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ON CERTAIN BRITISH HEMIPTERA-HOMOPTERA.

BY JOHN SCOTT.

Revision of the Family DELPHACIDÆ, and descriptions of several new species of the Genus *Delphax* of authors.

As the Vol. on the *Hemiptera-Homoptera* by Mr. Douglas and myself will not make its appearance for some little time, I have thought that probably it might be of assistance to those who are at work on these insects, if the results of our labours in certain groups down to the present time were laid before them as a kind of guide as I know well from experience how very difficult it is to determine any of the species, both through the indefinite manner in which they have been described, and their great similarity of facies. I think, however, that I have mastered the difficulties, and that the division of the genus *Delphax* of authors into sections, and the diagnostic characters following hereafter, will enable any one, after a little practice, to separate the species. The greater portion of the species composing this genus are of minute dimensions, and, by far the largest number occur only in an undeveloped form. This may probably have led earlier collectors to regard them only as "immaturities," and so they were passed over. Boheman was the first to do anything with these half-winged creatures, and, moreover, discovered that the developed and undeveloped forms of each species were very dissimilar, and that the outline of the genital segment of the male of each was different in shape (in mentioning the genital segment it is always to be understood that I refer to the terminal one) and Dr. Flor, acting on this hint in his *Rhyncoten Livlands*, vol. ii, describes, as well as can be done in words, the peculiarity of the form of the genital segment of every species known to him, both when viewed from the side and posteriorly. Still later, and with a greater depth of sagacity, Dr. Fieber observed that, in addition to this peculiarity of shape, the males of this same genus had certain styloid processes attached to the genital segment, and visible with the aid of a lens when viewed from behind (these processes are situate, and diverge more or less from, a little above the middle of the lower margin), and that each species had a form of process peculiar to itself. Since then, he has applied the same principle to the *Deltocephali*, and with a like result. Whether this peculiarity of structure in the males holds good throughout the whole of the *Homoptera*, or is only observable in certain sections, is to me as yet unknown, as I have only been able at present to investigate the species hereafter enumerated, and those of the genera *Cixius* and *Deltocephalus*; but I shall feel surprised if it is not the general rule.

In the Verhandl. d. k. k. zool. bot. Gesell. Wien for 1866, Fieber figures the genital segment, as seen from behind, showing the position and shape of the processes, of no fewer than 68 species of *Delphacidæ*; and, since that time, to my knowledge, he has added several others. Kirschbaum, in 1868, published a small volume on "*Cicadinen*," but I am sorry to say that it is almost incomprehensible. In many instances, the colour of the different parts of the insects is not given, and, moreover, I believe in a great number of cases that the same insect does duty under various names. Of Fieber's 68 species mentioned above, 2 are from Sarepta, 1 from Italy, 2 from the Pyrenees, 3 Spain and Portugal, 5 south of France, and 2 without any reference as to their locality; the remaining 53 may all be expected to be found in this country, in anticipation of which I append the following enumeration of the major portion of them, trusting that I may thereby excite greater enthusiasm in those who have already begun to collect, and raise up new workers in the field. Unlike the "pernicious bloodsucker of sleeping man," they are all warranted inodorous, and may be felt, but not smelt. The proper time for collecting them is between June and October, and by sweeping moist or marshy places by far the greatest number of species will be obtained.

The Family DELPHACIDÆ we divide into five genera, viz., *Asiraca*, *Delphax*, *Liburnia*, *Dicranotropis*, and *Stiroma*.

Genus 1—ASIRACA.

Face with two middle keels. *Antennæ* long, first joint foliaceous, transversely trigonate, second about one-third the length of the first. *Pronotum* with three indistinct keels. *Scutellum* with four longitudinal keels. *Elytra*, basal cell wanting. *Legs*, fore-thighs and tibiæ broad, foliaceous; posterior tibiæ with three spines.

Genus 2—DELPHAX.

Face with one middle keel, scarcely perceptible on the forehead. *Antennæ* long, first joint foliaceous, transversely trigonate, second two-thirds the length of the first. *Scutellum* with three longitudinal keels. *Elytra* with a short basal cell. *Legs*, fore-thighs and tibiæ not dilated.

Genus 3—LIBURNIA.

Crown variously shaped. *Face* with one middle keel, not distinctly furcate on the forehead, except in one or two instances. *Antennæ* not foliaceous, first and second joints somewhat cylindrical, first shorter than the second. *Scutellum* with three keels. *Elytra* generally only partially developed. *Legs* simple; hinder tibiæ with one upper and one lower spine.

Genus 4 — DICRANOTROPIS.

Face with two middle keels, united at a greater or lesser distance from the base. All the other characters as in *Liburnia*.

Genus 5 — STIROMA.

Face with two middle keels, sometimes somewhat indistinct. All the other characters as in the two former genera.

Genus 1 — ASIRACA, *Lat.*

Asiraca clavicornis, Fab. This insect is rarely taken by sweeping, as it seems to be of retired habits, living at the roots of grass, &c. (see Ent. Mo. Mag., vol. vi, 162).

Genus 2 — DELPHAX, *Fab.*

This is the genus *Aræopus* of Spinola, a name which has been generally adopted by later authors, but it cannot stand, because Fabricius had already characterized his genus *Delphax* from the species *crassicornis* (see Ent. Sys. supp., 522, 1). The *Delphax* of authors therefore requires another name, and we have adopted that of *Liburnia*, Stål (see next genus). As far as we at present know, we have but one species in this country, which was figured and described by Curtis, whose name it will bear; and, singularly enough, in the text relating to the plate, he says, “*allied to crassicornis*, Fab. and Panz., 35, 19,” a fact which has been hitherto overlooked, or considered of no value whatever. The following is the synonymy:—

DELPHAX PULCHELLA.

♂ *Asiraca pulchella*, Curt., 445, and plate (1833).

♀ *Asiraca dubia*, Curt., 445, 2 (1833).

Aræopus crassicornis, Marshall, Ent. Mo. Mag., ii, 31, 1 (1865).

Aræopus Minki, Fab., Verhandl. Zool. bot. Gesell., xvi, 522, 1 (1866).

It differs from *crassicornis* in having the basal cell of the elytra, and the space between the second and third longitudinal nerves only, black or brown; whereas in that insect the basal cell is white, and the entire space between the first and third nerves, as far, nearly, as the transverse nerves, black or brown. The shape of the processes attached to the genital segment is also different.

To be found not uncommonly by sweeping on the margins of the marshes around Lee, in August and September. The ♀ is very rarely found in the winged state.

Genus 3 — LIBURNIA, Stål.
(Hem. Afv., iv, 179 (1866).

Delphax, Auct.

A. Head elongate, more or less narrow, sides more or less parallel.

1 (2). Pronotum and scutellum side keels diverging more or less posteriorly, but reaching to the posterior margin.

a. Scutellum middle keel reaching to the apex.

Developed form, ♂. Clavus with a short black streak at its apex.

Undeveloped form. Yellow, sides of the pronotum, scutellum, and a streak on the elytra and sides of the abdomen, black 1. *notula*, Germ.

a a. Scutellum middle keel *not* reaching to the apex.

Developed form, ♂. Elytra black, clavus and anterior margin of the corium more or less yellow. ♀. Elytra yellow, with a more or less distinct black streak at the apex 2. *longipennis*, Curt.

Elytra yellow, with a more or less broad dark longitudinal streak.

Developed form, ♂. Genital segment fuscous or black 3. *fuscovittata*, Stål.

Do. ♂. Genital segment yellow..... 4. *lineola*, Germ.
Cheeks with a large, round, black spot.. 5. *guttula*, Germ.

NOTE.—The head of the first four species is much longer than any of the following.

Undeveloped form of the four last species unknown to us.

