THE COLEOPTERA

OF

THE BRITISH ISLANDS.

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THE

COLEOPTERA

OF

THE BRITISH ISLANDS.

A DESCRIPTIVE ACCOUNT OF THE FAMILIES, GENERA, AND SPECIES INDIGENOUS TO GREAT BRITAIN AND IRELAND, WITH NOTES AS TO LOCALITIES, HABITATS, ETC.

BY THE

REV. CANON FOWLER, M.A., F.L.S.

SECRETARY TO THE ENTOMOLOGICAL SOCIETY OF LONDON, AND EDITOR (FOR COLEOPTERA) OF THE "ENTOMOLOGIST'S MONTHLY MAGAZINE."

VOL. V.

HETEROMERA—RHYNCHOPHORA—ABNORMAL COLEOPTERA.

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1891.

PREFACE TO VOL. V.

In issuing the concluding Volume of this work, I feel that acknowledgement is due to the many supporters who have helped to make it a success, and to the many friends who have so kindly assisted me with information as to habits and localities, or by the loan of specimens; besides those whom I have mentioned (Vol. I. Preface, p. vi.), I am especially indebted to Mr. S. Stevens, Mr. H. Moncreaff, Mr. W. F. H. Blandford and Dr. A. Chapman, and also to Mrs. Power for kindly placing Dr. Power's collection at my disposal.

At the beginning of Vol. I. (Preface, p. xviii.) I expressed my intention of discussing the classification adopted in the work at its conclusion; the chief points, however, have been alluded to under the different divisions and families, and I have therefore abandoned the idea of dealing further with the subject, especially as I see no reason for altering the general classification in the present state of our knowledge.

As I before said, in a work like the present, in which so many details have to be examined and verified, and many thousand references to localities collected and tabulated, it is impossible to avoid some errors and inaccuracies; from the few, however, that have been brought to my notice, I am induced to hope that they are far less than might have been expected; I may perhaps say, in this connection, that the characters assigned to the divisions, families, genera, etc., are such as will apply to them universally, or at all events as far as the European fauna is concerned, except in a few cases in which it is especially mentioned that they apply to British species only, and in one or two instances in which I have, in error, adopted characters which I have afterwards found not to be universal (e.g. Anthicidæ, Vol. V. pp. 3 and 83, on which a

note is added at the end of the volume). From the letters and communications which I have received during the progress of the work, I am led to think that the hope I expressed, in the Preface to Vol. I., that it might, at all events, prove of some help towards encouraging the study of our native Coleoptera, has been to a certain extent realized. If such has been, or shall be, the case, I shall be well rewarded for the close work and sacrifice of spare time which it has of necessity entailed.

THE SCHOOL HOUSE, LINCOLN,
July, 1891.

ERRATA.

Vol. I.,	p. 80, l. 4 from bottom, *for* "tibiæ," *read* "tarsi."
,,	p. 87, l. 32, *for* "elytra," *read* "thorax."
,,	p. 195, l. 21, *for* "posterior tarsi," *read* "anterior tarsi."
Vol. II.,	p. 36, l. 18, *for* "A. Waterhousei," *read* "O. Waterhousei."
Vol. III.,	p. 57, l. 12 from bottom, *for* "4½–8 mm," *read* "4½–5 mm."
,,	p. 96, l. 12, *for* "Kew," *read* "Ken."
,,	p. 210. l. 28, *for* "thorax," *read* "forehead."
,,	p. 229, l. 14, *for* "2 mm.," *read* "4 mm."
,,	p. 337, *for* C *read* c, and *for* D *read* d.
,,	p. 378, l. 8 from bottom, omit "thorax duller"; and l. 7 from bottom, omit "thorax more shiny."
Vol. IV.,	p. 102, l. 6, *for* "shorter" *read* "longer."

In Vol I., Plate A., Figs. ii. and iii. it is the *under-side* of the beetle which is in each case represented (as mentioned in the text) by the left-hand portion of the figure, and not the upper portion under the elytra (which is represented in Fig. i.); this point was criticized in a review in "Nature," and might certainly prove misleading, if not explained.

Description of Plate CL. (Illustrated Edition) *for* "Notoxus paradoxus," *read* "Notoxus monoceros."

Description of Plate CLII., figs. 12, 13, *for* "populeti," *read* "betuleti."

INDEX TO PLATES.

Plates 1 to 36 are contained in Vol. 1.
„ 37 „ 70 „ „ 2.
„ 71 „ 98 „ „ 3.
„ 99 „ 142 „ „ 4.
„ 143 „ 180 „ „ 5.

PLATE CXLIII.

FIG. 1. Blaps mucronata, *Latr.*
2. „ similis, *Latr.*
3. Crypticus quisquilius, *L.*
4. Heliopathes gibbus, *F.*
5. Opatrum sabulosum, *L.*
6. Microzoum tibiale, *F.*
7. Phaleria cadaverina, *F.*
8. Bolitophagus reticulatus, *L.*
9. Heledona agaricola, *Herbst.*
10. Diaperis boleti, *L.*
11. Platydema dytiscoides, *Rossi* (*violaceum*, F.).
12. Scaphidema æneum, *Payk.*
13. Alphitophagus quadripustulatus, *Steph.*

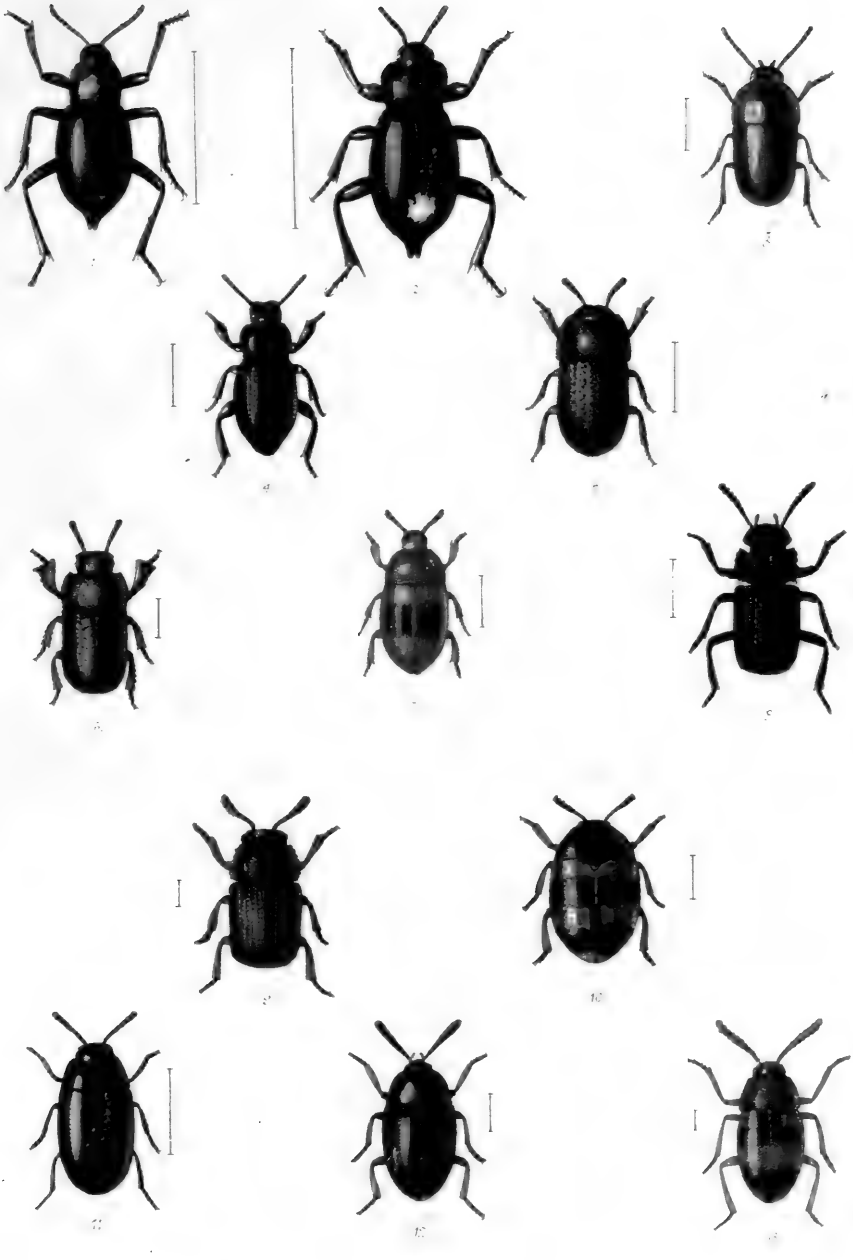

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PLATE CXLIV.

FIG. 1. Tenebrio obscurus, *F.*
2. „ molitor, *L.*
3. Alphitobius diaperinus, *Panz.*
4. „ piceus, *Ol.*
5. Gnathocerus cornutus, *F.*, male.
6. Tribolium ferrugineum, *F.*
7. Palorus melinus, *Herbst.* (*depressus*, F.).
8. Hypophlœus castaneus, *F.*
9. „ bicolor, *Ol.*
10. Latheticus oryzæ, *Wat.*
11. Helops cœruleus, *L.*
12. „ pallidus, *Curt.*
13. „ striatus, *Fourc.*

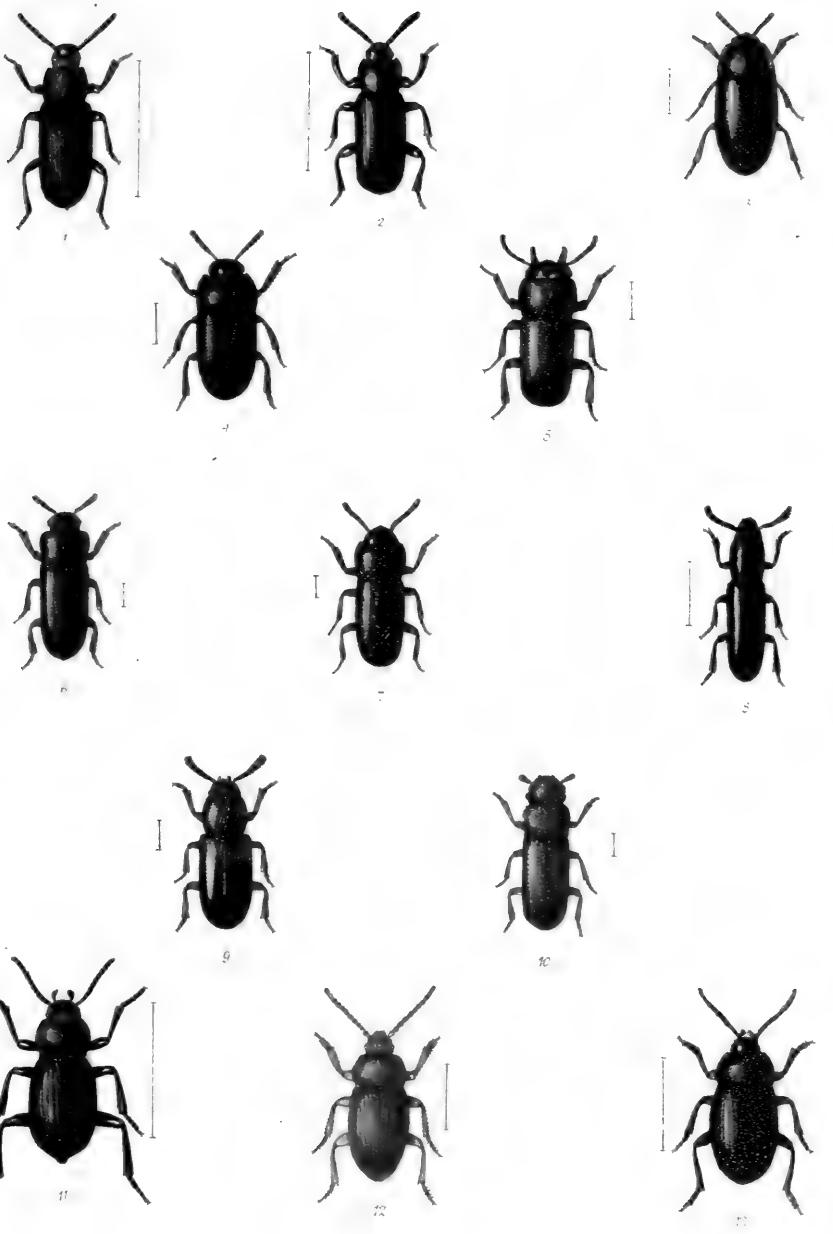

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PLATE CXLV.

FIG. 1. Lagria hirta, *L.*
2. Cistela ceramboides, *L.*
3. ,, murina, *L.*
4. ,, ,, *var.*
5. ,, luperus, *Herbst.* (*fulvipes*, F.).
6. ,, ,, *var.* ferruginea *F.*
7. Eryx ater, *F.*
8. Mycetochares bipustulata, *Ill.*
9. Cteniopus sulphureus, *L.*
10. Omophlus armeriæ, *Curt.*
11. Tetratoma fungorum, *F.*
12. ,, Desmaresti, *Latr.*
13. ,, ancora, *F.*

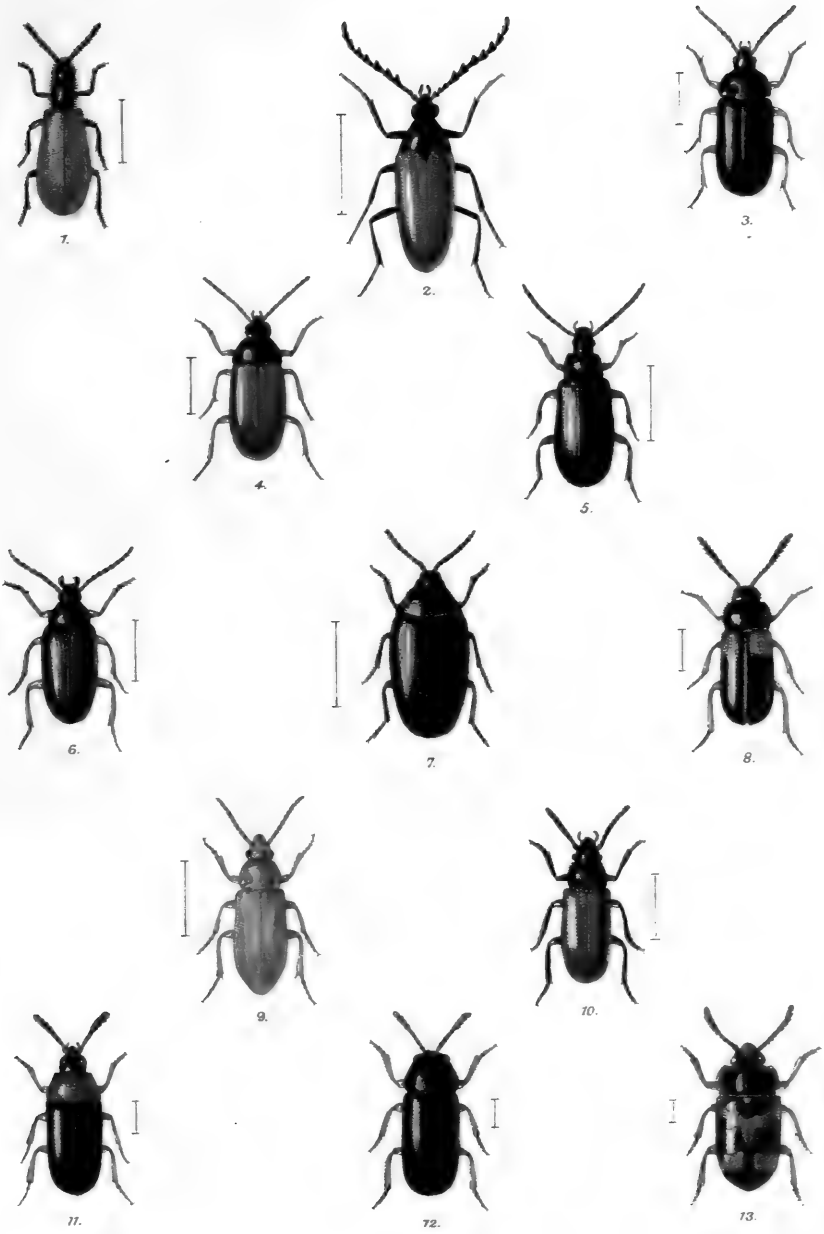

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PLATE CXLVI.

