

IV. *A Synopsis of British Homoptera-Cicadina.*

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THE object of the present Synopsis is to provide students of our British *Cicadina* with a concise descriptive catalogue of such species as have hitherto been recorded as occurring in Britain, and, by furnishing the means of identifying their captures, to add to the interest of their pursuit. The study of these insects in this country is still in its infancy, and, seeing that more than twenty years have elapsed since the last attempt to deal with the group collectively, it is felt that little apology is needed for the present undertaking.

The arrangement here adopted, and the characters employed, are simply intended to apply to our British forms; but it is believed that the analytical tables and short descriptions embrace the most reliable characters assigned to the respective species, and will be found as absolute as the difficulty of the subject will permit. Every reasonable care has been taken to insure accuracy in the bibliographical references, but the writer cannot assume any personal responsibility in the matter, being largely indebted in this respect to the Catalogue of Messrs. Douglas and Scott, and the continental works of Sahlberg, Flor, and others. Characters drawn from the genitalia have not been used, except where absolutely necessary, but it is nevertheless imperative that the student should make himself thoroughly acquainted with the structure of the latter, for, although in certain groups (*Acocephalus*, *Idiocerus*, &c.), they scarcely present any available differential characters, in others (*Delphacidae*, *Typhlocybidae*, &c.), the most striking and constant structural differences are observable.

The *crown* is that portion of the head which is visible from above, and the passage from this to the *face* (the obliquely sloping under side of the head considered as a whole) is the *forehead*. The face is generally divided by

more or less distinct sutures into the following, *viz.*, the *frons*, a large area occupying the greater portion of its disc; the *clypeus*, a rectangular area joined to the apex of the former; the *loræ*, a pair of small areas occupying the angles formed by the sides of the frons at their junction with the clypeus; and the *cheeks*, which constitute the remainder of the face. Those portions of the cheeks which lie between the inner margins of the eyes and the frons are sometimes referred to as the *temples*.

Each elytron is divided into corium, clavus, and membrane, the latter consisting of the *apical areas*, and frequently having a free membranous margin or *appendix*; the *clavus* is the triangular inner portion marked off from the remainder, which constitutes the *corium*, by a more or less impressed straight line running obliquely from the basal margin to a point on the suture, where the membrane commences. In some groups there exists a pair of small scales (the *tegulæ*) at the base of the elytra. The longitudinal nerves of the corium are the *brachial*, the simple nerve standing immediately above the claval suture, and the *cubital*, the forked nerve coming between the brachial nerve and the costa; the branches of the cubital nerve, which are generally forked at the apex, may be designated as *inner* and *outer* respectively, according to their position. The nerves forming the inner boundary of the apical areas are best considered as *angular* nerves, leaving the term *transverse* to be applied to such other nerves as may occur in a position warranting its application. The longitudinal nerves of the clavus are the *anal*, immediately below the claval suture and the *axillary*, standing nearest the scutellum.

The terminal segment of the abdomen, which is modified in order to accommodate the genital apparatus, may be conveniently termed the *pygofer*; sometimes, as in *Liburnia* male, it consists of a complete chitinous cylinder, its hind margin exhibiting in different species great diversity of outline; at others it appears as a chitinous plate, folded in a somewhat conical form, so as to leave a slit on its lower side and a small aperture at its apex: in some cases, e. g., *Deltocephalus* male, the armature of the lower edges of this plate affords striking characters. In the female this segment is always folded

more or less conically, and the slit on its lower side is occupied by the saw-case, the base of which is frequently flanked on either side by a small oblong plate (*lateral lobe*); in this sex, too, the outline of the hind margin of the last ventral segment frequently presents good distinctive characters. In any reference to the upper or hind margin of the pygofer a side view is to be understood. Normally the genital appendages of the male are as follows, *viz.*, a pair of *plates* of a more or less triangular form placed side by side, their inner margins contiguous, and their bases covered by a single *valve*, which is usually triangular; just above the plates, and usually concealed by them, is a pair of smaller appendages (*styles*), and between these latter is situate the *penis*. In many groups (*Athysanus*, *Deltocephalus*, &c.), all these appendages are present, but in others (*Idiocerus*, &c.) the valve is wanting, while in those in which the pygofer forms a complete cylinder (*Liburnia*, &c.), the styles and penis are all that are visible. The *anal tube*, which bears the *anal style*, is a supplementary piece of apparatus situate on the upper side of the extreme apex of the abdomen, where there is generally a notch in the pygofer for its reception; its lower margin often (*Liburnia* male, &c.) bears a pair of teeth or other processes. The remaining terms employed do not require special notice.

The specific names made use of in the following pages are, in the main, those of the second edition of Dr. Puton's 'Catalogue'; a circumstance which results less from a conviction on the part of the writer that the names in that publication are always equitably employed than from a great disinclination to disturb the received order of things.

A few remarks on the preservation of these insects may not be out of place. For a working collection they should all be pinned close to the scutellar angle of the right elytron, the larger species with black Vienna pins, the smaller ones, such as *Deltocephalus*, *Typhlocyba*, &c., with the varnished steel pins specially prepared for micro-insects, the fine pin being ultimately stuck into a small block of pith or cork impaled on a strong pin. Neatly-carded specimens are pretty to look at, but when it becomes necessary to examine their under side they prove a nuisance. It is desirable to keep the boxes in

which they are stored *well* supplied with camphor, which will effectually prevent any inconvenience either from mould or mites. A critical examination of the genitalia of the smaller species is best accomplished when the abdomen has been mounted in Canada balsam, but this should always be preceded by a thorough investigation of the parts in question in an unmounted state.

I have much pleasure here in thanking those who have kindly helped me with the loan of specimens, &c., and especially are my warmest acknowledgments due to my father in Entomology, Mr. J. W. Douglas, for the valuable assistance which he has at all times most readily afforded me for many years past.

HOMOPTERA.

Mouth suctorial. Rostrum springing from the hind margin of the under side of the head.

CICADINA.

From 1—3 basal joints of the antennæ thick, the remainder forming a terminal seta. Elytra deflexed, of nearly equally firm consistence throughout. Hind legs generally long, powerful, and formed for jumping. Tarsi 3-jointed.

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| 1 | (2). Front thighs thickened, toothed beneath | I. CICADIDÆ. |
| 2 | (1). Front thighs not thickened nor toothed behind. | |
| 3 | (4). Pronotum produced into a process behind | II. MEMBRACIDÆ. |
| 4 | (3). Pronotum not produced into a process behind. | |
| 5 | (12). Antennæ inserted beneath the eyes. | |
| 6 | (7). Frons nearly on the same level with the cheeks. Elytra horny | III. TETTIGOMETRIDÆ. |
| 7 | (6). Frons distinctly projecting from the cheeks, with sharp or keeled side margins. | |
| 8 | (9). Clypeus without marginal keels. Elytra horny | IV. ISSIDÆ. |
| 9 | (8). Clypeus with marginal keels. Elytra membranous. | |
| 10 | (11). 1st joint of hind tarsi without a spur at the base | V. CIXIIDÆ. |
| 11 | (10). 1st joint of hind tarsi with a spur at the base | VI. DELPHACIDÆ. |

- 12 (5). Antennæ inserted between the eyes.
 13 (14). Hind tibiæ cylindric, with two spines VII. CERCOPIDÆ.
 14 (13). Hind tibiæ not cylindric.
 15 (16). Pronotum with a compressed ear-like
 process on each side VIII. LEDRIDÆ.
 16 (15). Pronotum without any process.
 17 (20). Hind tibiæ unarmed, or only with weak
 bristles on the angles.
 18 (19). Frons convex, swollen IX. ULOPIDÆ.
 19 (18). Frons flat, depressed on its upper half X. PAROPIDÆ.
 20 (17). Hind tibiæ multispinose.
 21 (22). Ocelli on the frons XI. BYTHOSCOPIDÆ.
 22 (21). Ocelli not on the frons.
 23 (24). Ocelli on the disc of the crown .. XII. TETTIGONIDÆ.
 24 (23). Ocelli not on the disc of the crown.
 25 (26). Crown always distinctly separated from
 the face, generally by a well-defined
 border, its disc more or less excavated
 or bearing impressions, frequently
 rugose in front parallel with the
 forehead, or at least distinctly sculp-
 tured XIII. ACOCEPHALIDÆ.
 26 (25). Crown and face passing gradually the
 one into the other. Disc of the
 former never distinctly excavated,
 nor bearing impressions, nor rugose
 in front parallel with the forehead,
 rarely perceptibly sculptured.
 27 (28). Elytra with one or more transverse
 nerves XIV. JASSIDÆ.
 28 (27). Elytra without transverse nerves .. XV. TYPHLOCYBIDÆ.

I. CICADIDÆ.

Head short, wide. Frons very convex. Ocelli 3, on the crown. Tegulæ wanting. Hind coxæ subconic, not reaching the sides of the breast. Tibiæ cylindric. No pulvilli between the claws. Male with a pair of stridulating organs at the base of the abdomen.

CICADETTA, *Am.* (Pl. I., fig. 10).

Am., Ann. Soc. Fr., 2nd ser., v., 156, 377 (1847).

Antennæ inserted in a strong depression beneath a fold of the temples, apparently 7-jointed, by reason of the articulation of the robust seta. Elytra lanceolate, much longer than the abdomen, membranous, hyaline; apex with a narrow, free margin; nerves strong, raised. Basal area of corium oblong, narrow, the brachial and cubital nerves springing from its lower apical angle; apical areas 8, narrow, 1st reaching further inwards than 2nd, which is

widened behind, 3—7 parallel-sided, increasing in width, 8th trapeziform; subapical areas 5, 4th widened behind. Clavus narrow-lanceolate. Wings hyaline, with 6 apical and 3 basal areas.

1. *Cicadetta montana*, Scop.

Cicada montana, Scop., Ann. Hist. Nat., v., 109, 108; Hagen, Stett. Zeit., xvii., 74, 9; Kirschb., Cicad., 61.

C. hæmatodes, Linn., Sys. Nat., 707, 14; Germ., Mag. d'Ent., iv., 98, 9; Siebold, Stett. Zeit., 1848, 8.

Tettigonia hæmatodes, Fab., Sys. Rhyn., 42, 50; Fall., Hem. Suec., ii., 79, 1.

Cicada orni, Sulz., Kenntz. Ins., 24, pl. 10, fig. 65.

C. tibialis, Latr., H. N., xii., 306, 6.

C. anglica (Leach), Sam. Ent. Comp., 447, pl. 5, fig. 2; Curt., Brit. Ent., p. and pl. 392; Westw., Introd., ii., 421, fig. 114; Marshall, Ent. Mo. Mag., i., 154.

Melampsalta montana, J. Sahl., Not. Fenn., xii., 79, 1.

Cicadetta montana, Fieb., Cicad. d'Eur., pt. ii., 79, 12.

Black, with fine yellow hair-like scales. Crown triangular, apex obtuse, surface very uneven, with a deep transverse impressed line in front. Pronotum with two closely placed parallel fine straight raised lines down the middle in front; disc with three strongly impressed lines on each side, two straight oblique somewhat in front, and one just within its lobate hinder angles, the curve of which it follows. Elytra clear, nerves black, costa and the basal accessory membrane yellow-red. Wings coloured as elytra. Abdomen, dorsal segments black, with yellow-red hind margins, ventral segments in female almost entirely yellow-red. Legs yellow-red; knees, base of front tibiæ, trochanters, and some stripes on the femora, black. Front femora with 3 teeth, that nearest the base depressed, its apex obliquely truncate, the other two erect, successively smaller. Length (including elytra), 23—28 mm.

Rare. New Forest; Haselmere, Surrey.

II. MEMBRACIDÆ.

Crown almost vertical. Ocelli 2, on the crown. Face much deflexed, nearly horizontal. Tegulæ wanting. Hind coxæ transverse, reaching nearly to the sides of the breast. Tibiæ prismatic.

The genera may be thus distinguished :—

Pronotum with a horn on each side; hind process sinuate	i. CENTROTUS.
Pronotum without horns at the sides; hind process straight	ii. GARGARA.

i. CENTROTUS, *Fab.* (Pl. I., fig. 11).

Fab., *Sys. Rhyn.*, 16, 3 (1803).

Lateral angles of pronotum acutely produced, hind process long, arching over, but not concealing the scutellum. Elytra with 5 apical areas.

1. *Centrotus cornutus*, Linn.

Cicada cornuta, Linn., *Faun. Suec.*, 239, 879; *Sys. Nat.*, ii., 705, 6.

Membracis cornuta, *Fab.*, *Ent. Sys.*, iv., 14, 22; *Panz.*, *Deuts. Ins.*, 50, 19.

Cicada fusca, *DeGeer*, *Abh. Geseb. Ins.*, iii., 116, 3, t. 11, figs. 22 and 23.

Centrotus cornutus, *Fab.*, *Sys. Rhyn.*, 19, 15; *Fall.*, *Hem. Suec.*, ii., 8, 1; *Burm.*, *Handb.*, ii., 132, 1; *Flor. Rhyn. Liv.*, ii., 104, 1; *Marsh.*, *Ent. Mo. Mag.*, ii., 34, 1; *Kirschb.*, *Cicad.*, 67, 5; *Fieb.*, *Cicad. d'Eur.*, pt. ii., 10, 1.

C. sicularius, *gallicus*, *italicus*, *turcicus*, and *abbreviatus*, *Kirschb.*, *l. c.*, 66 and 67.

Black, roughly punctured, with fine yellow pubescence. Pronotum with a fine central keel; side processes diverging, wide, triangular, deflexed at the apex; hind process bisinuate, acute, nearly as long as the abdomen. Elytra rugose, fusco-hyaline, nerves dark brown, on the hind margin in the 5th apical area a fuscous spot. Wings hyaline, nerves dark brown. Abdomen above black, with large shallow punctures. Tibiæ reddish yellow, edges of hind pair with a close row of black setiferous granules.

♂. Hind margin of pygofer with a strong triangular tooth. Valve wanting. Plates connate, elongate-triangular, with a deep longitudinal impression near the base, and a strong lateral constriction just below their rounded apex. Two last ventral segments with a fine longitudinal keel.

♀. Hind margin of last ventral segment with a wide triangular notch, which reaches quite to its base. Length, 7—8 mm.

Not uncommon in woods.

ii. GARGARA, *Am. et Serv.* (Pl. I., fig. 12).

Am. et Serv., Hém., 537, 430 (1843).

Sides of pronotum angulated, but without a distinct horn; hind process straight, concealing the scutellum.

1. *Gargara genistæ*, Fab.

Centrotus genistæ, Fab., Sys. Rhyn., 21, 26; Panz., F. G., 50, 20; Curt., Brit. Ent., p. and pl. 313.

Oxyrrhachis genistæ, Burm., Handb., ii., 133, 2; Flor, Rhyn. Liv., ii., 106, 1; Marsh., Ent. Mo. Mag., ii., 34, 1.

Gargara genistæ, Kirschb., Cicad., 68; Fieb., Cicad. d'Eur., pt. ii., 13, 1.

Head and thorax deep black, shiny, very closely and coarsely punctured. Elytra yellow-brown, nerves darker. Thighs and basal half of tibiæ black, apical half of the latter and the tarsi piceous. Head, thorax, and nerves of elytra with fine yellowish pubescence. Length, 3 mm.

Rare. On *Genista tinctoria*, Purfleet, Essex, August; on *Genista anglica*, Chobham, Kent.

III. TETTIGOMETRIDÆ.

Characters those of the single genus.

TETTIGOMETRA, *Latr.* (Pl. I., fig. 13).

Latr., Gen. Crust. et Ins., iii., 163, 394 (1807).

Easily recognised by its Ptyeloid facies, horny elytra with conspicuous tegulæ, the want of facial keels, and by the antennal seta situate on the hinder side of the 2nd joint before the apex.

1. *Tettigometra impressopunctata*, Sign.

Tettigometra impressopunctata, Sign., Ann. Soc. Fr., 4me ser. vi., 150, 13; Marsh., Ent. Mo. Mag., iii., 149; Fieb., Cicad. d'Eur., pt. ii., 130, 15.

T. frontalis and *fasciata*, Fieb., Eur. Tettig., 567, 14, and 571, 22.

T. nitidula, Kirschb., Cicad., 59, 6.

Brown or greenish brown, closely and deeply punctured, abdomen black. Crown obsoletely tricarinate, side keels parallel.

Frons flat above, slightly swollen towards the clypeus; colour above reddish, between the eyes a large ill-defined black spot, from the antennæ to the clypeus white, the latter and the loræ pitch-brown, rostrum black at the apex. Pronotum and scutellum uneven, the hind angles of the former obliquely truncate to make room for the tegulæ. Elytra horny, equally punctured, generally with a short black streak on the suture beyond the apex of the clavus. Wings ample, hyaline, nerves fuscous. Legs concolorous, tibiæ with two rows of bristles, claws fuscous. Length, 4 mm.

Sandhills, Freshwater Bay, Pembrokeshire; amongst thyme and short grass; local. Isle of Wight; Folkestone Warren, one from a tuft of *Teucrium*, August, 1876; Shiere, near Guildford, hybernating in yew, February, and by beating junipers in September.

IV. ISSIDÆ.

Ocelli wanting. Pronotum as long as the crown, hind margin subtruncate. Tegulæ large and conspicuous. Represented in the British fauna by the single genus

Issus, *Fab.* (Pl. I., fig. 14).

Fab., *Sys. Rhyn.*, 99, 1 (1803).

Body short, ovate. Head with the eyes distinctly narrower than pronotum. Sides of elytra strongly subangularly dilated before the middle. Outer side of hind tibiæ with two spines on the lower half.

1. *Issus coleoptratus*, Geoffr.

Cicada coleoptrata, Geoffr., *Hist. abr. Ins.*, i., 418, 7.

Cercopis coleoptrata, *Fab.*, *Ent. Sys.*, iv., 53, 26.

Fulgora gibbosa, *Oliv.*, *Enc. Méth.*, vi., 576.

Issus coleoptratus, *Fab.*, *Sys. Rhyn.*, 99, 1; *Germ.*, *Mag. d'Ent.*, iii., 204, 1; *Am. et Serv.*, *Hist. nat. Hem.*, 518, 1; *Fall.*, *Hem. Suec.*, ii., 69, 1; *Curt.*, *Brit. Ent.*, p. and pl. 449; *Marsh.*, *Ent. Mo. Mag.*, ii., 33, 1; *Kirschb.*, *Cicad.*, 52; *J. Sahl.*, *Not. Fenn.*, xii., 396, 1; *Fieb.*, *Cicad. d'Eur.*, pt. ii., 253, 7.

Very variable in colour and markings. Uniform leaden grey reticulated with black, with or without an ill-defined black patch near the suture of each elytron, or more or less dark brown, with a wide pale band across the widest part. Front pairs of tibiæ in

all the forms pale, with the apex and a more or less distinct median ring dark brown; hind tibiæ narrowly dark at the extreme apex only. Length, 6—7 mm.

Not uncommon in the south.

V. CIXIIDÆ.

Body wide, depressed. Head with the eyes distinctly narrower than the pronotum. Ocelli 2, on the sides of the head with an indication of a third near the apex of the middle facial keel. Pronotum very short, strongly subangularly notched behind. Elytra ample, hyaline, widely rounded at the apex, subhorizontal nerves strongly raised. First joint of hind tarsi elongate.

The two British genera may be thus distinguished:—

Scutellum with five keels	..	..	..	..	i. OLIARUS.
Scutellum with three keels	..	..	..	..	ii. CIXIUS.

i. OLIARUS, *Stal.* (Pl. I., fig. 15).

Stal. Berl. ent. Zeit., vi., 306 (1862).

Hind margin of crown angularly notched. Nerves of the elytra without the large black granules so conspicuous in the following genus.

Crown longer than wide	..	..	..	..	1. <i>pallidus</i> .
Crown transverse	..	..	..	..	2. <i>leporinus</i> .

1. *Oliarus pallidus*, H.-S.

Flata pallida, H.-S., Deuts. Ins., 144, 4.

Cixius leporinus, Curt., Brit. Ent., 673, 9.

Oliarus pallidus, Scott, Ent. Mo. Mag., vii., 119, 1;

Fieb., Cicad. d'Eur., pt. ii., 197, 9.

O. leporinus, J. Sahl., Not. Fenn., xii., 385, 1.

Crown about one and a half times as long as broad, its breadth somewhat less than the length of the hind margin of the eye; black, with pale keels. Eyes red. Pronotum black, with white keels and hind margin. Scutellum black. Elytra lacteo-hyaline, stigma well marked, nerves fine pale fuscous; angular nerves and those beyond much darker, almost black. Legs pale, front pairs of tarsi and the claw-joint of the hind pair black. Length, 5—6 mm.

“Coarse grass by the side of the Avon, Clifton.”—*Curtis*.

2. *Oliarus leporinus*, Linn.

Cicada leporina, Linn., Faun. Suec., 895; Sys. Nat., 711, 43; Schr., En., 501, 260; Panz., F. G., 61, 19

Flata leporina, Germ., Thon. Arch., ii., 50, 50; Schöff., F. G., 144, 4.

Pentastira leporina, Kirschb., Cicad., 44, 2.

Oliarus leporinus, Scott, Ent. Mo. Mag., vii., 120, 2; Fieb., Cicad. d'Eur., pt. ii., 203, 15.

Crown broader than long, its length about one and a half times and its breadth about twice the length of the hind margin of the eye; black, with pale keels. Eyes black. Elytra lacteo-hyaline, stigma well marked; nerves fine, fuscous, becoming darker towards the apex. Length, $4\frac{1}{2}$ —5 mm.

On *Tamarix*; Deal, end of June.

ii. CIXIUS, Latr. (Pl. I., fig. 16).

Latr., Gen. Crust et Ins., iii., 166 (1807).

Hind margin of crown roundly notched. Nerves of the elytra more or less closely set with large black setigerous granules.

TABLE OF SPECIES.

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| 1 | (2). Costal granules not or scarcely larger than those on the other nerves. Costa generally with three short black lines | 1. <i>pilosus</i> . |
| 2 | (1). Costal granules distinctly larger than those on the other nerves. | |
| 3 | (4). Elytra entirely brown. Clypeus deep black | 2. <i>stigmaticus</i> . |
| 4 | (3). Elytra not entirely brown, or, if brown, clypeus not deep black. | |
| 5 | (6). Elytra with a broad transverse fuscous band, proceeding from the stigma to the inner margin; an ill-defined fuscous spot in the apex of the wings | 3. <i>cunicularius</i> . |
| 6 | (5). Elytra without a transverse band proceeding from the stigma. | |
| 7 | (10). All nerve-granules oblong. | |
| 8 | (9). Costa with about 15 or 16 rather closely-placed granules | 4. <i>simplex</i> . |
| 9 | (8). Costa with about 8 or 9 distant granules .. | 5. <i>similis</i> . |
| 10 | (7). All nerve-granules round or roundish. | |
| 11 | (12). Smaller. Styles reaching somewhat beyond the apex of the yellow anal tube | 6. <i>brachyranus</i> . |
| 12 | (11). Larger. Styles scarcely exerted, not reaching beyond the basal third of the black anal tube | 7. <i>nervosus</i> . |

1. *Cixius pilosus*, Ol.

- Fulgora pilosus*, Oliv., Enc. Méth., vi., 575, 41.
Flata contaminata, Germ., Mag. d'Ent., iii., 196, 7.
F. albicincta, Germ., l. c., 199, 9.
F. cunicularia, Fall., Hem. Suec., ii., 72, 2.
Cixius contaminatus, Flor, Rhyn. Liv., ii., 24, 2;
 Marsh., Ent. Mo. Mag., i., 155, 2; Scott, Ent.
 Mo. Mag., vii., 190, 5; Kirschb., Cicad., 49, 9;
 J. Sahl., Not. Fenn., xii., 383, 4; Fieb., Cicad.
 d'Eur., pt. ii., 170, 2.

Crown and face black, with brownish-yellow keels. Pronotum brownish yellow, suffused with black behind the eyes. Scutellum black. Elytra pale grey, with feeble traces of various fuscous marks, entirely dark brown, save a pale spot at the stigma, or with a dark brown stripe occupying the sutural half (var. *albicincta*). On the costa are three short black lines, which are very constant in their occurrence. Stigma inconspicuous. Legs brownish yellow, thighs darker. Length, 4—4½ mm.

Common.

2. *Cixius stigmaticus*, Germ.