Developed form, ♂. Abdomen yellow, genital segment posteriorly snowy-white 6. *Scotti*, Fieb. M.S. (n.s.).

2 (1). Pronotum side keels *not* reaching to the posterior margin, but curved outwardly at or beyond the middle of the disc.

b. Scutellum side keels parallel.

Developed form, ♂. Greenish-grey; abdomen black, genital segment yellowish-white 7. *smaragdula*, Stål.

Do. ♂. Green; abdomen and genital segment black... 8. *unicolor*, H. Schf.

Undeveloped form of the two last species bright green.

The different form of the genital segment of the ♂ of each of the following species, as seen from above, will be found to be of great assistance in separating them.

bb. Scutellum side keels diverging posteriorly.

* Keels of the head and face white.

Undeveloped form, ♂ ¶¶. Pronotum white, beyond the side keels a black patch almost concealed beneath the posterior margin of the eyes 9. *elegantula*, Boh.

¶¶. Pronotum and scutellum yellowish or pale brownish-yellow, keels of the former and middle keel of the latter white.

c. Middle keel of the face distinctly furcate before the apex.

Do. Head and face yellow, keels margined with black... 10. *collina*, Boh.

Do. Crown yellow, face between the keels black... 12. *distincta*, Flor.

Developed form of the three last species unknown to us.

cc. Middle keel of the face not distinctly furcate before the apex.

Developed form, ♂. Keels of the face margined with black... 11. *sordidula*, Stål.

¶¶¶. Pronotum and scutellum keels concolorous.

Undeveloped form, ♀. Face between the keels black.. 13. *Boldi* (n. s.).

** Keels of the head and face concolorous.

Developed form, ♀. Head, pronotum, and scutellum smoky-brown. Elytra pale brownish-yellow, nerves brown, distinctly granulated 14. *capnodes* (n. s.).

Undeveloped form, ♂. Head, face, pronotum, and scutellum yellow. Elytra fuscous-yellow, nerves distinctly granulated 15. *Signoreti* (n. s.).

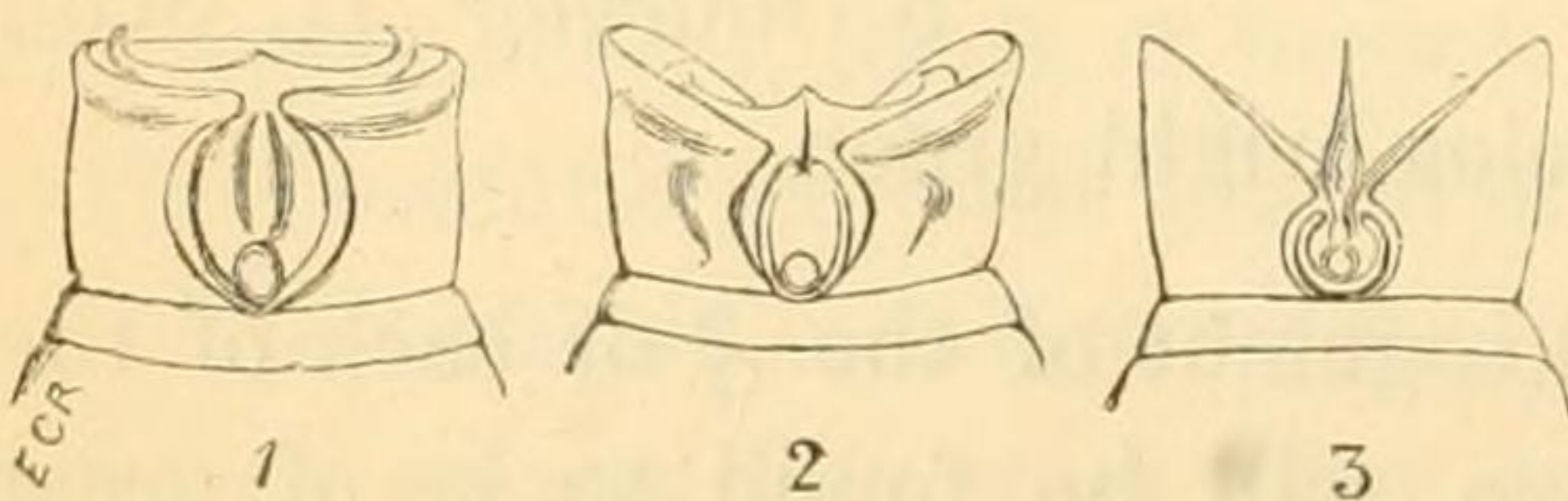
Undeveloped form, ♂. Head, pronotum, and scutellum clear brownish-yellow. Face between the keels black... 16. *adela*, Flor.

Undeveloped form, ♂. Head, pronotum, and scutellum clear brown. Face, pronotum, and scutellum beyond the side keels, black 17. *melanopachys* (n. s.).

Undeveloped form, ♂. Head clear brown. Pronotum and scutellum fuscous-brown. Elytra smoky lacquer-yellow... 18. *venosa*, Germ.

B. Head quadrate.

I here give an outline of the form of the genital segment, when viewed from above, of the ♂ of the three following species, so that the value of the character to be thus obtained in separating such difficult species as *pellucida* and *discolor* may be seen.



1. *forcipata*. 2. *pellucida*. 3. *discolor*.

Undeveloped form, ♂. Black, shining. Elytra, along the scutellar region, yellowish 19. *forcipata*, Boh.

Undeveloped form, ♂. Piceous, somewhat shining ... 20. *pellucida*, Fab.

Do. ♂. Pronotum and scutellum black. Elytra brown, marginal nerve whitish-yellow... 21. *discolor*, Boh.

Pronotum generally whitish or yellowish-white.

Developed form, ♂. Elytra pale, almost transparent. Clavus with a short black streak at the apex .. 22. *striatella*, Fall.

Do. ♂. Clavus *without* a short black streak at the apex... 23. *neglecta*, Flor.

Do. ♂. Elytra with a broad, curved, black streak at the apex 24. *speciosa*, Boh.

Exceedingly like a small *Delphax pulchella* (see preceding genus). On the Continent there is another species closely allied to ours (*basilinea*, Germ.).

1. Head, pronotum, and scutellum brown.

Undeveloped form, ♂. Elytra posterior margin almost truncate, with two white oblong spots, the nerves spotted with black, but not so prominent as in the next species 25. *Fieberi* (n. s.).

Do. ♂. Elytra posterior margin rounded... 26. *lepida*, Boh.

2. Head and pronotum brown. Scutellum black, sides and apex more or less white.

Undeveloped form, ♂. Elytra black, scutellar and posterior margin white. Abdomen black. Genital segment, viewed from behind, black.... 27. *leptosoma*, Flor.

3. Pronotum and scutellum white.

Undeveloped form, ♂. Elytra dark brown or pitchy-brown, scutellar region pale, posterior margin narrowly white. Abdomen black. Genital segment, when viewed from behind, greyish-white... 28. *albofimbriata*, Curt.

This is an old manuscript name of Curtis, of which *apicalis* was the ♂ and this the ♀. Fieber in his list (Verhandl. K. K. Zool. bot. Gesell. xvi, 534, 35) assigns it to Signoret; but this is an error, as that gentleman possesses types of both sexes, received from Curtis, the labels written in a lady's hand (most probably that of his daughter).

Undeveloped form, ♂. Elytra black, posterior margin white. Abdomen black, last segment above, and the genital segment, margined with white .. 29. *niveimarginata* (n. s.).

4. Head, pronotum, and scutellum entirely yellow.

Undeveloped form, ♂. Elytra black, with a purplish gloss, posterior margin very narrowly whitish-yellow. Abdomen yellow. Genital segment black...30. *pullula*, Boh.

