die beiden Seitenäste einen spitzen Winkel bilden, d. h. in stumpfem Winkel zum Zentralbügel stehen. Bei *M. freyi* nov. spec. ist das letzte Tergit nach kurzem, wagrechtem Verlauf stark nach oben gekrümmt und der Bügel an der Spitze in zwei Seitenäste geteilt, die fast im rechten Winkel zum Zentralbügel stehen. Verwandtschaftlich ist die neue Art in die Nähe von *M. kochi m.* zu stellen.

Es freut mich, diese interessante Form ihrem Entdecker, Herrn Georg Frey in München, widmen zu können.

A third [1]) Contribution to the knowledge of the early stages of Oriental Lepidoptera.

By **E. P. Wiltshire**, F. R. E. S.

Plate I.

1) Notes on some Clytie Hbn. Larvae from the Middle East.

The entomologist who beats tamarisks in the Near or Middle East is pretty sure to knock out into his tray a number of catocaloid larvae, green if immature, brownish if full-grown, with white or yellow subdorsal stigmata on somite 4.These larvae are almost sure to be Clytiid larvae, or the larvae of some species such as *Grammodes rogenhoferi* (also a tamarisk feeder) or perhaps *Ophiusa algira*, which feeds on various trees and shrubs.

But the fact that, in every district in this area that I know, several different species of the genus *Clythie* occur together will leave him in doubt as to which is which, since the standard works to which he may have reference give no account of the early stages of the various species. It is hoped that the following notes may partly remedy this state of things.

Clytie sancta Stgr.

I published a description of this larva in the Ent. Rec. July-Aug. 1935. Since then I have not come across this species again, for it seems confined to the Syrian littoral, but from my subsequent acquaintance with its congeners I am inclined

[1]) The two previous contributions to this subject were: „Notes on the Larvae of Syrian Lepidoptera", Ent. Rec. Vol. XLVII July-Aug. 1935 (No. 7—8); and „More notes on early stages of Syrian Lepidoptera", Ent. Rec.Vol. XLVIII. Oct. 1936. (No. 10.)

to suspect that the spiracles may not be black, as there stated; it is very possible that black stigmata were mistaken for spiracles. The spiracles of this genus are often very hard to perceive, even using a lens.

Clytie syriaca Bugn. (Fig 10.)

Larva: May be distinguished from *sancta* by the darker grey hue of the subdorsal and sublateral stripes.

Slatey mauve, tinted with orange and prettily mottled with fine wavy grey longitudinal lines. Most conspicuous are the broad olive-grey subdorsal and sublateral stripes; the intervening lateral stripe is less emphatic. Underside, of ground colour, with a purple ventral line. Spiracles, grey, black-rimmed; below them, a reddish undulating double line. Head, larger and rounder than *terrulenta*, i. e. more circular in a lateral section, brown with black mottling and a black cheek-stripe low down. The subdorsal dot, typical of the genus, on somite 4, is large and yellow.

Pupa: Similar to that of *sancta*; large, fairly stout, red-brown with a purple bloom.

Habits: a night-feeder on tamarisk. In Mesopotamia successive broods occur from April to October. Larvae pupating in November hatched in mid-April, at Bagdad. The imago comes to light during the summer and autumn (Bekaa, Syria, VII. 34, and Ahwaz, Iran, X. 38). In Mesopotamia the representatives of this genus are commoner in autumn, doubtless because of the damage done by spring floods to the pupae and imagines of early summer.

Clytie delunaris Stgr. (Fig. 6, 7, 8.)

Larva: May be distinguished from *sancta* and *syriaca* by the interruption of the subdorsal stripe on each somite.

I have only seen one larva of this species in the 4th instar, and none in an earlier instar; this one larva was green. Whether this retention of the green hue until the penultimate instar is invariable in this species, I cannot say. After the last moult, the green hue remained for 12 hours, then gradually darkened. The other species here described are coloured in the penultimate as in the final, instar.

(Fig. 6, 7.) Green form, with a colour scheme recalling that of *Macaria aestimaria* and other tamarisk-feeding larvae

i. e. bright green with interrupted chains of white or yellow-white dashes. Dorsal line, finely and irregularly egded with white. Subdorsal lines, chains of bold white dashes, interrupted on each somite. Sublateral line, similar but more continuous, especially posteriorly. Between these two lines, traces of a fine white interrupted lateral line. Head, green, with black-edged white vertical streaks continuing from the subdorsal stripes. The stigmata on somite 4, white. Somital joints, yellowish. Ventral surface, pale green, lined with whitish green.