- Flata stigmatica*, Germ., Mag. d'Ent., iii., 199, 8.
Cixius musivus, Marsh., Ent. Mo. Mag., i., 155, 3.
C. distinguendus, Kirschb., Cicad., 48, 6; J. Sahl.,
 Not. Fenn., xii., 382, 3.
C. stigmaticus, Scott, Ent. Mo. Mag., vii., 191, 6,
 figs. *a*, *b*, *c*, p. 193 (♂ genitalia); Fieb., Cicad.
 d'Eur., pt. ii., 183, 12.

Crown scarcely twice as broad as long. Face between the keels black. Pronotum pale, scutellum black. Elytra entirely brown, nerves somewhat paler; granules roundish, black. Stigma inconspicuous. Thighs piceous, their extreme apex, the tibiae, and tarsi, brownish yellow; apical joint of the latter black. Apical lobes of styles bluntly triangular, their stalks strongly incurved. Length, 4½—5 mm.

Inverness-shire; Deal, amongst *Hippophæe*; Isle of Wight; Norfolk.

3. *Cixius cunicularius*, Linn.

Cicada cunicularia, Linn., Sys. Nat., ii., 711, 44.

Flata cunicularia, Fab., Sys. Rhyn., 55, 48; Germ.,
Mag. d'Ent., iii., 195, 6.

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

Cixia cunicularia, Burm., Handb., ii., 157, 3.

Cicada nervoso-punctata, DeGeer, Abh. Gesch. Ins.,
iii., 117, 4, t. 12, figs. 1—5.

Flata nervosa, var. β . Fall., Hem. Suec., iii., 71, 1.

Cixius Dionysii, Curt., Brit. Ent., 673.

C. nervosus, Kirschb., Cicad., 47, 2; Flor, Rhyn.
Liv., ii., 22, 1 (partim); Marsh., Ent. Mo. Mag.,
i., 154, 1, var. *a*.

C. cunicularius, Scott, Ent. Mo. Mag., vii., 122, 1; J.
Sahl., Not. Fenn., xii., 380, 1; Fieb., Cicad.
d'Eur., pt. ii., 181, 10.

Head and pronotum brownish yellow; crown between the keels, and the scutellum, black. Face more or less suffused with black in its upper half. Elytra hyaline, a narrow band before the middle (more or less interrupted and sometimes entirely obliterated), a broad curved band before the apex, a roundish spot on the costa beyond this, and some of the angular nerves, fuscous; or entirely reddish brown, except a pale space before the base of the stigma (var. *Dionysii*). Length, 4—7 mm.

Widely distributed.

4. *Cixius simplex*, H.-S.

Flata simplex, H.-Schäff., Nom. Ent., 1, 64 (1835).

Cixius distinguendus, Kirschb., Cicad., 48, 6.

C. simplex, Scott, Ent. Mo. Mag., vii., 191, 7, fig. *i*,
p. 193 (styles); Fieb., Cicad. d'Eur., pt. ii.,
184, 13.

Face black, keels brownish yellow. Pronotum black, side keels and hind margin pale brownish yellow. Scutellum black, side margins at the base and at the junction with the side keels narrowly clear brown. Elytra whitish hyaline, nerves pale yellowish white, their granules eye-shaped; the angular nerves, the apex of the claval suture, and a short streak on the inner margin, black. Thighs pitch-black, apex narrowly yellow; tibiae yellow, with a fine piceous stripe, base of all the pairs with a narrow

blackish ring; tarsi yellow, claw-joint black or brown. Apical lobes of styles obovate, their stalks short, spreading outwards. Length, 5 mm.

Bonchurch, October. Granulation of elytra closer than in *similis*.

5. *Cixius similis*, Kirschb.

Cixius similis, Kirschb., Cicad., 49, 7; Scott, Ent. Mo. Mag., vii., 192, 8, fig. *k*, p. 193 (styles); Fieb., Cicad. d'Eur., pt. ii., 185, 14.

Crown scarcely twice as broad as long, face between the keels black. Elytra lacteo-hyaline, nerves chalk-white, sparingly and somewhat regularly set with oblong black granules, the length of nerve between each granule being about twice the length of the granule. Costal granules and the intervening spaces about equal in length. Stigma conspicuous, black. Thighs piceous, their extreme apex, the tibiæ, and tarsi brownish yellow. Apical lobes of styles obovate, their stalks of moderate length, not spreading outwards. Length, 5 mm.

Bonchurch, Isle of Wight; Deal, on *Hippophæe*.

6. *Cixius brachyranus*, Fieb.

Cixius intermedius, Scott, Ent. Mo. Mag., vii., 147, 3, fig. *g*, p. 193 (styles).

C. brachyranus, Scott, *l. c.*, 148, 4, figs. *d. e, f*, p. 193 (♂ genitalia); Fieb., Cicad. d'Eur., pt. ii., 179, 9.

Crown twice as broad as long. Elytra hyaline, with the base, the angular nerves, and a straight band somewhat before the middle, fuscous; granules black, stigma piceous. Face and legs entirely brownish yellow. Length, 5—6 mm.

Gosforth; Penzance; Hirst Wood, Tunbridge Wells; Foxley Wood, Norfolk. Exceedingly like a small *nervosus* in appearance.

7. *Cixius nervosus*, Linn.

Cicada nervosa, Linn., Faun. Suec., 882; Fab., Ent. Sys., iv., 442, 64.

C. cunicularia, Linn., Sys. Nat., 465, 44.

Flata nervosa. Fab., Sys. Rhyn., 54, 47; Germ., Mag. d'Ent., iii., 191, 5; Fall., Hem. Suec., iii., 71, 1.

Cixia nervosa, Burm., Handb., ii., 157, 2.

Cicada muscæformis, Schr., Enum., 253, 482.

Cixius nervosus, Schäff., F. G., 112, 22; Zett., Ins. Lapp., 304, 1; Marsh., Ent. Mo. Mag., i., 154, 1; Scott, Ent. Mo. Mag., vii., 146, 2, fig. *h*, p. 193 (styles); Fieb., Cicad. d'Eur., pt. ii., 176, 7.

Cixius minor, Kirschb., Cicad., 47, 3.

Head and face as in *cunicularius*, pronotum brownish yellow more or less suffused with black behind the eyes. Scutellum black, keels sometimes brownish yellow. Elytra hyaline, with faint traces of two fuscous bands, one (broad) at the base, and the other (narrow) before the middle; angular nerves and stigma black; some of the costal granules generally united. Legs brownish yellow, sometimes suffused with darker. Length, 6—7 mm.

Common.

VI. DELPHACIDÆ.

Eyes reniform. Ocelli on the cheeks. Antennæ of moderate length, 2nd joint cylindrical, tuberculate. A large movable spur at the base of the 1st joint of the hind tarsi. Tegulæ small.

TABLE OF GENERA.

- | | | |
|--------|--|--------------------|
| 1 (4). | Basal joint of antennæ much longer than 2nd. | |
| 2 (3). | Frons with two middle keels | i. ASIRACA. |
| 3 (2). | Frons with one middle keel | ii. DELPHAX. |
| 4 (1). | Basal joint of antennæ much shorter than 2nd. | |
| 5 (8). | Frons with one middle keel. | |
| 6 (7). | Frontal keel entire or only forked on the forehead | iii. LIBURNIA. |
| 7 (6). | Frontal keel forked much before the forehead | iv. DICRANOTROPIS. |
| 8 (5). | Frons with two middle keels | v. STIROMA. |

The genus *Achorotile*, Fieb., has been considered as British, but, as it seems to the writer, upon insufficient evidence. The genus in question is characterised, *inter alia*, by the possession of certain tubercles in the channels between the sides of the frons and the middle keels, a structure which is also found in the nymph of *Liburnia*, and no adult insect presenting these facial characters has yet been recorded as British. Scott (Ent. Mo. Mag., vii., 196, 1) described *Achorotile albo-signata*, Dahl., as British from a brachypterous male received from Stal on the strength of six nymphs taken by Dale, but there is nothing in his remarks to show

that these latter did not pertain to some common species of *Liburnia*. The writer has bred *Liburnia Fairmairei*, Perris, from *Achorotile bivittata*, Boh.

i. *ASIRACA*, *Latr.* (Pl. I., fig. 17).

Latr., *Préc.*, p. xii. et 91 (1796).

First joint of antennæ triangular-prismatic, of equal width throughout, about thrice as long as 2nd. Front thighs and tibiæ much flattened. Scutellum with four keels. Hind tibiæ with three spines on their outer side. Spur at the base of hind tarsi subulate.

1. *Asiraca clavicornis*, *Fab.*

Delphax clavicornis, *Fab.*, *Sys. Rhyn.*, 83, 1; *Spin.*, *Ann. Soc. Fr.*, viii., 337.

Asiraca clavicornis, *Curt.*, *Brit. Ent.*, 445, 1; *Marsh.*, *Ent. Mo. Mag.*, ii., 32, 1; *Kirschb.*, *Cicad.*, 17; *Scott*, *Ent. Mo. Mag.*, vii., 24, 1; *Fieb.*, *Cicad. d'Eur.*, pt. iii., 1, 1.

Crown pale, about one-half longer than broad, pronotum somewhat darker, scutellum black, the two latter with pale scale-like hairs. Elytra grey, with traces of a white band at base; nerves brown, strongly raised, sparingly set with large setiferous granules, some fuscous markings on the costa towards the apex and on the membrane. Front pairs of legs black, with some band-like spots and the apex of the tibiæ broadly white; hind tibiæ brown, paler towards the apex. Abdomen above black. Length, 4 mm.

At roots of grass in dry places.

ii. *DELPHAX*, *Fab.* (Pl. I., fig. 18).

Fab., *Ent. Sys.*, *Supp.*, 522, 1 (1798).

First joint of antennæ triangular-prismatic, gradually narrowed to the base; 2nd about two-thirds as long as the 1st. Fore legs simple. Scutellum with three keels. Hind tibiæ with two spines on their outer side. Spur at the base of hind tarsi flat, triangular.

1. *Delphax pulchella*, *Curt.*

Asiraca pulchella, *Curt.*, *Brit. Ent.*, p. and pl. 445 (♂).

A. dubia, *Curt.*, *l. c.*, 445, 2 (♀).

Aræopus crassicornis, *Marsh.*, *Ent. Mo. Mag.*, ii., 31, 1; *Kirschb.*, *Cicad.*, 18.

A. Minki, Fieb., Grundz. Delph., 522, 1.

Delphax Minki, J. Sahl., Not. Fenn., xii., 401, 2.

D. pulchella, Scott, Ent. Mo. Mag., vii., 24, 2.

Aræopus pulchellus, Fieb., Cicad. d'Eur., pt. iii., 6, 2.

Crown nearly square. Pronotum and scutellum pale, narrowly brown at the sides. Elytra pale yellowish, with a stripe just above the claval suture, a broad curved stripe occupying about the lower half of the membrane, and a line along the nerve dividing the 2nd and 3rd apical areas, dark brown. Legs pale, tarsi of the front pairs and claw-joint of the hind pair dark brown. Abdomen above black, its base, the sides narrowly, and a narrow dorsal line brownish yellow.

♀. Generally brachypterous; elytra half as long as the abdomen, yellowish without dark markings. Length, $5\frac{1}{2}$ —6 mm.

Marshes; not uncommon.

iii. LIBURNIA, *Stal.* (Pl. I., fig. 19).

Stal, Hem. Afr., iv., 179 (1866).

A somewhat numerous group of small species, the members of which agree in having but one more or less distinct central facial keel, which is never forked for half its length, although sometimes divided on the forehead.

Several well-defined minor groups might be eliminated, but there seems to be no advantage in giving to these sections distinctive names. Some of the species are so excessively similar in appearance that they can only be satisfactorily separated by the characters afforded by the male genital armature, and in most cases the time bestowed in attempting to identify females of this genus would be better employed in endeavouring to discover and capture their respective males. In comparing specimens with Fieber's figures ('Grundzüge zur generischen Theilung der Delphacini,' Taf. viii.) it is important to bear in mind that in his fig. *d*, "Afterträger von hinten gesehen," the point of view is such that the base of the styles are visible, because a trifling alteration in the point of view will give rise to a considerable difference in the appearance of the parts; characters derived from the *form* of the styles are much more reliable, but in many instances it is almost impossible to understand their correct form without dissecting them out, a course which should always be resorted to in doubtful cases.

TABLE OF SPECIES.

- 1 (20). Side keels of pronotum reaching hind margin.
- 2 (3). Basal joint of antennæ two-thirds as long as 2nd. Basal joint of hind tarsi longer than the other two together 1. *notula*.
- 3 (2). Basal joint of antennæ one-third as long as 2nd.
- 4 (9). Frons more than three times as long as its width in the middle.
- 5 (8). Front pairs of tibiæ simple, not widened towards the apex.
- 6 (7). Face between the keels pale 2. *lineola*.
- 7 (9). Face between the keels black or blackish .. 3. *fuscovittata*.
- 8 (5). Front pairs of tibiæ gradually widened to the apex 4. *longipennis*.
- 9 (4). Frons one and a half to twice as long as its width in the middle.
- 10 (19). Scutellum yellow or partly yellow.
- 11 (16). Cheeks with a large round black spot.
- 12 (15). Elytra with a black or fuscous marking at the apex.
- 13 (14). Length, $3\frac{1}{2}$ —4 mm. 5. *vittipennis*.
- 14 (13). Length, $2\frac{1}{3}$ — $2\frac{1}{2}$ mm. 6. *guttula*.
- 15 (12). Elytra entirely pale yellow 7. *perspicillata*.
- 16 (11). Cheeks with a small punctiform black spot, or unspotted.
- 17 (18). Crown distinctly narrowed in front; elytra yellow, with a fine black line or lines .. 8. *pallidula*.
- 18 (17). Crown parallel-sided; markings of elytra not in the form of fine black lines .. 9. *Scotti*.
- 19 (10). Scutellum black or pitch-black. Species small, shining black or pitch-black .. 36. *venosa*.
- 20 (1). Side-keels of pronotum not reaching hind margin.
- 21 (44). Crown longer than wide.
- 22 (25). Species green or greyish green.
- 23 (24). Frons widest in the middle. Pygofer, seen from behind, almost circular 10. *smaragdula*.
- 24 (23). Frons widest in the lower third. Pygofer, seen from behind, transversely oval .. 11. *unicolor*.
- 25 (22). Species not green or greyish green.
- 26 (35). Facial keels white.
- 27 (30). A narrow white stripe down the crown, pronotum, and scutellum. Facial keels margined with black in both sexes.
- 28 (29). The dark margin of the facial keels continued on the crown. Styles yellowish, diverging, their apex hooked outwards .. 12. *collina*.

- 29 (28). The dark margin of the facial keels not extending to those of the crown. Styles subulate, their ciliate inner margin with a strong sharp tooth near the base .. 13. *sordidula*.
- 30 (27). No pale stripe down the crown, pronotum, and scutellum. Face black between the keels, or keels margined with black.
- 31 (32). Hind margin of pygofer with a wide arcuate notch 14. *elegantula*.
- 32 (31). Hind margin of pygofer not notched.
- 33 (34). Styles diverging, their apex pointed .. 15. *distincta*.
- 34 (33). Styles incurved, their inner apical angle produced into a sharp tooth; outer apical angle produced and bluntly rounded .. 16. *Boldi*.
- 35 (26). Facial keels not white.
- 36 (39). Crown yellow or clear brownish yellow.
- 37 (38). Central facial keel obsolete on the forehead 17. *Signoreti*.
- 38 (37). Central facial keel distinct on the forehead 18. *adela*.
- 39 (36). Crown brown.
- 40 (41). Scutellum beyond the side-keels black; face (except the forehead) black (brachypterous male). Nerves non-granulate 19. *melanopachys*.
- 41 (40). Scutellum generally without dark markings. Nerves non-granulate.
- 42 (43). Elytra clear brownish yellow; nerves strong, with concolorous granules, marginal nerve pale 20. *similis*.
- 43 (42). Elytra smoky yellow; nerves brown with concolorous granules 21. *capnodes*.
- 44 (21). Crown not longer than wide.
- 45 (90). Crown square.
- 46 (89). Hind tarsi shorter than the tibiæ, basal joint subequal in length to the other two together.
- 47 (48). Scutellum pale brownish yellow, with a black spot at the base on each side of the middle keel, beyond the side-keels entirely black 22. *scutellata*.
- 48 (47). Scutellum not pale, with distinct black markings.
- 49 (52). Elytra pitch-brown, their truncate hind margin with two white spots.
- 50 (53). Tibiæ brown, with three pale rings .. 23. *lepida*.
- 51 (52). Tibiæ brownish, without pale rings .. 24. *Fieberi*.
- 52 (49). Elytra without white spots on the hind margin.
- 53 (60). Elytra black, hind margin white or yellow.
- 54 (57). Scutellum yellow.
- 55 (56). Hind margin of elytra very narrowly whitish yellow; abdomen yellow 25. *pullula*.
- 56 (55). Entire margin of elytra narrowly and base broadly yellowish 26. *lugubrina*.

- 57 (54). Scutellum not yellow.
- 58 (59). Facial keels equally strong, central one distinct on the forehead 27. *leptosoma*.
- 59 (58). Central facial keel much more prominent than the side keels, and obsolete on the forehead 28. *niveimarginata*.
- 60 (53). Elytra not black with pale hind margin.
- 61 (80). Abdomen black, or chiefly black, at least in the male.
- 62 (79). Elytra without a dark streak at the apex of the clavus.
- 63 (72). Scutellum black.
- 64 (65). Upper notch of pygofer widely yellow .. 29. *Dalei*.
- 65 (64). Pygofer entirely black.
- 66 (71). Central facial keel equally strong throughout.
- 67 (70). Teeth of anal tube long, perpendicularly connate.
- 68 (69). Apical angles of upper notch of pygofer right angles or nearly so 30. *pellucida*.
- 69 (68). Apical angles of upper notch of pygofer very obtuse 31. *discolor*.
- 70 (67). Teeth of anal tube very small, tuberculiform 32. *obscura*.
- 71 (66). Central facial keel feebler, or evanescent on the forehead. Apical angles of upper notch of pygofer acute 33. *forcipata*.
- 72 (63). Scutellum yellow or yellowish.
- 73 (74). Lower margin of pygofer, when viewed from behind, produced into a sharp tooth .. 34. *denticauda*.
- 74 (73). No appearance of a tooth on the lower margin of the pygofer, when viewed from behind.
- 75 (78). Hind margin of pygofer with a tooth-like projection at its lower extremity.
- 76 (77). Hind margin of pygofer straight. Abdomen and pygofer entirely black 35. *exigua*.
- 77 (76). Hind margin of pygofer angular. Abdomen pitchy black, hind margin of the last segment broadly white. Pygofer shining black 37. *insignis*.
- 78 (75). No tooth-like projection from the lower extremity of the hind margin of pygofer. Abdomen with pale longitudinal markings 38. *Aubei*.
- 79 (62). Elytra with a dark streak at the apex of the clavus 39. *striatella*.
- 80 (61). Abdomen yellow or chiefly yellow, sometimes with a dark lateral stripe.
- 81 (84). Hind margin of pygofer with a large arcuate notch.
- 82 (83). Inner margin of styles, when viewed from behind, simple 40. *Fairmairei*.

- 83 (82). Inner margin of styles, when viewed from behind, with a feeble obtuse tooth just above the middle, and another similar at the apex 41. *brevipennis*.
- 84 (81). Hind margin of pygofer without a notch.
- 85 (86). Hind margin of pygofer truncate. Styles (viewed from behind) very small and pincer-shaped, occupying little more than one-fourth of the height of the cavity of the pygofer, yellow with the base and tip blackish. Anal tube very large, apparently composed of a pair of pendant lobes, which gradually widen to their truncate apices, where they are generally blackish 42. *straminea*.
- 86 (85). Hind margin of pygofer widely rounded.
- 87 (88). Antennæ entirely pale 43. *flaveola*.
- 88 (87). Antennæ with the base of the 1st joint and apex of the 2nd narrowly black .. 44. *paludosa*.
- 89 (46). Hind tarsi longer than the tibiæ; basal joint one-half longer than the other two together 45. *speciosa*.
- 90 (45). Crown not square.
- 91 (98). Crown transverse.
- 92 (93). Nerves of elytra with large dark granules 46. *limbata*.
- 93 (92). Nerves of elytra without large dark granules.
- 94 (97). Face with white spots.
- 95 (96). Scutellum brown 47. *Douglasi*.
- 96 (95). Scutellum pale with dark stripes .. 48. *lineata*.
- 97 (94). Face not spotted with white, between the keels black 49. *uncinata*.
- 98 (91). Crown pentagonal 50. *mesomela*.

1. *Liburnia notula*, Germ.

Delphax notula, Germ., Thon. Arch., ii., 57, 8; Flor, Rhyn. Liv., ii., 45, 4; Marsh., Ent. Mo. Mag., i., 226, 5.

D. truncatipennis, Boh., Ofv., 266, 12 (1847); Kirschb., Cicad., 20, 1.

D. lineola, Stal, Ofv., 190, 1 (1854).

Megamelus notulus, Fieb., Grundz. Delph., 519, 4, t. 8, fig. 2 (details); Cicad. d'Eur., pt. iii., 9, 1; J. Sahl., Not. Fenn., xii., 412, 1.

Liburnia notula, Scott, Ent. Mo. Mag., vii., 25, 1.

Crown, pronotum, scutellum, and abdomen above yellow or whitish yellow, sides of the three latter widely blackish brown. Scutellum as long as pronotum. Elytra half as long as abdomen

(male), or one-third as long (female), costa gently rounded, apex truncate, brownish yellow streaked with dark brown, or black with the margins narrowly white, nerves elevated, non-granulate. Abdomen above with a fine dorsal line, and a line forming the inner boundary of the dark lateral stripe, white.

Macropterous form.—Scutellum twice as long as pronotum. Elytra one-third longer than abdomen, whitish hyaline; nerves fine, brown, finely granulate, a dark brown line on the inner margin near the apex of the clavus. Length, 3—4 mm.

Marshes; common. Very variable in colour, sometimes wholly dark; at others the dark markings are so faint as to be scarcely perceptible.

2. *Liburnia lineola*, Germ.

Delphax lineola, Germ., Mag. d'Ent., iii., 209, 1; F. E., 7, 19; Marsh., Ent. Mo. Mag., i., 200, 1.

D. longifrons, Boh., Sv. Ak. Handl., 42, 12 (1847); Kirschb., Cicad., 21, 2.

Stenocranus lineolus, Fieb., Grundz. Delph., 519, 5, t. 8, fig. 3 (details); Cicad. d'Eur., pt. iii., 11, 1.

Liburnia lineola, Scott, Ent. Mo. Mag., vii., 25, 4.

Stenocarenus minutus, J. Sahl., Not. Fenn., xii., 415, 1.

Elongate, pale brownish yellow; crown, pronotum, and scutellum with a fine white stripe. Crown nearly three times as long as its basal width, narrowed in front, its middle keel strongly raised. Pronotum two-thirds as long as the crown. Scutellum somewhat longer than the crown, its middle keel abbreviated. Elytra narrow, one-half longer than abdomen, yellowish hyaline, finely wrinkled transversely with a dark brown streak at their narrowly rounded apex, sometimes produced inwardly nearly to the base and frequently another just below the claval suture, nerves pale. Legs pale, thighs with a pair of fine black lines. Abdomen above more or less marked with black. Length, 4—5 mm.

Not uncommon.

3. *Liburnia fuscovittata*, Stal.

Delphax fuscovittata, Stal, Stett. Zeit., xix., 191, 82.

D. major and *colorata*, Kirschb., Cicad., 21, 22, 3 and 4.

Liburnia fuscovittata, Scott, Ent. Mo. Mag., vii., 25, 3.

Stenocranus fuscovenosus, Fieb., Grundz. Delph., t. 8, fig. 3 (style).

S. fuscovittata, Fieb., Cicad. d'Eur., pt. iii., 12, 2.

Pale yellowish, with a dark brown or black streak at the apex of the elytra. Greatest length of the crown in advance of the eyes nearly equal to one-half the entire length down the centre. Hind margin of pronotum roundly notched. Elytra nearly twice as long as abdomen, hyaline; nerves yellowish, except those of the membrane, which are brown; in the 6th apical area is a brown or black streak, which is sometimes prolonged towards the base. Front pairs of tibiae with a narrow black streak in front, all the tarsi fuscous at the extreme apex. Abdomen black above, side margins yellow. Length, $4\frac{1}{2}$ — $5\frac{1}{2}$ mm.

Not common.

4. *Liburnia longipennis*, Curt.

Delphax longipennis, Curt., Brit. Ent., p. and pl. 657.

Liburnia longipennis, Scott, Ent. Mo. Mag., vii., 25, 2.