Undeveloped form, ♂. Elytra black, with a purplish gloss, the whole margin narrowly and scutellar region broadly yellowish.....31. *lugubrina*, Boh.

Do. ♂. Elytra yellow. Abdomen black.

32. *denticauda*, Boh.

5. Head and pronotum yellow.

Undeveloped form, ♂. Scutellum black. Abdomen black. Genital segment yellow 33. *Dalei* (n. s.).

6. Head, pronotum, scutellum, and elytra yellowish or greyish-yellow.

Undeveloped form, ♂. Abdomen black, a dorsal line and three or four longitudinal rows of streaks on the sides, yellow. Genital segment above yellow...34. *cognata*, Fieb.

Do. ♂. Abdomen and genital segment entirely black...

35. *exigua*, Boh.

Undeveloped form, ♀. The space between the keels on the crown, face, and clypeus smutty or black, keels of the two latter yellowish-white. Elytra sordid yellow, distinctly granulated. Abdomen sordid yellow, the margins of the segments more or less broadly black 36. *uncinata*, Fieb.

We have not as yet met with the ♂ of this or the next species. The ♀ most nearly resembles that of *pellucida* or *discolor*, whilst the ♂ (according to Fieber's outline) may be known by the genital segment, as seen from above, somewhat resembling that of *forcipata* (see sketch).

Undeveloped form, ♀. Face, from the base almost to the forehead, and clypeus black, keels yellow. Elytra pale and transparent, as long as the abdomen. Abdomen whitish-yellow, two or three segments at the base on the sides margined with black...

37. *obs curella*, Boh.

Not unlike the undeveloped ♀ of *neglecta*, but larger and clearer in colour.

C. Head transverse.

Undeveloped form, ♂. Crown yellow. Face black, between the keels spotted with white. Elytra dark brown. Abdomen piceous, genital segment above paler...

38. *Douglasi*, Fieb. M.S. (n. s.).

Developed form, ♂. Head, pronotum, and scutellum yellow. Pronotum more or less brown towards and at the apex. Elytra with a very pale lavender hue, nerves distinctly and somewhat remotely spotted with dark brown; apex with a curved brown band, its inner margin divided into rays, which run along the longitudinal nerves to the marginal nerve; apex of the clavus with a short black streak.

Undeveloped form, ♂. Elytra not covering half of the abdomen, anterior portion whitish, posteriorly with a broad brown band, nerves spotted as in the developed form ..

39. *limbata*, Fab.

Exceedingly common in damp places in the latter form amongst rushes, &c. This is the *pictipennis* of Curtis.

Developed form, ♂. Head brown. Face black, with two transverse white patches on each side of the middle keel. Pronotum dark brown, side keels and posterior margin more or less greyish. Scutellum black, middle keel generally brown. Elytra pale, nerves brown; along the inner margin a more or less broad, smoky streak.

Undeveloped form, ♂. Head yellow. Face as in the developed form. Pronotum and scutellum grey, outer angles of both and a streak along each side of the middle keel of the latter brown. Elytra pale, covering more than half of the abdomen. Abdomen black, more or less broadly yellow above .. 40. *lineata*, Perris.

D. Head pentagonal.

Undeveloped form, ♂. Head, pronotum, scutellum, and elytra white or faintly yellowish. Abdomen deep glossy black, the two last segments margined with snow-white. Legs black..... 41. *mesomelas*, Boh.

(To be continued.)

Mr. Blackmore exhibited *Lepidoptera* and *Coleoptera* captured by him at Tangiers during last winter. Among them was a long series of the true *Anthocharis Eupheno*, Linné. A beetle, *Pimelia scabrosa*, was remarkable for its monstrous antennæ, these organs being furcate.

Mr. F. Moore exhibited cocoons of a species of *Sagra* from Bombay, collected by Mr. Newton. These cocoons were placed, many together, in large galls, or swellings of the stems, of *Cocculus macrocarpus*, a creeping plant.

The President read an extract from a letter from Mr. Everett, from Sarawak, remarking on cases of mimicry in some spiders and caterpillars, these creatures having a most deceptive resemblance to pieces of bird's dung.

Mr. Müller exhibited galls on *Ammophila arundinacea* found by Mr. Trail, near Aberdeen.

Prof. Westwood made some observations on certain minute *Acari*, especially with reference to a species which causes the minute galls on the leaves of the pear trees. This species, together with that infesting the buds of black-currant, and others, formed a distinct group distinguished by the possession of only four legs, and he proposed to institute for their reception a genus under the name of *Acarellus*, the pear species being *A. pyri*. Mr. Müller suggested that these forms were identical with those described by Dejean under the name of *Phytopus*.

Mr. Jenner Weir communicated "Further observations on the relation between colour and edibility of *Lepidoptera* and their larvæ."

Mr. A. G. Butler read a "List of species in a collection of Butterflies sent by Mr. Ansell from Kinsembo, S.W. Africa."

Mr. H. W. Bates read "Contributions to the Insect-fauna of the Amazons (*Coleoptera*; *Longicornia*, Fam. *Cerambycidae*).

Mr. F. Walker communicated a "List of *Hymenoptera* collected by Mr. J. K. Lord in Egypt and Arabia."

ON CERTAIN BRITISH HEMIPTERA—HOMOPTERA.

BY JOHN SCOTT.

(Continued from p. 29.)

Descriptions of new species of the Genus *Liburnia*, Stål.

Species 6.—LIBURNIA SCOTTI.

Delphax pallidulus, Marshall, Ent. Mo. Mag., i, 201, 3 (1865).

Kelisia Scotti, Fieb. (M.S.).

Developed form, ♂ and ♀. Pale ochreous. *Abdomen* yellow, genital segment posteriorly snowy-white.

Head: cheeks, ocelli, and a spot lower down next the inner margin, black.

Thorax: pronotum with a small black spot at the posterior angles. *Elytra*: corium with an ovate black spot at the apex, or continued as a more or less broad line along the middle nerve, as far as the transverse nerves. *Sternum* ochreous. *Legs* ochreous. *Claws* dark brown.

Abdomen pale ochreous, margins of the segments above more or less black; genital segment snowy-white.

Var. a. A somewhat triangular spot at the apex of the clavus, a short, narrow streak along the suture near the base, and an oval spot at the apex of the corium black.

Var. b. Nearly the entire elytra black, the oval spot at the apex darkest; the entire margin, a patch near the base of the clavus, and another in a line with the transverse nerves, pale ochreous.

Length $1\frac{1}{4}$ — $1\frac{3}{4}$ line.

This is not, as was supposed by the Rev. T. A. Marshall at the time he described the insect, the *D. pallidulus*, Boh. The latter insect is smaller, paler, and without a vestige of dark markings on the elytra. We have compared it with a true type of the insect, described by Boheman, kindly forwarded to us by Dr. Stål, to whom we would here express our thanks for this, as well as for types of other of Boheman's species.

Local, but abundant where it occurs. Near Leicester (Marshall); Glanvilles Wootton (Dale); Sallow pit, Lee, and Abbey Wood Marshes, on *Arundo phragmites* in September and October.

Var. b is much rarer than the other forms.

Species 13.—LIBURNIA BOLDI, *n. s.*

Undeveloped form, ♀.

Head: crown yellow, the two basal foveæ distinct and somewhat deep: *keels* white, interstices black, as are also those of the forehead. *Face* and *clypeus* yellow: *keels* of the former white, the middle one on each side, and the side ones interiorly narrowly margined with black. *Antennæ* brownish-yellow. *Eyes* brown.