(Fig. 8.) Brown form, markings of body as in green form, but ground colour olive grey or blue-grey, and paler markings now fainter and dull orange. Dorsal line, darker grey, with a fine irregular whitish edging. Stigmata on somite 4, whitish orange. Underside, whitish grey, lineally mottled with white. Spiracles, inconspicuous, black-rimmed. Head, orange-brown, with the vertical streaks now interrupted and formed as follows: at top, a double white spot, then a blackish line containing another white dot, then less black, less firm, with a paler outer (lower) edge, ending just above the mouth. Sometimes these dots are more yellow than white. Sublateral ridge, wavy, not strongly coloured.

Pupa: smaller than *sancta* and *syriaca*, with less bloom. Pupal period, in Sept., about 10 days.

Locality: Ahwaz, IX & X, 38.

Clytie terrulenta Christ. (Fig. 5.)

Smaller than any of the foregoing.

Larva, smaller, less plump and sleek than *syriaca*, and distinguished by a dark dorsal pattern, on somites 4—8, of more or less complete V-marks.

Light grey-brown, with a dark grey dorsal pattern, on somites 4—8, consisting of a grey filling-in of the subdorsal stripe on each somite, the shades thus formed tending to unite across the back and form V-marks on somites 7 & 8. Dorsal line, dark grey, interrupted. Subdorsal line, on thoracic somites finer and zigzag; on succeeding somites, see above. Tubercles, white, or white and black. Spiracles, very inconspicuous, of ground colour. Head grey, or brownish, mottled with black. Sublateral stripe, of ground colour, with a darker grey edging above and below.

Pupa smaller, slenderer than any of the foregoing, and without bloom.

Both the preceeding species and this feed at night on tamarisk.

Localities: Bagdad, '36, '37; Ahwaz, '38. Its times of emergence are similar to that of *syriaca*.

Remarks on the identity of the above larvae.

The identification of *terrulenta* presented no special difficulties.

The identification of the species here recorded as *syriaca* Stgr. was in doubt at first owing to Rothschild's having recorded *arenosa* Roths. from Iraq. The Mesopotamian species is very variable, and three representative specimens were sent to Dr. Jordan, who very kindly compared them with the (Algerian) type of *arenosa*. He replied as follows: „Your female with the strong markings agrees closely with *Cl. arenosa* Roths. described from South Algeria and of which we have one male and two females (not the other way round as Lord Rothschild said). The male of *arenosa* and your male do not agree in the genitalia. Your male is much nearer to *syriaca* in the genitalia (as far as I can see them without dissection). The specimens recorded by Lord Rothschild are not at Tring; it is almost certain that they were the species you sent me for inspection...."

Evidently therefore we must regard the record of *arenosa* from Mesopotamia as an error. In case it should later prove that the Iraqian species is distinct from the Syrian *syriaca* (which I doubt), it should be noted that the larvae described above are from Bagdad and Ahwaz. This species varies as follows:

1. The commonest form is of a lilac-grey ground colour on the forewing. The submarginal line may be completely (or partially) accompanied proximally by black dashes, or completely unaccompanied thereby; in the latter case, the proximal edge of the line is seen to be reddish.

2. The warm sandy-coloured forewing is dusted with black scales, but the submarginal line is not accompanied by black dashes.

In both of these forms the median area may or may not stand out, according to the strength or weakness of definition of the post- and ante-median lines. The hindwing is usually a

warmer yellow-grey inside the black band than outside it, but occasionally the whole hindwing is whiter, and less strongly marked.

My series from Bekaa (Coele Syria) was not bred, and is not in a fresh condition. As far as it is possible to say without microscopic structural examination, however, these *syriaca* are the same, if less variable and rather larger. The difference in size may well be due to their not being bred.

As for *delunaris*, I have to thank Herrn Otto Bang-Haas for the kind loan of the type (from Ashkabad), thus enabling me to be sure of the identity of this species.

Zoogeographical remarks:

The occurrence of Central Asian species in the plains of Mesopotamia, and the southern side of the Iranian plateau is of great interest, but must be considered at the same time as the discovery in Iran of species previously regarded as Mediterranean.

A parallel to the occurrence in Khuzistan of *delunaris* is that of *Catocala optima* Stgr. in Bagdad, among *Populus euphratica*. The type of this species from Kuldja (for which likewise I am indebted to Herrn O. Bang-Haas) is slightly smaller than the Bagdad example, but otherwise, except for its less fresh hues, indistinguishable.

Another species of moth with a rather similar range is *Ocneria signatoria* Stgr. also a tamarisk feeder, which, unlike the two foregoing, is also known from the Jordan valley, to which it probably found its way via the Coele Syrian plain.