Stenocranus longipennis, Fieb., Cicad. d'Eur., pt. iii., 13.

Male, above brown; female, pale yellowish. Greatest length of the crown in advance of the eyes about equal to one-third of the entire length down the centre. Hind margin of pronotum angularly notched. Elytra nearly twice as long as the abdomen, in the male brown, with the clavus and a stripe on the costa yellow; in the female hyaline, with yellowish nerves. Front pairs of tibiae in male black, widely pale at the base, all the tarsi black at the apex; in the female all the tibiae are pale, and the tarsi black at the apex. Length, $4\frac{1}{2}$ mm.

Not common.

5. *Liburnia vittipennis*, J. Sahl.

Delphax vittipennis, J. Sahl., Not. Fenn., ix., 1867, 187, 180 (1868).

D. guttuliferus, Kirschb., Cicad., 25, 12.

Stenocarenus guttuliferus, J. Sahl., Not. Fenn., xii., 416, 2.

Kelisia vittipennis, Fieb., Cicad. d'Eur., pt. iii., 23, 7.

Liburnia guttula, Dougl., sec. sp. comm.

Crown, pronotum, and scutellum yellowish white, the sides of the two latter widely, a large round spot on the cheeks, and a small round spot on the sides of the prosternum, black. Crown parallel-sided, about one-half longer than its basal width, projecting but very little in advance of the eyes. Pronotum distinctly shorter

than crown. Scutellum about twice as long as pronotum. Elytra whitish hyaline, slightly widened towards their rounded apex; on the membrane a black or dark brown streak, continued to the base of the elytron as a wide ill-defined brown stripe, which is sometimes very faint, but always discernible on holding the elytron up to the light. Abdomen above blackish, with a narrow pale dorsal line. Styles (Pl. II., fig. 14) oblong, parallel, very distinctly flattened vertically, suddenly acuminate at about the apical third. Insect generally macropterous. Length, 3—4 mm.

Not uncommon. In the brachypterous form the elytra are sublanceolate, but specimens in this state are easily distinguished from *guttula* by their superior size.

6. *Liburnia guttula*, Germ.

Delphax guttula, Germ., d'Mag. Ent., iii., 216, 7; Curt., Brit. Ent., 657, 10; Flor, Rhyn. Liv., ii., 42, 2; Marsh., Ent. Mo. Mag., i., 200, 2; Kirschb., Cicad., 25, 13.

Kelisia guttula, Fieb., Grundz. Delph., 519, 6, t. 8, fig. 4 (details); Cicad. d'Eur., pt. iii., 22, 6.

Liburnia guttula, Scott, Ent. Mo. Mag., vii., 25, 5?

Stenocarenus guttula, J. Sahl., Not. Fenn., xii., 417, 3.

At first sight this species much resembles a very small pale example of the foregoing, but upon examination it proves to be abundantly structurally distinct. Crown, pronotum, and scutellum pale yellow; the sides of the two latter, although sometimes slightly darker than the disc, do not appear to develop the dark stripe so conspicuous in *guttulifera*, at least such is not the case in the twenty examples I have examined. Elytra not widened towards their sublanceolate apex, the dark marking on the membrane rarely more than a small subtriangular black spot. Styles (Pl. II., fig. 13) curved, subparallel, scarcely perceptibly flattened vertically, gradually acuminate from the base. Length, $2\frac{1}{3}$ — $2\frac{1}{2}$ mm.

Stratton Strawless, Norfolk; local. Insect very rarely macropterous.

7. *Liburnia perspicillata*, Boh.

Delphax perspicillata, Boh., Sv. Ak. Handl., 164, 31 (1847); Kirschb., Cicad., 31, 26.

Liburnia perspicillata, Scott, Ent. Mo. Mag., x., 270.

Stenocarenum perspicillatus, J. Sahl., Not. Fenn., xii., 419, 5.

Kelisia perspicillata, Fieb., Cicad. d'Eur., pt. iii., 19, 4.

Pale yellow, a large round spot on the cheeks, and a smaller one on the sides of the prosternum, black. Crown somewhat longer than wide, obtusely rounded in front, impressions obsolete. Frons convex, slightly rounded, dilated at the lower margin of the eyes, middle keel obsolete. Pronotum somewhat shorter than crown. Scutellum one-half longer than pronotum, keels acute. Elytra whitish hyaline, as long as the abdomen, very finely wrinkled transversely, slightly narrowed towards their narrowly rounded apex, outer cubital nerve forked behind. Wings very short. Abdomen more or less blackish above. Length, 2 mm.

Cheviots, October ; one example (*Hardy*).

8. *Liburnia pallidula*, Boh.

Delphax pallidula, Boh., Sv. Ak. Handl., 48, 16 (1849) ; Flor. Rhyn. Liv., ii., 44, 3 ; Kirschb., Cicad., 25, 11.

D. punctulum, Kirschb., *l. c.*, 25, 10.

Liburnia pallidula, Scott, Ent. Mo. Mag., vii., 193, 5 a.

Stenocarenum pallidulus, J. Sahl., Not. Fenn., xii., 418, 4.

Kelisia pallidula, Fieb., Cicad. d'Eur., pt. iii., 17, 2.

Pale brownish yellow, cheeks generally with a punctiform black spot. Crown a trifle longer than pronotum, distinctly narrowed in front, projecting for about one-fourth of its length beyond the eyes. Scutellum a little longer than crown. Elytra lanceolate, a little longer than the abdomen, yellowish hyaline, with their middle nerve, at least at the apex, and sometimes also the brachial nerve and those of the clavus, black. Middle keel of scutellum and inner margin of elytra narrowly white.

Macropterous form.—Scutellum twice as long as the pronotum. Elytra one-half longer than the abdomen, slightly widened behind, apex obtusely rounded, membrane scarcely half as long as the corium, its middle nerve widely fuscous. Length, 3—3½ mm.

Wet commons, &c. I have a few female examples, taken at Stratton Strawless, in a place where the type-form of this species does not occur, which want the punctiform spot on the cheeks, and have the wings fully

developed, although the elytra are of the same shape as in brachypterous *pallidula*; possibly these will prove to belong to a distinct species.

9. *Liburnia Scotti*, Fieb.

Kelisia Scotti, Fieb., Cicad. d'Eur., pt. iii., 18, 3.

Delphax pallidulus, Marsh., Ent. Mo. Mag., i., 201, 3.

Liburnia Scotti, Scott, Ent. Mo. Mag., vii., 67, 6.

Pale brownish yellow, cheeks with a small punctiform black spot. Crown somewhat longer than pronotum, parallel-sided, projecting beyond the eyes for about one-third of its length. Scutellum a little longer than crown. Elytra yellowish hyaline, a trifle longer than the abdomen, parallel-sided, their apex obtusely rounded; in the male with a spot at the apex of the clavus, a spot on the costa at the base of the first apical area, and another at the apex of the middle nerve of the membrane, black; in the female with a large irregular patch at the base, another at the apex of the clavus, and an oval patch on the middle nerve of the membrane, black. These markings have a strong tendency either to coalesce, or to disappear leaving only a small black spot at the apex of the middle nerve of the membrane. Upper side of the abdomen occasionally with the base of some of the segments narrowly black.

Macropterous form.—Scutellum nearly twice as long as pronotum. Elytra yellowish hyaline, one-third longer than abdomen, apex of the clavus filled up with black. Length, 3—4 mm.

Marshes; local.

10. *Liburnia smaragdula*, Stal.

Delphax smaragdula, Stal, Ofv., 174, 1 (1853); Kirschb., Cicad., 22, 5.

Liburnia smaragdula, Scott, Ent. Mo. Mag., vii., 25, 7.

Chloriona smaragdula, Fieb., Grundz. Delph., t. 8, fig. 6 (♂ genitalia); Cicad. d'Eur., pt. iii., 26, 1; J. Sahl., Not. Fenn., xii., 407, 2.

♂. Elongate, pale green. Head strongly keeled, basal keel of crown acute. Scutellum more than twice as long as pronotum. Elytra twice as long as the abdomen, greyish white, opaque, narrowly rounded at the apex, nerves with very fine black hairs, second subapical area nearly twice as long as the fifth. Abdomen black, with reddish side margins. Legs with very fine black hairs, claws black.

♀. Scutellum scarcely one-half longer than the pronotum. Elytra greyish white, about one-third as long as abdomen, separately rounded at the apex. Wings wanting. Apex of the saw-case black. Length, $4\frac{1}{2}$ —5 mm.

Not common.

11. *Liburnia unicolor*, H.-S.

Delphax unicolor, Schöff., F. G., 143, 20.

Chloriona unicolor, Fieb., Grundz. Delph., 519, 7, t. 8, fig. 5 (details); Cicad. d'Eur., pt. iii., 27, 2; J. Sahl., Not. Fenn., xii., 406, 1.

Liburnia unicolor, Scott, Ent. Mo. Mag., vii., 25, 8.

Elongate, greenish or yellowish white; brachypterous female pale green.

♂. Basal keel of crown obtuse. Scutellum twice as long as pronotum. Elytra greyish white, opaque, twice as long as the abdomen, apex narrowly rounded, nerves with very fine black hairs, second subapical area somewhat longer than the fifth. Abdomen black, margins of the segments yellowish. Legs as in *smaragdula*. Pygofer sometimes white.

♀. *Macropterous form*.—Scutellum more than twice as long as pronotum. Elytra one-half longer than abdomen, greyish white, sometimes faintly fumose at the apex. *Brachypterous form*.—Scutellum scarcely one-half longer than pronotum. Elytra one-third as long as abdomen, greyish white, their apex separately rounded. Length, 4—5 mm.

On reeds, June and July.

12. *Liburnia collina*, Boh.

Delphax collina, Boh., Sv. Ak. Handl., 51, 18 (1849); Flor, Rhyn. Liv., ii., 70, 18; Marsh., Ent. Mo. Mag., i., 274, 15; Kirschb., Cicad., 24, 8.

D. pallens, Stal, Ofv., 192, 11 (1854); Fieb., Grundz. Delph., t. 8, fig. 27 (♂ genitalia).

Liburnia collina, Scott, Ent. Mo. Mag., vii., 26, 10; J. Sahl., Not. Fenn., xii., 429, 4; Fieb., Cicad. d'Eur., pt. iv., 19, 16.

Pale yellow, with fuscous markings; keels of the head white, with black margins. Crown somewhat longer than wide, basal impressions subtriangular, fulvous, about half as long as the crown. Scutellum one-half longer than pronotum, side keels distinct. Elytra

about half as long as abdomen, separately rounded at apex, pale yellow with white margins. Abdomen (male) blackish, with the margins, a dorsal stripe, and a few short lines towards the sides behind, rust-red; female, yellow faintly marked with fuscous, each dorsal segment with a transverse row of dark points interrupted in the middle. Styles hooked outwardly at apex, teeth of anal tube apparently crossing each other. Anal tube and its style entirely pale. Length, 2—2½ mm.

Macropterous form.—Scutellum twice as long as pronotum, side keels obsolete, diverging. Elytra more than one-half longer than abdomen, yellowish hyaline; nerves smooth, whitish yellow behind. Length, 3—3½ mm.

13. *Liburnia sordidula*, Stal.

Delphax sordidula, Stal, Ofv., 174, 2 (1853); Kirschb., Cicad., 29, 19; Fieb., Grundz. Delph., t. 8, fig. 26 (♂ genitalia).

Liburnia sordidula, Scott, Ent. Mo. Mag., vii., 26, 11; J. Sahl., Not. Fenn., xii., 434, 7; Fieb., Cicad. d'Eur., pt. iv., 17, 14.

Pale yellow; facial keels, a stripe along the crown pronotum and scutellum, and the marginal nerve of elytra, white. Facial keels narrowly and obsoletely margined with fuscous in the male. Scutellum nearly twice as long as pronotum. Elytra yellowish hyaline, narrowly rounded at the apex, one-third (male) or one-half (female) shorter than abdomen, nerves smooth. Abdomen (male) blackish, with the side margins, the dorsal line, and some irregular spots towards the apex, rust-red; female, yellow, sometimes with a row of dark spots on each side, or otherwise marked with black. Styles subulate, their ciliate inner margin with a strong sharp tooth near the base. Length, 3—3½ mm.

Macropterous form.—Scutellum two and a half times as long as pronotum. Elytra two-thirds (male) or one-half (female) longer than the abdomen, nerves darker towards the apex. Length, 4—5 mm.

Female sometimes entirely pale.

14. *Liburnia elegantula*, Boh.

Delphax elegantula, Boh., Sv. Ak. Handl., 63, 27 (1849); Flor, Rhyn. Liv., ii., 70, 18; Marsh., Ent. Mo. Mag., i., 252, 11; Kirschb., Cicad., 26, 6; Fieb., Grundz. Delph., t. 8, fig. 22 (♂ genitalia).

Liburnia elegantula, Scott, Ent. Mo. Mag., vii., 26, 9 ;
J. Sahl., Not. Fenn., xii., 424, 1 ; Fieb., Cicad.
d'Eur., pt. iv., 7, 4.

L. æmulator, Scott, Ent. Mo. Mag., ix., 238, 8a, sec.
spec. typ.

Elongate, black ; keels of the head, pronotum, with the exception of a black patch behind each eye, and apex of scutellum, white. Crown distinctly longer than wide, basal impressions yellow, apical impression very narrow, continued on to the forehead. Scutellum one-third longer than pronotum, side keels distinct, diverging. Elytra greyish white, pellucid, about half as long as abdomen, apex truncate, with rounded angles, nerves smooth. Abdomen above with a wide brownish yellow central stripe, a narrow whitish dorsal line, and some longitudinal rows of brownish yellow spots on the dark side portions. Legs yellow, femora faintly striped with fuscous. Styles incurved, subequal in width, with a strong triangular tooth at the apex within, and a long process directed backwards at the base. Teeth of anal tube (male) long, acute, diverging, visible from the side.

♀. Pronotum and scutellum pale brownish or greyish yellow ; abdomen brownish yellow, darker towards the sides, where there are some rows of pale spots, dorsal line whitish. Length, 2—2½ mm.

Macropterous form.—Scutellum convex, twice as long as pronotum, side keels very feeble. Elytra one-half longer than abdomen rounded at the apex, nerves dirty yellow. Length, 3—3½ mm.

15. *Liburnia distincta*, Flor.

Delphax distincta, Flor, Rhyn. Liv., ii., 68, 17 ; Fieb., Grundz. Delph., t. 8, fig. 23 (♂ genitalia).

Liburnia distincta, Scott, Ent. Mo. Mag., vii., 26, 12 ;
Fieb., Cicad. d'Eur., pt. iv., 11, 9.

L. albocarinata, J. Sahl., Not. Fenn., xii., 426, 2.

L. consanguinea, Scott, Ent. Mo. Mag., ix., 239.

Head black, with white keels, the two basal impressions of crown yellow. Pronotum and scutellum yellow, sometimes with fuscous markings, margins and keels white. Elytra one-half shorter than abdomen, yellowish with white margins, hind margin truncate, angles rounded ; nerves smooth, whitish. Abdomen (male) black, last segment entirely, and pygofer above, broadly pale ; female, black, side margins very narrowly, a fine central line, and the last dorsal segment in the middle, brownish yellow, varying to yellow with a row of dark spots down each side, or entirely yellow except

the saw-case. Styles elongate-triangular, outer margin straight, inner margin concave in the middle and cut off obliquely to a sharp point. Length, 2—2½ mm.

Macropterous form.—Scutellum twice as long as pronotum, side keels obsolete, parallel. Elytra more than one-half longer than abdomen, apex rounded. Length, female, 4 mm.

16. *Liburnia Boldi*, Scott ?.

Liburnia Boldi, Scott, Ent. Mo. Mag., vii., 68, 13 ;
Fieb., Cicad. d'Eur., pt. iv., 17, 15 (?).

Crown yellow, keels white, interstices black. Face yellow, keels white, the middle one on each side and the side ones inwardly margined with black. Pronotum and scutellum yellow, with a greyish shade, keels distinct, somewhat paler than the disc, side keels of the former almost reaching to the hind margin. Elytra yellowish grey, barely covering half the abdomen, hind margin rounded, nerves not prominent nor granulate, apex of clavus sometimes with a short narrow dark brown streak. Abdomen (male) above black, with a fine rust-red dorsal line, apex of each segment of the connexium yellow-red; female, above brownish yellow, darker on the sides, side margins orange-yellow, outer margins of the segments black, a fine dorsal line and the hind margins of the segments pale. Styles (Pl. II., fig. 17) short and broad, inner margin strongly, outer margin faintly, concave, inner apical angle produced into a pointed tooth, outer apical angle produced and bluntly rounded, thus giving to the style a form very suggestive of a profile view of a bird's head and neck. Length, 2—2½ mm.

Sandy coasts. Near Newcastle-on-Tyne and Norfolk. It is impossible to be quite certain that the insect above described is identical with Scott's insect, but his description of the female, the only sex he knew, agrees very well with the female of the insect here characterised.

17. *Liburnia Signoreti*, Scott.

Liburnia Signoreti, Scott, Ent. Mo. Mag., vii., 69, 15 ;
Fieb., Cicad. d'Eur., pt. iv., 55, 50.

♂. Head, pronotum, scutellum, and elytra dirty brownish yellow, abdomen pitch-black. Sides of metasternum with an oval black spot. Crown nearly square, keels distinct, concolorous. Facial keels concolorous, the central one forked and nearly evanescent on the forehead. Pronotum shorter than crown, keels distinct. Scutellum a little longer than crown. Elytra nearly as

long as abdomen, rounded at apex; nerves strong, pitch-black, closely and strongly granulate. Legs dirty brownish yellow. Upper notch of pygofer wide, triangular, occupying the entire width of the segment, its margin, viewed from the side, straight, oblique, and forming an obtuse angle with the vertical straight hind margin, which it nearly equals in length; lower notch bluntly triangular, very large and deep, its margin, when viewed from the side, forming an obtuse angle with the hind margin, the length of which it somewhat exceeds. Styles, when viewed *in situ* under a low magnifying power, scantily pilose, apparently strap-shaped, slightly widened at their subtruncate apex, their lower half parallel with the outline of the lower notch of the pygofer, their upper half upright and slightly curved backward (Pl. I., fig. 7, Pl. II. fig. 15). Anal tube large, exerted, its teeth very short and obtuse.

♀. Pale brownish yellow, claws and apex of the saw-case black. Elytra one-third shorter than abdomen. Length, male, $2\frac{2}{3}$ mm.; female, 4 mm.

Marshes, in June; Abbey Wood and Brundall, Norfolk.

18. *Liburnia adela*, Flor.

Delphax adela, Flor, Rhyn. Liv., ii., 63, 14; Fieb., Grundz. Delph., t. 8, fig. 50 (♂ genitalia).

Liburnia adela, Scott, Ent. Mo. Mag., vii., 26, 16; Fieb., Cicad. d'Eur., pt. iv., 54, 49.

Brownish yellow, abdomen above black, with white hind margins to the segments. Basal impressions of the crown deeper than the apical. Face between the keels sometimes black, its central keel sharp, nearly evanescent on the forehead. Elytra as long as the abdomen, dirty brown, with a very narrow and indistinct pale margin; nerves strong, brown, distinctly granulate. Legs sometimes with indistinct dark stripes. Pygofer (male) black, viewed from behind, oval, widest in the middle. Upper notch deep, triangular, margined with white, viewed from the side its margin forms a very obtuse angle with the hind margin of the pygofer, which is angularly prominent in the middle; lower notch deep, narrow, somewhat sinuate. Styles long, strap-shaped, reaching about two-thirds the height of the cavity, oblique at the base, afterwards upright and slightly incurved towards their truncate apex, inner margin sinuate, inner apical angle produced into a blunt tooth. Anal tube whitish, scarcely exerted, its teeth short and blunt. Length, $2\frac{1}{2}$ mm.

Female undescribed.

19. *Liburnia melanopachys*, Scott.

Liburnia melanopachys, Scott, Ent. Mo. Mag., vii., 70, 17; Fieb., Cicad. d'Eur., pt. iv., 36, 31.

Crown clear brown, the keels acute and prominent. Face (except the forehead) black. Pronotum clear brown, keels acute and prominent, hinder angles broadly black. Scutellum clear brown, keels distinct, sometimes the middle keel and a narrow margin on either side, especially towards the apex, blackish, beyond the side keels black. Elytra about two-thirds as long as abdomen, shining lacquer-yellow, somewhat transparent, hind margin rounded, nerves prominent, unpunctured. Breast black. Legs yellow, front pairs of tarsi brown, hind pair yellow. Abdomen above pitchy brown, beneath black. Pygofer (male) black, seen from behind, slightly arched outwardly below the middle, obtusely narrowed towards the base, widely rounded at the top, viewed from the side forming a triangle, of which the longest side is formed by the oblique hind margin, which is continuous with the margin of the upper notch. Anal tube large, semicircular, not exerted, occupying the entire width of the upper part of the pygofer, but not reaching the middle. Styles brownish yellow, shaped like a pruning-knife, narrow at the base, widened towards the top, strongly arched outwardly above the middle, and ending in a slightly incurved point, which reaches the lower side of the anal tube; their points contiguous. Length, 2 mm.

Gosforth, October. Female undescribed. Larger than *L. venosa*, to which it is said to bear a great resemblance.

20. *Liburnia similis*, Kirschb.

Delphax similis, Kirschb., Cicad., 30, 22.

Liburnia similis, Scott, Ent. Mo. Mag., ix., 240, 13 a; Fieb., Cicad. d'Eur., pt. iv., 10, 8.

Brownish yellow, last tarsal joint, the saw-case, and a row of spots on the sides of the abdomen above, darker; face, except the keels, black. Facial keels filiform, the middle one distinct on the forehead. Keels of the crown strong, the impressions deep, the basal ones brownish, about one-third as long as the crown. Pronotum not half so long as the scutellum, keels of the latter distinct. Elytra half as long as abdomen, rounded behind, dirty brownish yellow with white margins, nerves strong, with dense concolorous

granules. Lateral lobes nearly semicircular at the base, afterwards strongly sinuate, very wide and rounded behind. Length, $2\frac{1}{2}$ mm.

Scotland. Male undescribed.

21. *Liburnia capnodes*, Scott.

Liburnia capnodes, Scott, Ent. Mo. Mag., vii., 69, 14 ;
Fieb., Cicad. d'Eur., pt. iv., 41, 36.

Head, pronotum, and scutellum brownish yellow; keels of the latter fine, but distinct. Elytra one-third longer than abdomen, pale smoky yellow, almost transparent; all the nerves brown, distinctly and regularly granulate, a blackish streak on the inner margin at the apex of the clavus. Legs pale fuscous-yellow, claws and apex of the claw-joint brown. Abdomen above dark brown, paler towards the apex, beneath brownish yellow, hind margin of the segments more or less broadly black, segments themselves with two or three scattered black punctures, pygofer and saw-case brownish yellow, lateral lobes narrowly and very obliquely truncate at the base, their inner angle slightly rounded, somewhat widened behind, obliquely rounded at the apex. Length, 3 mm.

At once recognisable by the uniform brown nerves and minute but distinct concolorous granules thereon. Male undescribed.

22. *Liburnia scutellata*, Scott.

Liburnia scutellata, Scott, Ent. Mo. Mag., x., 107.

Macropterous form. — ♂. Crown brownish yellow, slightly widening from the base to the front margin; keels acute, prominent, slightly paler than the disc, apical impression small, the two basal ones large and deep. Face brownish yellow; keels paler than the disc, central one somewhat more feeble on the frons. Pronotum brownish yellow, darker behind each eye, keels somewhat paler. Scutellum brownish yellow, darker on each side of the middle keel, on either side of which at the base is a black spot, beyond the side keels black, side margins brownish yellow. Elytra whitish hyaline, very finely wrinkled transversely, about one-half longer than abdomen; nerves yellowish, darker behind, non-granulate, marginal nerve round the apex black. Legs fuscous, hind claws and apex of claw-joint black. Abdomen above black, beneath black, hind margin of the two last segments very narrowly yellow. Pygofer and styles black, the latter somewhat billhook-shaped at the apex. Length, $2\frac{1}{2}$ mm.

♀. Similar to the male, but paler and wants the pair of black spots at the base of the scutellum.

This species at first sight bears some resemblance to the macropterous form of *L. Fairmairei*, but it is at least one-third smaller.

23. *Liburnia lepida*, Boh.

Delphax lepida, Boh., Sv. Ak. Handl., 39, 10 (1849); Kirschb., Cicad., 35, 34; Fieb., Grundz. Delph., t. 8, fig. 36 (♂ genitalia).