Thorax: *pronotum* and *scutellum* yellow, with a greyish shade, *keels* distinct, paler than the disc, side *keels* of the former almost reaching to the posterior margin. *Elytra* yellowish-grey, barely covering half of the abdomen, posterior margin rounded, nerves distinct but not prominent, nor granulated: *clavus*, apex with a short, narrow, dark brown streak. *Legs* yellow, with a slight fuscous shade: *thighs*, third pair, with a black longitudinal streak on the upperside: *claws* black.

Abdomen above, brownish-yellow, darker on the sides, side margins orange-yellow, exterior margin of the segments black, underneath black or pitchy-brown, margins of the segments orange-yellow, genital segments brown.

Length 1 line.

Most nearly allied to *D. distincta*, Flor, but the face between the keels is not black, the elytra not so yellow, nor the marginal nerve white, as in that species. On the other hand *distincta* is without the short dark brown streak at the apex of the clavus.

A single ♀ example of this insect was captured by Mr. T. J. Bold, after whom we have much pleasure in naming it, in Seghill Dene, near Newcastle-on-Tyne, in May.

Species 14.—LIBURNIA CAPNODES, *Fieb.* (M.S.).

Developed form, ♀. Keels of the head and face concolorous.

Head pale brownish-yellow; *crown*, the three foveæ distinct, the two basal ones deepest. *Face*, *clypeus*, and *cheeks* pale brownish-yellow. *Antennæ* pale brownish-yellow, 2nd joint somewhat fuscous. *Eyes* brown.

Thorax: *pronotum* and *scutellum* pale brownish-yellow, side keels of the former curved round just beyond and running parallel with the posterior margin of the eyes; keels of the latter fine but distinct, disc depressed posteriorly. *Elytra* pale smoky-yellow, almost transparent; all the nerves brown, distinctly and regularly granulated with black: *clavus*, apex of the marginal nerve blackish. *Legs* pale fuscous-yellow; *tarsi*, apex of the 3rd joint and claws brown.

Abdomen above, dark brown, paler towards the apex; underneath, brownish-yellow, lower margins of the segments more or less broadly black, segments themselves with two or three scattered black punctures; genital segments and ovipositor brownish-yellow. Length $1\frac{1}{2}$ -line.

Unlike any other species of the genus, and will be at once recognised by the uniform brown nerves, and minute, but distinct, black granules thereon.

A single ♀ example taken somewhere in this neighbourhood in October, 1863, but the locality not recorded.

Species 15.—LIBURNIA SIGNORETI, *n. s.*

Undeveloped form, ♂.

Head yellow, with a slight fuscous shade; *crown*, the three foveæ distinct, the two basal ones deepest. *Face* and *clypeus* yellow, *keels* slightly paler, middle keel of the former furcate on the forehead, a little above the lower margin of the eyes; *cheeks* yellow; *ocelli* black. *Antennæ* yellow, with a slight fuscous shade, 2nd joint nearly twice as long as the 1st, reaching to beyond the clypeus suture. *Eyes* black.

Thorax: *pronotum* yellow, with a slight fuscous shade, *keels* distinct, side keels curved outwardly and terminating before reaching the posterior margin; *scutellum* yellow, with a slight fuscous shade, keels distinct, apex finely wrinkled transversely. *Elytra* pale fuscous-yellow, reaching to beyond the apex of the abdomen, and somewhat narrowed posteriorly, posterior margin rounded; nerves brown, prominent, with distinct darker granules placed somewhat thickly and at regular intervals, the 1st nerve, next the anterior margin, as far as the bifurcation, without or with only one or two granules. *Legs* dark fuscous; *claws* black.

Abdomen black, base broadly yellow, last segment margined with white; genital segment black. Length 1 line.

Rather larger and stouter than *D. adela*, Flor, to which it is allied, but the distinct dark granules on the elytra, and the different form of the styloid processes easily distinguish it from the last named.

Taken in the marshes near Abbey Wood, in June, and named after Dr. Signoret, for his great kindness in assisting us by the loan of examples of several species of this genus.

Species 17.—LIBURNIA MELANOPACHYS.

Delphax melanopachys, Fieb. (M.S.).*Undeveloped form*, ♂.

Head: crown clear brown, the three foveæ deep and distinct, keels acute and prominent. Face (except the forehead), clypeus, and cheeks black. Antennæ clear brown, 2nd joint about $1\frac{1}{2}$ time longer than the 1st.

Thorax: pronotum clear brown, keels acute and prominent, posterior angles broadly black; scutellum clear brown, keels distinct, sometimes the middle keel and a narrow margin on either side, especially towards the apex, blackish; sides, beyond the side keels, black. Elytra about two-thirds the length of the abdomen, lacquer-yellow, shining, somewhat transparent, nerves prominent, unpunctured; posterior margin rounded. Sternum black. Legs yellow; tarsi, 1st and 2nd pairs, brown, 3rd, yellow.

Abdomen above, pitchy-brown; underneath black; genital segment black.

Length, ♂, 1 line.

Altogether a larger species than *L. venosa*, to which it bears a great resemblance, but it is at once to be distinguished from it by the characters on the pronotum and scutellum, as given above.

The peculiar lacquer-yellow colour of the elytra is only met with, at least amongst British species, in *L. venosa*, and the present insect, but in the former it is not nearly so clear as in the latter.

The discovery of this interesting species is due to Mr. T. J. Bold, who took a single ♂ specimen in Gosforth Woods in October.

Species 25.—LIBURNIA FIEBERI, n. s.

Undeveloped form, ♂.

Elytra: posterior margin with two white oblong spots, the nerves faintly spotted with black.

Head: crown yellow, the three foveæ distinct, basal ones deepest; forehead yellow. Face fuscous-black; keels yellowish, base and apex narrowly margined with yellowish, and on each side of the middle a transverse yellowish line; cheeks fuscous-black. Antennæ yellow, 2nd joint stout, somewhat brownish towards the apex.

Thorax: pronotum brown, beyond the side keels black, posterior margin brown; keels acute, prominent; scutellum brown, beyond the side keels black; keels acute, prominent. Elytra pitchy-brown, not covering half of the abdomen, posterior margin truncate, angles rounded; clavus yellowish-white, scutellar margin narrowly pitchy-brown, apex with a large, somewhat oval, black spot; corium, posterior margin white, divided in the centre by a black spot, nerves faintly spotted with black. Sternum dark brown. Legs pale fuscous-yellow; tibiæ, 1st pair slightly darker before the apex; thighs, 3rd pair, piceous; tibiæ fuscous-yellow, darkest towards the base, apex and spines pale yellow; tarsi yellow, 1st joint, except the apex, pale fuscous.

Abdomen above, brownish-yellow, with a black streak along the sides; side margins black, with a small yellow spot at the lower angle of each segment; genital segment yellow, sides piceous; underneath black, genital segment yellow.

Length 1 line nearly.

Undeveloped form, ♀.

Very similar to the ♂ in all respects, except that the posterior margins of the segments of the abdomen, on each side of the dorsal line, are black.

Length 1 line.

Larger than *L. lepida*, and at once to be distinguished from it by the absence of the minute white spots on the pronotum, and the less prominent black spots on the elytra.

We know of only two examples: one (♀) taken by Mr. T. J. Bold, in Gosforth Woods, near Newcastle-on-Tyne, in October; and one (♂) taken at Abbey Wood, in July (Scott).

Species 29. — LIBURNIA NIVEIMARGINATA.

Delphax thoracicus, Marshall, Ent. Mo. Mag., iii, 269 (1867).

Undeveloped form, ♂.

Elytra black, posterior margin white. *Abdomen* black, last segment above, and the genital segment, margined with white.

Head brown; *crown*, the two basal foveæ distinct but not deep, the anterior one faint. *Face* and *clypeus* dark brown; *keels* paler, on the forehead almost obsolete; *cheeks* brown. *Antennæ* brownish-yellow.