FIG. 1. Orchesia micans, *Panz.*
2. Clinocara tetratoma, *Thoms.* (*Orchesia minor*, Walk.).
3. „ undulata, *Kr.*
4. Hallomenus humeralis, *Panz.*
5. Conopalpus testaceus, *Ol.*
6. „ „ *v.* Vigorsi, *Steph.*
7. Melandrya caraboides, *L.*
8. „ dubia, *Schall.* (*canaliculata*, F.).
9. Anisoxya fuscula, *Ill.*
10. Abdera quadrifasciata, *Steph.*
11. „ bifasciata, *Marsh.*
12. „ triguttata, *Gyll.*
13. „ flexuosa, *Payk.*

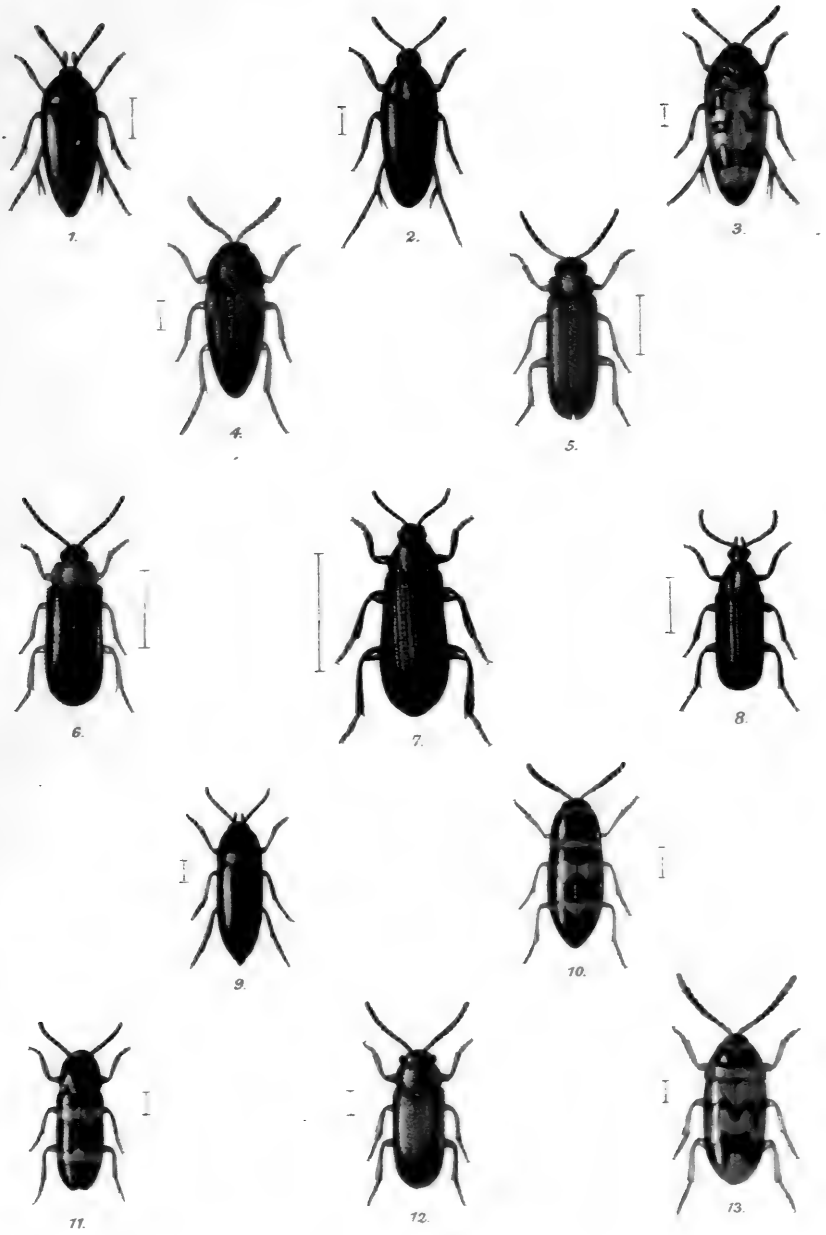

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PLATE CXLVII.

FIG. 1. Phlœotrya rufipes, *Gyll.* (*Stephensi*, Duv.).
2. Xylita lævigata, *Hel.*
3. Zilora ferruginea, *Payk.*
4. Hypulus quercinus, *Quens.*
5. Osphya bipunctata, *F.*, male.
5a. ,, ,, ,, posterior leg.
6. ,, ,, female.
7. Pytho depressus, *L.*
8. Salpingus castaneus, *Panz.*
9. ,, æratus, *Muls.*
10. Lissodema quadripustulatum, *Marsh.*
11. Rhinosimus ruficollis, *L.*
12. ,, viridipennis, *Steph.*
13. ,, planirostris, *F.*

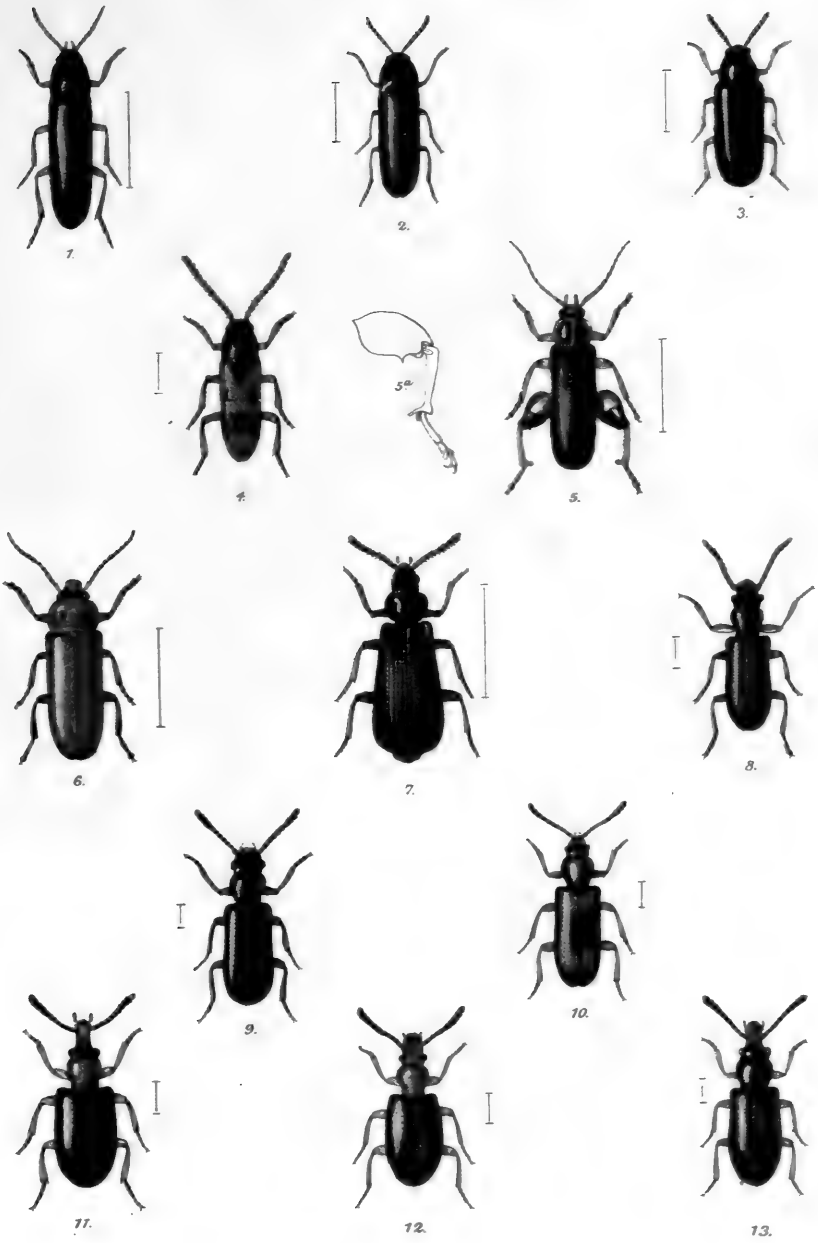

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PLATE CXLVIII.

FIG. 1. Mycterus curculionoides, *F.*
2. Œdemera nobilis, *Scop.*, male.
3. „ „ female.
4. „ lurida, *Marsh.*
5. Oncomera femorata, *F.*
6. Nacerdes melanura, *L.*, male.
7. Asclera cœrulea, *L.*
8. „ sanguinicollis, *F.*
9. Pyrochroa coccinea, *L.*
10. „ serraticornis, *Scop.*
11. „ pectinicornis, *L.*
12. Scraptia fuscula, *Müll.*
13. Tomoxia biguttata, *Gyll.*

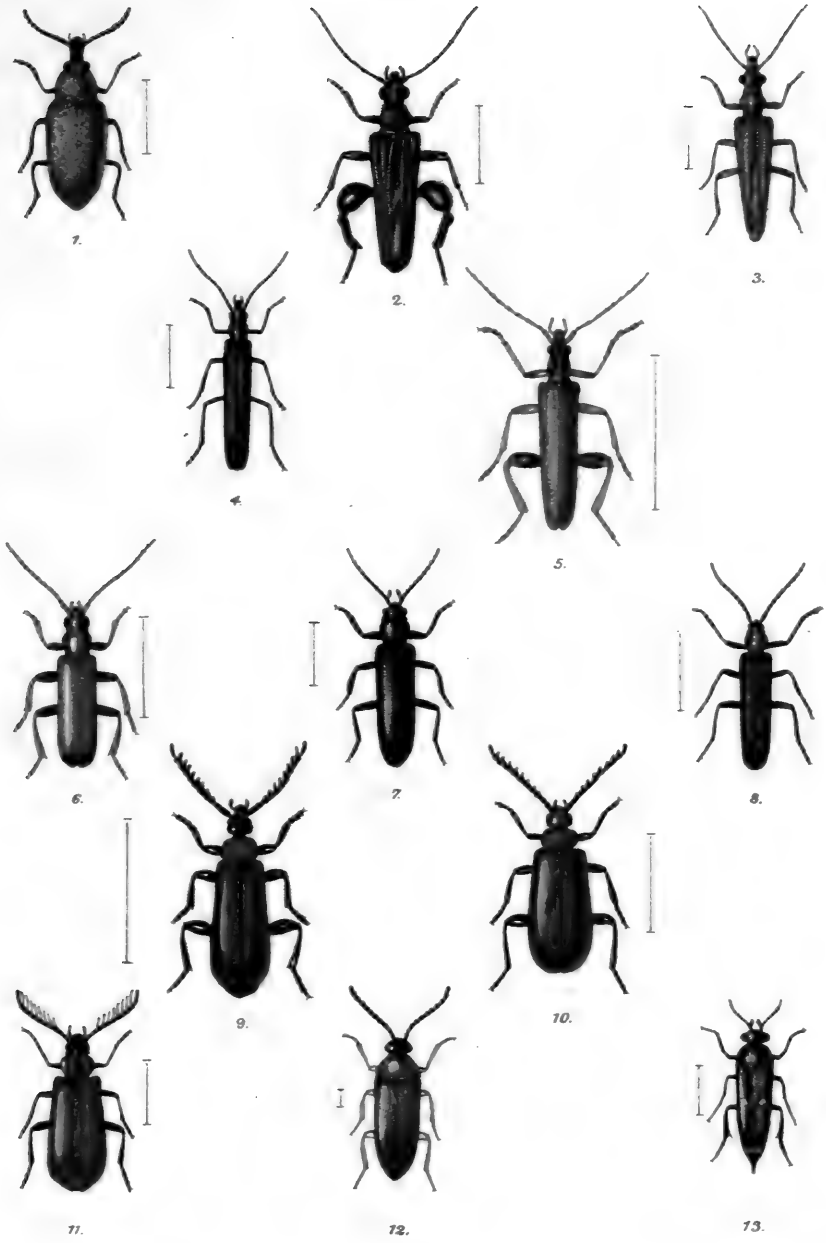

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PLATE CXLIX.

FIG. 1. Mordella fasciata, *F.*
2. Mordellistena abdominalis, *F.*, male.
3. ,, ,, female.
4. ,, humeralis, *L.*
5. ,, brunnea, *F.*
6. ,, pumila, *Gyll.*
7. ,, brevicauda, *Boh.*
8. Anaspis frontalis, *L.*
9. ,, rufilabris, *Gyll.*
10. ,, Garneysi, *Fowler.*
11. ,, Geoffroyi, *Müll.*
12. ,, ruficollis, *F.*
13. ,, subtestacea, *Steph.*

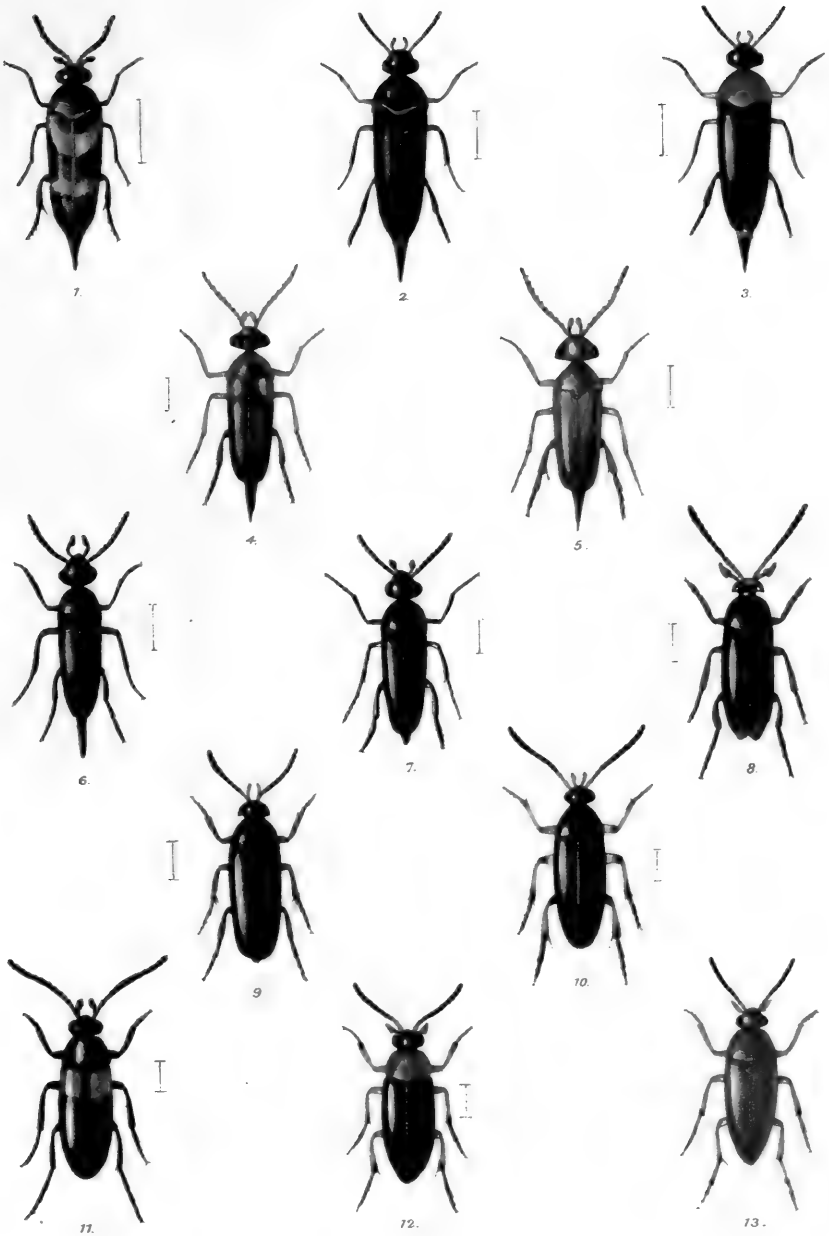

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PLATE CL.