D. tristis, Boh., Sv. Ak. Handl., 60, 25 (1849).

Liburnia lepida, Scott, Ent. Mo. Mag., vii., 27, 26; J. Sahl., Not. Fenn., xii., 466, 29; Fieb., Cicad. d'Eur., pt. iv., 32, 28.

Blackish brown, face spotted with white; keels of pronotum and scutellum, three broad rings on the tibiae, and the chief part of the tarsi, pale yellow. Apical impression of crown continued on to the frons. Pronotum distinctly shorter than crown. Middle keel of pronotum and scutellum stout. Scutellum three-fourths longer than pronotum; side keels straight, diverging. Elytra (male) one-third (female) one-half as long as abdomen; apex truncate with rounded angles, dark brown, paler at the base, two large semi-circular spots on the hind margin, a small spot at the apex of the clavus, and a streak on the inner margin, white; nerves with large brown granules. Abdomen above black, generally with three lines of small white spots. Pygofer (male), seen from behind, wide, oval; upper notch widely triangular, its margin, seen from the side forming an obtuse angle with the hind margin, which is straight and directed obliquely inwards, lower margin produced into a blunt lobe. Styles erect, approximating at the base and apex, widened above, outer apical angle widely rounded, inner drawn out into a fine sharp point. Length, $2\frac{1}{2}$ —3 mm.

Macropterous form.—Scutellum two and a half times as long as pronotum; side keels diverging, slightly curved. Elytra nearly twice as long as abdomen, whitish hyaline; nerves strong, with large brown granules, an oblique band before the middle, a band on the angular nerves, a streak at the apex of the clavus, and some small spots at the apex of the nerves of the membrane, brown. Length, $3\frac{1}{2}$ mm.

24. *Liburnia Fieberi*, Scott.

Liburnia Fieberi, Scott, Ent. Mo. Mag., vii., 70, 25 ;
Fieb., Cicad. d'Eur., pt. iv., 33, 29.

Blackish brown above, yellow-brown beneath, hind margin of elytra with two white spots separated by a black one. Keels of crown sharp, frons at the apex narrowly pale. Pronotum and scutellum subequal in length, their keels sharp. Elytra (male) one-half (female) one-third as long as abdomen, suffused with pale at the base of the suture, apex truncate with rounded angles; nerves strong, smooth. Abdomen above, male blackish brown, sometimes with three lines of pale spots; female yellow-brown, widely darker on the sides, with three more or less distinct lines of pale spots. Pygofer (male) sparingly set with fine pale hairs, upper notch wide, triangular, reaching the preceding segment, its margin, seen from the side, forming an obtuse angle with the hind margin, which is vertical, and has its lower angle rounded off. Styles (Pl. II., fig. 16) long, narrow, incurved, quite reaching the lower margin of the anal tube, their inner apical angle produced inwardly and hooked. Length, 2—2½ mm.

Not uncommon at roots of rushes.

25. *Liburnia pullula*, Boh.

Delphax pullula, Boh., Sv. Ak. Handl., 116 (1853);
Stal, Ofv., 196, 28 (1854); Fieb., Grundz. Delph.,
t. 8, fig. 38 (♂ genitalia).

Liburnia pullula, Scott, Ent. Mo. Mag., vii., 28, 30 ;
J. Sahl., Not. Fenn., xii., 448, 17 ; Fieb., Cicad.
d'Eur., pt. iv., 42, 37.

♂. Dirty yellow, elytra and abdomen black, hind margin of the former narrowly white. Crown rounded in front, apical impressions very narrow and obsolete. Frons strongly roundly dilated below the middle, slightly narrowed before the apex, its middle keel evanescent above. Pronotum somewhat shorter than crown. Scutellum one-half longer than pronotum. Elytra coriaceous, half as long as abdomen, widely rounded at the apex; nerves strong, sparingly granulate. Legs slender, pale yellow. Pygofer black, seen from behind elongate-oval, upper notch acutangular, its margin, seen from the side, short, and forming an obtuse angle with the hind margin, which is straight, somewhat oblique, and has its lower angle widely rounded off. Styles yellow, very small, about one-fourth as long as the opening of the pygofer, seen from the side with a large triangular tooth behind at the base,

apex truncate, outer apical angle produced into a wide triangular tooth. Anal tube black, somewhat prominent, its teeth long, vertically connate, curved forwards at the apex, and nearly reaching to the middle of the opening of the pygofer.

♀. Entirely dirty yellow, except some obsolete spots at the base of the abdomen and the saw-case and claws, which are brown. Length, $1\frac{1}{2}$ —2 mm.

Macropterous form (female).—Scutellum twice as long as the pronotum, side keels distinct and curved outwards. Elytra two-thirds longer than abdomen, yellowish hyaline; nerves pale yellow, sparingly granulate with brown, marginal nerve of membrane brown. Length, $3\frac{1}{3}$ mm.

26. *Liburnia lugubrina*, Boh.

Delphax lugubrina, Boh., Ofv., 266, 11 (1847); Flor, Rhyn. Liv., ii., 73, 20; Kirschb., Cicad., 33, 29; Fieb., Grundz. Delph., t. 8, fig. 39 (♂ genitalia).

Liburnia lugubrina, Scott, Ent. Mo. Mag., vii., 28, 31; J. Sahl., Not. Fenn., xii., 446, 15; Fieb., Cicad. d'Eur., pt. iv., 43, 38.

♂. Pale yellow, elytra black, costal and hind margins narrowly yellowish white, inner margin near the apex of the scutellum broadly yellow; abdomen above yellow with black margins, or with the basal segments entirely dark. Central facial keel sharp, forked, and becoming indistinct on the forehead. Scutellum three-fourths longer than pronotum, its side keels straight, strongly diverging, sometimes with a black spot on each side at the base, or black with the apex yellow. Elytra scarcely two-thirds so long as abdomen, hind margin broadly rounded, nerves finely granulate. Legs slender, spur of hind tibiae large and wide. Pygofer, seen from behind, distinctly wider than high, and having three blunt angles, namely, one just below the middle of each side, and one in the middle of the lower margin. Viewed from the side the nearly horizontal margin of the upper notch forms an obtuse angle with the hind margin, which is oblique and nearly straight; the rounded right angles, in which the hind joins the lower margin, coincides with the point of the greatest width of the pygofer, when seen from behind. Styles straight, strongly diverging, narrow-triangular, pointed, reaching half the height of the cavity of the pygofer. Teeth of anal tube distant, slightly curved outwards at the apex. Length, $2\frac{3}{4}$ —4 mm.

♀. Entirely pale brownish yellow.

Macropterous form (female).—Scutellum nearly three times as

long as pronotum, side keels distinct, slightly curved outwards. Elytra yellowish, subpellucid, one-half longer than abdomen, rounded at the apex, nerves non-granulate. Length, 5 mm.

27. *Liburnia leptosoma*, Flor.

Delphax leptosoma, Flor, Rhyn. Liv., ii., 76, 22; Marsh., Ent. Mo. Mag., i., 252, 12; Fieb., Grundz. Delph., t. 8, fig. 34 (♂ genitalia).

D. Heydenii, Kirschb., Cicad., 37, 39 (♀).

D. albolimbata, Kirschb., l. c., 32, 27 (♂).

D. albofimbriata, Fieb., Grundz. Delph., t. 8, fig. 35 (♂ genitalia).

Liburnia leptosoma, Scott, Ent. Mo. Mag., vii., 27, 27; Fieb., Cicad. d'Eur., pt. iv., 29, 26.

L. albofimbriata, Scott, l. c., 27, 28.

♂. Face pitch-black, keels sometimes pale. Crown dirty brownish yellow, remainder of upper side shining black, with the pronotum, and occasionally the base of the elytra, dirty white, hind margin of the latter pure white. Elytra half as long as abdomen, hind margin truncate with rounded angles; nerves strong, not perceptibly granulate. Pygofer black margined with white, the upper notch very wide and deep, its sides feebly concave, and its base concealed beneath the preceding segment. Styles diverging, straight, pointed, shining black, reaching about half the height of the cavity.

♀. Lighter or darker brownish yellow, hind margin of elytra white. Length, 2—2 $\frac{2}{3}$ mm.

Common.

28. *Liburnia niveimarginata*, Scott.

Delphax thoracicus, Marsh., Ent. Mo. Mag., iii., 269, nec Stal.

Liburnia niveimarginata, Scott, Ent. Mo. Mag., vii., 71, 29; Fieb., Cicad. d'Eur., pt. iv., 27, 24.

♂. Face and crown pale brownish yellow. Pronotum and scutellum white. Elytra about half as long as abdomen, apex truncate with rounded angles, hind margin broadly white; nerves strong, but not perceptibly granulate. Abdomen black, last segment in the middle above and margin of pygofer broadly white. Upper notch of pygofer sharply triangular. Teeth of anal tube long, pointed, vertically contiguous. Styles pale, diverging, somewhat lanceolate, reaching the level of the teeth of anal tube.

♀. Similar to that of the last species, but distinguishable by the difference in the central keel of the face. Length, $2\frac{1}{2}$ —3 mm.

Apparently not common.

29. *Liburnia Dalei*, Scott.

Liburnia Dalei, Scott, Ent. Mo. Mag., vii., 72, 33.

♂. Crown yellow, the two basal impressions distinct, the front one appearing as a deep puncture. Central facial keel distinct, but not prominent. Pronotum yellow. Scutellum deep black, shining, sides and apex narrowly yellow. Elytra yellow, not half so long as abdomen, hind margin rounded, nerves non-granulate. Abdomen black, shining, side margins and a very narrow dorsal line yellow, last two segments clear yellow. Pygofer above whitish yellow, sides and beneath black; seen from behind its outline is inversely oval, the sides narrowed below, rounded above. Upper notch triangular, its margin, seen from the side, forming an obtuse angle with the nearly vertical hind margin, lower angle somewhat less obtuse. Lower notch deep, rounded, with sinuate edges. Styles upright, slightly diverging, nearly reaching the teeth of the anal tube, narrow, cuneiform, obliquely truncate on their inner side near the base. Anal tube large, sunken, its teeth short, distant. Length, $1\frac{2}{3}$ mm.

♀. Unknown.

Lulworth, in August.

30. *Liburnia pellucida*, Fab.

Delphax pellucida, Fab., Sys. Rhyn., 84, 6; Flor, Rhyn. Liv., ii., 65, 16; Marsh., Ent. Mo. Mag., i., 273, 14; Fieb., Grundz. Delph., t. 8, fig. 20 (♂ genitalia).

D. flavescens, Fab., Sys. Rhyn., 84, 7.

D. marginata, Fab., l. c., 84, 9.

D. dispar, Fall., Hem. Suec., ii., 74, 2; Kirschb., Cicad., 27, 16.

D. hemiptera, Stal, Ofv., 5, 14 (1854).

D. suturalis, Curt., Brit. Ent., 657, 5.

D. dubia, Kirschb., Cicad., 26, 14.

Liburnia pellucida, Scott, Ent. Mo. Mag., vii., 27, 20; J. Sahl., Not. Fenn., xii., 436, 9; Fieb., Cicad. d'Eur., pt. iv., 4, 2.

Macropterous form.—♂. Black; facial keels, pronotum (except a patch behind each eye), tegulae, and apex of scutellum, white.

Scutellum more than three times as long as pronotum, apex reflexed; side keels fine, parallel, obsolete behind. Elytra whitish hyaline, twice as long as abdomen; nerves pale at the base, darker behind, distinctly and moderately closely granulate throughout, marginal nerve of membrane black. Abdomen black, sides narrowly yellowish. Pygofer large, prominent, black, its hind margin generally edged with white below. Viewed from above the upper notch is wide and deep, scarcely angular at the base, its edges forming a right angle, or nearly a right angle with the hind margin. Styles spreading almost horizontally, their apex reflexed. Teeth of anal tube long, vertically connate. Head, pronotum, and scutellum frequently entirely black or pitch-black.

♀. Black; facial keels, pronotum, scutellum, and sides of the abdomen, pale brownish yellow. Elytra yellowish hyaline. Body frequently entirely yellow, except the upper side of the abdomen near the base. Length, $3\frac{1}{2}$ — $4\frac{1}{2}$ mm.

Brachypterous form. — ♂, ♀. Varying in colour from pale brownish yellow to pitch-black, but sometimes the coloration of the fore parts mentioned above is developed in the male. Scutellum more than twice as long as pronotum; keels distinct, diverging behind. Elytra about as long as abdomen, apex narrowly rounded, nerves strong, closely set with conspicuous black granules. Length $2\frac{1}{2}$ —3 mm.

This excessively variable and abundant species may be readily identified by the characters derived from the male genitalia.

31. *Liburnia discolor*, Boh.

Delphax discolor, Boh., Sv. Ak. Handl., 61, 26 (1849); Flor, Rhyn. Liv., ii., 63, 15; Fieb., Grundz. Delph., t. 8, fig. 19 (♂ genitalia).

D. patens, Kirschb., Cicad., 36, 37.

Liburnia discolor, Scott, Ent. Mo. Mag., vii., 27, 21; J. Sahl., Not. Fenn., xii., 441, 12; Fieb., Cicad. d'Eur., pt. iv., 3, 1.

Black; keels of head and pronotum yellow, hind margin of the latter generally narrowly white in the male; elytra pellucid, pale brown, marginal nerve paler. Scutellum about twice as long as pronotum; side keels strong, divergent. Elytra about one-half as long as abdomen, widely rounded behind; nerves strong, their granulation indistinct. Pygofer (male) large, prominent, black, the upper notch, viewed from above, large, deep, round at the base,

its edges forming at their junction with the hind margin an obtuse angle. Styles and anal tube almost as in *pellucida*. Length, $2\frac{1}{2}$ —3 mm.

Macropterous form.—Scutellum two and a half times as long as pronotum; side keels distinct, somewhat diverging. Elytra yellowish hyaline, nearly twice as long as abdomen; nerves yellow, at the base afterwards dark, with small setigerous granules towards the apex, costal margin white, that of the membrane and the suture dark. Length, $3\frac{1}{4}$ — $3\frac{3}{4}$ mm.

Woods, in spring.

32. *Liburnia obscurella*, Boh.

Delphax obscurella, Boh., Sv. Ak. Handl., 53, 20 (1849); Fieb., Grundz. Delph., t. 8, fig. 29 (♂ genitalia).

Liburnia obscurella, Scott, Ent. Mo. Mag., vii., 28, 37; J. Sahl., Not. Fenn. xii., 443, 13; Fieb., Cicad. d'Eur., pt. iv., 20, 18.

Crown brown, fork of the middle keel evanescent in front. Frontal channels blackish, paler down the middle, keels whitish. Pronotum brownish yellow, somewhat shorter than the crown. Scutellum twice as long as pronotum, brownish yellow, with a large blackish spot on each side and another at the apex, keels sharp, pale. Elytra as long as the abdomen, brownish grey, rounded behind, costal margin and suture yellow-brown, hind margin and clavus brownish; nerves strong yellow-brown, closely set with setigerous granules. Abdomen above, male black, last segment paler; female yellow, more or less widely brown at the base, dorsal line whitish, each segment narrowly black at the base, apical segments frequently entirely pale. Upper notch of pygofer (male), seen from the side, almost vertical, and forming a very obtuse angle with the straight hind margin, which is directed obliquely forwards, lower notch very wide. Styles very short, sublanceolate, arched forwards. Length, 2— $2\frac{1}{2}$ mm.

Macropterous form.—Scutellum three times as long as pronotum, transversely impressed at the apex; side keels obsolete, subparallel. Elytra twice as long as abdomen, fusco-hyaline; nerves yellow, with black setigerous granules, which are stronger on the corium than on the membrane, margins brown. Length, 3— $3\frac{1}{2}$ mm.

33. *Liburnia forcipata*, Boh.

Delphax forcipata, Boh., Sv. Ak. Handl., 57, 23 (1849); Flor, Rhyn. Liv., ii., 60, 12; Kirschb., Cicad., 37, 38; Fieb., Grundz. Delph., t. 8, fig. 33 (♂ genitalia).

Liburnia forcipata, Scott, Ent. Mo. Mag., vii., 27, 19; J. Sahl., Not. Fenn., xii., 461, 26; Fieb., Cicad. d'Eur., pt. iv., 26, 23.

Pitch-black, shining; facial keels, crown, hind margin of pronotum, and base of elytra widely, yellowish, marginal nerve of the latter pale. Scutellum one-half longer than pronotum; side keels distinct, diverging. Elytra coriaceous, about one-half as long as abdomen, widely rounded behind; nerves strong, their granulation indistinct. Pygofer (male) large, prominent, black, the upper notch deep, reaching to the preceding segment, viewed from above elliptic, at least one-half wider across the middle than at its opening on the hind margin, its edges forming at their junction with the latter an acute angle. Length, 2—2½ mm.

Macropterous form.—Scutellum two and a half times as long as pronotum, flattened towards the apex; side keels obsolete, slightly curved outwards. Elytra about twice as long as the abdomen, fuscous, somewhat pellucid (male), aqueo-hyaline (female), base yellowish, nerves with small setigerous granules. Length, 2¾—4 mm.

Woods in spring.

34. *Liburnia denticauda*, Boh.

Delphax denticauda, Boh., Sv. Ak. Handl., 64, 28 (1849); Flor, Rhyn. Liv., ii., 59, 11; Fieb., Grundz. Delph., t. 8, fig. 46 (♂ genitalia).

Liburnia denticauda, Scott, Ent. Mo. Mag., vii., 28, 32; J. Sahl., Not. Fenn., xii., 456, 22; Fieb., Cicad. d'Eur., pt. iv., 49, 44.

♂. Pale brownish yellow, breast and abdomen black, the latter with the hind margin of the last dorsal segment white. Pronotum distinctly shorter than crown, side keels curved outwards. Scutellum scarcely one-half longer than pronotum; side keels acute, strongly diverging. Elytra about half as long as abdomen, pale yellow, pellucid, very finely wrinkled transversely, hind margin truncate with rounded angles; nerves strong, non-granulate. Margin of upper notch of pygofer, seen from the side, oblique and forming with the sinuate hind margin, which is directed obliquely

forwards, a wide triangular tooth. Middle of the lower margin of pygofer with a long sharp tooth. Teeth of anal tube short, obtuse, vertically connate.

♀. Entirely pale brownish yellow, elytra about one-third as long as abdomen. Length, 2—2½ mm.

Macropterous form.—Scutellum two and a half times as long as pronotum; apex reflexed, white; side keels very indistinct, nearly parallel. Elytra, male two-thirds, female one-half, longer than abdomen, yellowish hyaline; nerves dirty yellow, dusky towards the apex. Length, 3—3¼ mm.

A vernal wood-frequenting species like the preceding.

35. *Liburnia exigua*, Boh.

Delphax exigua, Boh., Sv. Ak. Handl., 65, 29 (1849); Flor, Rhyn. Liv., ii., 61, 13; Kirsch., Cicad., 34, 32; Fieb., Grundz. Delph., t. 8, fig. 43 (♂ genitalia).

Liburnia exigua, Scott, Ent. Mo. Mag., vii., 28, 35; J. Sahl., Not. Fenn., xii., 457, 23; Fieb., Cicad. d'Eur., pt. iv., 45, 40.

♂. Greyish yellow, abdomen black with the apical segments sometimes narrowly margined with yellow. Facial keels strong, evanescent on the forehead. Scutellum scarcely one-half longer than pronotum; side keels distinct, strongly diverging. Elytra about half as long as abdomen, pale greyish yellow, pellucid, margins paler, apex truncate with rounded angles; nerves strong, non-granulate. Pygofer black, retracted, upper notch wide, rounded, margined with yellow, lower notch feeble, hind margin straight. Styles narrow, somewhat lanceolate, with a long narrow tooth at the base projecting backward. Anal tube nearly circular, its teeth represented by a long narrow straight process from the middle of its lower margin.

♀. Pale greyish yellow, head, pronotum, scutellum, and elytra whitish, sides of abdomen above with some blackish markings. Length, 1¾—2 mm.

Macropterous form, ♂.—Scutellum nearly three times as long as pronotum, transversely impressed before the apex, sides fuscous; side keels fine, subparallel. Elytra nearly twice as long as abdomen, whitish hyaline; nerves non-granulate, pale brown, darker towards the apex. Length, 2½ mm.

36. *Liburnia venosa*, Germ.

Delphax venosa, Germ., Thon. Arch., ii., 57, 5.

D. rhypara, Flor, Rhyn. Liv., ii., 48, 5.

D. nitidula, Kirschb., Cicad., 36, 36.

Liburnia venosa, Scott, Ent. Mo. Mag., vii., 26, 18 ;
Fieb., Cicad. d'Eur., pt. iv., 35, 30.

L. curtula, J. Sahl., Not. Fenn., xii., 450, 18.

Fore parts lighter or darker pitch-brown, abdomen black. Elytra and legs yellow-brown; nerves of the former strongly raised, black. Crown rectangular, a little longer than wide, its keels strong. Pronotum a trifle shorter than the crown, its side keels straight, strongly diverging, but reaching the hind margin. Scutellum very little longer than the pronotum. Elytra about two-thirds as long as the abdomen, widely rounded at the apex, entire marginal nerve black (Pl. I., fig. 8).

Macropterous form.—Scutellum one and a half times as long as pronotum. Elytra dirty whitish hyaline, finely wrinkled transversely, nearly twice as long as abdomen; nerves dark brown, strongly raised. Length, $1\frac{1}{2}$ —2 mm.

At roots of coarse grass and rushes. Easily distinguished from our other black species by its small size, and the side keels of the pronotum reaching the hind margin.

37. *Liburnia insignis*, Scott.

Liburnia insignis, Scott, Ent. Mo. Mag., xviii., 270.

♂. Pale yellowish, abdomen pitch-black, shining, with a large yellow or brownish yellow transverse patch on the upper side at the base, hind margin of the last four segments very narrowly brown, down the centre of each a short narrow streak not reaching the front margin, hind margin of the last segment broadly white. Side keels of pronotum somewhat indistinct, disc on each side of the centre somewhat depressed. Keels of scutellum distinct, somewhat acute. Elytra about half as long as abdomen, their apex flatly rounded; nerves fine, non-granulate. Legs yellow, thighs fuscous at the base. Pygofer black, shining; viewed from the side the hind margin is produced into a flat isosceles-angular form, and has a short curved acute tooth at the lower extremity; viewed from behind the pygofer appears almost circular, margins of the upper half folding down inwardly and forming two triangular flaps, leaving a small space between their edges down the centre.

Styles black, forming a wide V-shaped character, apex of the arms white, produced into a point. Length, 3 mm.

♀. Unknown.

Pitlochry, Perthshire.

38. *Liburnia Aubei*, Perris.

Delphax Aubei, Perris, Nouv. Exc. Ann. Soc. Linn. Lyon, iv. (1857).

D. cognata, Fieb., Grundz. Delph., 527, t. 8, fig. 42 (♂ genitalia).

D. obsoleta, Kirschb., Cicad., 33, 30; J. Sahl., Not. Fenn., xii., 453, 20.

Liburnia cognata, Scott, Ent. Mo. Mag., vii., 28, 34; Fieb., Cicad. d'Eur., pt. iv., 45, 39.

♂. Greyish yellow, abdomen black with a whitish dorsal line, each segment with a transverse row of about three short narrow reddish yellow stripes near each side. Middle keel of pronotum and scutellum and marginal nerve of elytra whitish. Elytra pellucid, half as long as abdomen, apex widely rounded; nerves moderately strong, non-granulate. Pygofer black, moderately prominent, the margin of its deep angular notch and a large subquadrate spot adjoining its obsolete lower notch yellowish, hind margin straight. Styles pale, sinuate, blunt, nearly reaching the very feeble obtuse teeth of the anal tube.

♀. Abdomen greyish yellow with a whitish dorsal line, each segment with a transverse row of about three short black stripes near each side. Coloration otherwise as in the male. Length, $2\frac{1}{2}$ —3 mm.

Sandy coasts; common.

39. *Liburnia striatella*, Fall.

Delphax striatella, Fall., Hem. Suec., ii., 75, 3; Flor, Rhyn. Liv., ii., 54, 8; Marsh., Ent. Mo. Mag., i., 251, 10; Fieb., Grundz. Delph., t. 8, fig. 21 (♂ genitalia); Kirschb., Cicad., 27, 17.

D. notula, Stal, Ofv., 192, 10 (1854).

Liburnia striatella, Scott, Ent. Mo. Mag., vii., 27, 22; J. Sahl., Not. Fenn., xii., 435, 8; Fieb., Cicad. d'Eur., pt. iv., 5, 3.