Thorax: *pronotum* white, the anterior margin brown; *keels* distinct; *scutellum* yellowish-white, middle keel more distinct than the side ones. *Elytra* black, shining, half the length of the abdomen, posterior margin rounded, white, nerves prominent. *Legs* fuscous-brown; *tibiæ* and *tarsi* paler, 3rd joint of the latter, black.

Abdomen black, shining, margin of the last segment above, white, side margins very narrowly pale; genital segment above, and the posterior margin on the sides, narrowly margined with white.

Undeveloped form, ♀.

Scutellum yellowish or white. *Elytra* pale brownish, posterior margin white. *Abdomen* brown, darkest on the sides. All the other characters as in the ♂.

Length, ♂, 1; ♀, 1½ lines.

Most nearly allied to *L. leptosoma*, but it is larger than that species, and differs from it in the absence of the pale sutural region of the elytra, and by having the scutellum white.

Taken by the Rev. T. A. Marshall at Wimbleton, in September, on marshy places. He referred it to the *D. thoracicus*, Stål., but as that insect is merely the developed form of the ♀ of *mæsta*, Boh., the above name has been proposed instead thereof.

Species 33.—LIBURNIA DALEI, *n. s.**Undeveloped form, ♂.*

Head yellow: *crown*, the two basal foveæ distinct, the anterior one appearing as a deep puncture. *Face* widest below the eyes, the middle keel distinct but not prominent: *clypeus*, middle keel distinct. *Antennæ* yellow, second joint twice as long as thick at the base. *Eyes* purplish.

Thorax: *pronotum* yellow, *keels* distinct; *scutellum* deep black, shining, keels fine but distinct, sides and apex narrowly yellow: *elytra* yellow, not covering half of the abdomen, posterior margined rounded, nerves not granulated. *Sternum* yellow: *mesosternum*, sides black, apex narrowly yellowish. *Legs* yellow; *coæ* of all the pairs anteriorly black: *tarsi*, apex of the third joint and claws black.

Abdomen black, shining, side margins and a very narrow dorsal line yellow, two last segments clear yellow; genital segment above clear yellow, sides and underneath black. Length $\frac{3}{4}$ line.

♀ Unknown.

We are not acquainted with any species with which this insect is likely to be confounded.

The description has been drawn up from a single ♂ specimen in the collection of Mr. J. C. Dale, who has at all times been ready to aid and assist us, and after whom we have much pleasure in naming it. It was taken at Lulworth, Mr. Dale believes, in August, 1832.

Species 38—LIBURNIA DOUGLASI.

Delphax Douglasi, Fieb. M.S.*Undeveloped form, ♂.*

Head: *crown* and forehead yellow; the three foveæ on the former distinct but shallow. *Face* and *clypeus* black, the former between the keels irregularly spotted with white; *cheeks* black, along the margin of the face, with three or four white spots. *Antennæ* brownish-yellow.

Thorax: *pronotum* yellow, *keels* somewhat indistinct; *scutellum* pale brown, beyond the side keels dark brown, keels distinct but not prominent. *Elytra* brown, more than half the length of the abdomen, posterior margin almost truncate, angles rounded, nerves fine but distinct, not granulated. *Legs* yellowish or pale brownish-yellow, with a fuscous shade.

Abdomen black; genital segment above brownish-yellow, sides black.

Length $\frac{3}{4}$ line.

Totally unlike either of the two other species belonging to this section, and at once recognizable by its brown elytra. A single ♂ example was taken by Mr. Douglas at Folkestone, in September, 1862.

Genus 4.—DICRANOTROPIS, *Fieb.*

Head almost square.

Undeveloped form, ♂. Keels of the head and face white, interstices black. Crown, pronotum and scutellum greyish- or whitish-yellow, the latter with a black spot beyond the side keels. Elytra greyish-white, apex of the clavus with a short black streak. Abdomen black, with a narrow more or less interrupted white dorsal line. Genital segment large, the sides much projected and black; upper portion white1. *hamata*, Boh.

A common species and easily recognised by its curiously formed genital segment.

Genus 5.—STIROMA, *Fieb.*

Head transverse, the anterior margin of the crown but a little way in front of the eyes.

Undeveloped form, ♂. Head, pronotum and scutellum yellow, the two latter somewhat brownish. Face at the base with a black cuneate patch on each side of the furcate middle keel. Pronotum and scutellum each with a black patch beyond the side keels, posterior margin of the former pale. Elytra greyish-yellow, not covering half of the abdomen. Abdomen piceous, on the back pitchy-brown..... 1. *affinis*, Fieb.

Undeveloped form, ♂. Face at the base with a black patch on each side of the furcate middle keel, the patches generally united into one. Scutellum only with a black patch beyond the side keels. Elytra as in the former species. Abdomen castaneous, darker on the sides2. *nasalis*, Boh.

The easiest character by which to separate these species is in the markings on the pronotum and scutellum, whilst an examination of the structural differences of the styloid processes will establish their distinctness. In the former, the apex of these is somewhat of a fish-tail shape, and in the latter aculeate and curved.

Undeveloped form, ♂. Head and pronotum bright yellow, the latter frequently darker between the side keels next the posterior margin. Scutellum and elytra black, the latter covering more than half of the abdomen. Abdomen black or yellow. Genital segment above generally brownish or yellow.....3. *pteridis*, Boh.

Not readily confounded with any species that we know. The middle keels of the face are almost obsolete.

Undeveloped form, ♂. Head yellowish or brownish-yellow. Keels of the head and face white. Pronotum generally white. Scutellum yellow. Elytra more or less dark piceous, very narrowly somewhat paler along the scutellar region, posterior margin white. Abdomen black. Genital segment black, posterior margin above white.....4. *albomarginata*, Curt.

This is the *D. adelpha* of Flor. It is easily separated from similar species of *Liburnia* through its having two middle keels to the face.

Undeveloped form, ♂. Pronotum white, anterior portion clear pale yellowish-brown. Scutellum clear yellowish-brown, sides and apex white. Elytra clear pitchy-brown, shining, posterior margin white. Abdomen black, margin of the last segment white. Genital segment on the sides black, above and posterior margin white ... 5. *mœsta*, Flor.

Somewhat larger than the last species, but extremely difficult to separate from it. The different form of the opening of the genital segment, when viewed from behind, the white margin to the last abdominal segment, and the white upper portion of the genital segment are the most striking outward characters whereby to distinguish this insect from *S. albomarginata*.

My task, as far as my knowledge of the species of *Delphacidæ* of this country is concerned, is now completed; and, although my investigation of this family, both anatomically and otherwise, has enabled me to treble the number of species hitherto recorded as British, yet I am far from believing that these are all its representatives to be met with in this country. Their minute size and great resemblance to each other in many instances (as noticed below), and their extremely active habits, rendering them so difficult of capture in the net, have led me to this conclusion. From Ireland I have not seen a single individual; and as to Scotland, whence I believe many additions will yet come, the few observers who have done anything have either been limited as to time, or merely taken such species as fell in their way while collecting insects of other Orders. Wales pairs with Ireland, and the South-coast and Isle of Wight only return one or two members.

Northumberland furnishes its quota, but the London district as yet bears off the palm, and Dorsetshire "labors hard to swell the list with the good things it yields." Except Berwickshire, these are the only places from which I have seen any examples of the *Delphacidæ*, and what may be expected from the yet unexplored parts, I leave my readers to judge for themselves.