FIG. 1. Anaspis flava, *v.* thoracica, *L.*
2. „ maculata, *Fourc.*
3. Metœcus paradoxus, *L.*, male.
3a. „ „ „ antenna.
4. „ „ female.
4a. „ „ „ antenna.
5. Notoxus paradoxus, *L.*
5a. „ „ head viewed sideways.
6. „ „ *var.*
7. Anthicus humilis, *Germ.*, *var.*
8. „ salinus, *Crotch.*
9. „ floralis, *v.* quisquilius, *Thoms.*
10. „ instabilis, *Curt.*
11. „ angustatus, *Curt.*
12. „ scoticus, *Rye.*
13. „ antherinus, *L.*

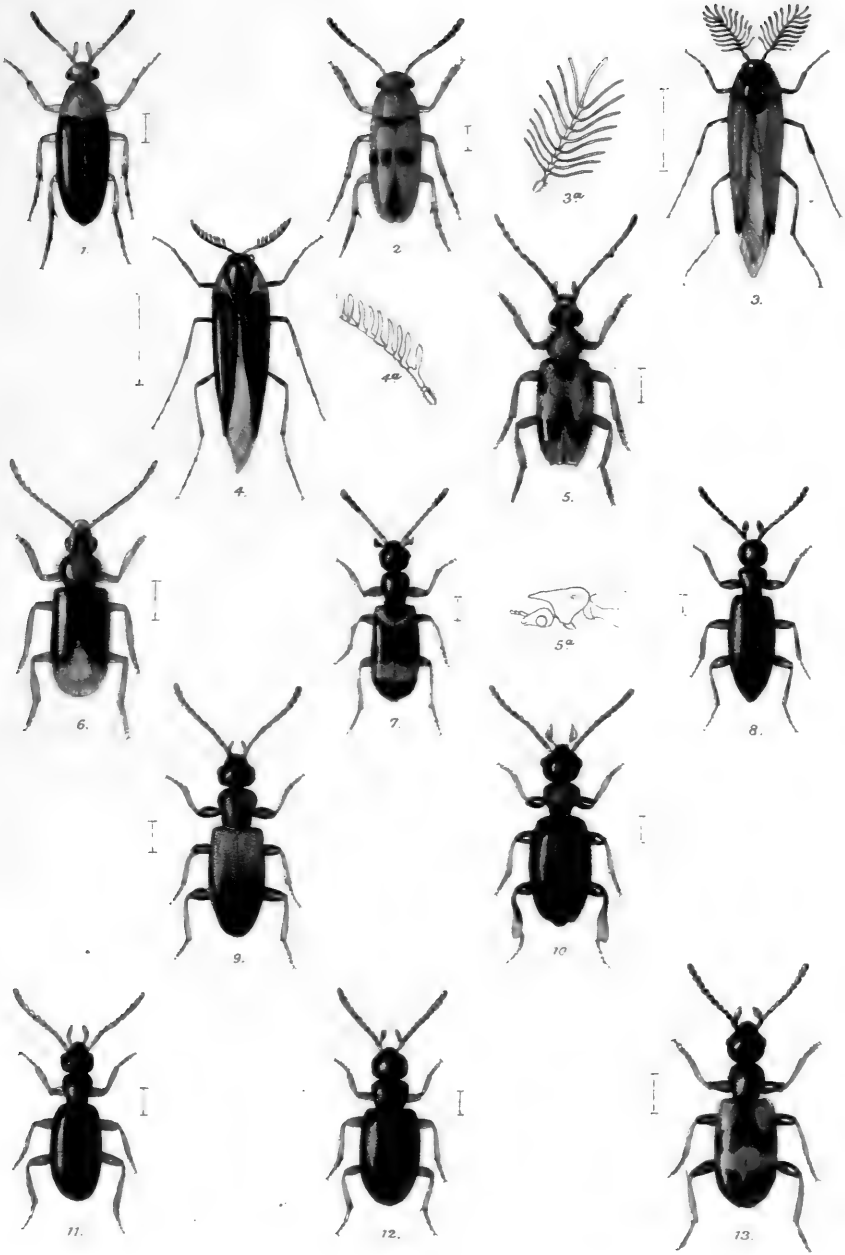

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PLATE CLI.

FIG. 1. Anthicus bimaculatus, *Ill.*
2. Xylophilus populneus, *F.*
3. „ oculatus, *F.*, male.
3a. „ „ antenna of male.
3b. „ „ antenna of female.
3c. „ „ intermediate leg.
3d. „ „ labrum.
3e. „ „ maxillary palpus.
4. „ „ female.
5. Meloe proscarabæus, *L.*, male.
6. „ „ female.
7. „ violaceus, *Marsh.*
8. „ cicatricosus, *Leach.*
9. „ variegatus, *Don.*
10. „ rugosus, *Marsh.*
11. „ brevicollis, *Panz.*
12. Sitaris muralis, *Forst.*
13. Lytta vesicatoria, *L.*

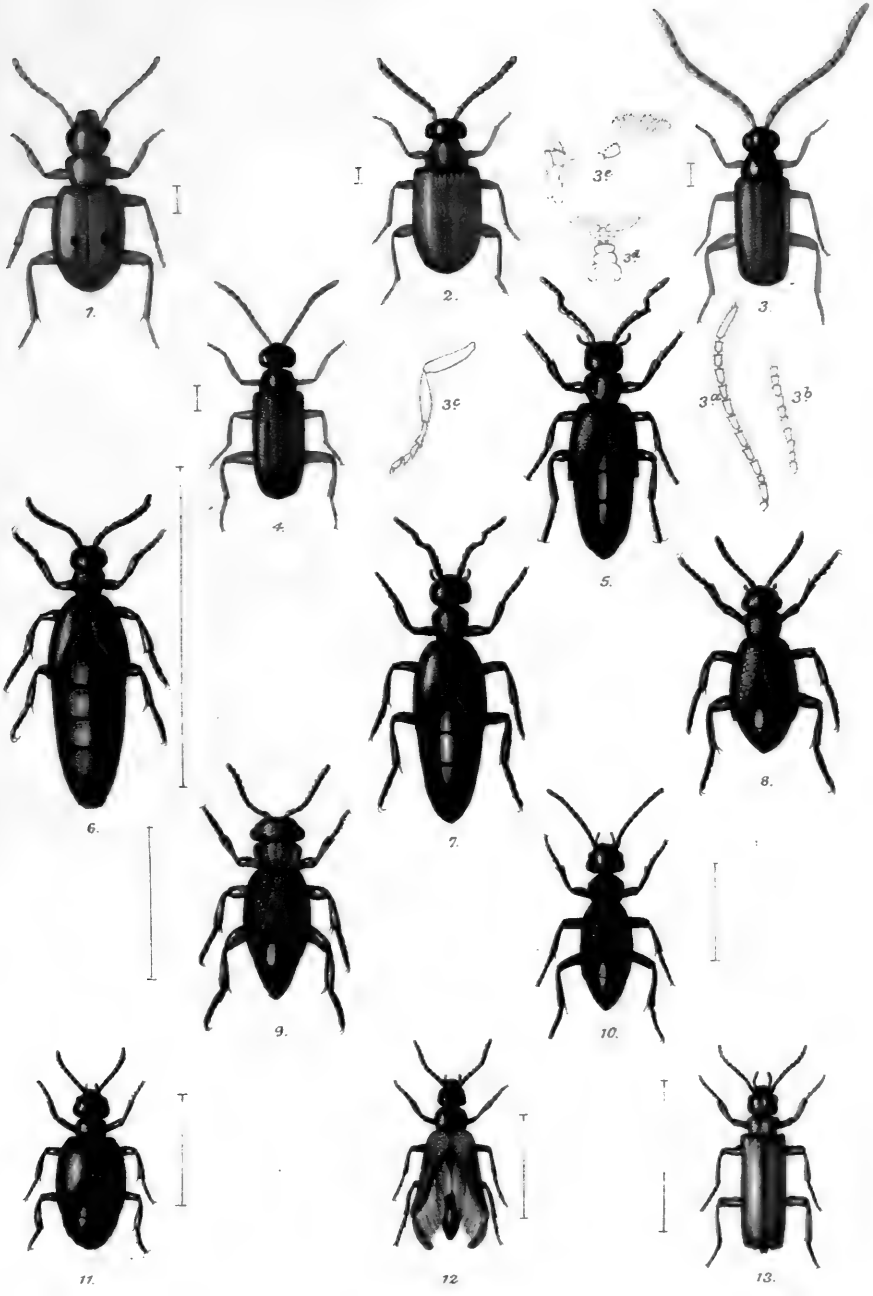

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PLATE CLII.

FIG. 1. Brachytarsus fasciatus, *Forst.*
2. „ varius, *F.*
3. Macrocephalus (*Anthribus*) albinus, *L.*, male.
4. „ „ „ female.
5. Platyrrhinus latirostris, *F.*
6. Tropideres niveirostris, *F.*
7. „ sepicola, *F.*
8. Choragus Sheppardi, *Kirby.*
9. Rhinomacer attelaboides, *F.*
10. Apoderus coryli, *L.*
11. Attelabus curculionoides, *F.*
12. Byctiscus populeti, *F., var.*, male.
13. „ „ „ female.

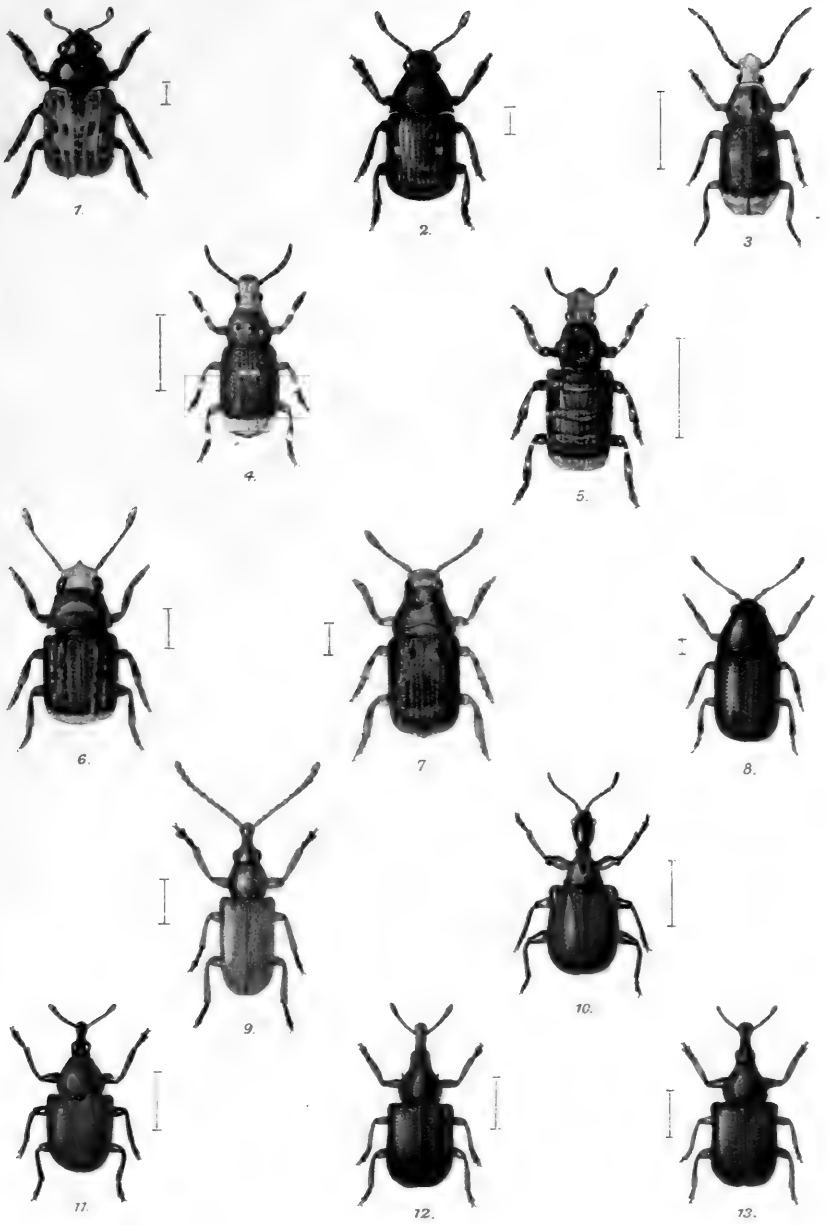

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PLATE CLIII.

FIG. 1. Byctiscus populi, *L.*, male.
2. Rhynchites auratus, *Scop.*, male.
3. „ Bacchus, *L.*
4. „ cupreus, *L.*
5. „ æquatus, *L.*
6. „ æneovirens, *Marsh.*
7. „ cœruleus, *De G.* (*conicus*, Ill.).
8. „ interpunctatus, *Steph.* (*alliariæ*, Brit. Cat.).
9. „ nanus, *Payk.*
10. „ sericeus, *Herbst.* (*ophthalmicus*, Steph.).
11. „ pubescens, *F.*
12. Deporaüs megacephalus, *Germ.*
13. „ betulæ, *L.*, male.