♂. Black; facial keels, pronotum (except a large spot behind each eye), and apex of scutellum, whitish, crown pale. Elytra but little longer than abdomen, pale brownish, rounded at the

apex, nerves sparingly granulate. Legs yellow. Aperture of pygofer constricted, its outline sinuate, upper notch semicircular, its margin, seen from the side, oblique; hind margin nearly vertical, sinuate just before it joins the margin of the upper notch. Styles very short, broad at the base, rapidly narrowing towards their somewhat rhomboidal apex. Teeth of anal tube long, vertically subcontiguous. Length, $1\frac{3}{4}$ — $2\frac{3}{4}$ mm.

♀. Pronotum and scutellum widely pale down the middle, their sides and the abdomen above blackish, the latter sometimes with pale spots towards the apex. Length, $2\frac{1}{2}$ —3 mm.

Macropterous form.—Elytra hyaline, nearly twice as long as abdomen; nerves fine pale brown, darker towards the apex, sparingly granulate, apical third of costal nerve black, sixth apical area fuscous, at least in the female. Length, $3\frac{1}{2}$ — $4\frac{1}{2}$ mm.

40. *Liburnia Fairmairei*, Perris.

Delphax Fairmairei, Perris, Nouv. Exc. Ann. Soc. Linn. Lyon, iv., 170 (1857).

D. neglecta, Flor, Rhyn. Liv., ii., 57, 10; Fieb., Grundz. Delph., t. 8, fig. 52 (♂ genitalia); Marsh., Ent. Mo. Mag., i., 274, 16?

Liburnia neglecta, Scott, Ent. Mo. Mag., vii., 27, 23; Fieb., Cicad. d'Eur., pt. iv., 57, 52.

L. extrusa, Scott, l. c., 194, 22a, sec. spec. comm.

Pale brownish yellow, sides of pronotum and scutellum and frequently also sides of abdomen widely brown. Elytra in the brachypterous form about two-thirds as long as abdomen, broadly rounded at the apex, inner marginal nerve white; nerves strong, sparingly and indistinctly granulate; in the macropterous form nearly twice as long as abdomen, whitish hyaline; nerves fine, pale, darker towards the apex, very finely and sparingly granulate, marginal nerve of membrane black. Towards the apex of the abdomen each segment has a transverse row of about three black punctures on each side, and a fine pale dorsal line runs down the middle. Upper notch of pygofer (male) rounded at the base, very wide and deep; hind margin, viewed from the side, with a wide and deep arcuate notch in the middle, produced above into a strong triangular tooth, lower angle of the notch rectangular or nearly so; styles visible, cleaver-shaped, reaching across the mouth of the notch. Styles (Pl. II., fig. 10), viewed from behind, wide, flat, black, parallel-sided, straight and connivent for a short distance from the base, then suddenly bent outwards and afterwards curved upwards, their apex truncate. Length, $2\frac{2}{3}$ — $4\frac{1}{2}$ mm.

The female of this species is abundant at the roots of grass in the autumn, and varies much in colour, some examples being nearly black, in which case the pale disc of the pronotum and scutellum and the inner marginal nerve of the elytra are very conspicuous. Males are difficult to meet with in company with females, but they occur more freely a little earlier in the season. The nymph of this species is the *Achorotile bivittata*, Boh., of Fieber and Puton's catalogues.

41. *Liburnia brevipennis*, Boh.

Delphax brevipennis, Boh., Sv. Ak. Handl., 49, 17 (1847).

D. hyalinipennis, Stal, Ofv., 6, 19 (1854); Fieb., Grundz. Delph., t. 8, fig. 51 (♂ genitalia); Kirschb., Cicad., 28, 18.

Liburnia hyalinipennis, Fieb., Cicad. d'Eur., pt. iv., 56, 51.

L. brevipennis, J. Sahl., Not. Fenn., xii., 444, 14.

Similar in size and appearance to the last named, but the pale ground colour of the upper side is dirty white, inclining to bluish grey, and the dark stripe on the sides of the pronotum and scutellum is rarely so decided as in that species. Styles (Pl. II., fig. 12), viewed from behind, somewhat cleaver-shaped, wide, flat, black, truncate at the apex, their inner margin faintly concave on its lower half, with a feeble obtuse tooth just above the middle, and another, similar, at the apex, outer margin simple.

Dunston, near Norwich, at roots of coarse grass, September and October; local. The nymph of this species cannot be distinguished from that of the last, except by the evidence afforded by its occurrence in company with the adult form.

42. *Liburnia straminea*, Stal.

Delphax straminea, Stal, Sv. Ak. Handl., 358, 11 (1858); Fieb., Grundz. Delph., t. 8, fig. 54 (♂ genitalia).

Liburnia straminea, J. Sahl., Not. Fenn., xii., 458, 24; Fieb., Cicad. d'Eur., pt. iv., 60, 55.

L. V-flava, Scott, Ent. Mo. Mag., xviii., 104, sec. spec. typ.

♂. Pale yellow, claws fuscous. Scutellum two-thirds longer than pronotum, its side keels distinct, diverging. Elytra yellowish hyaline, about one-half as long as abdomen, separately rounded at the apex; nerves raised, concolorous. Upper notch of pygofer angular with sinuate sides, its margin, when viewed from the side, forming an obtuse but distinct angle with the vertical hind margin. The styles are really placed horizontally, so that only their ends are visible when viewed *in situ* behind. (Plate II., figs. 7 and 8).

Macropterous form.—Scutellum two and a half times as long as pronotum, its side keels scarcely perceptible, slightly diverging. Elytra hyaline, nearly twice as long as abdomen, narrowly rounded at the apex, nerves yellowish white.

♀. Similar in colour to the male. Elytra in the macropterous form about two-thirds longer than the abdomen. Length, 2—3½ mm.

Stratton Strawless, Norfolk. The male of this species may be easily recognised by the structure of the genitalia, but the female is hardly to be distinguished from that of the next.

43. *Liburnia flaveola*, Flor.

Delphax flaveola, Flor, Rhyn. Liv., ii., 72, 19; Kirschb., Cicad., 34, 31; Fieb., Grundz. Delph., t. 8, fig. 55 (♂ genitalia).

Liburnia flaveola, J. Sahl., Not. Fenn., xii., 459, 25; Fieb., Cicad. d'Eur., pt. iv., 61, 56; Scott, Ent. Mo. Mag., xiii., 130.

Yellow or somewhat ferruginous. Central facial keel acute, obsolete on the forehead. Elytra pale yellow, transparent, about one-half as long as abdomen, their apex broadly rounded. Legs yellow, sometimes with a reddish tinge, claws dark brown. Abdomen sometimes brown above. Upper notch of pygofer (male) angular with sinuate sides, its margin, when viewed from the side, passing gradually into the convex hind margin. Styles narrow-lanceolate, obliquely truncate at the apex. Teeth of anal tube large, blunt. Length, 2 mm.

Macropterous form.—Elytra nearly twice as long as abdomen, pale, transparent; nerves pale, finely granulate, marginal nerve of membrane brownish. Length, 3 mm.

London district; in July.

44. *Liburnia paludosa*, Flor.

Delphax paludosa, Flor, Rhyn. Liv., ii., 82, 27; Fieb., Grundz. Delph., t. 8, fig. 49.

Liburnia paludosa, Fieb., Cicad. d'Eur., pt. iv., 52, 47; Scott. Ent. Mo. Mag., xii., 205.

Pale yellowish or brownish yellow, apex of the 1st and base of the 2nd joint of antennæ narrowly black, tarsi darker towards the apex. Elytra ovate-lanceolate, as long as the abdomen, slightly narrowed towards the apex, nerves somewhat thickly and finely granulate. Pygofer (male) brown, its outline, when viewed from behind, lozenge-shaped with rounded angles, upper notch large, semicircular, margined with yellow; viewed from the side the margins of both the upper and lower notches pass gradually into the hind margin, thereby giving the latter the appearance of being roundly produced at the middle of its height. Styles wide, nearly reaching the teeth of the anal tube, obliquely truncate at the apex, their inner margin with a large notch near the base. Teeth of anal tube short, pointed, divergent. Length, $2\frac{1}{3}$ —3 mm.

London district; in June and July.

45. *Liburnia speciosa*, Boh.

Delphax speciosa, Boh., Sv. Ak. Handl., 59, 30 (1847).

Euides speciosa, Fieb., Grundz. Delph., t. 8, fig. 7 (details); J. Sahl., Not. Fenn., xii., 403, 1; Fieb., Cicad. d'Eur., pt. iii., 32.

Delphax basilinea, Flor, Rhyn. Liv., ii., 83, 28.

Dicranotropis basilinea, Kirschb., Cicad., 40, 1.

Liburnia speciosa, Scott, Ent. Mo. Mag., vii., 27, 24.

♂. Dirty yellow, pronotum and scutellum with a whitish central stripe. Elytra yellowish hyaline, twice as long as abdomen, with a large wedge-shaped basal spot, a broad curved band at the inner margin of the membrane, and a streak on the suture near the apex of the clavus, black, nerves very finely granulate. Scutellum more than twice as long as pronotum. Abdomen blackish brown, dorsal segments narrowly margined with whitish. Upper notch of pygofer widely arcuate, its margin, seen from the side, forming an obtuse angle with the nearly vertical hind margin; lower notch wide, shallow, obtusangular, and having in the middle a short triangular tooth. Styles short; viewed from behind their apex is apparently expanded into a large rhomboidal plate. Teeth of anal tube long, distant, curved forward at the apex.

♀. Scutellum scarcely twice as long as pronotum. Elytra about one-half as long as abdomen, yellowish hyaline, without black markings, apex obtusely rounded. Abdomen brown or yellow-brown with a darker lateral stripe, sometimes with a pale dorsal line. Length, $3\frac{1}{2}$ —5 mm.

On *Phragmites communis*.

46. *Liburnia limbata*, Fab.

Delphax limbata, Fab., Sys. Rhyn., 84, 5; Boh., Sv. Ak. Handl., 60, 31 (1847); Flor, Rhyn. Liv., ii., 85, 29; Marsh., Ent. Mo. Mag., i., 226, 6; Kirschb., Cicad., 36, 35.

D. signifera, Boh., Ofv., 164, 30 (1845).

D. palliata, Boh., Sv. Ak. Handl., 56, 22 (1849).

D. anceps, Germ., Mag. d'Ent., iv., 105, 10; Schöff., Nom. Ent., i., 65.

D. pictipennis, Curt., Brit. Ent., 657, 7.

Conomelus limbatus, Fieb., Grundz. Delph., t. 8, fig. 10 (details); Cicad. d'Eur., pt. iii., 39, 1.

Liburnia limbata, J. Sahl., Not. Fenn., xii., 467, 30; Scott, Ent. Mo. Mag., vii., 29, 39.

Fore parts above yellow, elytra whitish hyaline with a faint lilac tinge, hind margin brown, nerves with large remote black granules. Abdomen blackish brown with some transverse rows of pale spots. Crown, pronotum, and scutellum subequal in length. Elytra less than half as long as abdomen, their apex truncate. Length, $2\frac{1}{2}$ —3 mm.

Macropterous form.—Crown and pronotum yellow, scutellum yellow-brown, elytra whitish hyaline with a faint lilac tinge; a short line near the apex of the clavus, a broad curved band on the membrane (its convexity to the inner margin), the nerves of the latter, and the conspicuous granulation of all the nerves, black. Scutellum more than twice as long as pronotum, side keels obsolete. Elytra nearly twice as long as abdomen. Length, $3\frac{1}{3}$ —4 mm.

Excessively abundant amongst rushes; the macropterous form scarce.

47. *Liburnia Douglassi*, Scott.

Liburnia Douglassi, Scott, Ent. Mo. Mag., vii., 72, 38; Fieb., Cicad. d'Eur., pt. iv., 30, 27.

♂. Crown, forehead, and pronotum yellow. Face blackish, spotted with white between the keels, middle keel acute, obsolete

on the forehead. Scutellum pale brown, beyond the side keels dark brown. Elytra brown, more than half as long as abdomen, hind margin truncate with rounded angles; nerves fine, non-granulate. Abdomen black. Pygofer above brownish yellow, sides black, its outline seen from behind oval. Upper notch semicircular, with incurved angles not occupying the entire width of the segment, its margin, seen from the side, very oblique and forming a very obtuse angle with the vertical hind margin. Lower notch angular with arcuate sides. Styles large, yellowish, reaching the anal tube, upright, somewhat divergent in their lower two-thirds, suddenly narrowed into a short neck, and afterwards expanded into a square plate directed towards the interior of the cavity. Length, 2 mm.

♀. Undescribed.

Folkestone Warren; at roots of rushes.

48. *Liburnia lineata*, Perris.

Delphax lineata, Perris, Nouv. Exc. Ann. Soc. Linn. Lyon (1857), iv., 171.

D. quadrivittata, Kirschb., Cicad., 40, 45.

Eurysa vittata, Fieb., Grundz. Delph., 524.

E. lineata, Fieb., l. c., t. 8, fig. 9 (details); Cicad. d'Eur., pt. iii., 36, 2.

Liburnia lineata, Scott, Ent. Mo. Mag., vii., 29, 40.

♂. Crown yellow. Face black with two transverse white patches on each side of the middle keel, the latter obtuse obsolete above. Pronotum and scutellum grey, outer angles of both and a streak on each side of the middle keel of the latter brown. Elytra pale, more than half as long as abdomen, apex widely rounded, nerves non-granulate. Abdomen black, the two last dorsal segments more or less widely yellow. Pygofer, seen from the side obtusely angular in the middle at the junction of the shallow arcuate upper notch with the hind margin; lower notch deep, angular. Styles incurved, their inner apical angle produced into a pointed tooth, outer apical angle produced, obliquely truncate, and bearing a few fine hairs, the whole strongly resembling a profile view of a bird's head and neck. Teeth of anal tube, seen from behind, long, pointed, strongly divergent.

♀. Face brown with white patches, abdomen generally pale with blackish stripes.

Macropteros form (male). — Crown brown. Pronotum dark brown, side keels and hind margin more or less grey. Scutellum black, middle keel generally brown. Elytra pale, nearly twice as

long as abdomen, with a more or less broad smoky streak along the inner margin, nerves brown, non-granulate. Length, $2\frac{1}{2}$ —4 mm.

Shiere, near Guildford, &c.; in grassy places in spring.

49. *Liburnia uncinata*, Fieb.

Delphax uncinata, Fieb., Grundz. Delph., 524, 1, t. 8, fig. 11 (details).

Liburnia uncinata, Scott, Ent. Mo. Mag., vii., 28, 36; Fieb., Cicad. d'Eur., pt. iv., 7, 5.

♂. Face and crown black, keels yellowish. Pronotum and scutellum yellowish grey with white keels. Elytra dusky, in the macropterous form much longer than the abdomen, nerves with brown granules, costa and inner margin pale; membrane slightly darker, its marginal and other nerves brownish yellow. Abdomen orange at the base, the other dorsal segments black with white margins. Outline of pygofer, viewed from behind, roundish; upper notch wide-oval, apical angles acute, strongly incurved, its oblique margin, viewed from the side, forming with the hind margin, which is somewhat sinuate and directed obliquely downwards and forwards, a large angular incurved black-pointed tooth; lower notch semicircular bordered with white. Teeth of anal tube not apparent. Styles brown, nearly reaching the tooth on the hind margin of the pygofer, wide, lanceolate, their outer margin convex, inner margin sinuate, pilose. Length, 3 mm.

♀. This sex was apparently unknown to Fieber, but it is thus characterised by Scott:—"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."

Pitlochry, Perthshire; on grass in woods.

50. *Liburnia mesomela*, Boh.

Delphax mesomela, Boh. Sv. Ak. Handl., 257 (1849); Flor, Rhyn. Liv., ii., 50, 6; Kirschb., Cicad., 35, 33.

Delphacinus mesomelus, Fieb., Grundz. Delph., t. 8, fig. 12 (details); Cicad. d'Eur., pt. iii., 25, 1; J. Sahl., Not. Fenn., xii., 421, 1.

Liburnia mesomela, Scott, Ent. Mo. Mag., vii., 29, 41.

♂. Crown, pronotum, scutellum, and elytra white; abdomen deep black, the last two segments margined with white; legs black,

knees pale. Scutellum one-half longer than pronotum. Elytra about half as long as abdomen, truncate with rounded angles, nerves non-granulate.

♀. Whitish yellow, claws black.

Macropterous form.—Elytra pellucid, longer than the abdomen, slightly widened behind, their apex narrowly rounded, nerves pale yellow, somewhat infuscated towards the apex, marginal nerve of membrane narrowly blackish. In the male the white margin to the last two abdominal segments is wanting. Length, $2\frac{1}{4}$ — $3\frac{1}{2}$ mm.

Stratton Strawless, Norfolk; Shiere, near Guildford, &c.; in grassy places.

iv. *DICRANOTROPIS*, Fieb. (Pl. I., fig. 20).

Fieb., Grundz. Delph., 521, 16 (1866).

Easily separated from the last genus by the greater length of the bifurcation of the central facial keel, which is equal to or exceeds one-half of its entire length. Of the four described European species one only has hitherto been recorded from Britain.

1. *Dicranotropis hamata*, Boh.

Delphax hamata, Boh., Sv. Ak. Handl., 45, 14 (1849); Flor, Rhyn. Liv., ii., 51, 7; Marsh., Ent. Mo. Mag., i., 228, 9.

D. notula, H.-S., F. G., 143, 19.

D. striatella, Stal, Ofv., 191, 19 (1854).

Dicranotropis hamata, Fieb., Grundz. Delph., t. 8, fig. 17 (details); Kirschb., Cicad., 41, 2; Scott, Ent. Mo. Mag., vii., 73, 1; J. Sahl., Not. Fenn., xii., 469, 1; Fieb., Cicad. d'Eur., pt. iv., 87, 4.

♂. Pale testaceous, facial keels white, more or less strongly margined with black, pronotum and scutellum with a narrow white central stripe. Elytra more than half as long as abdomen, pellucid greyish white, hind margin white, truncate with rounded angles, inner apical angle with a short black line. Abdomen black with a fine pale dorsal line, and occasionally some rows of pale spots on each side. Pygofer black, down the middle of the upper side broadly white, upper notch deep, angular, hind margin strongly sinuate and directed obliquely downwards and forwards. Legs pale, thighs dusky, hind pair black.

♀. Paler than the male, abdomen pale testaceous, with the sides widely, the hind margin of each segment, and a fine line on

each side of the pale dorsal line black, on the dark side portions a few rows of pale spots. Elytra less than half as long as abdomen. Legs entirely pale. In some examples the dark markings, including the short line at the apex of the clavus, are entirely wanting. Length, $2\frac{3}{4}$ — $3\frac{1}{2}$ mm.

Macropterous form.—Scutellum nearly three times as long as the pronotum, its keels obsolete. Elytra about twice as long as abdomen, whitish hyaline, inner margin at the apex of the clavus with a short black line; nerves pale brown, darker behind, closely set with fine setigerous granules. Length, 4— $4\frac{1}{2}$ mm.

Very common.

V. STIROMA, Fieb. (Pl. I., fig. 21).

Fieb., Grundz. Delph., 521, 18 (1866).

Frons smooth with two keels on the disc, which, although sometimes obsolete above, are always observable near the clypeus.

TABLE OF SPECIES.

- | | | |
|----|--|---------------------------|
| 1 | (4). Facial keels filiform throughout. | |
| 2 | (3). Facial keels strong, separate at the clypeus, mouth of pygofer (male) triangular .. | 1. <i>albomarginata</i> . |
| 3 | (2). Facial keels feeble, confluent at the clypeus, mouth of pygofer (male) wide-oval, widest above the middle | 2. <i>borealis</i> . |
| 4 | (1). Facial keels obsolete above. | |
| 5 | (10). Pronotum and scutellum not striped with black. | |
| 6 | (7). Frons narrow-oblong, entirely yellow .. | 3. <i>pteridis</i> . |
| 7 | (6). Frons wide, narrowed and marked with black just above the clypeus. | |
| 8 | (9). Styles obliquely truncate at the apex, each angle produced into a small pointed tooth .. | 4. <i>affinis</i> . |
| 9 | (8). Styles acuminate at the apex | 5. <i>bicarinata</i> . |
| 10 | (5). Pronotum and scutellum yellow, each with two black stripes | 6. <i>nigrolineata</i> . |

1. *Stiroma albomarginata*, Curt.

Delphax albomarginata, Curt., Ent. Mag., i., 195; Marsh., Ent. Mo. Mag., i., 227, 8.

D. mæsta, Boh., Sv. Ak. Handl., 59, 24 (1849); Stal, Ofv., 8, 32 (1854).

D. collaris, Stal, Ofv., 175, 3 (1853).

D. adelpha, Flor, Rhyn. Liv., ii., 81, 26.

Ditropis adelpha, Fieb., Grundz. Delph., t. 8, fig. 18 (♂ genitalia); Kirschb., Cicad., 43, 5.

Stiroma adelpha, Fieb., Cicad. d'Eur., pt. iv., 91, 1.

S. albomarginata, Scott, Ent. Mo. Mag., vii., 74, 4.

♂. Crown and face brownish yellow, keels white, pronotum white, scutellum dirty yellow, elytra pitch-black, hind margin broadly white, abdomen pitch-black with a fine pale dorsal line. Crown, pronotum, and scutellum subequal in length. Elytra about one-half as long as abdomen, subtruncate at the apex. Styles spreading horizontally, triangular, acuminate.

♀. Similar to the male, but shorter elytra and the black coloration replaced by yellow-brown. Length, 2—2½ mm.

Macropterous form.—Scutellum somewhat convex, more than twice as long as pronotum, transversely impressed behind, side keels wanting. Elytra nearly twice as long as abdomen, fusco-hyaline, nerves yellow, the marginal nerve of the membrane brown. Length, 3½—4 mm.

Common.

2. *Stiroma borealis*, J. Sahl.

Ditropis borealis, J. Sahl., Not. Fenn., xii., 477, 4.

Delphax mæsta, Flor, Rhyn. Liv., ii., 80, 25.

Ditropis mæsta, Fieb., Grundz. Delph., t. 8, fig. 18 (♂ genitalia).

Stiroma mæsta, Scott, Ent. Mo. Mag., vii., 74, 5; Fieb., Cicad. d'Eur., pt. iv., 92, 2.

♂. Very similar to the last species in size and colour. Styles diverging, moderately curved, pointed, their inner margin strongly bisinuate, outer margin simple.

♀. Pale brownish yellow, facial keels and hind margin of elytra white.

Macropterous form (female).—Scutellum pitch-black, its keels obsolete. Elytra much longer than abdomen, hyaline with a faint brownish tinge, nerves brownish. Abdomen black or pitch-black.

In the synonymy of this species and the preceding I follow J. Sahlberg.

3. *Stiroma pteridis*, Boh.

Delphax pteridis, Boh., Sv. Ak. Handl., 115 (1852); Stal, Ofv., 197, 14 (1854); Marsh., Ent. Mo. Mag., i., 201, 4.

Ditropis pteridis, Fieb., Grundz. Delph., t. 8, fig. 18 (♂ genitalia); Kirschb., Cicad., 42, 2.

Stiroma pteridis, Scott, Ent. Mo. Mag., vii., 73, 3; Fieb., Cicad. d'Eur., pt. iv., 94, 3.

♂. Shining black, head, pronotum, and legs yellow. Elytra rather more than half as long as abdomen. Mouth of pygofer rhomboidal, upper notch angular. Styles black, spreading, acuminate. Anal tube white.

♀. Generally somewhat paler than the male, sometimes entirely brownish yellow. Elytra one-third as long as abdomen. Length, $2\frac{1}{2}$ —3 mm.

Macropterous form (female).—Elytra livid, brownish at the base, nerves yellowish. Length, $4\frac{1}{2}$ mm.

On *Pteris*; common. The macropterous form rare.

4. *Stiroma affinis*, Fieb.

Stiroma affinis, Fieb., Grundz. Delph., 531, 1, t. 8, fig. 18 (details); Cicad. d'Eur., pt. iv., 96, 5; Scott, Ent. Mo. Mag., vii., 73, 1.

S. nasalis, Dougl., sec. spec. comm.

♂. Fore parts dirty greyish yellow, abdomen yellow-brown, darker on the sides, a black patch on each side of the frons adjoining the clypeus (occasionally confluent), and another on each side of the scutellum beyond the side keels, and the claw-joints black. Crown a little longer than pronotum, which is about one-third shorter than the scutellum. Elytra about one-third as long as abdomen, subtruncate behind. Mouth of pygofer pyriform-oval.

♀. Yellowish white, with the usual black markings on the frons and scutellum, and generally a dark stripe down each side of the abdomen.