Amongst the continental species most likely to be added to our lists in this group are *Delphax crassicornis*, Fab. (see genus 2, p. 24); *Liburnia stenoptera*, Flor, closely allied to *smaragdula* and *unicolor*; *L. hyalinipennis*, Stål, like a small *neglecta*; *L. paryphasma*, Flor, belonging to the *leptosoma* group; *L. straminea*, Stål; *L. modesta*, Fieb.; *L. flaviceps*, Fieb.; *L. limitata*, Fieb.; *L. protrusa*, Flor; *L. paludosa*, Flor; *L. flaveola*, Flor; *L. spinosa*, Mink (somewhat like *L. cognata*, but with a black abdomen, or with a row of yellow spots down the middle of the back); *L. Bohemanni*, Stål, somewhat resembling *pullula*, but larger, and *Metropis Mayri*, Fieb., a black species with a head shaped like that of *L. mesomelas*.

In conclusion, I consider it an extremely interesting point that the similarity of many of the species is so great that they can be broken up into what I call parallel pairs. Indeed, so similar are the creatures of each pair, both in the developed and undeveloped form (*i. e.*, with complete elytra and wings, or with incomplete elytra and no wings), that, except by the form of the genital segment and the styloid processes, it would be next to impossible to separate them. With the exception of the first-named, and of *L. basilinea*, Germ., all the species are British, and their diagnostic characters have been already given.

They are as follows:—

Delphax crassicornis, Fab., and *D. pulchella*, Curtis.

Liburnia fuscovittata, Stål, and *L. lineola*, Germ.

„ *smaragdula*, Stål, and *L. unicolor*, H. Schf.

„ *pellucida*, Fab., and *L. discolor*, Boh.

„ *speciosa*, Boh., and *L. basilinea*, Germ.

„ *Fieberi*, Scott, and *L. lepida*, Boh.

„ *leptosoma*, Flor, and *L. niveimarginata*, Scott.

„ *cognata*, Fieb., and *L. exigua*, Boh.

Stiroma affinis, Fieb., and *S. nasalis*, Boh.

„ *albomarginata*, Curtis, and *S. mæsta*, Flor.

The next paper will comprise the British species of *Oixiidæ*.

(To be continued.)

ON CERTAIN BRITISH HEMIPTERA-HOMOPTERA.

BY JOHN SCOTT.

(Continued from page 76).

REVISION OF THE FAMILY CIXIIDÆ.

We have no nearer relatives of the *Delphacidæ* in England than the *Cixiidæ*; (nor are there any, as far as I am aware, on the Continent), and even their relationship is not of the closest kind, the shape of the face with its keels being the strongest outward and visible sign of it.

As in the *Delphacidæ*, so in the *Cixiidæ*, many of the species are exceedingly like to each other, and this has led to great confusion. Authors have not known what to do with them, and so they have been separated by one, put together by another, and finally mixed up almost indiscriminately. But here again the processes attached to the genital segment of the males serve as a simple but great guide. They are not shaped as in the *Delphacidæ*, neither are they placed as in that family, but are situated on the sides and project beyond the end of the segment, and support the tube; and, for general purposes, I have denominated them "claspers." Attached to the diagnoses of the species will be found a drawing of some two or three of them, showing the differences of structure, and which, I hope, will be considered useful.

Of the nine species enumerated by Curtis, in his *British Entomology* (673), five only remain, when the varieties have been disposed of; and of the four described by the Rev. T. A. Marshall, in the *Ent. Mo. Mag.*, Vol. i, pp. 154 and 155, *musivus*, Germ., must be sunk, as the insects in Mr. Douglas' collection, and from which the description was made, are *stigmaticus*, Lat. *C. musivus*, has not as yet, I believe, been found in this country. But Mr. Marshall gives *cunicularius*, L., and *stigmaticus*, Lat., as varieties (*a* and *d*) of *nervosus*, L.; and, as these are good species, his number is increased by one, and so reaches that of Curtis. By the time this paper shall have been completed, I shall have described 10 species, divisible into two genera, *Oliarus* and *Cixius*.

Family CIXIIDÆ.

Cixiidæ, Stål, Hem. Afr. iv, 129.*Dictyophoridæ*, Kirschb., Cicad. 11.

Head not produced in front. *Antennæ* short, inserted at some distance below the eyes, 1st joint concealed, 2nd short, sub-globose. *Eyes* faintly sinuate beneath. *Ocelli* 3 or 2. *Elytra* membranous, nerves generally granulated. *Tibiæ*, 3rd pair with two or three spines, and *without* a moveable spur. *Abdomen*, 1st and 2nd segments sealed together.

Crown, posterior margin angulate emarginate.

Ocelli 3.

Scutellum with five longitudinal keels.

Genus 1.—*OLIARUS*, Stål.

Crown, posterior margin concave.

Ocelli 2.

Scutellum with three longitudinal keels.

Genus 2.—*CIXIUS*, Lat.

Genus 1.—*OLIARUS*, Stål.

Head: crown frequently longer than broad, widest at the base, deeply concave, and with a more or less distinct middle keel, frequently not reaching to the convex anterior margin; *forehead* small, composed of two triangular pieces separated by a middle keel. *Face* dilated, with three longitudinal keels, lateral margins rounded. *Clypeus* large, separated from the face by an angular suture, and with a distinct middle keel. *Ocelli* 3, placed as follows, viz.:—two close to the margin of the face near the lower margin of the eyes, and one at the apex of the middle keel of the face.

Thorax: *pronotum* very small; posterior margin deeply angulate in the middle and rounded off towards the posterior angles; central keel very short, side keels semi-circular, generally just beyond the posterior margin of the eyes, and running parallel with them. *Scutellum* with five longitudinal keels.

Elytra without bands or spots.

A.—Crown longer than broad1. *pallidus*.

B.—Crown transverse2. *leporinus*.

A.—Crown longer than broad.

Species 1.—*OLIARUS PALLIDUS*.

Flata pallida, H. Schf., D. I., 154, 4.

Pentastiridius pallens, Kirschb., Cicad., 45, 9 (1868).

Elytra transparent, pale yellowish, nerves pale brownish-yellow, minutely, but somewhat indistinctly, granulated.

Head black; crown longer than broad, marginal keels brownish-yellow, middle keel black, rather indistinct, not reaching to the anterior margin. *Face* and *clypeus* keels brownish-yellow. *Antennæ*, 2nd joint brown.

Thorax: *pronotum* black, keels and posterior margin yellow or yellowish-white. *Scutellum* black, side margins and apex narrowly brown; keels black, or sometimes piceous, the 2nd and 4th keels slightly diverge for about two-thirds their length from the base, where they then contract towards the apex. *Elytra* transparent, very pale yellowish, nerves minutely but somewhat indistinctly granulated, pale brownish-yellow as far as the transverse nerves, from thence to the apex brown; marginal nerve not granulated, but round the apex, on the inside, narrowly margined with brown; the cuneate patch adjoining the anterior margin more or less brown interiorly. *Wings* clear and

transparent, nerves brown. *Legs* fuscous, or brownish-yellow; *thighs* dark brown; *tibiæ*, 1st and 2nd pairs fuscous, 3rd yellowish, with a fuscous streak along the inside; *tarsi*, 3rd joint of the 1st and 2nd pairs piceous, 3rd pair, at the apex, brown.

Abdomen black, margins of the segments narrowly yellow.

Length, $2\frac{1}{2}$ —3 lines.

Easily separated from the next species by its narrower head and yellower elytra. I have not seen any recently-captured examples of this species, and I am indebted to Mr. J. C. Dale for the loan of his specimens, and the following communication with respect to their capture:—"The first was taken by sweeping grass on the downs by "Marley Wood, Lulworth, afterwards on the heath by the Aylestone "in Purbeck, and since near Ryde, Isle of Wight."

Curtis, who supposed it to be the *leporinus*, Lin. (B. E., 673, 9), says—"in abundance on coarse grass by the side of the Avon, Clifton." Time of appearance, June and July.

B.—Crown transverse.

Species 2.—*OLIARUS LEPORINUS*.