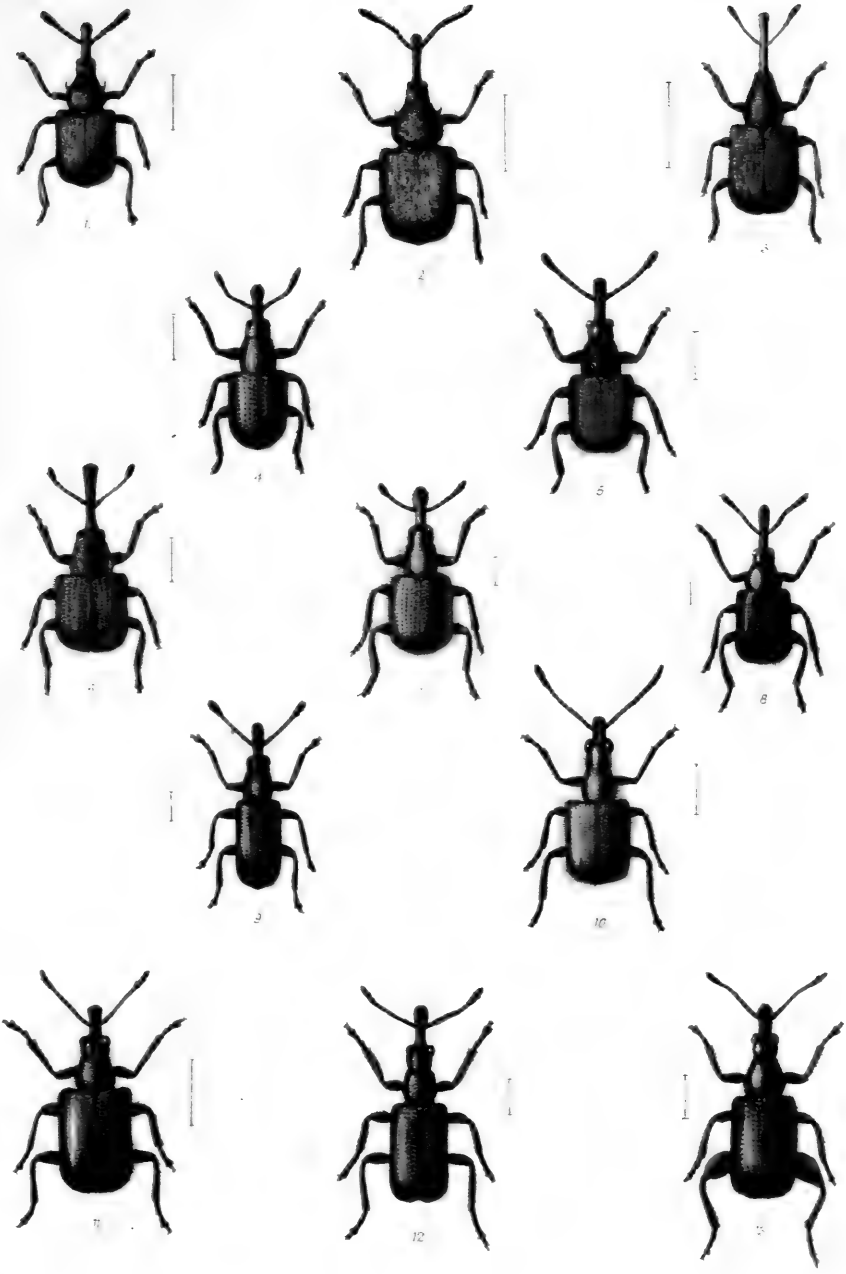

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PLATE CLIV.

Fig. 1. Apion pomonæ, *F.*
2. ,, craccæ, *L.*
3. ,, subulatum, *Kirby.*
4. ,, carduorum, *Kirby.*
5. ,, confluens, *Kirby.*
6. ,, atomarium, *Kirby.*
7. ,, Hookeri, *Kirby.*
8. ,, ulicis, *Forst.*
9. ,, genistæ, *Kirby.*
10. ,, urticarium, *Herbst.* (*vernale*, F.).
11. ,, æneum, *F.*
12. ,, radiolus, *Marsh.*
13. ,, astragali, *Payk.*

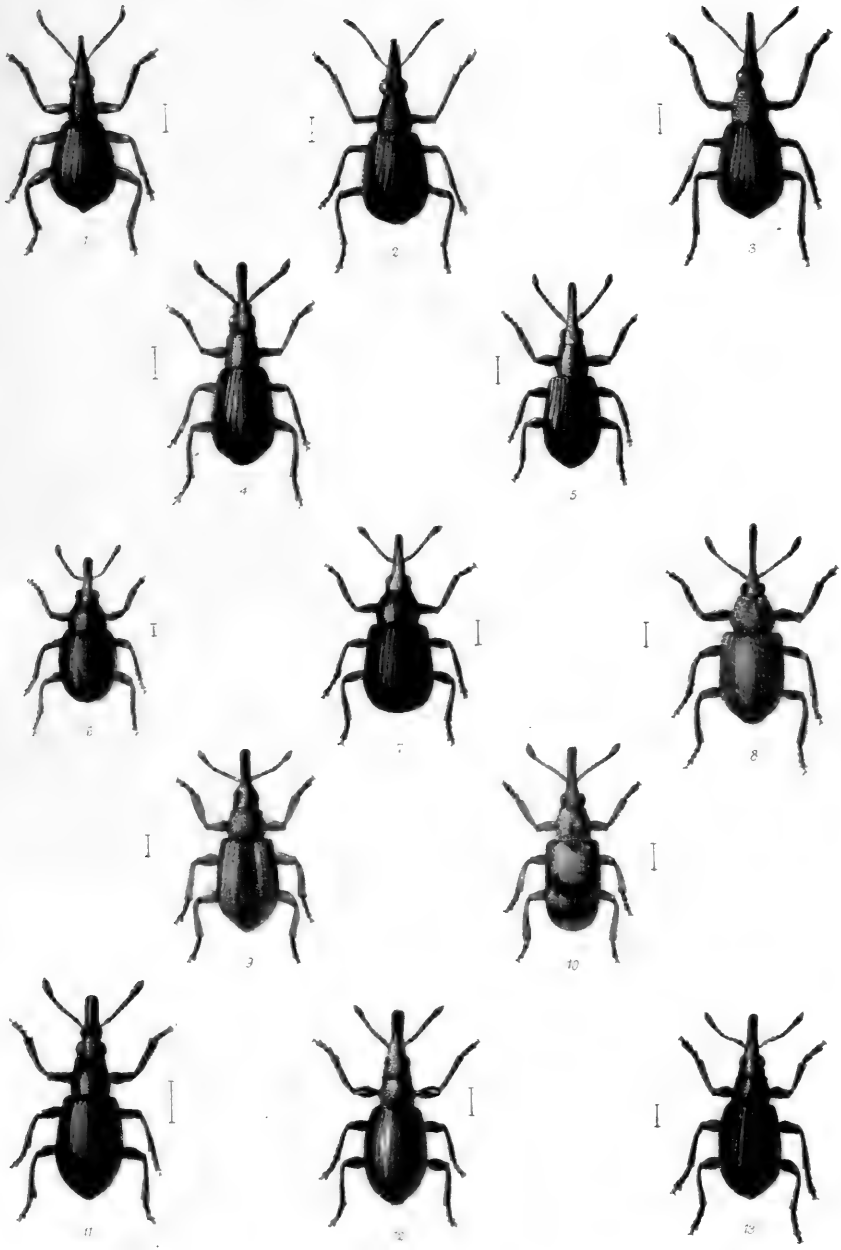

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PLATE CLV.

FIG. 1. Apion striatum, *Marsh.*
2. ,, Curtisi, *Walt.*
3. ,, seniculum, *Kirby.*
4. ,, rufirostre, *F.*, male.
5. ,, difforme, *Germ.*, male.
6. ,, lævicolle, *Kirby.*
7. ,, apricans, *Herbst.* (*fagi*, Kirby).
8. ,, nigritarse, *Kirby*, male.
9. ,, ebeninum, *Kirby.*
10. ,, tenue, *Kirby.*
11. ,, punctigerum, *Payk.*
12. ,, unicolor, *Kirby* (*platalea*, Germ.).
13. ,, minimum, *Herbst.*

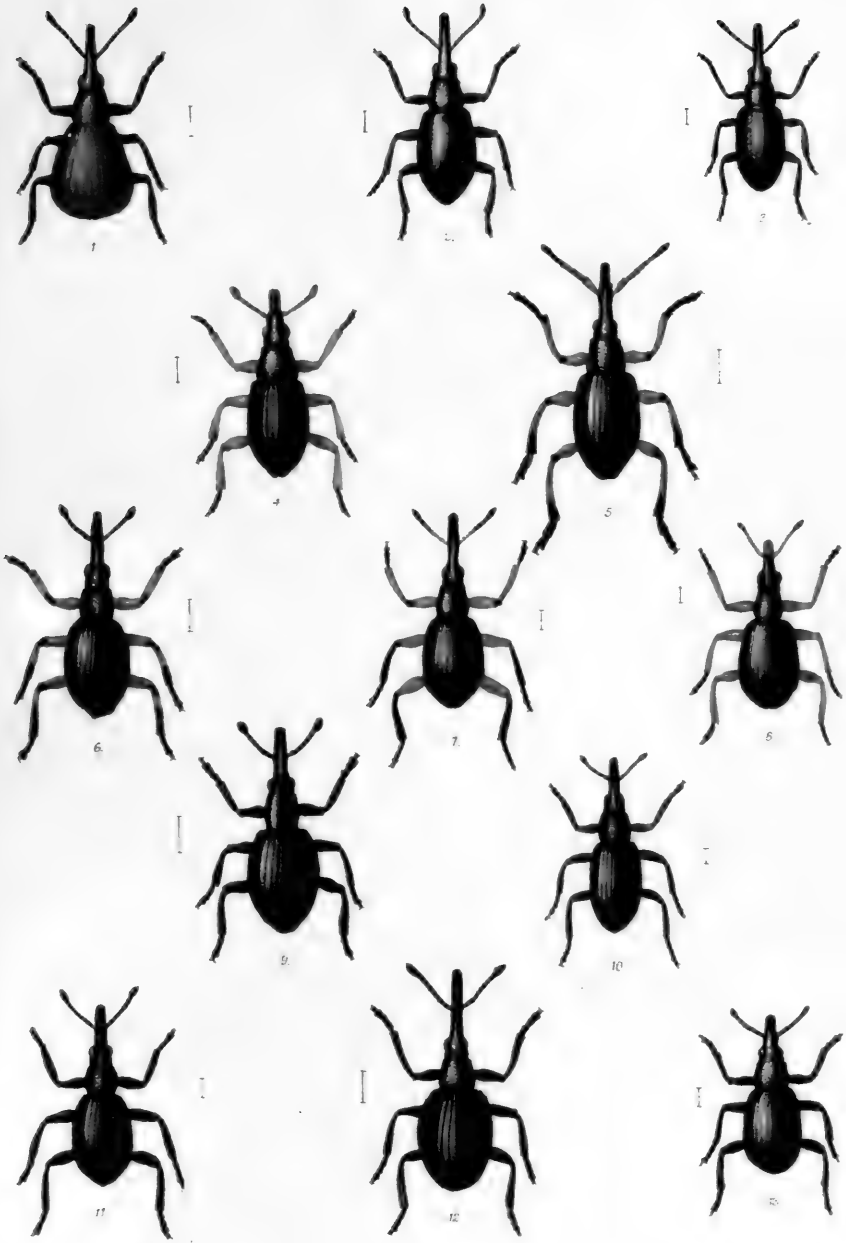

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PLATE CLVI.

FIG. 1. Apion ervi, *Kirby*, male.
2. „ æthiops, *Herbst.*
3. „ pisi, *F.*
4. „ sorbi, *F.*
5. „ vorax, *Herbst.*
6. „ miniatum, *Germ.*
7. „ hæmatodes, *Kirby* (*frumentarium*, Payk.).
8. „ rubens, *Steph.*
9. „ malvæ, *F.*
10. „ limonii, *Kirby.*
11. „ violaceum, *Kirby.*
12. „ affine, *Kirby.*
13. „ humile, *Germ.*

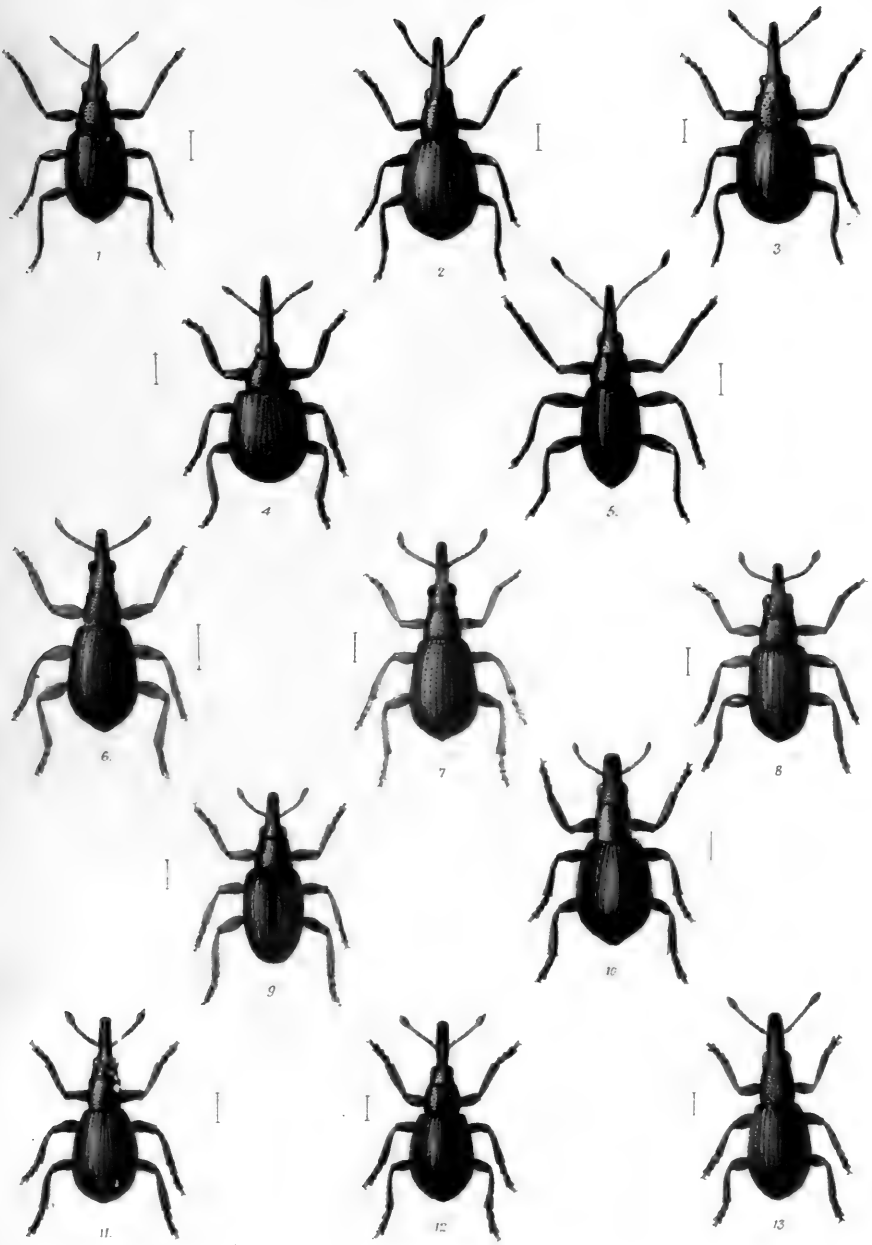

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PLATE CLVII.