Macropterous form (female).—Crown and face yellow-brown, the dark marking at the apex of the frons faint and ill-defined, remainder of the body dark piceous. Scutellum at least twice as long as pronotum; its side keels obsolete, subparallel. Elytra one-third longer than abdomen, fusco-hyaline; nerves fine, brown. Length, $3\frac{1}{4}$ —4 mm.

Not uncommon in woods.

5. *Stiroma bicarinata*, H.-Scff.

Delphax bicarinata, H.-Scff., Deuts. Ins., 143, 21.

D. nasalis, Boh., Sv. Ak. Handl., 41, 11 (1849); Flor, Rhyn. Liv., ii., 78, 24; Marsh., Ent. Mo. Mag., i., 227, 7.

D. mutabilis, Boh., Sv. Ak. Handl., 43, 3 (1849).

Stiroma mutabilis, Fieb., Grundz. Delph., 15, 2, t. 8, fig. 18 (♂ genitalia).

Ditropis bicarinata, Kirschb., Cicad., 43, 3; J. Sahl., Not. Fenn., xii., 480. 6.

Stiroma nasalis, Scott, Ent. Mo. Mag., vii., 73, 2; Fieb., Cicad. d'Eur., pt. iv., 95, 4.

This species so nearly resembles the preceding that it can only be separated from it with certainty by the characters derived from the male genitalia. Mouth of pygofer pyriform-oval.

Hitherto rare, but I have examined one undoubted male from coll. Capron.

6. *Stiroma nigrolineata*, Scott.

Eurybregma nigrolineata, Scott, Ent. Mo. Mag., ii., 92.

♂. Crown almost twice as broad as long, brown, impressions black, keel between the two basal ones yellow. Face yellow-brown, its lower half, outside the middle keels, black; keels rudimentary, approximating and uniting at the apex. Pronotum and scutellum yellow, their side margins and a wide stripe down each side of the centre black. Elytra much longer than the abdomen, whitish hyaline; a brown stripe (becoming darker behind) near the costa, and another near the claval suture, round the apex broadly black. Abdomen black, dorsal line and side margins narrowly yellow. Pygofer black, with a somewhat triangular yellow patch on each side near the upper margin, hind margin almost vertical, mouth transverse-ovate. Styles long, aculeate, diverging, almost touching the margin at the height of the anal tube. Legs pale fusco-testaceous, thighs with a black stripe on the inside. Length, nearly 5 mm.

♀. Undescribed.

By sweeping in June, Fawley.

VII. CERCOPIDÆ.

Frons strongly convex. Ocelli two, placed on the hind part of the crown. Hind margin of pronotum with a notch in the middle. Elytra coriaceous. Tibiæ cylindric, hind pair with two spines on the outer side and a ring of bristles round the apex. Two basal joints of the tarsi denticulate at the apex. Pulvilli between the claws distinct.

TABLE OF GENERA.

- | | |
|---|-----------------|
| 1 (2). Front of pronotum straight | i. TRIECPHORA. |
| 2 (1). Front of pronotum produced between the eyes. | |
| 3 (4). Crown and pronotum with a middle keel | ii. APHROPHORA. |
| 4 (3). Crown and pronotum not keeled | iii. PHILÆNUS. |

i. *TRIECPHORA*, *Am. et Serv.* (Pl. I., fig. 22).

Am. et Serv., Hém., 561, 458 (1843).

Ocelli much nearer to each other than to the eyes. Rostrum 2-jointed, not reaching beyond the middle coxæ. The free side margins of the pronotum as long as the scutellum.

1. *Triecphora vulnerata*, Illig.

Cercopis sanguinolenta, Panz., Faun. Germ., 33, 12;
Burm., Handb., ii., 125, 7, var. c.

C. vulnerata, Illig., Germar's Mag. d'Ent., iv., 45, 15;
Curt., Brit. Ent., p. and pl. 461; Fieb., Ent.
Mon., 7, 1, t. 1, figs. 1, 2; Kirschb., Cicad., 63, 8.

Triecphora sanguinolenta, Marsh., Ent. Mo. Mag., ii.,
54, 1.

Black, the basal third of the clavus, an abbreviated band across the middle of the corium, and an outwardly curved band just before the apex of each elytron, blood-red. Pubescence pale and very fine. Punctuation very close and fine. Side keels of the face indistinct, the central one wanting. Length, 10—11 mm.

Woods in the south, on alder; very abundant in Lincolnshire and Derbyshire, usually on long grass.

ii. *APHROPHORA*, *Germ.* (Pl. I., fig. 23).

Germar, Mag. d'Ent., iv., 50 (1821).

Ocelli as in the last genus. Rostrum 3-jointed, reaching or nearly reaching the hind coxæ. The free side margins of the pronotum much shorter than the scutellum.

We possess two species of this genus, which may be thus distinguished :—

Costa with an oblique band-like spot near the middle and another (triangular) behind	1. <i>alni</i> .
Costa without distinct white markings	2. <i>salicis</i> .

1. *Aphrophora alni*, Fall.

Cercopis alni, Fall., Hem. Suec., ii., 11, 2.

C. bifasciata, Fab., Ent. Sys., iv., 56, 40.

Aphrophora spumaria, Germ., Mag. d'Ent., iv., 50, 1;
Burm., Handb., ii., 121, 1; *Am. et Serv.*, Hém.,
536, 1.

A. alni, Flor, Rhyn. Liv., ii., 135, 1; Marsh., Ent. Mo. Mag., ii., 57, 1; Kirschb., Cicad., 64, 2; Scott, Ent. Mo. Mag., vii., 271, 1; J. Sahl., Not. Fenn., xii., 86, 1.

Pale greyish brown with very short yellow pubescence, closely and deeply punctured with black, except on the white portions of the elytra, where the punctuation is pale. Markings on elytra as above. Abdomen black. Legs pale, dark at the extreme apex. Length, $8\frac{1}{2}$ — $9\frac{1}{2}$ mm.

Common on alders, &c.

2. *Aphrophora salicis*, DeG.

Cicada spumaria salicis, DeGeer, Abh. Gesch. Ins., iii., 116, 2.

Cercopis rustica, Fab., Ent. Sys., iv., 54, 33; Sys. Rhyn., 97, 52.

C. salicis, Fall., Hem. Suec., ii., 11, 1.

Aphrophora salicina, Am. et Serv., Hém., 255, 2.

A. salicis, Flor, Rhyn. Liv., ii., 136, 2; Marsh., Ent. Mo. Mag., ii., 58, 2; Kirschb., Cicad., 63, 1; Scott, Ent. Mo. Mag., vii., 272, 2; J. Sahl., Not. Fenn., xii., 87, 3.

Greyish yellow with short yellow pubescence, closely and finely punctured with black. Elytra occasionally with faint traces of a triangular whitish spot on the costa near the base. Length, 10 — $10\frac{1}{2}$ mm.

Not so common as the preceding.

iii. PHILÆNUS, *Stal.* (Pl. I., fig. 24).

Stal, Stett. Ent. Zeit., xxv., 66, (1864).

Ocelli nearer to the eyes than to each other. Rostrum 2-jointed, not reaching beyond the middle coxæ. The free side margins of the pronotum much shorter than the scutellum.

TABLE OF SPECIES.

1 (2). Sides of elytra distinctly rounded	1. <i>spumarius</i> .
2 (1). Sides of elytra parallel.	
3 (6). Costa with one or more large white spots.	
4 (5). Costa with two white spots	2. <i>campestris</i> .
5 (4). Costa with one white spot and a white streak	3. <i>exclamationis</i> .
6 (3). Costa with a white streak, without spots, or elytra entirely black	4. <i>lineatus</i> .

1. *Philænus spumarius*, Linn.

It is unnecessary to encumber this work with the full synonymy of this abundant and well-known species, which may at all times be readily distinguished from its congeners by the distinctly curved side margins of its elytra. Some of its colour varieties are very constant in pattern, and the following, according to J. Sahlberg, have received distinctive names:—

spumaria, Auct. Yellowish brown, costa with two large transverse white spots.

fasciata, Fab. Head and pronotum yellow, elytra black with two large transverse white spots on the costa.

gibba, Zett. Crown and front half of the pronotum yellow; hind part of the latter, scutellum, and elytra black, the latter with a large white transverse spot before the middle.

biguttata, Fab. Black mottled with yellow, elytra with a small round white spot behind.

leucophthalma, Linn. Entirely black.

leucocephala, Linn. Black with the crown and front of pronotum yellow.

lateralis, Linn. Black, sides of elytra widely yellow.

marginella, Fab. Black; crown, front of pronotum, and sides of elytra yellow.

vittata, Fab. Yellowish; hind part of pronotum, scutellum, and a wide sutural stripe brown.

ustulata, Fall. Yellowish; crown, pronotum, and margin of elytra at the base and apex black.

præusta, Fab. Yellowish; hind part of pronotum, scutellum, and apex of elytra brown.

lineata, Fab. Yellowish; middle of the hind part of pronotum, scutellum, a stripe on the elytra, and the suture blackish brown.

populi, Fab. Unicolorous yellow.

Length, 5—6 mm.

2. *Philænus campestris*, Fall.

Cercopis campestris, Fall., Hem. Suec., ii., 20, 7.

Ptyelus campestris, Flor, Rhyn. Liv., ii., 125, 3;
Kirschb., Cicad., 65, 4; Scott, Ent. Mo. Mag.,
vii., 243, 2.

Philænus campestris, J. Sahl., Not. Fenn., xii., 95, 6.

Upper side pale yellowish brown or fawn-colour, costa at the base narrowly and two large triangular spots upon it behind white.

Very closely and finely punctured. Pubescence dense, pale. Crown, pronotum, and scutellum sometimes with a blackish brown central stripe. Length, 4—5 mm.

The least common of the genus.

3. *Philænus exclamationis*, Thunb.

Cicada exclamationis, Thunb., Act. Ups., iv., 24, 40.

Cercopis exclamationis, Fall., Hem. Suec., ii., 21, 8.

Ptyelus exclamationis, Flor, Rhyn. Liv., ii., 124, 2;

Marsh., Ent. Mo. Mag., ii., 56, 2; Kirschb.,

Cicad., 65, 3; Scott, Ent. Mo. Mag., vii., 242, 3.

Philænus exclamationis, J. Sahl., Not. Fenn., xii., 93, 4.

Lighter or darker yellowish brown with a faint bronzy tinge, costa widely and a large triangular spot upon it just before the apex white. Apex of the clavus sometimes widely pale. Very closely and somewhat strongly punctured, densely clothed with short pale hairs. Length, $3\frac{1}{2}$ —4 mm.

Moderately common.

4. *Philænus lineatus*, Linn.

Cicada lineata, Linn., Faun. Suec., 241, 888.

Cercopis lineata, Fall., Hem. Suec., ii., 20, 6.

C. abbreviata, Fab., Ent. Sys., iv., 35, 41.

Ptyelus lineatus, Flor, Rhyn. Liv., ii., 123, 1; Marsh.,

Ent. Mo. Mag., ii., 55, 1; Kirschb., Cicad., 65, 2;

Scott, Ent. Mo. Mag., vii., 242, 2.

Philænus lineatus, J. Sahl., Not. Fenn., xii., 96, 7.

Pale yellow, costa with a white stripe, just within which is a black one, which becomes indistinct on the hinder half of the elytron. Densely clothed with very short pale pubescence, punctuation very close and fine. Length, $4\frac{1}{2}$ — $6\frac{1}{2}$ mm.

Very common. Through the kindness of Mr. E. A. Butler I have had the opportunity of examining eight examples of a black form of this species, which may be classified as follows:—

- a. Pitch-black, costa whitish (three females).
- b. Pitch-black, costa whitish on its basal half (male and female).
- c. Pitch-black, metasternum and hind coxæ yellow (male and female).
- d. Entirely pitch-black (one male).

One example of var. *c* was from Scotland, and all the others from Chobham. Although this species is at times excessively abundant here in Norfolk, I have not hitherto met with a variety.

VIII. LEDRIDÆ.

Characters those of the single genus.

LEDRA, *Fab.* (Pl. I. fig. 25).

Fab., *Sys. Rhyn.*, 24 (1803).

Crown foliaceous in front, its front margin bluntly angular in the middle and forming a distinct obtuse angle near each eye. Eyes small, globose. Ocelli near the base of the crown nearly twice as far from the eyes as from each other. Elytra subcoriaceous. Outer edge of hind tibiæ produced in a flattened knife-like form, serrato-dentate and densely ciliate.

1. *Ledra aurita*, Linn.

Cicada aurita, Linn., *Sys. Nat.*, 706, 7.

Membracis aurita, *Fab.*, *Ent. Sys.* iv., 11, 15; *Panz.*, *F. G.*, 50, 18.

Ledra aurita, *Fab.*, *Sys. Rhyn.*, 24, 1; *Germ.*, *Mag. d'Ent.*, iv., 54, 1; *Fall.*, *Hem. Suec.*, ii., 9, 1; *Burm.*, *Handb.*, ii., 116, 16; *Gen. Ins. descr. and pl.*; *Curt.*, *Brit. Ent.*, p. and pl. 676; *Kirschb.*, *Cicad.*, 71, 1; *J. Sahl.*, *Not. Fenn.*, xii., 103, 1.

Lighter or darker brown with a greenish tinge, elytra paler towards the apex, with a broad indistinct pale band before the middle, and traces of a pale subtriangular spot on the costa just before the apex. Abdomen above black (male) or brownish yellow (female). Upper side roughly punctured with brown. Crown tricarinate, the side keels abbreviated. Pronotum in front and between the processes and the scutellum behind transversely wrinkled. Nerves of elytra brown, strongly raised. Length, 13—18 mm.

On oaks; not very common.

IX. ULOPIDÆ.

The characters coincide with those of the single genus.

ULOPA, *Fall.* (Pl. I., fig. 26).

Fall., *Hem. Suec. Cicad.*, 65 (1826).

Legs subsimilar. Tibiæ triangular-prismatic. Front margin of crown acute.

Of the five described European species only two have been detected in Britain, and they may be distinguished as follows:—

Front margin of crown forming an obtuse but distinct angle near each eye, straight or faintly concave in the middle	.. .. .	1. <i>reticulata</i> .
Curve of front margin of crown continuous	.. ..	2. <i>trivia</i> .

1. *Ulopa reticulata*, Fab.

Cercopis reticulata, Fab., *Sys. Rhyn.*, 98, 64.

C. ericæ, Germ., *Faun. Ins.*, iii., t. 24.

Ulopa obtecta, *Fall.*, *Hem. Suec.*, ii., 66, 2; Germ., *Mag. d'Ent.*, iv., 55, 1; *Burm.*, *Handb.*, ii., 106, 1; *Flor. Rhyn. Liv.*, ii., 140, 1; *Marsh.*, *Ent. Mo. Mag.*, ii., 59, 1; *Kirschb.*, *Cicad.*, 69, 2.

Eulopa ericetorum, *St. Farg. et Serv.*, *Enc. Méth.*, x., 765, 1.

Ulopa macroptera, *Kirschb.*, *Cicad.*, 69, 3.

U. reticulata, *J. Sahl.*, *Not. Fenn.*, xii., 372, 1.

Brown with a reddish tinge, elytra with two oblique white bands running from the suture to nearly the same point on the costa. Fore parts strongly punctured. Crown with a large depression near each eye. Pronotum with a horseshoe-shaped impression on each side. Elytra convex, parallel-sided, narrowed and deflexed behind, ocellate-punctate; nerves strongly raised, claval suture not apparent.

Macropterous form.—Pronotum wider and more convex behind. Elytra pellucid, not deflexed behind, claval suture distinct, the white bands obsolete. Length, 3—3 $\frac{3}{4}$ mm.

Common.

2. *Ulopa trivia*, Germ.

Ulopa trivia, Germ., *Faun. Ins.*, iv., pl. 21, ♂; *Mag. d'Ent.*, iv., 56, 4; *Burm.*, *Gen. Ins.*, i., pl. 3; *Kirschb.*, *Cicad.*, 68, 1; *Scott.*, *Ent. Mo. Mag.*, vii., 272, 2.

U. decussata, Germ., *Mag. d'Ent.*, iv., 55, 2 (♀).

Similar in form to the preceding, but somewhat smaller. Male

yellowish white; a broad stripe on the crown near each eye, the front and hind margins of pronotum, and three stripes on each elytron, dark brown or black. Female entirely yellowish white. Length, $2\frac{1}{2}$ — $3\frac{1}{2}$ mm.

Macropterous form undescribed. Scarce. Lulworth; Riddlesdown; Shiere, near Guildford; by sweeping, and at the roots of low plants.

X. PAROPIIDÆ.

Represented in Britain by the single genus.

MEGOPHTHALMUS, *Curt.* (Pl. II., fig. 3).

Curt., *Ent. Mag.*, i., 174 (1832).

Each end of the keel dividing the crown from the face split into a fork, in the angle of which is placed the ocellus. Legs sub-similar. Front tibiæ triangular-prismatic, the hind pair quadrangular-prismatic.

1. *Megophthalmus scanicus*, Fall.

Cicada scanica, Fall., *Act. Holm.*, 113 (1806).

Ulopa scanica, Fall., *Hem. Suec.*, ii., 65, 1.

Cælidia scutata, Germ., *Mag. d'Ent.*, iv., 79, 5 (♂).

Megophthalmus bipunctatus, *Curt.*, *Ent. Mag.*, i., 194.

Paropia scutata, Burm., *Gen. Ins.*, i., pl. 7.

P. pallidipennis, Hardy, *Trans. Tyneside Field Club*, i., 430, 1 (♀).

Megophthalmus scanicus, Marsh., *Ent. Mo. Mag.*, ii., 83, 1.

Paropia scanica, Kirschb., *Cicad.*, 70, 1; J. Sahl., *Not. Fenn.*, xii., 375, 1.

Dirty brownish yellow, roughly punctured, nerves of elytra strongly raised. Male, crown with three spots, pronotum with a fine central line and two blotches on each side confluent in front, and the scutellum entirely, except a short pale line at each end of the transverse impression, black; female generally entirely pale, but examples are frequently met with in which the dark markings of the male are strongly indicated, the elytra have the nerves and two short lines on the suture fuscous or black, and the areas, especially towards the apex, are sparingly speckled with fuscous. Length, 3—4 mm.

Common and generally distributed.

XI. BYTHOSCOPIDÆ.

Forehead obtuse. Crown short and very wide. Ocelli on the upper part of the frons much below its upper margin. Face dilated, frons and clypeus somewhat convex. Cubital nerves forked, the inner one joined to the brachial by a transverse nerve. Front tibiæ without spines on the outer side.

TABLE OF GENERA.

- 1 (6). Antennæ inserted in a deep cavity beneath a ledge.
- 2 (5). Striation of pronotum transverse.
- 3 (4). Side margins of pronotum sharply keeled, of moderate length i. MACROPSIS.
- 4 (3). Side margins of pronotum not sharply keeled, very short ii. BYTHOSCOPIUS.
- 5 (2). Striation of pronotum running obliquely from the middle of its front margin towards its hinder angles iii. PEDIOPSIS.
- 6 (1). Antennæ inserted in a feeble cavity, their base free.
- 7 (8). Head with the eyes wider than the elytra at the base. Membrane with an appendix .. iv. IDIOCERUS
- 8 (7). Head with the eyes as wide as the elytra at the base. No appendix to the membrane .. v. AGALLIA.

i. MACROPSIS, *Lewis*. (Pl. II., fig. 2).

Lewis, Trans. Ent. Soc. Lond., i., 59 (1836).

Crown with the eyes not wider than the pronotum. Frontal suture not reaching the base of the antennæ. Pronotum finely transversely striate. Elytra subcoriaceous, deeply punctured.

Elytra finely punctured with black	1. <i>microcephala</i> .
Punctuation of elytra concolorous	2. <i>lanio</i> .

1. *Macropsis microcephala*, H.-S.

Bythoscopus microcephalus, H.-Schäff., Faun. Germ., 164, 8.

Batracomorphus irroratus, *Lewis*, Trans. Ent. Soc. Lond., i., 51, pl. 7, fig. 5.

Jassus punctulatus, *Forel*, Bull. Soc. Vaud., v., 253, pl. 2.

Macropsis punctuosus, *Kirschb.*, Cicad., 168, 2.

M. microcephala, *Fieb.*, Eur. Bythosc., 450, 1; *Scott*, Ent. Mo. Mag., x., 22, 1.

Very pale bluish green, elytra with a fine black punctuation,

which occasionally extends to the crown and pronotum. Crown distinctly longer in the middle than at the sides, at least in the male. Length, 4—5 mm.

Amongst *Helianthemum* in July, Mickleham Downs, &c.

2. *Macropsis lanio*, Linn.

Cicada lanio, Linn., Faun. Suec., 892; Sys. Nat., v., 464, 33.

Jassus lanio, Fab., Sys. Rhyn., 86, 4; Germ., Mag. d'Ent., iv., 81, 1; Fall., Hem. Suec., ii., 59, 1.

Bythoscopus lanio, Burm., Handb., 109, 1.

Cicada brunnea, Fab., Ent. Sys., 43, 68.

Jassus brunneus, Fab., Sys. Rhyn., 87, 10.

Macropsis lanio, Am. et Serv., Hem., 581, 1; Flor. Rhyn. Liv., ii., 155, 1; Marsh., Ent. Mo. Mag., ii., 102, 1; Kirschb., Cicad., 168, 1; Fieb., Eur. Bythosc., 450, 3; J. Sahl., Not. Fenn., xii., 115, 1; Scott, Ent. Mo. Mag., x., 23, 2.

Crown, pronotum, and scutellum pale brown, more or less closely speckled with red-brown or black; elytra green or pale reddish brown, with a shallow rugose punctuation and strongly raised nerves. Crown not longer in the middle than at the sides. Length, 7—8 mm.

Very common on oak.

ii. BYTHOSCOPIUS, *Germ.* (Pl. II., fig. 1).

Germ., Silb. Revue, i., 180, 43 (1833).

Distinguished from the preceding genus by its impunctate elytra and the much greater obliquity of the ledge which covers the base of the antennæ, and from the following by the less angular hind margin of the crown and the transverse sculpture of the pronotum.

TABLE OF SPECIES.

- 1 (4). Face (seen in profile) somewhat flattened.
- 2 (3). Face with a deep narrow curved impression on each side, which is distinct in the female.
Inhabits alder 1. *alni*.
- 3 (2). Face with a wide shallow impunctate impression on each side, which is only faintly indicated in the female. Inhabits sallow and birch 2. *rufusculus*.
- 4 (1). Face strongly convex, consequently the facial impressions appear much deeper than in our other species 3. *flavicollis*,

1. *Bythoscopus alni*, Schr.

Cicada alni, Schrank, Faun. Boic., ii., 50, 1056.

Jassus alni, Boh., Sv. Ak. Handl., 56, 28 (1847).

Pediopsis Heydenii, Kirschb., Cicad., 171, 2.

P. alni, Thoms., Opusc. Ent., iii., 319, 5; J. Sahl., Not. Fenn., xii., 119, 2.

Bythoscopus alni, Scott, Ent. Mo. Mag., x., 82, 1.

♂. Crown and face greenish yellow, the former more or less suffused with blackish, but having a pale central line and a black puncture on each side, the latter with a pale central line in its upper half, a black puncture on each side near the eye, the upper part of the curved impression filled up with black and generally a pair of small black points towards the apex. Pronotum greenish yellow, with a large irregular dark patch on each side of the front margin and one or two black punctures behind each eye, the disk having a blackish appearance owing to the channels of the sculpture being mostly black. Scutellum reddish yellow; a large triangle on each side at the base, a linear central stripe, the transverse channel and a pair of small round spots just above it, brown or black. Elytra transparent brownish yellow, the apical two-thirds of the costal and subapical areas, the disc of the subcostal area and that below it, and a broad band at the base of the clavus, whitish hyaline; claval suture and the nerves dark brown or black; cubital nerve as far as the fork, brachial nerve as far as the first transverse nerve, the basal three-fourths of the anal and axillary nerves, the nerve of the inner margin with the exception of a short piece at the apex of the clavus and the part between the apices of the anal and axillary nerves, white. Abdomen above black, hind margin of the segments narrowly reddish. Legs pale, hind tibiae with a black stripe both on the inner and outer sides.

♀. Similar in coloration to the male, but with all the dark markings less pronounced, and the abdomen above entirely reddish yellow-brown. Length, $5\frac{1}{2}$ —6 mm.

Abundant on alder.

2. *Bythoscopus rufusculus*, Fieb.

Bythoscopus rufusculus, Fieb., Eur. Bythosc., 456, 1; Scott, Ent. Mo. Mag., x., 241.