2) The early stages of some other River moths of Mesopotamia.

It is convenient to publish, together with the foregoing, the early stages of some of the accompanying moths of different family.

The larva of *Macaria aestimaria* is already known to science, but it is included in the plate for the sake of comparison with that of *Clytie delunaris*, and to shew the sort of pattern that is typical of tamarisk-feeding larvae. (Fig. 3.)

A description is also given of the larva of *Macaria syriacaria*, which, in Iraq, occurs not only together with *aestimaria*, but also in the waterless desert.

Dicranura intermedia Teich.

This larva (Fig. 1.) can be readily distinguished from that of *vinula* (Fig. 2.) by the more regular course of the subdorsal white stripe, and, in the last instar, by the blue-green colour of the dorsal area.

The ovum is variable in colour. I have seen white eggs, pale pink eggs, and pale brown eggs. White ova are the general rule in Mesopotamia. The pale brown eggs were seen at Hamadan, Iran. According to Hingston, when freshly laid the egg is rosy pink, but quickly becomes bleached. This observation was made in Iraq. Ova laid in Bagdad on 16. V. 36 hatched on 22. V. 36.

The first instar is similar to *vinula.*

The second instar also resembles *vinula* considerably. The lateral and ventral areas are yellow, but the dorsal area is black. There is also a faint purplish subdorsal line and a vague purplish lateral shade on somites 6 – 9. But the shape of the black dorsal area is as in the later instars.

In the third and fourth instars, these purplish traces have disappeared. The colour of the dorsal area is still as in *vinula*, but the outline is as in the 5th instar, i. e. it does not reach as far as the spiracles, and is smooth. Sometimes the dorsal area becomes paler and green already at the end of the 4th instar.

The fifth instar invariably lacks *vinula*'s brown dorsal coloration, but the dorsal area is usually a bluer green than the rest of the larva's body. The interval between the spiracles and the subborsal stripe is, at its least point, 3 mm.

In instars 2 & 3, somites 10—12 are stained brown ventrally; in instar 5 the ventral markings on these somites consist of large black dots and only very faint, small, smears of brown on ss. 10 & 11.

The pupal period of the first brood larvae in Bagdad is about a fortnight.

The first brood flies in March, the second in April and May, in Iraq and Khuzistan. I am unable to say if there are two broods in the higher elevations of this moth's range. Hamadan specimens were whiter than Bagdad and Ahwaz specimens. The duskier grey colouring of the lowland race may be regarded

as a protective adaptation to the colour of the foodplant's bark; the dark-barked Euphrates poplar does not grow at Hamadan (2000 m).

It is interesting to note that the larva of *intermedia* is most like that of *vinula* in the early stages and, instar by instar, gradually diverges in pattern therefrom. The final colouring renders it very inconspicuous on the Euphrates-poplar foliage.

Ocneria signatoria poenitens Stgr. (Fig. 9.)

Oval period, 9 days in October, in Bagdad.

Larva: when newly hatched, pale ochreous, coloured green internally by its food. Head, black, brown near the mouth. Conspicuous warts on the first somite. Somites 4—7 and 10—11 are stained dorsally with brown.

After about fifteen days, the larvae were half an inch long (c. 12 mm). Dull brown grey, with pale brown warts, and pale ochreous hairs. Dorsal line, pale grey, with a darker interrupted edging. Subdorsal lines, pale grey, edged heavily but irregularly on somites 4—11 with black above. This edging is especially heavy on ss. 4, 10 & 11. Dorsal line, and crossbar on somite 1, creamy. Somites 1 & 2 are dotted with black. Head, pale brown, with two heavy black blobs above.

The plate (Fig. 9.) shews a larva in the last moult, enlarged.

The last instar is similar to the preceeding instar, but the subdorsal black marks are now comma-shaped, and each is edged below with whitish yellow. The dorsal line is pale ochreous and clearer than the subdorsals. Spiracles, black. Feet and claspers, with brown-ringed joints.

The shortest larval period was 30 days.

Pupa, yellow-brown, glossy, with yellow-brown hairs. Wing-cases, duller brown or grey. The somital joints and the interstices which mark the latent anatomy on the case, are black. In a frail cocoon, attached by its pointed cremaster.

Larval habit: hiding gregariously on the ground or low down by day, feeding only at night.

Foodplant, tamarisk.

There are two broods, the autumnal being more numerous than the spring, doubtless because the latter is decimated by spring floods.