FIG. 1. Otiorrhynchus tenebricosus, *Herbst.*
2. ,, atroapterus, *De G.*
3. ,, blandus, *Gyll* (*monticola*, Walt.).
4. ,, maurus, *Gyll.*
5. ,, raucus, *F.*
6. ,, scabrosus, *Marsh.*
7. ,, ligneus, *Ol.*
8. ,, septentrionis, *Herbst.*
9. ,, picipes, *F.*
10. ,, sulcatus, *F.*
11. ,, ligustici, *L.*
12. ,, rugifrons, *Gyll.*
13. ,, ovatus, *L.*

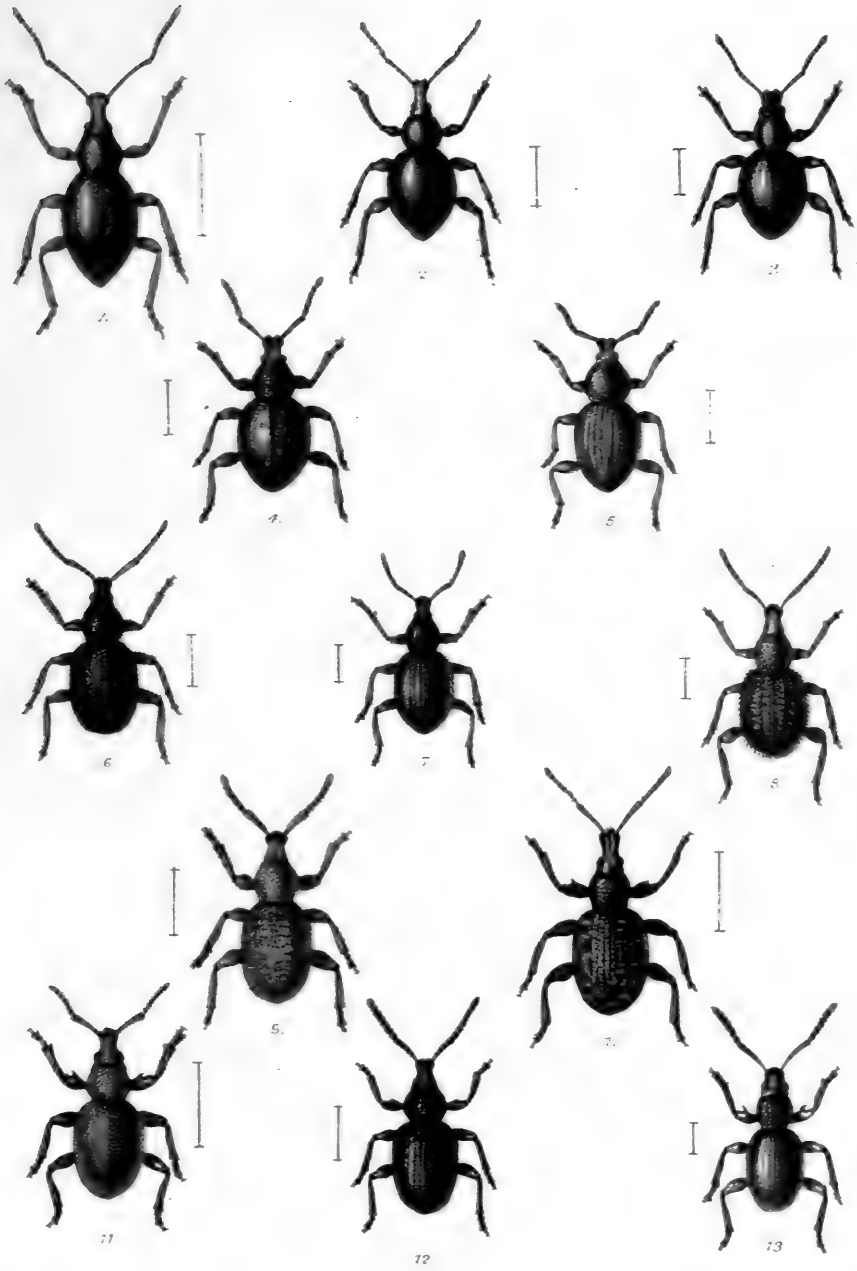

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PLATE CLVIII.

Fig. 1. Peritelus griseus, *Ol.*
2. Trachyphlœus myrmecophilus, *Seidl.*
3. ,, aristatus, *Gyll.*
4. ,, scaber, *L.*
5. ,, spinimanus, *Germ.*
6. Cathormiocerus socius, *Boh.*
7. ,, maritimus, *Rye.*
8. Cænopsis fissirostris, *Walt.*
8*a*. ,, ,, deciduous mandibles.
9. ,, Waltoni, *Schönh.*
10. Strophosomus coryli, *F.*
11. ,, capitatus, *De G.* (*obesus*, Marsh).
12. ,, retusus, *Marsh.*
13. ,, faber, *Herbst.*

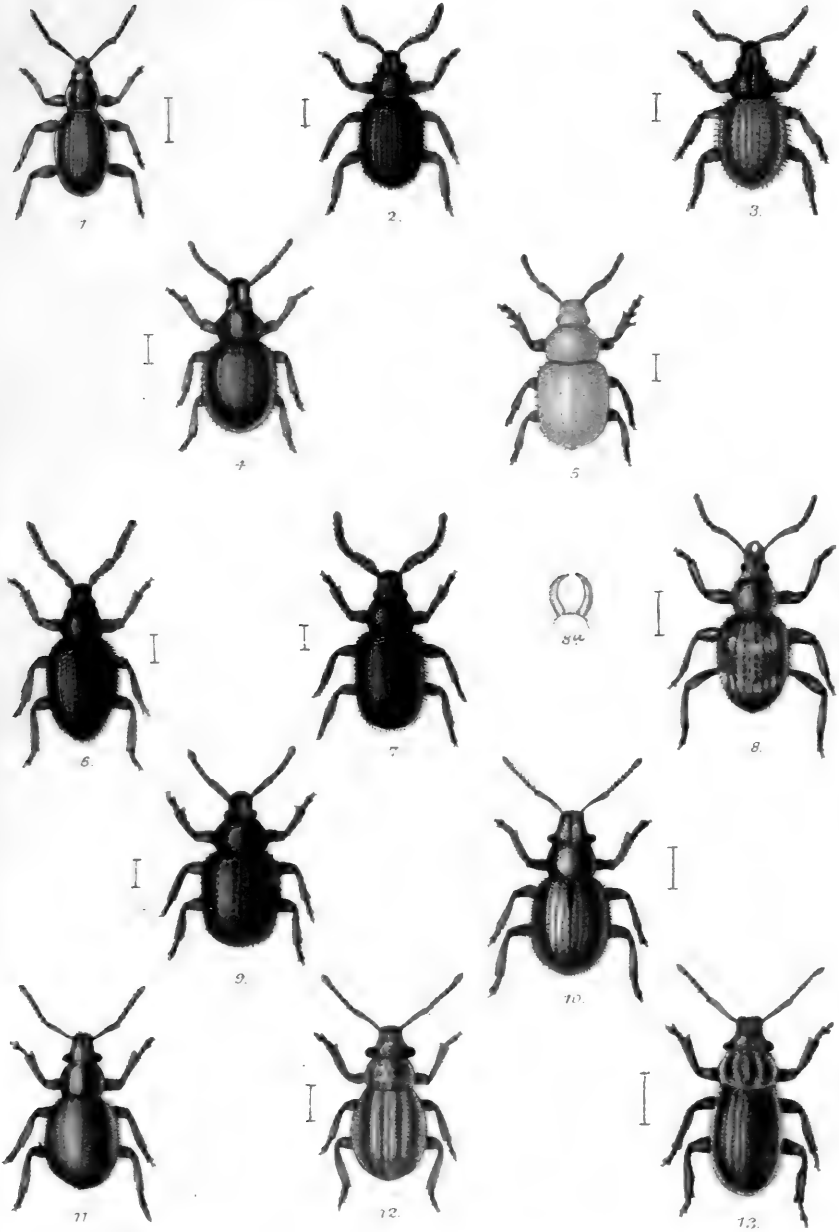

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PLATE CLIX.

Fig. 1. Strophosomus lateralis, *Payk.* (*limbatus*, F.).
2. Exomias araneiformis, *Schrank.* (*brunnipes*, Ol.).
3. ,, pellucidus, *Boh.*
4. Omias mollinus, *Boh.*
5. Brachysomus echinatus, *Bonsd.* (*hirsutulus*, F.).
6. Eusomus ovulum, *Ill.*
7. Sciaphilus muricatus, *F.*
8. Tropiphorus carinatus, *Müll.*
9. ,, tomentosus, *Marsh* (*mercurialis*, Brit. Cat.).
10. ,, obtusus, *Bonsd.*
11. Barypeithes sulcifrons, *Boh.*
12. Liophlœus nubilus, *F.*
13. Metallites marginatus, *Steph.*

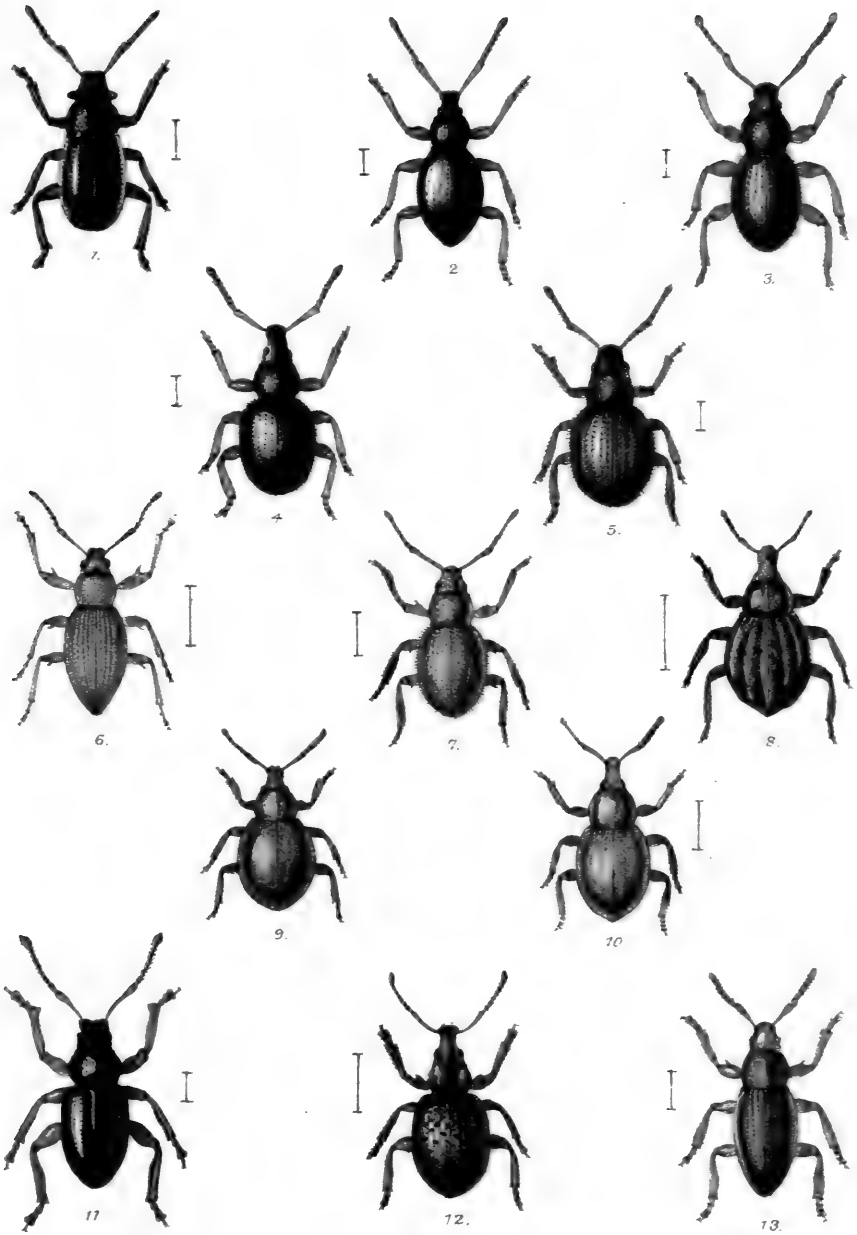

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PLATE CLX.

FIG. 1. Polydrusus micans, *F.*
2. „ tereticollis, *De G.* (*undatus*, F.)
3. „ pterygomalis *Boh.*
4. „ flavipes, *De G.*
5. „ cervinus, *L.*
6. „ chrysomela, *Ol.*
7. „ confluens, *Steph.*
8. Phyllobius oblongus, *L.*
9. „ calcaratus, *F.*
10. „ urticæ, *De G.* (*alneti*, F.).
11. „ pyri, *L.*
12. „ argentatus, *L.*
13. „ maculicornis, *Germ. var. cinereus.*

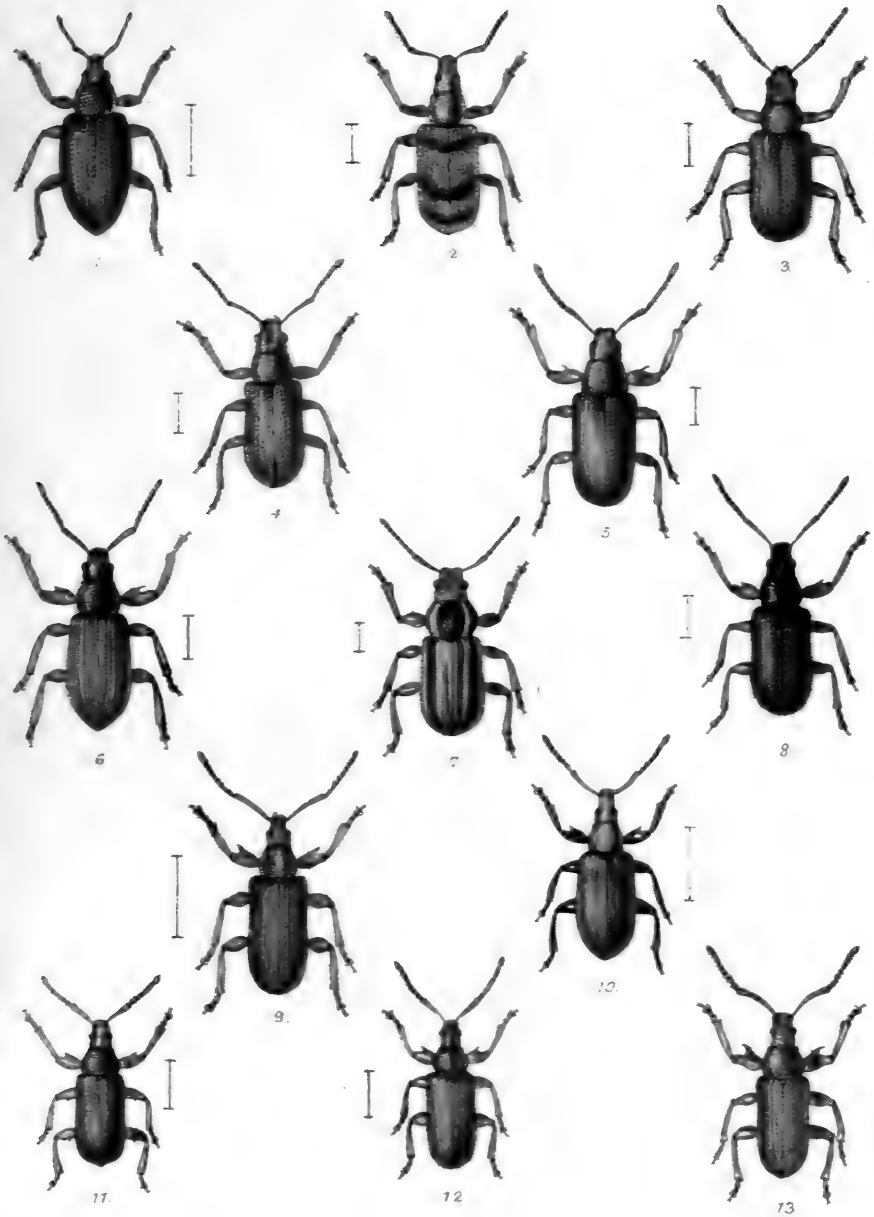

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PLATE CLXI.