Pediopsis fruticola, var. 7, *frontalis*, Flor, Rhyn. Liv., ii., 186, 2 (partim).

P. brevicauda, Thoms., Opusc. Ent., iii., 318, 3; J. Sahl., Not. Fenn., xii., 124, 5.

♂. Crown dark brown or black, narrowly greenish yellow in front with a black puncture on each side. Face greenish yellow, generally with a narrow black band above not reaching the ocelli at either end. Pronotum greenish yellow, the channels of the sculpture mostly blackish. Scutellum reddish yellow; a large triangle on each side at the base, a narrow central stripe reaching as far as the transverse channel, and occasionally a pair of minute round spots just above the latter, reddish brown or black. Elytra whitish hyaline, clavus with a faint yellow-brown tinge; the apical areas, an ill-defined spot on the base of the second and third subapical areas, the apex of the clavus, and the space between the apices of the anal and axillary nerves, dark brown, claval suture and the nerves blackish brown, the basal half of the axillary nerve white. Abdomen above black, hind margins of the segments very narrowly yellow. Hind tibiae with a black stripe on the outer edge only.

♀. Crown, face, pronotum, scutellum, and upper side of the abdomen reddish yellow-brown, generally without darker markings. Elytra brown, the discs of the subcostal area and the one below it and the apical three-fourths of the subapical areas whitish hyaline. Length, 4—5 mm.

On sallow and birch; somewhat local.

3. *Bythoscopus flavicollis*, Linn.

Cicada flavicollis, Linn., Faun. Suec., 242, 891.

Jassus reticulatus, *ferrugineus*, *flavicollis*, *pulchellus*, *fenestratus*, and *personatus*, Curt., Brit. Ent., 636, 2—7.

Pediopsis fruticola, Flor, Rhyn. Liv., ii., 184, 2; Marsh., Ent. Mo. Mag., ii., 125, 3; Kirschb., Cicad., 170, 1; Thoms., Opusc. Ent., iii., 318, 2.

P. flavicollis, J. Sahl., Not. Fenn., xii., 120, 3.

Bythoscopus fruticola, Fieb., Eur. Bythosc., 457, 2; Scott, Ent. Mo. Mag., x., 126, 2.

An exceedingly variable species, but always easy to distinguish from its congeners when once the structural characters of the face have been appreciated. The following are some of the more usual colour varieties:—

1. Elytra whitish hyaline, nerves blackish brown.
2. Upper side entirely pale brown.
3. Upper side greenish yellow.

4. Crown, pronotum, scutellum, and base of the clavus widely, greenish yellow. Elytra pale yellow-brown, a large ill-defined blotch in the middle and another before the apex white.
5. Closely resembling female *alni* in the coloration of the elytra. Length, 5—6 mm.

Abundant on birch.

iii. PEDIOPSIS, *Burm.* (Pl. II., fig. 6).

Burmeister, *Genera Insectorum*, 16 (1838).

Distinguished from its allies by the direction of the sculpture of the pronotum. This genus as here limited comprises two very natural groups, one consisting of wide species with the crown less angular and the face convex with its upper margin widely rounded, as in *tiliæ*, *scutellatus*, &c., and the other comprising our remaining species, which are narrower and more pointed in front, and have the face flat and rhomboidal in shape. The full complement of black markings on the face of those species which have spotted faces is nine, placed as follows: a pair of moderate size near the upper margin with a dissimilar one between them, a small round one at each ocellus, a large subtriangular or comma-shaped pair just above the clypeus, and between the bases of these a minute punctiform pair. These markings occur in various combinations in different species, and, notwithstanding their liability to vary within certain limits, sometimes afford useful aids to identification.

TABLE OF SPECIES.

- | | | |
|---|---|-------------------------|
| 1 | (2). Crown linear, scarcely visible from above .. | 1. <i>tiliæ</i> . |
| 2 | (1). Crown distinctly visible from above. | |
| 3 | (8). Front margin of crown rounded or scarcely angular in front. Face distinctly convex. | |
| 4 | (5). Elytra lacteo-hyaline | 2. <i>nanus</i> . |
| 5 | (4). Elytra hyaline with a brownish yellow tinge, nerves dark brown or black. | |
| 6 | (7). Inner side of hind tibiæ pale throughout .. | 3. <i>scutellatus</i> . |
| 7 | (6). Inner side of hind tibiæ with two short black streaks, one near the base, the other just before the apex | 4. <i>tibialis</i> . |
| 8 | (3). Front margin of crown nearly rectangular. Face flat. | |

- 9 (20). Species not pale green.
 10 (17). Face spotted with black.
 11 (14). Nerves darker than the elytra.
 12 (13). Nerves not suffused with fuscous 5. *nassatus*.
 13 (12). Nerves at the base of the subapical areas conspicuously suffused with fuscous 6. *fuscinervis*.
 14 (11). Nerves concolorous.
 15 (16). Wider and less pointed in front; elytra without fuscous bands 7. *impurus*.
 16 (15). Narrower and more pointed in front; elytra with two wide ill-defined fuscous bands .. 8. *distinctus*.
 17 (10). Face unspotted.
 18 (19). Costa narrowly brown. Inhabits elm .. 9. *ulmi*.
 19 (18). Costa concolorous. Inhabits sallow .. 10. *cereus*.
 20 (9). Species pale green 11. *virescens*.

1. *Pediopsis tiliæ*, Germ.

Jassus tiliæ, Germ., Faun. Eur., 14, 14

Pediopsis tiliæ, Flor, Rhyn. Liv., ii., 183, 1; Kirschb., Cicad., 176, 9; Fieb., Eur. Bythosc., 457, 1; Thoms., Opusc. Ent., iii., 317, 1; J. Sahl., Not. Fenn., xii., 118, 1; Scott, Ent. Mo. Mag., x., 128, 1.

Head and pronotum greenish yellow. Scutellum and elytra yellow-brown, the latter generally irrorated with darker brown, especially towards the apex; on the inner margin beyond the apex of the clavus a whitish spot followed by a dark brown one. Abdomen above black, hind margin of the segments narrowly pale, beneath yellow. Legs yellow-brown. Length, 5—5½ mm.

Rare. Esher, in June. Said to occur on *Tilia parvifolia*.

2. *Pediopsis nanus*, H.-S.

Bythoscopus nanus, H.-Scff., Deuts. Ins., 143, 6.

Pediopsis nanus, Flor, Rhyn. Liv., ii., 192, 6; Kirschb., Cicad., 173, 5; Fieb., Eur. Bythosc., 461, 12; J. Sahl., Not. Fenn., xii., 136, 16; Scott, Ent. Mo. Mag., x., 235, 11.

♂. Body black, face generally with a stripe on its lower half and the free side margins narrowly yellow. Hind margin of the crown narrowly, sides and hind margin of the pronotum, and the hind margin of the scutellum irregularly, whitish. Elytra lacteo-

hyaline; nerves brown, paler on the disc. Legs pale, hind pairs of thighs black except at the apex, all the tibiae with a black spot on the outside at the base.

♀. Face above and the crown more or less yellow. Otherwise as in the male. Length, 2—2½ mm.

On short grass, Boxhill, July.

3. *Pediopsis scutellatus*, Boh.

Jassus scutellatus, Boh., Ofv., 162, 25 (1845); Sv. Ak. Handl., 53, 26 (1847).

Bythoscopus diadema, H.-Scff., Deuts. Ins., 143, 11.

Pediopsis diadema, Kirschb., Cicad., 172, 3.

P. scutellatus, Flor, Rhyn. Liv., ii., 191, 5; Marsh., Ent. Mo. Mag., ii., 125, 2; Thoms., Opusc. Ent. 320, 6; J. Sahl., Not. Fenn., xii., 135, 15; Scott, Ent. Mo. Mag., x., 194, 9.

P. fuscinervis, Scott, l. c., 122, 7, sec. spec. typ.

Head and pronotum pale greyish yellow, the former with from four to nine black spots, of which the uppermost pair are round, and the dissimilar one when present takes the form of a short double stripe, the latter more or less blotched with brown or black so as to leave the sides and front margin irregularly pale. Scutellum yellow, with a black triangle on each side at the base, and frequently a pair of black points before the transverse channel. Elytra hyaline with a faint brownish yellow tinge, claval suture and the nerves brown or black. Abdomen black, hind margins of the segments more or less widely yellow. Legs greyish yellow, hind tibiae with a black spot on the outside at the base. Length, 4½—5¼ mm.

On willows, &c.

4. *Pediopsis tibialis*, Scott.

Pediopsis tibialis, Scott, Ent. Mo. Mag., x., 195, 10.

Very similar in appearance to the preceding, but the two uppermost facial spots have a tendency to become comma-shaped, and have the included space suffused with blackish; the spot at each ocellus, which is seldom developed in *scutellatus*, is almost invariably well marked, while the pair of punctiform spots between the base of the lower comma-shaped pair are wanting; the hind tibiae, too, in addition to the spot on the outside at the base, have two short black streaks on the inner side, which latter markings are

occasionally present on the inner side of the two front pairs. Length, $3\frac{1}{2}$ — $4\frac{1}{2}$ mm.

Dartford Heath, Headley Lane, and Bexley road, on poplars in July and August. Not uncommon near Norwich in mixed hedges, especially amongst brambles. Specimens in which the markings on the inner side of the hind tibiae and the upper part of the face wholly or partially disappear are sometimes difficult to separate from *scutellatus*.

5. *Pediopsis nassatus*, Germ.

Jassus nassatus, Germ., Faun. Ins. Eur., 17, 13;

H.-Scff., Deuts. Ins., 143, 8.

Bythoscopus nitidulus, H.-Scff., l. c., 143, 12.

Pediopsis planicollis, Thoms., Opusc. Ent., i., 320, 8.

P. nassatus, Flor, Rhyn. Liv., ii., 189, 4; Kirschb.,

Cicad., 174, 6; J. Sahl., Not. Fenn., xii., 131, 11;

Scott, Ent. Mo. Mag., x., 193, 8.

♂. Face yellow, the uppermost pair of black spots small and round, with the space between them frequently dusky but no dissimilar spot, the lower comma-shaped pair very large, the pair of points between the bases of the latter distinct, and the spot at each ocellus occasionally present. Pronotum yellow with an ovate black spot behind each eye, its disc more or less suffused with brown or black. Scutellum yellow with a large black triangle on each side at the base. Elytra hyaline with a brown tinge, claval suture and the nerves pale brown. Abdomen above black, hind margins of the segments very narrowly paler. Thighs generally piceous, tibiae with a black stripe on the inner side, hind pair with a black spot on the outer side at the base.

♀. Similar to the male, but with a strong green tinge in the only example which I possess. Length, $4\frac{1}{4}$ —5 mm.

On willows, &c. Apparently scarce.

6. *Pediopsis fuscinervis*, Boh.

Jassus fuscinervis, Boh., Sv. Ak. Handl., 57, 29 (1847).

Pediopsis fuscinervis, Thoms., Opusc. Ent., i., 321, 10.

P. nassatus, J. Sahl., Not. Fenn., xii., 132, var. *f*.

♂. Face (Pl. II., fig. 11) greyish yellow with from three to five black spots, of which the subtriangular dissimilar spot

is the largest and most constant, the uppermost pair are frequently reduced to mere points, and the lower comma-shaped pair are either represented by a pair of black points or absent altogether. Pronotum greyish yellow, its disc more or less suffused with brown, the smooth ovate space behind each eye sometimes filled up with black. Scutellum greyish yellow with a black triangle on each side at the base and a pair of black points just above the transverse channel. Elytra whitish hyaline with a strong brown cloud on the base of the subapical areas, and the apical areas and the clavus below the anal nerve tinged with brown; nerves strong, rust-brown. Abdomen above black, hind margins of the segments narrowly yellow. Legs pale, hind tibiæ with a small black spot on the outer side at the base.

♀. General coloration with a bright rust-brown tinge. Length, $4\frac{1}{4}$ —5 mm.

On aspen. Stoke Holy Cross, Norfolk.

7. *Pediopsis impurus*, Boh.

Jassus impurus, Boh., Sv. Ak. Handl., 37, 9 (1849).

Pediopsis impurus, Thoms., Opusc. Ent., iii., 321, 11;
J. Sahl., Not. Fenn., xii., 133, 13; Scott, Ent.
Mo. Mag., x., 190, 5.

Face greyish yellow, its disc frequently suffused with dusky, the three uppermost spots subequal in size, the lower comma-shaped ones large and well-marked. Pronotum pale brownish grey, the smooth space behind each eye filled up with black. Scutellum greyish yellow, with a black triangle on each side at the base and occasionally a pair of black points just above the transverse channel. Elytra subopaque, pale brownish grey, nerves concolorous. Abdomen above black with the hind margins of the segments more or less widely yellow. Legs as in *fuscinervis*. Length, $3\frac{1}{4}$ —4 mm.

On salallows. The colour of this species occasionally varies to blackish grey, in which case the nerves are paler than the elytra.

8. *Pediopsis distinctus*, Scott.

Pediopsis distinctus, Scott, Ent. Mo. Mag., x., 191, 6.

Similar in appearance to the last, but the body is narrower and the angle of the crown more pointed. Elytra pale brownish grey,

subopaque, a stripe along the costa, a wide band across the middle, and another across the base of the membrane, fuscous; apical half of the clavus mottled with fuscous; nerves concolorous. Length (male), 4 mm.

Darenth, July. Examples in which the markings of the elytra are wanting might be mistaken for *P. impurus*, but on comparison of the two the narrower and more pointed form of *distinctus* is very apparent.

9. *Pediopsis ulmi*, Scott.

Pediopsis ulmi, Scott, Ent. Mo. Mag., x., 129, 2.

Fore parts brownish yellow. Scutellum with a brown triangle on each side at the base. Elytra and legs yellow-brown, the former subopaque with the costa narrowly dark brown and the nerves concolorous. Hind tibiae with a black spot on the outer side at the base. Abdomen above (male) black, hind margins of the segments narrowly pale; female brownish yellow. Length, 4—5 mm.

On elm. Lee and Norwich.

10. *Pediopsis cereus*, Germ.

Jassus cereus, Germ., Faun. Ins. Eur., 17, 14.

Pediopsis cerea, Fieb., Eur. Bythosc., 458, 2; Scott, Ent. Mo. Mag., x., 130, 3.

Face greyish yellow. Upper side reddish yellow-brown. Scutellum sometimes with a red-brown triangle on each side at the base. Elytra subopaque, just behind the middle a broad red-brown band, which seldom reaches the inner margin and never the costa, nerves concolorous. Legs concolorous, hind tibiae as in the last. Abdomen above (male) black, hind margins of the segments narrowly pale; (female) brownish yellow. Length, 4—5 mm.

Common on willows. Very frequently the dark brown band on the elytra is only indicated on the inner margin, though it is rarely entirely wanting, and in this state the species is best distinguished from *ulmi* by its habitat and the want of the brown line next the costa.

11. *Pediopsis virescens*, Fab.

Cicada virescens, Fab., Ent. Sys., iv., 46, 84.

Jassus prasinus, Boh., Sv. Ak. Handl., 123 (1851).

Pediopsis prasinus, Fieb., Eur. Bythosc., 459, 7.

P. virescens, Flor, Rhyn. Liv., ii., 188, 3; Marsh., Ent. Mo. Mag., ii., 126, 4; Kirschb., Cicad., 175, 8; Fieb., *l. c.*, 458, 5; Thoms., Opusc. Ent., iii., 321, 9; J. Sahl., Not. Fenn., xii., 127, 8; Scott, Ent. Mo. Mag., x., 189, 4.

Pale yellowish green, abdomen above in the male black, the hind margins of the segments very narrowly pale. Elytra whitish hyaline, nerves yellowish green. Length, 4—5 mm.

Common on osiers, &c. A variety is said to occur in which the face has a small black spot in the middle of the upper margin.

iv. IDIOCERUS, *Lewis*. (Pl. II., fig. 4).

Lewis, Trans. Ent. Soc. Lond., i., 47 (1836).

Crown widely rounded in front. Frontal suture reaching the ocellus. Antennal seta in the male generally with an oval black plate immediately before the apex (wanting in *distinguendus*, *tremulæ*, *vitreus*, and *aurulentus*).

TABLE OF SPECIES.

- | | | |
|----|---|---------------------------|
| 1 | (2). First and second apical areas of elytra sub-equal in length, <i>i. e.</i> , their bases level or nearly so | 1. <i>adustus</i> . |
| 2 | (1). First apical area much longer than second. | |
| 3 | (4). First subapical area triangular or 5-sided, reaching the costa | 2. <i>varius</i> . |
| 4 | (3). First subapical area parallel-sided, not reaching the costa. | |
| 5 | (6). Cheeks pubescent, more conspicuously so in the male | 3. <i>Herriehii</i> . |
| 6 | (5). Cheeks bare. | |
| 7 | (16). Elytra brownish, with a pale transverse band or bands. | |
| 8 | (11). Elytra with two pale bands. | |
| 9 | (10). Costa widely pale | 4. <i>distinguendus</i> . |
| 10 | (9). Costa not widely pale | 5. <i>tremulæ</i> . |
| 11 | (8). Elytra with one pale band. | |
| 12 | (15). First subapical area reaching much more than half as far backward as the second. | |

- 13 (14). Inner edge of the wide pale band on the
elytra commencing in the middle of the
inner margin 6. *viduatus*.
- 14 (13). Inner edge of the narrow pale band on the
elytra commencing at the apex of the
clavus 7. *elegans*.
- 15 (12). First subapical area reaching about half as
far backward as second 8. *laminatus*.
- 16 (7). Elytra without pale transverse bands.
- 17 (22). Apex of anal nerve standing in an oval
white patch.
- 18 (19). Cubital nerve only marked with white in
the lower boundary of the second sub-
apical area 9. *lituratus*.
- 19 (18). Cubital nerve chequered with black or rust-
colour and white.
- 20 (21). Frontal suture sharply bent inwards at the
base of the antennæ, the frons therefore
subtrapezoidal 10. *pæcilus*.
- 21 (20). Frontal suture evenly curved outwards
throughout, the frons therefore sub-
orbicular 11. *tibialis*.
- 22 (17). Apex of anal nerve white, but not standing
in an oval white patch, or nerves entirely
white.
- 23 (26). Brachial nerve with a white streak near the
apex. Face in the male with a small sharp
tooth on each side of the apex of the
clypeus.
- 24 (25). First transverse nerve white 12. *vitreus*.
- 25 (24). First transverse nerve not white 13. *aurulentus*.
- 26 (23). Brachial nerve not marked with white.
Apex of face simple in both sexes.
- 27 (32). Elytra green or greenish grey, more or less
tinged with reddish brown towards the
suture.
- 28 (29). Side margins of face angularly indented
below the eyes. Inhabits poplars .. 14. *fulgidus*.
- 29 (28). Side margins of face at most faintly sinuate.
- 30 (31). Male with the face and legs generally much
suffused with orange-yellow. Female with
about one-sixth of visible length of saw-
case projecting. Inhabits aspen .. 15. *populi*.
- 31 (30). Male without orange coloration. Female
with about one-third of visible length of
saw-case projecting. Inhabits willow .. 16. *confusus*.
- 32 (27). Elytra greenish white or almost milk-white,
nerves entirely white. Inhabits white
poplar 17. *albicans*.

1. *Idiocerus adustus*, H.-Scff.

Bythoscopus adustus, H.-Scff., Deuts. Ins., 144, 9.

Idiocerus stigmatalis, Lewis, Trans. Ent. Soc. Lond., i., 48.

I. varius, Marsh., Ent. Mo. Mag., ii., 103, 1.

I. adustus, Kirschb., Cicad., 153, 2; J. Sahl., Not. Fenn., xii., 140, 2; Scott, Ent. Mo. Mag., x., 24, 1.

♂. Face greyish yellow, cheeks with a dense short silvery pubescence. Crown greyish yellow, more or less suffused with fuscous in the middle, near each eye a dark puncture. Pronotum greyish yellow clouded with fuscous, front margin irregularly spotted with black. Scutellum greyish yellow, along the base three black triangles and in the middle a pair of somewhat comma-shaped black spots. Elytra hyaline with a yellow-brown tinge inclining to orange on the costa, from the inner margin at the apex of the anal nerve to the first apical area a very oblique pale band; nerves punctured, thick and black except in the pale band; first sub-apical area apparently incomplete but really reaching the costa, the latter vertically flattened in its basal two-thirds, yellow at the base, the middle third black and bearing a row of four or five large blunt tubercles. Abdomen above blackish, hind margins of the segments narrowly yellow. Legs pale, inner side of hind tibiae narrowly black.

♀. Face with a black triangle near each eye. Pubescence of the cheeks excessively fine, scarcely perceptible. Elytra hyaline with a yellow-brown tinge, the pale band only faintly indicated; costa but slightly flattened vertically without tubercles, nerves pale brown. Length, $6\frac{1}{2}$ —7 mm.

Abundant on willows.

2. *Idiocerus varius*, Fab.

Jassus varius, Germ., in Mus. Berolin.

Idiocerus varius, Kirschb., Cicad., 154, 4.

♂. Crown and face as in *adustus*, but the pubescence of the cheeks is less apparent. Pronotum greyish yellow clouded with dark fuscous, front margin irregularly spotted with black. Scutellum as in *adustus*, but the black triangle in the middle of the base is replaced by a linear stripe, and the pair of spots on the disc generally coalesce. Elytra hyaline with a dark brown tinge, which becomes almost black on the costa, from the inner margin at the

apex of the axillary nerve to the first apical area a very oblique pale band; first subapical area subtriangular, reaching the costa; nerves punctured, thick and black except in the pale band; costa slightly flattened vertically, the tubercles scarcely perceptible. Abdomen above black, hind margins of the segments narrowly yellow. Legs pale, hind tibiae narrowly black on both the outer and inner sides, thighs frequently with a black stripe.

♀. Face between the eyes much clouded and speckled with dark brown or black, cheeks bare. Elytra hyaline with a faint yellow-brown tinge, and only faint traces of the pale band; nerves dark brown or black except in the pale band; costa scarcely flattened vertically, without tubercles. Legs pale, all the tibiae generally narrowly black on both the outer and inner sides. Length, $5\frac{1}{2}$ —6 mm.

On *Salix triandra*; local. Kirschbaum is the only author known to me who satisfactorily distinguishes between this species and the last, but his *I. similis* is, according to types from Dr. Puton, a form of this species, in which the pale portions of the costa in the male, and particularly the roundish spot at the apex of the costal area, are bright yellow: the females of the two insects appear identical. I have not seen native examples of this form.

3. *Idiocerus Herrichii*, Kirschb.

Idiocerus Herrichii, Kirschb., Cicad., 153, 1; J. Sahl., Not. Fenn., xii., 139, 1.

♂. Face greyish yellow, disc above between the eyes with a dark fuscous cloud, near each eye a black triangle and a few small black spots, edges of the frons below the eyes with a black line, clypeus black, cheeks with a dense long silvery pubescence. Pronotum pale greenish grey mottled with fuscous, a wide central line pale. Scutellum pale greenish grey, marked as in *adustus*. Elytra hyaline with a greenish grey tinge; nerves stout, chequered with black and white, punctured, and having a row of fine short hairs on each side; costa slightly flattened vertically, but without tubercles. Abdomen above black, hind margins of the segments narrowly pale. Legs pale, femora and tibiae striped with black, intermediate tibiae with a short black line on the outer side at the base.

♀. Differs from the male in having the cheeks scarcely perceptibly pubescent, a row of black points down each side of the

frons below the eyes, the clypeus generally pale, and the costa not flattened vertically. Length, 6—6½ mm.

On *Salix alba*; not common.

4. *Idiocerus distinguendus*, Kirschb.

Idiocerus distinguendus, Kirschb., Cicad., 157, 9.

I. cognatus, Fieb., Eur. Bythosc., 455, 10.

Face greenish yellow, more or less suffused with fuscous above, sometimes with pale spots. Pronotum greenish yellow (male) or bluish white (female), more or less suffused with fuscous so as to leave the margins narrowly, a narrow central stripe, and a roundish spot on each side of the disc of the pale ground colour. Scutellum pale with a triangle on each side of the base and a pair of small roundish spots on the disc fuscous. Elytra lacteo-hyaline, with three wide brown bands which do not reach the costa and are placed one at the base, one just behind the middle, and one at the apex; nerves punctured, white except in the brown bands, where they are dark brown, base and apex of the anal nerve white, first subapical area reaching about three-fourths as far as the fourth. Abdomen above black, hind margins of the segments narrowly greenish. Legs pale, apex of the tarsi more or less fuscous.

