11 in length, segment 13 being half the length of 12 and the anal segment a broad, short triangle with the apex produced into a dorsally and ventrally flattened, somewhat down-curved, parabolic piece, half as broad as the posterior margin of segment (or anterior margin of segment 13), the apex of parabola or end of pupa set with a bunch of golden-brown, hooked shaftlets which are half as long as the segment, by which it is attached to little pad of laxly-spun, white silk. The front of the pupa is broadly blunt, formed of the lowly and broadly rounded or convex frons of the head between the somewhat prominent eyes of which only the top portions are narrowly visible from above and separated from each of these by a minute, sharp sinus ; the lateral outline to shoulders being formed thereafter by the outline of these eyes further back and a small portion of the front of the thorax, for the head is somewhat bowed and the frons low, so that the dorsal and ventral head-surfaces are separated only by a low bit of the frons which is in a plane at right angles to the longitudinal axis of the pupa ; the change from the ventral aspect and from the perpendicular frons to the vertex is of course gradual and rounded ; the vertex of *head* is rather broad between the eyes and, chiefly, between the bases of the antennæ, it is in a plane at about 45° to the longitudinal axis and segment 2 and the front half of thorax are also similarly inclined ; segment 2 is rather short, only moderately convex transversely and straight along both posterior and anterior margins (*i.e.*, these margins are quite parallel to each other transversely across pupa) ; the thorax is very moderately humped (convex longitudinally, and transversely) highest about the middle (may be a little before) which is the highest point of the whole pupa, thence gently sloping to hinder margin which is a somewhat broad parabolic curve meeting the wing-line in a very broadly rounded, rather deep angle of 45° ; the visible part of segment 4 thereafter is, in the dorsal line, the same length as segment 5 and this latter is somewhat shorter than segment 6 ; indeed segments 5-11 are about equal in length ; the ventral line is straight from head to near the ends of wings where it is very slightly convex, then slightly concave to end, as the end is somewhat turned down ; the proboscis is free at its extremity from the end of wings to near the hinder margin of segment 9, the wings themselves being slightly produced at their apices : the proboscis is stout, very slightly broadened toward extremity and then somewhat bluntly pointed. *Spiracles* of segment 2 are large, oval, very prominent raised perpendicularly from thorax-surface on hinder margin, slightly convex transversely and longitudinally on front face, the colour light brown with the hinder margin black ; the rest of the spiracles are small, oval, convex, light brown with black central slit. *Surface* of pupa is somewhat dull, aciculate-striate very superficially on thorax, rather distantly, minutely pitted on abdomen, more or less smooth on wings, shining on segment 14 ; the whole surface except wings and the major part of cremaster, covered with short, erect, fine nearly white, sometimes minutely bifid hairs all over ; this again all powdered with a white cereous powder more or less thickly. *Colour* very light, dead-yellow somewhat flushed brown on dorsum of the whole pupa, darkest on segments 1-3 ; the end of proboscis dark-brown ; the cremaster soiled, lightish brown-orange. L, 12mm.; B, 4mm.

Habits.—The egg is laid on the top surface of a leaf, not necessarily a particularly young one; the little larva eats the lid free and goes to the underside of the leaf at once where it cuts itself a small, nearly round cover from the edge, leaving it attached at a point on the edge and turns it over onto the underside. It fixes this down and lives under it, coating the inside with silk laxly and eating in the immediate neighbourhood. In the next stage it cuts a much larger, more or less square or oblong, piece from the edge inwards and turns it, generally, onto the upperside, living underneath and coating it with silk as usual, after fastening it down all round. Finally it doubles a whole leaf sometimes. None of the fixing-down after the first cell is particularly tight. The pupation takes place in a more tightly-woven and strongly closed cell, often made of young leaves which wither and fall or get caught up somewhere; so that, presumably, the cell is as often as not made amongst withered leaves or in a withered leaf.

One egg was found on	8th June 1916.
Larve emerged therefrom	10th „ „
Changed into second skin	12th „ „
Changed into third skin	14th „ „
Changed into fourth skin	18th „ „
Changed for last time	24th „ „
Pupated on the	3rd July 1916.
Butterfly emerged on	16th „ „

giving about forty days for a generation. The larvæ are shy of a very bright light and, in consequence, feed in the immediate vicinity of their cells on the leaf upon which it has been made. They are not particularly sluggish and sit in the cell at rest with the head turned round on the side. The butterfly flies quickly and in spasmodic starts and jumps so to speak; it settles on a leaf and is gone. It appears to fall off or jump off but that is about all that can be seen. It visits flowers in the mornings and afternoons. During the day, in the intervals of flight, it sits with the wings raised half way between the horizontal and perpendicular, the upper half of fore wing, the apical part that is, bent down slightly, the fore wing normally separated from the hind wing. In the mornings and evenings, when resting, the wings are generally held horizontally out, the costa of the fore wing at about 45° to the axis of the body or, in other words, the fore wing covering the hind wing partially. It has been observed resting at nights with the wings held perpendicularly over the back as in *Parnara*, *Hasora*, &c. The foodplant of the larva is malvaceous and it has always been, so far, *Abutilon indicum*, Sweet, a common weed all over the Deccan, in the Plains country. The insect is never found in the jungles or hills being apparently confined to regions of light rainfall above 2,000 feet level in Bombay. It is common in Dharwar, Poona, Khandesh Districts. Swinhoe says the

type came from Ceylon; that it exists at Karachi in Sind and he took it at Poona and has it from Madras and from Quetta; Evans records it from the Palni Hills and Moore from Kangra. He says it is a scarce species, though widely distributed within India, Ceylon and Baluchistan.

(To be continued.)