Fig. 1. Phyllobius pomonæ, *Ol.*
2. ,, viridiæris, *Laich* (*uniformis* Marsh), var *griseus*, Fowler.
3. ,, viridicollis, *F.*
4. Tanymecus palliatus, *F.*
5. Philopedon (*Cneorrhinus*) geminatus, *F.*
6. Atactogenus (*Cneorrhinus*) exaratus, *Marsh.*
7. Barynotus obscurus, *F.*
8. ,, elevatus, *Marsh* (*mærens auct, nec F.*).
9. Alophus triguttatus, *F.*
10. Sitones griseus, *F.*
11. ,, cambricus, *Steph.*
12. ,, ,, v. cinerascens, *Fahr.* (brown var.).
13. ,, regensteinensis, *Herbst.*

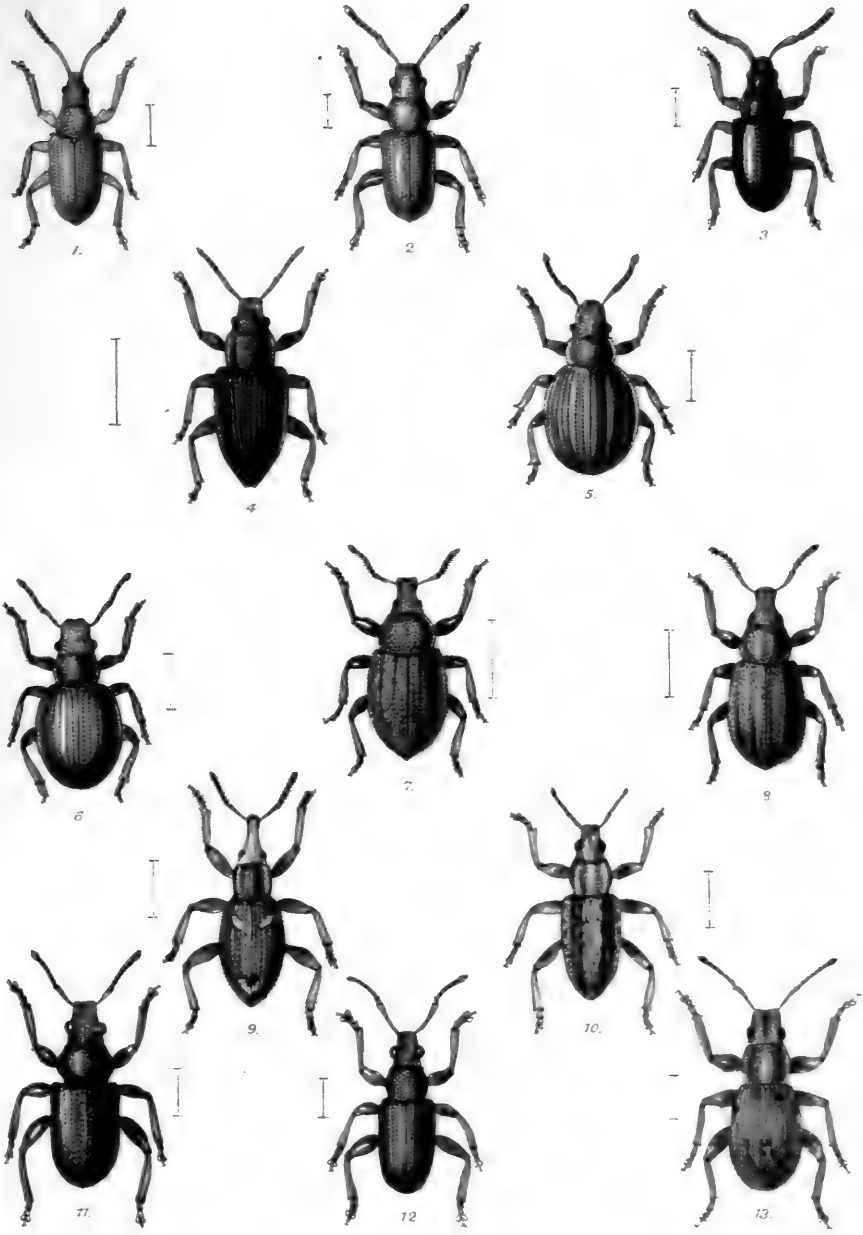

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PLATE CLXII.

FIG. 1. Sitones waterhousei, *Walt.*
2. ,, crinitus, *Herbst.*
3. ,, hispidulus, *F.*
4. ,, tibialis, *Herbst.*
5. ,, humeralis, *Steph.*
6. ,, flavescens, *Marsh.*
7. ,, suturalis, *Steph.*
8. ,, puncticollis, *Steph.*
9. ,, lineatus, *L.*
10. ,, sulcifrons, *Thunb.*
11. Gronops lunatus, *L.*
12. Limobius dissimilis, *Herbst.*
13. ,, mixtus, *Boh.*

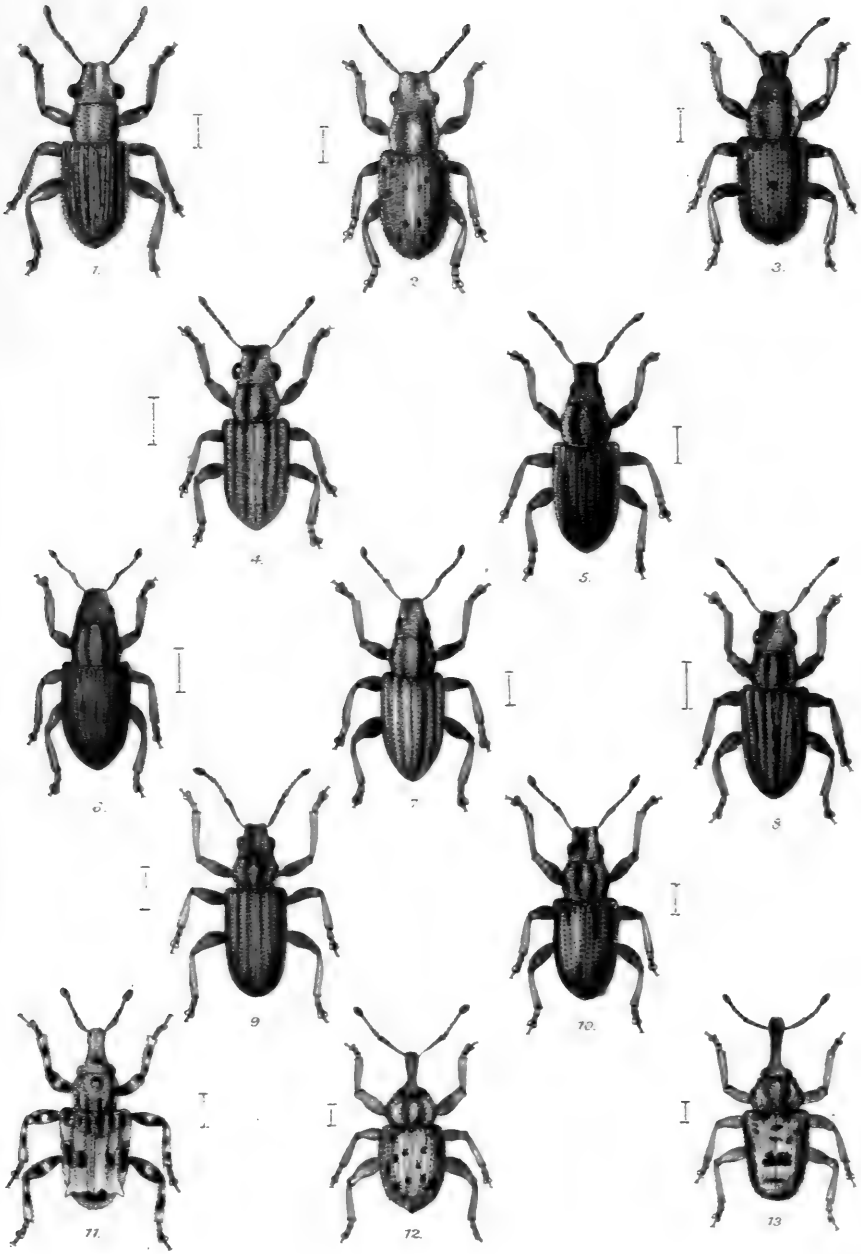

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PLATE CLXIII.

FIG. 1. Hypera punctata, *F.*
2. ,, fasciculata, *Herbst.*
3. ,, rumicis, *L.*
4. ,, pollux, *F.*
5. ,, alternans, *Steph.*
6. ,, polygoni, *L.*
7. ,, tigrina, *Boh.*
8. ,, suspiciosa, *Herbst.*
9. ,, variabilis, *Herbst.*
10. ,, plantaginis, *De G.*
11. ,, trilineata, *Marsh.*
12. ,, nigrirostris, *F.*
13. Rhinocyllus latirostris, *Latr.*

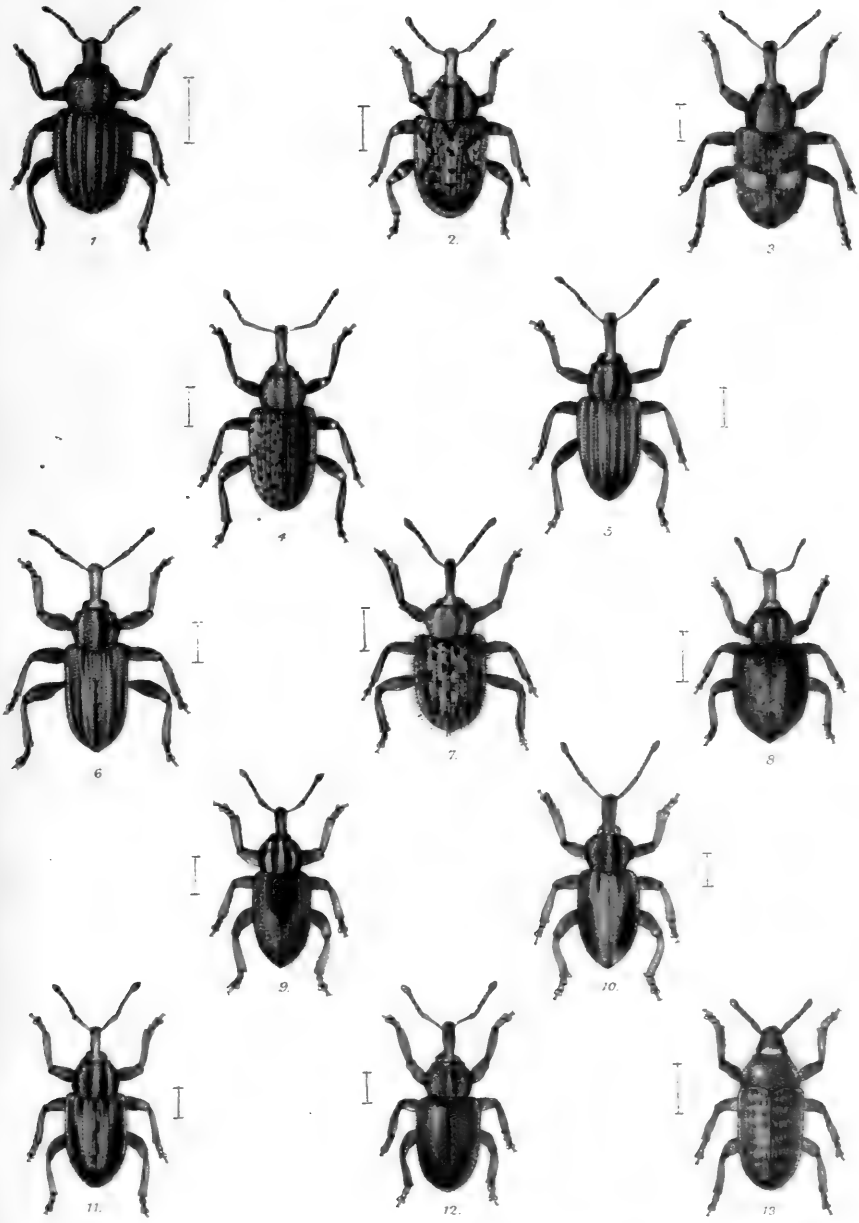

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PLATE CLXIV.

FIG. 1. Cleonus sulcirostris, *L.*
2. ,, albidus, *F.*
3. ,, nebulosus, *L.*
4. Lixus paraplecticus, *L.*
5. ,, bicolor, *Ol.*
6. ,, algirus, *L.* (*angustatus*, F.).
7. Larinus carlinæ, *Ol.*
8. Liosoma ovatulum, *Clairv.**
9. ,, ,, var. collaris, *Rye.**
10. ,, troglodytes, *Rye.*
11. Liparus (*Molytes*) coronatus, *Goeze.*
12. ,, germanus, *L.*
13. Curculio (*Hylobius*) abietis, *L.*

* The teeth on the femora, which are characteristic of this species, are not, or scarcely, visible from above; this applies also to certain other species in which the teeth may seem omitted in the plates.

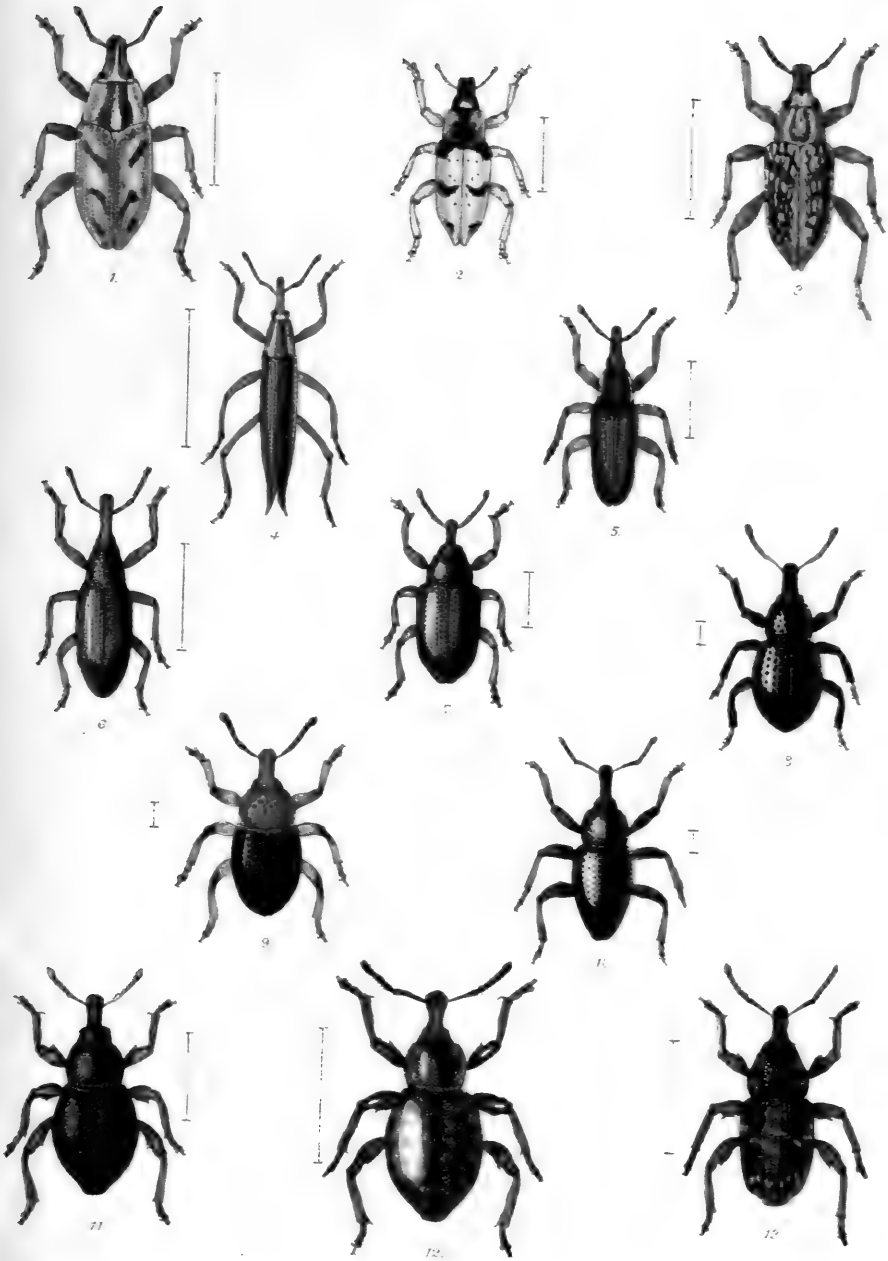

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PLATE CLXV.