Cicada leporina, L., F. S., 895 (1761); S. N., ii, 711, 43 (1767); Schrank, Enum. Ins. Aust., 501, 260 (1781); Panz., F. G., 61, 19 (1799).

? *Flata pallens*, Germ., Mag., iv, 101, 2 (1821).

Flata leporina, Germ., Thon Archiv., ii, 50, 50 (1830); H. Schf., 144, 4.

Pentastira leporina, Kirschb., Cicad., 44, 2 (1868).

Elytra pale, transparent, nerves brown, granulation minute, but distinct, black.

Head black; *crown* transverse, marginal keels yellow. *Face* and *clypeus* keels yellow, middle keel of the former furcate immediately below the margin of the forehead, with which it forms a small triangle. *Antennæ* yellow.

Thorax: *pronotum* black, keels and posterior margin whitish or yellowish-white. *Scutellum* black. *Elytra* pale, transparent, nerves brown as far as the transverse nerves, from thence to the apex dark fuscous; granulation black, minute, but distinct, the granules disposed at somewhat regular intervals; anterior marginal nerve not granulated, the cuneate patch brown. *Legs* yellow; *thighs* fuscous, apex narrowly yellow; *tibiæ* sometimes pale fuscous at the base; *tarsi*, 3rd joint brown.

Abdomen black, sides and margins of the segments narrowly yellow.

Length, $2\frac{1}{4}$ — $2\frac{1}{2}$ lines.

Two old specimens are in the collection of Mr. J. C. Dale; another example was taken at Deal by Mr. E. Saunders at the end of June, on *Tamarix*.

Genus 2.—CIXIUS, Lat.

Head: crown widest behind, deeply concave, with a depressed middle keel; posterior margin concave, anterior margin convex; *forehead* very small, almost in the same plane with the crown, generally composed of two triangular pieces, separated by a middle keel. *Face* much dilated, with three longitudinal keels. *Clypeus* large, separated from the face by an angular suture, and with a distinct middle keel. *Ocelli* 2, placed close to the margin of the face, between the eyes and antennæ.

Thorax: *pronotum* as in *Oliarus*. *Scutellum* with three longitudinal keels.

Nerves of the elytra distinctly granulated with black; the granules along the anterior margin always largest.

A.

Elytra pale, transparent; the base, a narrow band before the middle, frequently much interrupted, or sometimes nearly obliterated, and another broader one before the apex, brown...1. *cunicularius*, Fab.

1.—*Marginal nerve* with two or three of the granules at irregular intervals, generally united.

B.

Elytra without a band before the apex, the first nerve at the base, as far as the bifurcation, brown or black, transverse nerves black, the space between them and the apex with several more or less distinct pale fuscous, or brownish patches2. *nervosus*, Lin.

Head and *face* yellow, or pale brownish-yellow; *pronotum* pale chestnut-brown, darker on the sides. *Elytra*: marginal spots somewhat square. *Genital organs* pale brownish or yellowish...

3. *intermedius*, Fieb.

Elytra: marginal granules *not* square or elongate...4. *brachycranus*, Fieb.

Head black, keels broadly pale brownish-yellow. *Face* brownish-yellow. *Elytra* almost invariably with three short black streaks along the anterior margin, and a short transverse fuscous streak midway between the cuneate patch and the apex ...

5. *contaminatus*, Lat.

2.—*Marginal nerve* without united granules.

C.

Elytra without bands.

Elytra dark grey or brownish-grey, with several irregularly disposed, and more or less confluent, darker spots6. *stigmaticus*, Germ.

Elytra pale, marginal granules elongate, somewhat thickly placed, apex between the nerves with pale fuscous spots. *Clavus*: marginal nerve, next the apex, black7. *simplex*, H. Schf.

Elytra somewhat whitish, marginal granules elongate, and placed at wide intervals, *all the nerves white*, apex without spots between the nerves8. *similis*, Kirschb.

A.

Species 1.—CIXIUS CUNICULARIUS.

Flata cunicularia, Fab., Sys. Rhyn., 55, 48 (1803); Germ. Mag., iii, 195, 6 (1818); Thon Archiv., ii, 48, 27 (1829).

Cercopis Dionysii, Panz., F. G., 34, 24.

Cixia cunicularia, Burm., Handb., ii, 157, 3 (1835).

Cixius Dionysii, Curt., B. E., 673 (1837).

Cixius nervosus, Flor, Rhyn. Liv., ii, 22, 1 (1861); Marshall, Ent. Mo. Mag., i, 154, 1, var. a (1864).

? *Cixius dorsalis*, Hardy, Tyneside Nat. F. C., i, 430 (1850).

Elytra pale, transparent, sometimes of a milky hue, the base, a narrow band before the middle, frequently much interrupted or sometimes nearly obliterated, and another broader one before the apex, brown.

Head yellow; *crown* with a black, almost square, spot on each side of the middle keel. *Face* more or less pitchy-brown, darkest along the lower margin, keels yellow or whitish-yellow. *Clypeus* brownish, middle keel yellow, side keels pitchy-brown (in the ♀, the entire clypeus and keels are generally yellow). *Antennæ* yellow.

Thorax: *pronotum* yellow, more or less brown between the keels. *Scutellum* pitchy-black, or deep chestnut-brown, apex transversely wrinkled, middle keel paler than the disc, not reaching the apex distinctly, but appearing to terminate in a line with the apex of the side keels. *Elytra*: nerves pale yellowish, granules black, of slightly irregular size, and placed at irregular intervals, frequently in pairs diagonally towards the apex, each granule bearing a short black hair; junction of the nerves with the marginal nerve round the apex black, the spot generally of a triangular shape; the band before the middle is sometimes entirely obliterated or composed of one or two patches, or its position is alone indicated by a small patch next the anterior margin; the inner margin of the band before the apex always commences on the anterior margin in a line with the base of the cuneate patch, and curves inwards to the first transverse nerve from whence it passes almost straight across to the apex of the clavus. *Wings* pale, or somewhat fuscous, or frequently the inner portion towards and at the apex dark fuscous; nerves fuscous. *Legs* more or less fuscous-yellow.

Abdomen black, outer lower angles of the segments generally orange-reddish or yellowish: *genital segment* black, "claspers," &c., yellowish, or pale brownish-yellow. Length, $2\frac{3}{4}$ — $3\frac{1}{2}$ lines.

The band across the apex of the elytra is quite sufficient to show the difference between this species and *nervosus*, with which it has been confounded. Sometimes the entire elytra are of a dark brown or reddish-brown colour with the exception of a pale space before the base of the cuneate patch. This is the form *C. Dionysii*, Curt. In Mr. Bold's collection, there is a singularly small ♂ (only about two lines long) with the apex of the elytra almost entirely dark fuscous.

Less common than *C. nervosus*, with which species it is frequently taken by beating trees and bushes in woods, &c., in June and July. I have seen specimens from Dr. White of Perth, Mr. Hardy of Old cambus, Mr. Bold of Newcastle-on-Tyne, Mr. J. C. Dale of Glanville's Wootton, and those taken by Mr. Douglas and myself here.

(To be continued).

DESCRIPTION OF THE LARVA OF *DEILEPHILA GALII*, WITH NOTES ON ITS VARIATION.

BY WILLIAM BUCKLER.

Up to the present autumn it had been my chance to have seen but one larva of *D. galii*, and that a dead one, as long ago as 1859. This corpse I figured, but, as may well be supposed, I could never feel satisfied that my figure was at all trustworthy.

The satisfaction, therefore, and the feverish delight which have been wrought in me lately by the gift of four, and the loan of not less than twelve, larvæ in various stages of growth, may be better conceived than described!

To Mr. Nicholas Cooke and Mr. Henry Terry my warmest thanks are due for this great kindness, of which I have availed myself so far as to take fifteen figures, and to put together the following observations, which may, perchance, be deemed not altogether uninteresting.