The females fly considerable distances from the foodplant and come to light, but in order to obtain the males, one must visit tamarisk-thickets on the river banks at about 9 p. m., and there catch them as they fly commonly from bush to bush. In spring these trees are usually half submerged, so the collector is advised to go in October.

Bagdad dates: X, 36 & 37.

Ahwaz dates: IV & X, 38.

Macaria syriacaria Stgr. (Fig. 4.)

This species is not really a river-moth like the foregoing species, being dependent on *Prosopis stephaniana* and probably other steppe and desert plants. In Mesopotamia therefore it is almost ubiquitous, both in the plains and mountains, whereas *aestimaria* is never found far from a river, it being unusual to find tamarisk in this region in unrelieved desert. In Syr a and Palestine tamarisks grow along the sea-shore, and *aestimaria's* range, therefore, is less restricted in these parts. Fig. 3 gives an excellent idea of this well-known larva, which is almost invariably coloured bright green, with white and yellow dashes. Occasionally, however, at Bagdad in the autumn, I have noted a rosy purple tendency in the mature larva of *aestimaria*, perhaps accompanying the dyring up of certain tamarisk bushes. In this form the black lateral pencillings are more extensive, and the dorsal line more continuous; the head, feet, and claspers were also pencilled with black.

The larva of *syriacaria* is quite different.

When freshly hatched, it is grey with broad dark subdorsal stripes an a yellowish head.

The egg is bright green, long oval. Under a lenz, a raised network of sculpture is clearly visible. Eggs are laid singly or in twos. Oval period, 4 days (Ahwaz, VI. 38).

In the 2nd instar, the larva is dark green with broad whitish dorsal and lateral stripes. Head, ochreous.

3rd instar, markings as in final instar green form, except that there are as yet no black markings.

4th instar, similar to 3rd, but with two conspicuous black stigmata on somites 5 & 6.

5th (final instar): Brown form: brown, with many paler longitudinal lines, occupying all the dorsal and lateral area down to the spiracles, the dorsal and subdorsal lines being indistinguishable. Underside, lined as above, but with wavier lines. Spiracles, inconspicuous, black-rimmed; behind each, a black stigma; below each, and under the sublateral stripe, a heavy black blur on each of somites 4—10. Spiracular (or sublateral) stripe, conspicuous, yellow. Somital joints, reddish. Head, olive grey, mottled with brown and dotted with black. (Fig 4.)

Green form: pale green, with many pale lines edged with darker green; dorsal line, comparatively broad, darker grey-green, edged on either side with paler. Spiracular line, very clear, mixed yellow and white. There are black stigmata, especially along the spiracular line. Underside, marked with wavy double blackish lines. Head, green, with faint black dots and markings. Somital joints, yellowish.

Foodplant: *Prosopis stephaniana*, on which I have both found it wild (Bagdad) and bred it from ova (Ahwaz). This thorn grows throughout Iraq, on irrigated land, desert, or mountain. In captivity the larva has also eaten *Glycyrrhiza*, a common plant near rivers and in hill districts. Probably it feeds on other Papilionaceae also.

Larval habit; very inert by day, and difficult to see. Is best found by night, though never frequently seen. The female lays readily, however, so the breeding of this species, and the study of the genetics of its various forms would not be difficult, especially since the larval period is short, at least in the summer. In June 1938 larvae matured in 12 days.

Die Steninen Mittelamerikas (Col., Staph.)

Von **L. Benick**, Lübeck.

(Fortsetzung.)

Stenus cruentus L. Bck. n. sp.

Schwarz, Vorderkörper mäßig glänzend und ziemlich grob-rugos punktiert, Taster und Beine rötlichgelb, Knie kaum angedunkelt, Tarsengliedspitzen leicht gebräunt, Fühler rotbraun. An Basis und Spitze etwas aufgehellt; jede Flügeldecke mit einem mäßig großen, kreisrunden Fleck, der in der Länge das

Key to Tafel I.

NB. The figures are variably enlarged. For instance, *syriacaria* is, in anything, smaller than *aestimaria*. The photo of *syriacaria* is enlarged × 3.

1. *Dicranura intermedia* Teich. (Bagdad.)
2. *Dicranura vinula* (England).
3. *Macaria aestimaria* Hbn. (Beirut.)
4. *Macaria syriacaria* Stgr (brown form) (Ahwaz).
5. *Clytie terrulenta* Christ. (Bagdad).
6.—8. *Clytie delunaris* Stgr. (Ahwaz) (6 & 7, green form, 4th instar; 8 brown form, last instar).
9. *Ocneria signatoria poenitens* Stgr. (Bagdad).
10. *Clytie syriaca* Stgr. (Bagdad).

Tafel 1