♀. When fresh with the face and legs rather strongly tinged with pink. Length, 4½—5 mm.

On *Populus alba*, Beaufort Gardens, Lewisham; Shiere, near Guildford.

5. *Idiocerus tremulæ*, Estl.

Cicada tremulæ, Estl., Act. Holm., 129, pl. 5, fig. 3.

Idiocerus unifasciatus, Curt., Brit. Ent., 733, 6.

I. tremulæ, Flor, Rhyn. Liv., ii., 172, 6; Marsh., Ent.

Mo. Mag., ii., 105, 5; Kirschb., Cicad., 157, 8;

J. Sahl., Not. Fenn., xii., 146, 7; Scott, Ent. Mo.

Mag., x., 27, 4.

Very similar in appearance to the preceding species, and best distinguished therefrom by the brown bands of the elytra reaching the costa. Length, 4¾—5 mm.

On *Populus tremula*; not common.

6. *Idiocerus viduatus*, n. s.

♀. Crown and face yellow, variously spotted with rust-red and bluish white, a black puncture near each eye. Pronotum red-brown, a central stripe and a spot on each side of the disc bluish

white, hind margin narrowly pale. Scutellum yellow, with a blackish triangle on each side at the base and a rust-red marking on the disc in shape like a musical tuning-fork. Elytra (Pl. II. fig. 9) red-brown, darker behind, from the middle of the inner margin to the costa a broad oblique white band interrupted at the claval suture by a streak of the red-brown ground colour, membrane and appendix smoky hyaline; nerves punctured, dark red-brown, in the pale band white, those of the membrane dark brown, brachial nerve with one or two white spots. Abdomen above black, beneath rust-red. Legs yellow-red, a dark stripe on the outer side of the middle tibiæ. Length, $5\frac{1}{2}$ mm.

Of this fine and very distinct species I have seen but one female example, which was beaten from sallow in Foxley Wood on the 10th September, 1885. This sex may be easily recognised by its fine red-brown colour and the breadth and obliquity of the pale band on the elytra, which is similar in these respects to that which we find in *I. varius* male. Judging from the description it comes near *I. fasciatus*, Fieb. (Eur. Bythosc., 455, 9), but that species has the nerves of the clavus wholly white.

7. *Idiocerus elegans*, Flor.

Idiocerus elegans, Flor, Rhyn. Liv., ii., 147, 7; J. Sahl., Not. Fenn., xii., 147, 8.

♂. Face greyish or reddish yellow, side margins of the frons below the antennæ, side margins of the clypeus narrowly, and a wide stripe on the cheeks adjoining the loræ, dark brown or black. Crown more or less clouded with fuscous, with two or three punctiform black spots near each eye. Pronotum mottled with rust-red and brown, its front margin irregularly spotted with black. Scutellum greyish yellow, a black triangle on each side at the base, the disc clouded with rust-red. Elytra very shiny pale reddish brown, a spot at the apex of the anal nerve, two or three spots on the brachial nerve, and a narrow transverse band at the apex of the clavus, white; nerves punctured, dark brown, on the pale parts white. Abdomen above black, hind margins of the segments narrowly yellow. Legs pale yellow.

♀. Face greyish yellow speckled with red-brown, with a large fuscous spot in the middle above and a black puncture near each eye. Pronotum generally with a pale central stripe. Scutellum yellowish, its markings red-brown. Legs reddish or brownish yellow. Length, 5— $5\frac{1}{2}$ mm.

On willows and poplars; not common. I have

examined one female from coll. Capron which is possibly a variety of this species, but, in addition to the pale band across the apex of the elytra, both the transverse nerve and the apex of the anal nerve are white and stand in a round white spot, and the upper side of the abdomen has the basal half black and the apical half brownish yellow. This example was beaten from fir in March or April, 1885.

8. *Idiocerus laminatus*, Flor.

Idiocerus laminatus, Flor, Rhyn. Liv., ii., 171, 5; Marsh., Ent. Mo. Mag., ii., 104, 3; Kirschb., Cicad., 162, 21; J. Sahl., Not. Fenn., xii., 148, 9; Scott, Ent. Mo. Mag., x., 28, 5.

♂. Crown and face greyish yellow. Pronotum dirty greyish yellow, more or less suffused with fuscous. Scutellum greyish yellow, a black triangle on each side at the base and generally a pair of black points on the disc. Elytra pale brown, a spot at the apex of the anal nerve, the costal, first subapical, and the greater part of the first apical area and a wide band across the apex of the corium, white; nerves punctured, dark brown except in the white parts, where they are concolorous, first subapical area narrow-triangular, very small and indistinct. Abdomen above black, hind margins of the segments narrowly pale. Legs pale, claws black.

♀. Similar to the male, but larger and paler, with some fuscous markings on the middle of the crown. Length, $5\frac{3}{4}$ —6 mm.

On poplars; not common.

9. *Idiocerus lituratus*, Fall.

Jassus lituratus, Fall., Hem. Suec., ii., 60, 2.

Bythoscopus lituratus, H.-Scff., Deuts. Ins., 143, 13.

Idiocerus maculipennis, Curt., Brit. Ent., 733, 3.

I. lituratus, Flor, Rhyn. Liv., ii., 168, 4; Marsh., Ent. Mo. Mag., ii., 103, 2; Kirschb., Cicad., 154, 5; J. Sahl., Not. Fenn., xii., 141, 3; Scott, Ent. Mo. Mag., x., 25, 2.

♂. Crown greyish yellow, more or less clouded with rust-yellow, with a pair of black punctures (frequently united by a brown line) placed one near each eye. Face greyish yellow, in its upper half a large blackish grey triangle which frequently bears a black central stripe, frons and clypeus reddish yellow. In life the face is dull white with a wide greenish yellow central stripe. Pronotum greyish yellow clouded with fuscous and spotted with bluish white,

the front margin irregularly spotted with black. Scutellum greyish yellow; a triangle on each side of the base, a tuning-fork-shaped marking and a pair of points on the disc, black. Elytra whitish hyaline with a fuscous tinge, which takes the form of a wide central band reaching from the inner margin about half-way across the disc; nerves punctured, black, in the fuscous band much thickened; a small piece at the apex of the anal nerve, sundry pieces of the brachial and lower cubital nerves, and occasionally the first transverse nerve, white; costa yellow, vertically flattened but without tubercles. Abdomen above black, hind margins of the segments very narrowly pale. Legs pale, tibiae generally with a black line on both the outer and inner sides, thighs with a short black line at the apex.

♀. Face greyish yellow mottled with rust-red, the upper half of the disc occupied by a large subquadrate fuscous patch, in the lower half of which are some pale spots. Elytra hyaline with a yellow-brown tinge, a fine black line next the costa; nerves punctured, rust-brown on the corium, on the membrane black, their white markings not so conspicuous as in the male, but similar in position. Length, $6\frac{1}{2}$ — $6\frac{3}{4}$ mm.

On sallows; common.

10. *Idiocerus pæcilus*, H.-Scff.

Bythoscopus pæcilus, H.-Scff., Deuts. Ins., 144, 8.

B. falciger, Boh., Sv. Ak. Handl., 50, 24 (1847).

Idiocerus pæcilus, Kirschb., Cicad., 159, 15.

I. falciger, J. Sahl., Not. Fenn., xii., 142, 4.

I. venustus, Scott, Ent. Mo. Mag., x., 239, sec. spec. typ.

♂. Face greyish yellow, its lower half generally with four wide equidistant black stripes, its upper part variously clouded with fuscous; in strongly marked examples there is a short black stripe spotted with white next the inner margin of each eye. Crown with a black puncture on each side. Pronotum greyish yellow clouded with fuscous, speckled with black in front, down the centre a wide bluish white stripe. Scutellum greyish yellow; its base with a short linear stripe between two triangles, and a pair of spots on the disc frequently followed by a pair of stripes, black. Elytra greyish hyaline; nerves dark brown or black, those of the corium chequered with white. Abdomen above varying from pale brown to black. Legs pale, thighs generally striped with black, tibiae with a short black stripe on the outer side at the base, the hind pair with a black stripe down the inner side.

♀. Face greyish yellow, variously clouded and speckled with fuscous or black; the black stripes of the male represented by a

pair of narrow ones on the lower part of the frons. Length, $5\frac{1}{2}$ —6 mm.

On Lombardy poplar; not common.

11. *Idiocerus tibialis*, Fieb.

Idiocerus tibialis, Fieb., Eur., Bythosc., 452, 3.

I. affinis, Fieb., l. c., 454, 8.

I. Heydeni, Kirschb., Cicad., 155, 6; Scott, Ent. Mo. Mag., xi., 228 (♀).

I. vittifrons, Kirschb., l. c., 159, 14.

I. rotundifrons, Kirschb., l. c., 160, 16.

♂. Face greyish yellow, variously clouded and marked with rust-red black and brown, a black puncture near each eye. Pronotum clouded with fuscous, a narrow central stripe and a roundish spot on each side of the disc bluish white. Scutellum greyish yellow, with a black triangle on each side at the base. Elytra greyish hyaline; nerves brown, those of the corium chequered with white. Abdomen above generally brownish yellow, with a brown band across each segment. Legs pale, tibiae with a fine black stripe or stripes, hind thighs with a fine black stripe along the front and hind margins.

♀. Face greyish yellow, variously clouded and speckled with red-brown and black. Crown clouded with fuscous, with a pale central line and a black puncture near each eye. Length, $5\frac{1}{2}$ —6 mm.

Darenth, October, 1866 (*Douglas*). Well distinguished by the shape of the frons.

12. *Idiocerus vitreus*, Fab.

Cicada vitrea, Fab., Sys. Rhyn., 79, 90.

Idiocerus H-album, Fieb., Eur. Bythosc., 455, 11; Scott, Ent. Mo. Mag., x., 26, 3.

♂. Crown and face dirty whitish yellow, on the former near each eye a dark puncture. Pronotum pale brown, a central stripe and a small spot on each side in front whitish, near the front margin a few black points. Scutellum whitish yellow, a triangle on each side at the base and a pair of points on the disc black. Elytra pale yellow-brown; nerves punctured, dark brown, the transverse nerve and a short piece of the inner cubital and brachial nerves adjoining it, the apical third of the anal nerve, the extreme apex of the clavus, the apex of the brachial nerve, and a piece of

the outer half of the lower boundary of the second subapical area, white. Abdomen above yellow, base of each segment more or less widely black. Legs pale, inner side of hind tibiæ with a narrow black streak.

♀. Crown and face greyish yellow, the former with a black puncture on each side and between them a large brown patch divided down the middle by a pale stripe, some markings across the middle of the face and a line on each side of the frons rust-red. The nerves of the elytra are paler than in the male, and consequently the white parts are less conspicuous. Length, 5 mm.

On poplars ; not uncommon.

13. *Idiocerus aurulentus*, Kirschb.

Idiocerus aurulentus, Kirschb., Cicad., 165, 29.

♂. Crown and face yellow or greyish yellow, on the former near each eye a dark puncture. Pronotum yellow-brown, with a more or less distinct central stripe and a suboval spot on each side of the disc pale. Scutellum yellow, with a black or red-brown triangle on each side at the base and a pair of dark points on the disc. Elytra shiny reddish brown ; nerves punctured, dark brown ; apex of the anal nerve, the extreme apex of the clavus, a short piece at the apex of the brachial nerve, and the middle of the lower boundary of the second subapical area, white. Abdomen greenish yellow, dorsal segments widely black at the base. Legs pale, claws black.

♀. Crown yellow, with a dark puncture near each eye. Face yellow, an ill-defined subquadrate blackish spot in its upper half, temples spotted with rust-red. Pronotum and scutellum as in the male, but the ground colour more decidedly yellow and the markings obsolete. Elytra pale yellow-brown ; nerves punctured, almost concolorous, the white portions much less sharply defined than in the male. Length, 5 mm.

Lombardy poplar, Cossey, Norfolk. A very variable species and nearly allied to the preceding, but it does not appear ever to develop the white H so conspicuous on the elytra of that species.

14. *Idiocerus fulgidus*, Fab.

Cicada fulgida, Fab., Ent. Sys., iv., 44, 74.

Jassus fulgidus, Fab., Sys. Rhyn., 87, 13; Germ.,
Mag. d'Ent., iv., 84, 11.

Idiocerus ochroleucus, Kirschb., Cicad., 163, 22.

I. minki, Kirschb., l. c., 163, 23.

♂. Deep yellow. Antennal plate oblong-oval. Apex of the face frequently tinged with red, its upper part generally with a wide dusky central stripe. Scutellum with a black triangle on each side at the base, and occasionally a pair of black spots on the disc. Elytra yellowish hyaline, light yellow-brown towards the inner margin, membrane smoky hyaline; nerves dark yellow, those of the membrane blackish, apex of the anal nerve white. Abdomen above and the claws black.

♀. Similar to the male, but larger and paler, the colour of the body pale green in fresh, yellowish grey in dried, examples, the triangles at the base of the scutellum rust-red or wanting, the upper side of the abdomen black only down the middle. Length, $5\frac{1}{2}$ — $6\frac{1}{2}$ mm.

Abundant on poplars. Readily separated from its allies by the structure of the sides of the face. The insufficient descriptions by English authors of this species and the two following render any reference to them practically useless.

15. *Idiocerus populi*, Linn.

Cicada populi, Linn., Faun. Suec., 242, 890; Sys.
Nat., v., 463, 32.

Idiocerus populi, Flor, Rhyn. Liv., ii., 177, 8; Kirschb.,
Cicad., 163, 24; J. Sahl., Not. Fenn., xii., 149, 10.

♂. Crown yellowish white. Face yellow, frons and clypeus red. Pronotum fuscous, a large pale space on each side in front, a short black transverse line near each anterior angle sometimes joined to a short oblique line on each side of the disc. Scutellum greyish yellow, a triangle on each side at the base and a pair of points on the disc black. Elytra subopaque, pale brown, darker towards the inner margin; nerves punctured, concolorous or paler than the disc, those of the membrane blackish; inner marginal nerve black, its middle third and the apex of the anal nerve white. Abdomen above black, beneath yellow. Legs red-yellow, claws black.

♀. Legs and under side yellowish grey. Pronotum and scutellum as in the male. Nerves of corium hyaline. Abdomen above widely black down the middle. Length, 5—5½ mm.

Not uncommon, but apparently confined to *Populus tremula*. The female, when mature and fresh, frequently has the face and legs tinged with a fine pink colour.

16. *Idiocerus confusus*, Flor.

Idiocerus confusus, Flor, Rhyn. Liv., ii., 179, 9; Kirschb., Cicad., 164, 26; J. Sahl., Not. Fenn., xii., 150, 11.

♂. Crown, face, and legs yellow, frons sometimes dusky. Pronotum and scutellum greenish yellow. Elytra hyaline, with a faint fuscous tinge, which becomes brownish yellow on the inner margin; nerves punctured, concolorous or paler than the disc; costa pale green. Abdomen above black, beneath greenish yellow. Claws black.

♀. Larger and paler. Abdomen above widely black down the middle. Length, 5½—6½ mm.

On willows; common. Easily recognised when fresh by its pale greenish grey colour.

17. *Idiocerus albicans*, Kirschb.

Idiocerus albicans, Kirschb., Cicad., 165, 27.

Head, pronotum, and scutellum greenish white; face sometimes with a yellow tinge in the male, in which sex also there is sometimes a black puncture near each eye and a black triangle on each side of the base of the scutellum. Elytra whitish hyaline, sometimes with a faint reddish brown tinge near the inner margin in the male; nerves white, the apices of those on the membrane and the marginal nerve of the latter blackish. Dorsal segments of the abdomen narrowly black at the base (male) or entirely pale (female). Length, 5½—6½ mm.

Common on white poplar.

v. AGALLIA, Curt. (Pl. II., fig. 5).

Curt., Ent. Mag., i., 193 (1833).

Crown widely rounded in front. Clypeus, cheeks, loræ, and frons separated by distinct sutures. Frontal suture not reaching the ocelli. Antennal seta never clavate in the male. Species small, dirty white, with black or brown markings.

TABLE OF SPECIES.

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|--------|---|----|----------------------|--|
| 1 (4). | Pronotum twice or nearly twice as long as crown. Insect macropterous. | | | |
| 2 (3). | Pronotum faintly punctured | 1. | <i>puncticeps</i> . | |
| 3 (2). | Pronotum transversely striate | 2. | <i>venosa</i> . | |
| 4 (1). | Pronotum only slightly longer than crown. Insect brachypterous.. .. | 3. | <i>brachyptera</i> . | |

1. *Agallia puncticeps*, Germ.

Jassus puncticeps, Germ., Faun. Ins. Eur., 17, 12.

Agallia consobrina, Curt., Ent. Mag., i., 193; Marsh., Ent. Mo. Mag., iii., 151, 2.

A. versicolor, Flor, Rhyn. Liv., ii., 556, 3; Kirschb., Cicad., 150, 3; J. Sahl., Not. Fenn., xii., 152, 1.

A. puncticeps, Scott, Ent. Mo. Mag., x., 236, 1.

♂. Dirty greyish white. Crown with a round black spot on each side, and in the middle a pair of fine brown parallel lines, which are continued over the forehead beyond the ocelli. Face with a minute black point at each ocellus, from which a brown line runs obliquely outwards and downwards; frons black or dark brown, with a whitish central stripe; clypeus with a fine dark central stripe. Pronotum with a transverse line behind each eye, a pair of points in the middle of the front margin, a central stripe divided longitudinally by a fine pale line, and a large triangle on each side at the base, its base resting on the hind margin, dark brown or black. Scutellum with a triangle on each side at the base, and generally a pair of points on the disc, dark brown or black. Elytra with a fine line just below the claval suture, the nerves of the clavus, the transverse nerve, and the cubital nerve as far as the fork, white; the remaining nerves, and the inner margin narrowly, dark brown, the nerves of the disc much widened. Abdomen above black, widely pale at the sides, beneath pale. Legs more or less striped and banded with black.

♀. Similar to the male, but the dark markings are generally paler. The central stripe on the pronotum is apparently never divided by a pale line, the frons is pale, with a row of closely placed very short black transverse lines down each side, the sides of the abdomen above are more widely pale, and there is a black spot on each side of the ventral segments. Length, $2\frac{1}{2}$ — $3\frac{1}{2}$ mm.

Common on low plants.

2. *Agallia venosa*, Fall.

Cicada venosa, Fall., Hem. Suec., ii., 38, 21.

Bythoscopus venosus, Panz., Faun. Germ., 143, 5.

Agallia venosa, Flor. Rhyn. Liv., ii., 551, 1; Marsh., Ent. Mo. Mag., iii., 150, 1; Kirschb., Cicad., 150, 4; J. Sahl., Not. Fenn., xii., 153, 2; Scott, Ent. Mo. Mag., x., 237, 2.

♂. Dirty greyish white. Crown with a round spot on each side, a fine central line, which is continued over the forehead as far as the ocelli where it suddenly divides and proceeds in an arcuate form to the base of each antenna, a point at each ocellus, a sub-triangular spot, of which one point reaches the ocellus, on each temple, and the lower half of the face almost entirely, black. Pronotum with a curved line from each front angle to the front margin behind the spot on the crown, a linear central stripe, and a large roundish spot on each side at the base, black. Scutellum as in *puncticeps*. Nerves of the membrane and corium dark brown, brachial nerve as far as the transverse nerve and a small piece at the base of the upper cubital nerve pale; claval suture and inner margin narrowly, a stripe just above the anal nerve and extending for half its length, a piece of the anal nerve just before its apex, a stripe just above the axillary nerve and extending for two-thirds of its length, dark brown or black; a linear marking following the course of the anal nerve for about half its length, and then passing to the suture in the form of a blotch, the apex of the anal nerve, and the entire axillary nerve, white. Abdomen black. Legs variously striped and banded with black.

♀. Similar to the male, but larger and with most of the black markings replaced by rust-red. The central line on the crown divides almost immediately on leaving the base. Lower half of the face pale, with sundry dark markings; frons with a rust-red linear central stripe on its lower half, and a row of small black spots down each side. Abdomen above black, narrowly pale at the sides, beneath pale. Legs variously striped and banded with rust-red. Length, $2\frac{1}{2}$ —3 mm.

Very common at the roots of grass, &c.

3. *Agallia brachyptera*, Boh.

Athysanus brachypterus, Boh., Sv. Ak. Handl., 29, 4 (1849).

Agallia brachyptera, Flor, Rhyn. Liv., ii., 554, 2; Kirschb., Cicad., 151, 5; J. Sahl., Not. Fenn., xii., 154, 3; Scott, Ent. Mo. Mag., x., 238, 3.

Dirty yellowish white; two large roundish spots and sometimes a central stripe on the crown, four transverse spots and a central stripe on the pronotum, three stripes on each elytron, and the hind margins of the abdominal segments narrowly, black. Elytra about half as long as the abdomen, truncate, with rounded angles. Length, $2\frac{1}{2}$ —3 mm.

North Cliff, Scarborough, amongst newly-cut grass, end of June.

EXPLANATION OF PLATES.

PLATE I.

- FIG. 1. Face of a Jassid; *a* frons, *b* ocellus, *c* antenna, *d* temple, *e* eye, *f* cheek, *g* clypeus, *h* rostrum, *i* lora.
- „ 2. Elytron of a Jassid. Nerves: *a* cubital, *b* outer cubital, *c* inner ditto, *d* brachial, *e* transverse, *f* anal, *g* axillary, *h* angular; *i* claval suture. Areas: 1 costal, 2 basal, 3 brachial, 4 subcostal, 5 suprabrachial, 6 subapical, 7 apical; 8 appendix.
- „ 3. Terminal segments of a ♂ Jassid (under side), *b* valve, *c c* plates.
- „ 4. The same, viewed from the side; *a* pygofer, *b* valve, *c* plate, *d* anal tube, *e* anal style.
- „ 5. Terminal segments of a ♀ Jassid (under side), *a a* pygofer, *b* last ventral segment, *c* saw-case.
- „ 6. The same, viewed from the side.
- „ 7. Side view of the terminal segments of a ♂ Delphacid (*Liburnia Signoreti*), *a* pygofer, *b* anal tube, *c* anal style, *d* style.
- „ 8. Pygofer of a ♂ Delphacid (*Liburnia venosa*), seen from behind; *a* pygofer, *b* anal tube, *c* anal style, *d* styles.
- „ 9. Terminal segments of a ♀ Delphacid (under side); *a* basal plates.

FIG. 10. *Cicadetta*, elytron.

- „ 11. *Centrotus*, pronotum and scutellum.
- „ 12. *Gargara*, crown, pronotum, and scutellum.
- „ 13. *Tettigometra*, crown, pronotum, and scutellum.
- „ 14. *Issus*, upper side.
- „ 15. *Oliarus*, crown, pronotum, and scutellum.
- „ 16. *Cixius* „ „ „
- „ 17. *Asiraca*, *a* antenna, *b* fore leg.
- „ 18. *Delphax*, *a* antenna, *b* hind leg.
- „ 19. *Liburnia*, face.
- „ 20. *Dicranotropis*, face.
- „ 21. *Stiroma*, face.
- „ 22. *Triecphora*, crown, pronotum, and scutellum.
- „ 23. *Aphrophora* „ „ „
- „ 24. *Philænus* „ „ „
- „ 25. *Ledra*, head and pronotum (front view).
- „ 26. *Ulopa*, face.

PLATE II.

FIG. 1. *Bythoscopus*, crown, pronotum, and scutellum.

- „ 2. *Macropsis*, face.
- „ 3. *Megophthalmus*, crown, pronotum, and scutellum.
- „ 4. *Idiocerus*, crown, pronotum, and scutellum.
- „ 5. *Agallia*, face.
- „ 6. *Pediopsis*, crown, pronotum, and scutellum.
- „ 7. *Liburnia straminea* ♂, genital style dissected out and view from the side (the point of view mentioned has in all cases reference to the position of the organs when *in situ*).
- „ 8. *Liburnia straminea* ♂, anal tube viewed from below.
- „ 9. *Idiocerus viduatus* ♀, elytron.
- „ 10. *Liburnia Fairmairei* ♂, styles viewed from behind.
- „ 11. *Pediopsis fuscinervis*, face.
- „ 12. *Liburnia brevipennis* ♂, styles viewed from behind.
- „ 13. „ *guttula* ♂, styles viewed from above.
- „ 14. „ *vittipennis* ♂, styles viewed from above.
- „ 15. „ *Signoreti* ♂, styles viewed from behind.
- „ 16. „ *Fieberi* ♂, „ „ „
- „ 17. „ *Boldi* ♂, „ „ „



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