The larvæ arrived at intervals from the 6th to the 26th of September, 1870, and fed freely on flowers, unripe seeds and leaves of *Galium verum*, and occasionally ate a little *Fuchsia*; when full-fed they were restless, and wandered about for a day or two before they settled down to spin. They made for their covering a rather coarse network of threads, which bound the sand beneath them with the *Galium* above into a slight cocoon; and they had all retired by the 8th of October.

Differs considerably from northern species in the form of the anterior wings, which resemble those of *Perla*, whereas they are ordinarily short, broad, and obtusely angular, with a strongly dilated costal area, and strong and elevated veins; also in the extremely narrow prothorax, generally delicate appearance, and larger eyes.

As a contribution to a knowledge of the distribution of the genus, I may here note that Baron De Selys Longchamps possesses one male *Sialis* from Japan, identical with, or closely allied to, *S. lutaria*.

Lewisham: 12th November, 1870.

ON CERTAIN BRITISH HEMIPTERA-HOMOPTERA.

(Revision of the Family *Cixiidæ*).

BY JOHN SCOTT.

(Continued from page 123).

B.

1.—*Marginal nerve* with two or three of the granules, at irregular intervals, generally united.

Species 2.—CIXIUS NERVOSUS.

Cicada nervosa, Linn., S. N., ii, 709, 25 (1767); Fab., Ent. Sys., iv, 442, 64 (1794).

Cicada cunicularia, Linn., S. N., 465, 44 (1767).

Flata nervosa, Fab., Sys. Rhyn., 54, 47 (1803); Germ. Mag., iii, 191, 5 (1818); Fall., Hem. Suec., ii, 71, 1 (1826); Germ., Thon Archiv., ii, 48, 27 (1829).

Cixia nervosa, Burm., Handb., ii, 157, 2 (1835).

Cixius nervosus, H. Schf., D. I., 112, 22; Zett., Ins. Lapp., 304, 1 (1840); Am. et Serv., Hem., 508, 1 (1843); Marshall, Ent. Mo. Mag., i, 154, 1 (1864); Kirschb., Cicad., 46, 2 (1868).

Elytra without a band before the apex, the first nerve at the base, as far as the bifurcation, brown or black, transverse nerves black, the space between them and the apex with several more or less distinct pale fuscous or brownish patches.

Head black, margins and middle keel yellow; *forehead* piceous, margins yellow. *Face* black, keels yellow, clypeus yellow, apex on each side of the middle keel black. *Antennæ* brown or yellow.

Thorax: *pronotum* yellow, the portion beneath the eyes and the disc behind the side keels, more or less broadly black. *Scutellum* black, middle keel, and

sometimes the apex of the side keels, clear brown, or frequently all the three keels brown. *Elytra*: marginal nerve fuscous or yellowish, inner nerves pale yellow, granules black, of an elongate shape, deposited irregularly, two or three occasionally confluent where the transverse band passes across, and also at the bifurcations of the nerves, each granule bearing a short black hair; from the transverse nerves to the apex the granules on all the nerves are frequently confluent, so that the nerves appear black, transverse nerves black, margined on one or both sides with fuscous-brown; *clavus*, marginal nerve next the apex with six or seven granules, or the granules confluent, and forming two short streaks. *Wings* pale, transparent, or more or less fuscous, marginal and inner nerves black, bases of all yellow. *Legs* yellowish or fuscous; *thighs* next the apex frequently dark brown; *tibiæ* sometimes with a blackish patch at the base, on the outside; *tarsi*, 1st and 2nd pairs brownish-yellow or fuscous, 3rd joint black, 3rd pair yellowish, 3rd joint sometimes brown.

Abdomen black, margins of the segments on the sides very narrowly orange-reddish; *genital segment* black, or occasionally chestnut-brown; "claspers" fuscous.

Length, 3—3½ lines.

This is our commonest species, and is to be met with everywhere, by beating trees and bushes, from June to September.

Species 3.—CIXIUS INTERMEDIUS.

Cixius intermedius, Fieb. (M.S.).

Head and *face* yellow, or pale brownish-yellow; *pronotum* pale chestnut-brown, darker on the sides. *Elytra*: marginal granules somewhat square. *Genital organs* pale brownish or yellowish.

Head: *Face*, lower portion next the clypeus, with a more or less axe-shaped pitchy patch on each side of the middle keel. *Antennæ* black, apex of the 2nd joint brown.

Thorax: *pronotum* yellow. *Scutellum* clear brown, darkest on the sides from beyond the side keels, apex depressed, and very finely wrinkled transversely. *Elytra* somewhat of a chalky or milky hue, or with a slight brownish shade, anterior marginal nerve yellowish-white as far as the cuneate patch, from thence round the apex fuscous, granules along the marginal nerve somewhat square, and placed at different intervals in different individuals, granules on the inner nerves of a somewhat loose appearance, somewhat thickly disposed, and placed more or less in pairs, one granule on the right hand side of the nerve, and the other on the left, each granule bearing a short black hair; transverse band generally of an almost uniform width, more or less dark brown, and more or less distinct, it curves slightly outwardly, and reaches the inner margin nearly in the middle of the *clavus*, transverse nerves very narrowly black. *Wings* pale, transparent, nerves black. *Legs* yellow; *thighs* of all the pairs fuscous-brown; *tibiæ* sometimes with a fuscous shade.

Abdomen black, margins of the segments on the sides slightly reddish or yellowish; *genital segment* brown; "claspers," &c., yellowish. Length, 2½—3 lines.

Smaller than *nervosus*, to which it is related. The different arrangement of the granules on the nerves, the shape of those along the anterior margin, and the colour and form of the genitalia are the most conspicuous characters whereby to separate them.

Possibly this insect may be found in collections under the name of *nervosus*. At present I only know of a few examples, four taken by Mr. Bold, at Gosforth, near Newcastle-on-Tyne, a ♂ taken by Mr. Edward Saunders, at Penzance, and two others by Mr. Douglas, at Hirst Wood, Tunbridge Wells.

Time of appearance, August and September.

Species 4.—CIXIUS BRACHYCRANUS.

Cixius brachycranus, Fieb. (M.S.).

Elytra : marginal granules *not* square or elongate.

Head : crown and face brown, the latter darkest towards and at the apex, all the keels paler. *Antennæ* black.

Thorax : pronotum clear brown, shining, middle keel continued to the apex, which last is depressed and wrinkled transversely, extreme apex and side margins yellowish. *Elytra* faintly yellowish, transparent, marginal nerve yellowish as far as the cuneate patch, from thence round the apex fuscous; inner nerves fine, pale yellowish, all the granules minute, black, placed moderately closely together, and generally in pairs, slightly inclined from left to right towards the apex, transverse nerves fuscous, with a narrow margin of the same colour, inner margin of the fuscous cuneate patch with three or four granules; transverse band brown, narrow, more or less distinct, commencing on the anterior margin about midway between the base and the cuneate patch, and terminating a little beyond the middle of the inner margin of the clavus, along which are a few remote granules, larger than those on the corium. *Wings* pale, transparent, nerves fuscous, except at the base, where they are yellowish. *Legs* yellow; *thighs* more or less fuscous.

Abdomen black; *genital segment* pitchy-brown; "claspers," &c., yellowish.

Length, 2½ lines.

A smaller insect than *intermedius*, with the marginal granules, as well as those along the nerves of the elytra, more minute. The "claspers," however, are very similar in each, and, until I have seen more specimens, I admit that I am somewhat sceptical as to its distinctness.

I have made the description from a single ♂ example taken by Mr. T. J. Bold, at Gosforth, near Newcastle-on-Tyne, in September.

(To be continued).