Fig. 1. Plinthus caliginosus, *F.*
2. Pissodes pini, *L.*
3. ,, notatus, *F.*
4. Trachodes hispidus, *L.*
5. Orchestes quercus, *L.*
6. ,, alni, *L.*
7. ,, ilicis, *F.*
8. ,, ,, *v.* nigripes, *Fowler.*
9. ,, avellanæ, *Don.*
10. ,, fagi, *L.*
11. ,, pratensis, *Germ.*
12. ,, iota, *F.*
13. ,, stigma, *Germ.*

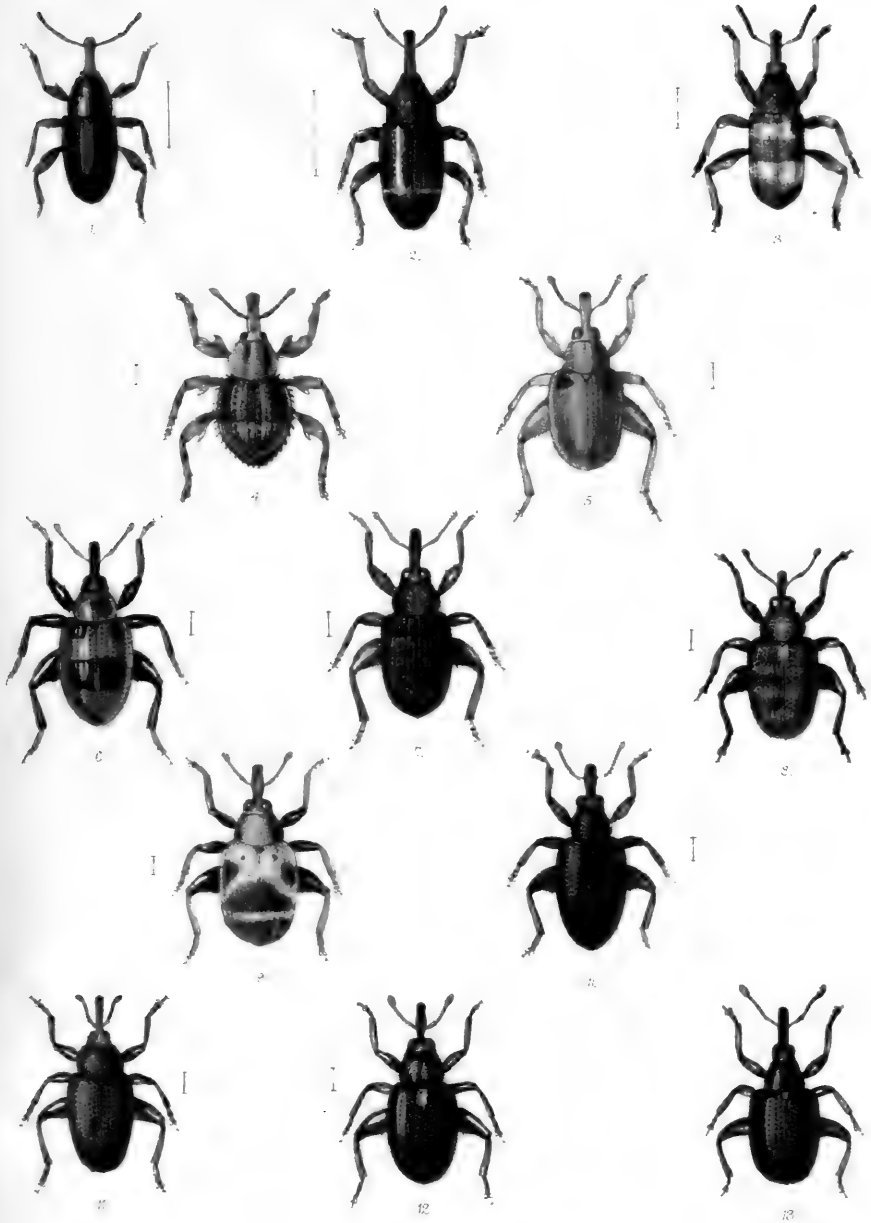

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PLATE CLXVI.

Fig. 1. Orchestes salicis, *L.*
2. ,, saliceti, *Payk.*
3. Rhamphus flavicornis, *Clairv.*
4. Orthocætes setiger, *Beck.*
5. Pseudostyphlus pilumnus, *Gyll.*
6. Procas armillatus, *F.* (*picipes* Marsh).
7. Pachytychius hæmatocephalus, *Gyll.*
8. Grypidius equiseti, *F.*
9. Erirrhinus scirpi, *F.*
10. ,, bimaculatus, *F.*
11. ,, acridulus, *L.*
12. ,, æthiops, *F.*
13. Thryogenes festucæ, *Herbst.*

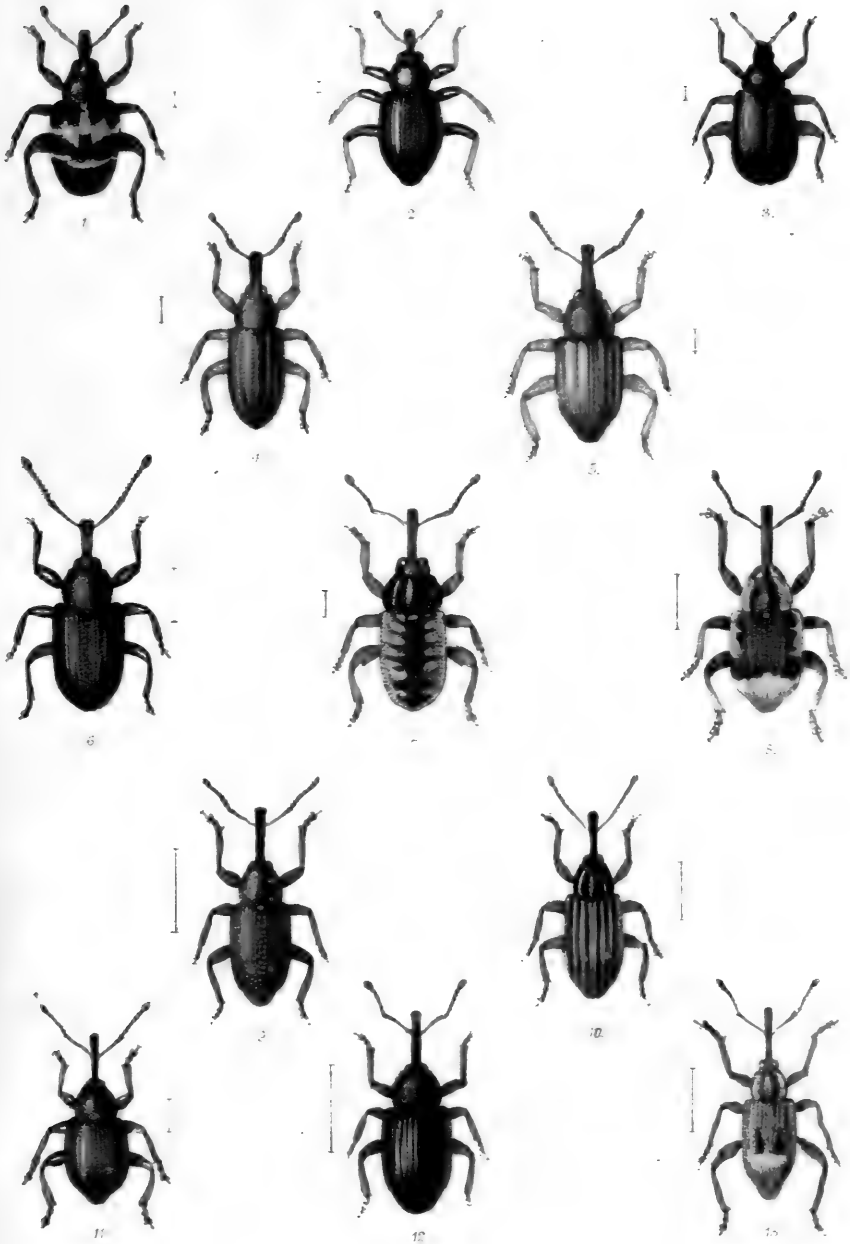

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PLATE CLXVII.

FIG. 1. Dorytomus vorax, *F.*, male.
2. ,, ,, female.
3. ,, tremulæ, *F.*
4. ,, hirtipennis, *Bedel* (*tæniatus*, Gyll).
5. ,, tortrix, *L.*
6. ,, validirostris, *Gyll.*
7. ,, maculatus, *Marsh.*
8. ,, melanophthalmus *Payk*, (*v.* agnathus, *Boh.*).
9. ,, salicinus, *Gyll.*
10. Smicronyx Reichei, *Gyll.*
11. Tanysphyrus lemnæ, *F.*
12. Bagous alismatis, *Marsh* (*Hydronomus*, Schönh).
13. ,, cylindrus, *Payk* (*Lyprus*, Schönh).

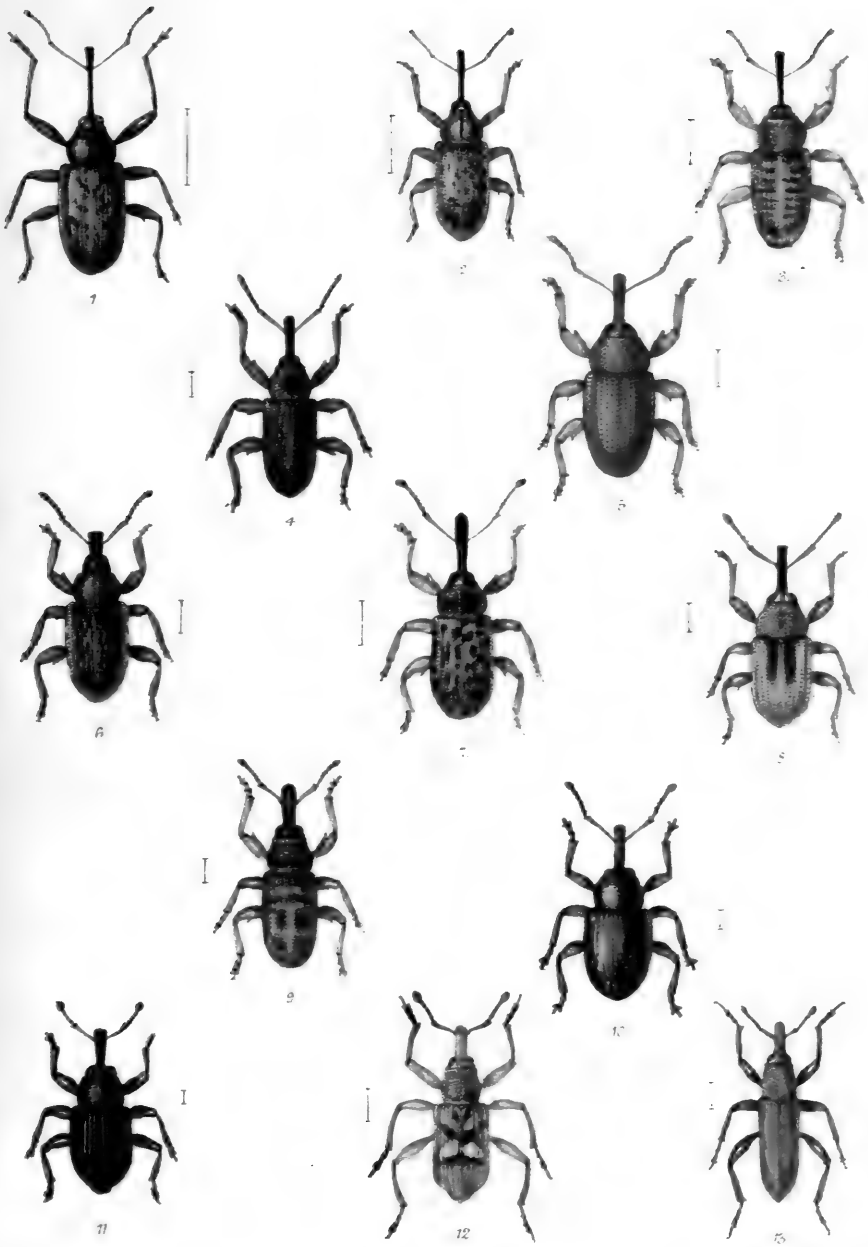

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PLATE CLXVIII.

FIG. 1. Bagous nodulosus, *Gyll* (*binodulus*, Thoms.).
2. ,, argillaceus, *Gyll* (*inceratus*, Brit. Cat.).
3. ,, limosus, *Gyll* (*subcarinatus*, Sharp's Cat.).
4. ,, tempestivus, *Herbst.*
5. ,, brevis, *Schönh.*
6. Anoplus plantaris, *Naez.*
7. Acalyptus carpini, *F.* (*v.* rufipennis, *Gyll*).
8. Elleschus bipunctatus, *L*
9. Tychius quinquepunctatus, *L.*
10. ,, venustus, *F.*
11. ,, Schneideri, *Herbst.* (*lineatulus*, Brit. Cat.).
12. ,, lineatulus, *Steph.* (*Schneideri*, Brit. Cat.).
13. ,, meliloti, *Steph.*

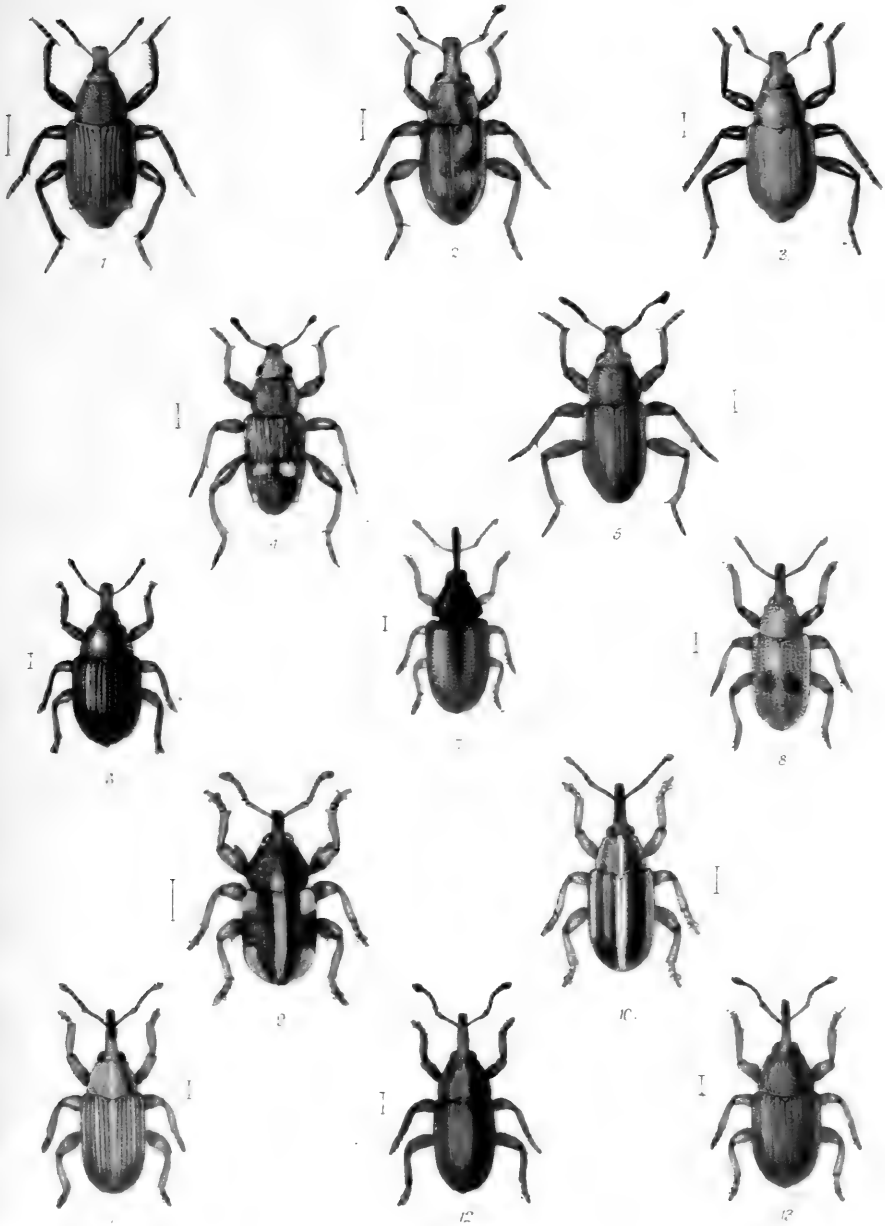

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PLATE CLXIX.

Fig. 1. Miccotrogus picirostris, *F.*
2. Sibinia potentillæ, *Germ.*
3. ,, arenariæ, *Steph.*
4. ,, sodalis, *Germ.*
5. Miarus graminis, *Gyll.*
6. ,, plantarum, *Germ.*
7. Gymnetron villosulus, *Gyll.*
8. ,, beccabungæ, *L.*
9. ,, melanarius, *Germ.*
10. ,, rostellum, *Herbst.*
11. ,, pascuorum, *Gyll.*
12. ,, labilis, *Herbst.*
13. ,, antirrhini, *Payk* (*noctis.* Brit. Cat.).

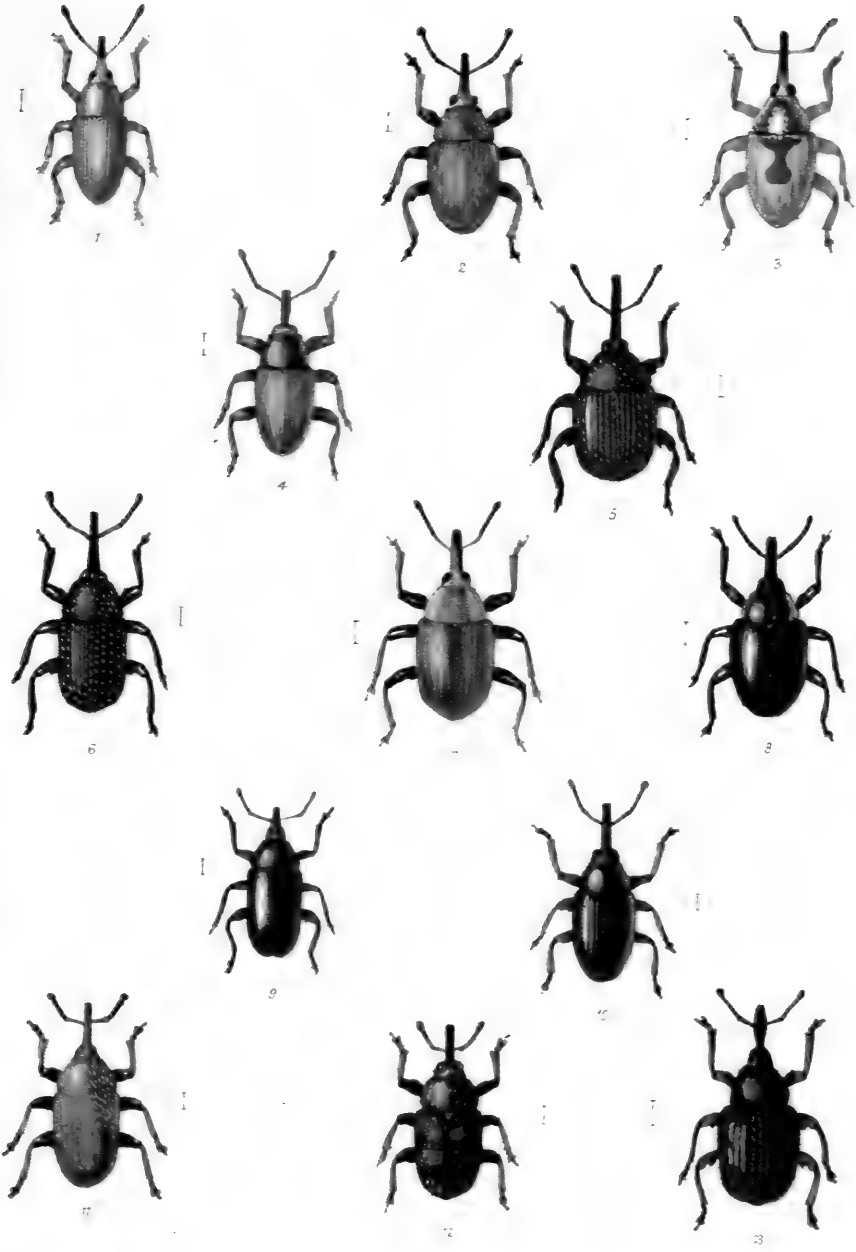

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PLATE CLXX.

FIG. 1. Gymnetron collinus, *Gyll.*
2. Mecinus pyraster, *Herbst.*
3. „ circulatus, *Marsh.*
4. „ collaris, *Germ.*
5. Anthonomus ulmi, *De G.*
6. „ „ „ *var.*
7. „ Rosinæ, *Des Gozis.*
8. „ pedicularius, *L.*
9. „ pomorum, *L.*
10. „ varians, *Payk.*
11. „ rubi, *Herbst.*
12. „ comari, *Crotch.*
13. Brachonyx pineti, *Payk* (*indigena*, Herbst.).

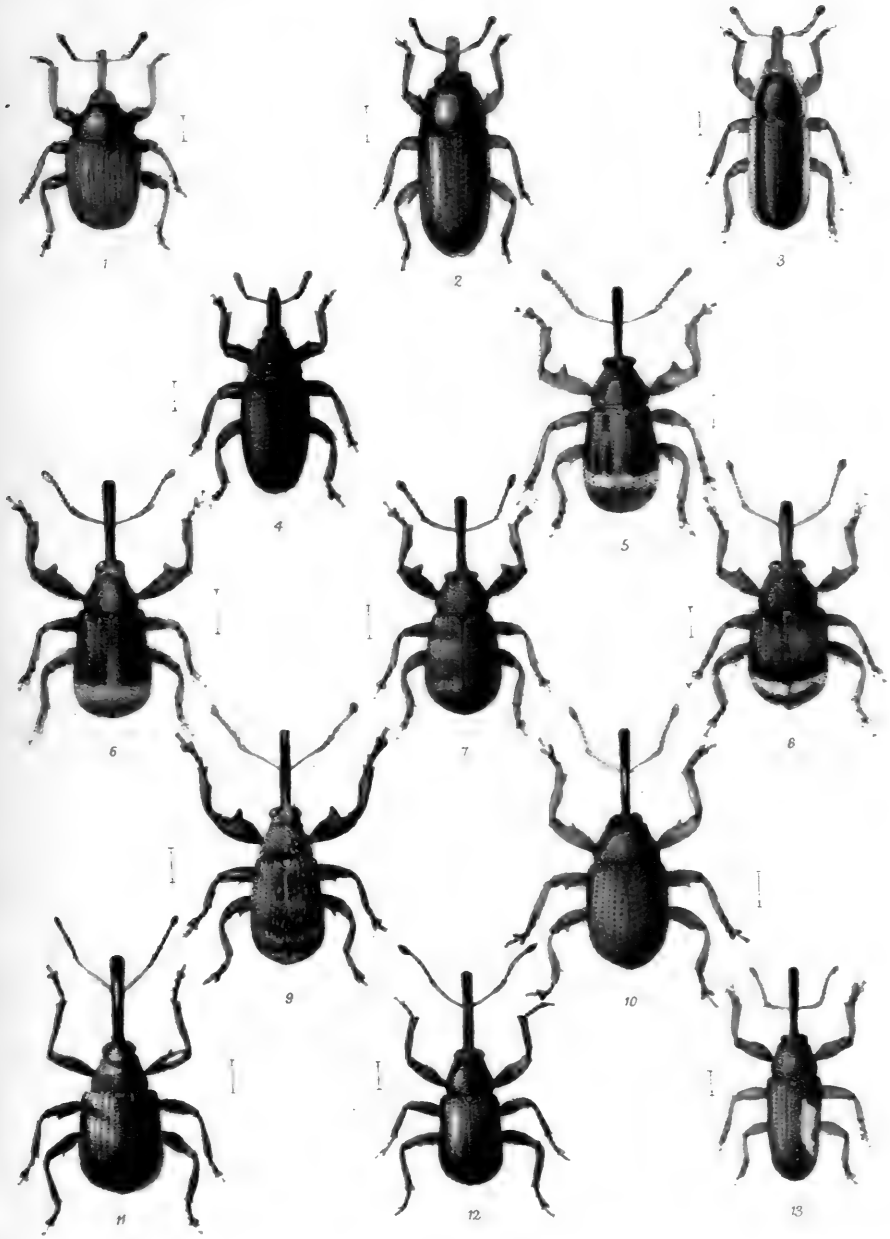

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PLATE CLXXI.

Fig. 1. Nanophyes lythri, *L.*
2. ,, gracilis, *Redt.*
3. Cionus scrophulariæ, *L.*
4. ,, tuberculosus, *Scop.* (*verbasci*, *F.*).
5. ,, hortulanus, *Marsh.*
6. ,, blattariæ, *F.*
7. ,, pulchellus, *Herbst.*
8. Orobitis cyaneus, *L.*
9. Cryptorrhynchus lapathi, *L.*
10. Acalles roboris, *Curt.*
11. ,, turbatus, *Boh.*
12. Mononychus pseudacori, *F.*
13. Cœliodes rubicundus, *Herbst.*

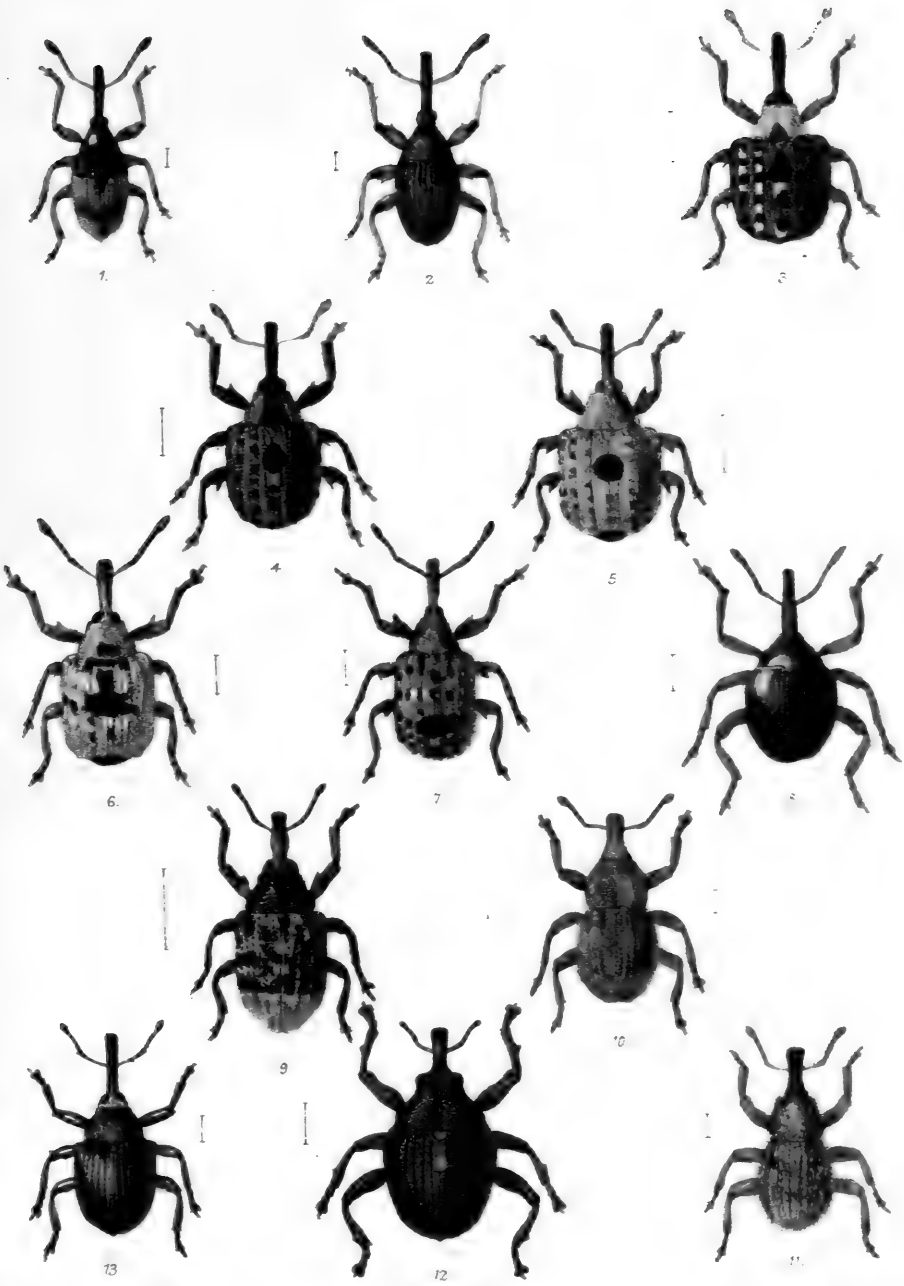

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PLATE CLXXII.

Fig. 1. Cœliodes ruber, *Marsh.*
2. „ quercus, *F.*
3. „ erythroleucus, *Gmel.*
4. „ cardui, *Herbst* (*fuliginosus* Marsh).
5. „ quadrimaculatus, *L.*
6. „ geranii, *Payk.*
7. Poophagus sisymbrii, *F.*
8. „ nasturtii, *Germ.*
9. Ceuthorrhynchus assimilis, *Payk.*
10. „ constrictus, *Marsh.*
11. „ cochleariæ, *Gyll.*
12. „ ericæ, *Gyll.*
13. „ erysimi, *F.*

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PLATE CLXXIII.

FIG. 1. Ceuthorrhynchus cyaneipennis, *Germ.*
2. ,, geographicus, *Goeze.* (*echii.* F.).
3. ,, pollinarius, *Forst.*
4. ,, pleurostigma, *Marsh* (*sulcicollis* Gyll).
5. ,, verrucatus, *Gyll* (*biguttatus* Boh).
6. ,, resedæ, *Marsh.*
7. ,, punctiger, *Gyll.*
8. ,, melanostictus, *Marsh.*
9. ,, asperifoliarum, *Gyll.*
10. ,, chrysanthemi, *Germ.*
11. ,, litura, *F.*
12. Ceuthorrhynchidius pyrrorhyncus, *Marsh.*
13. ,, posthumus, *Germ* (*pumilio* Gyll).

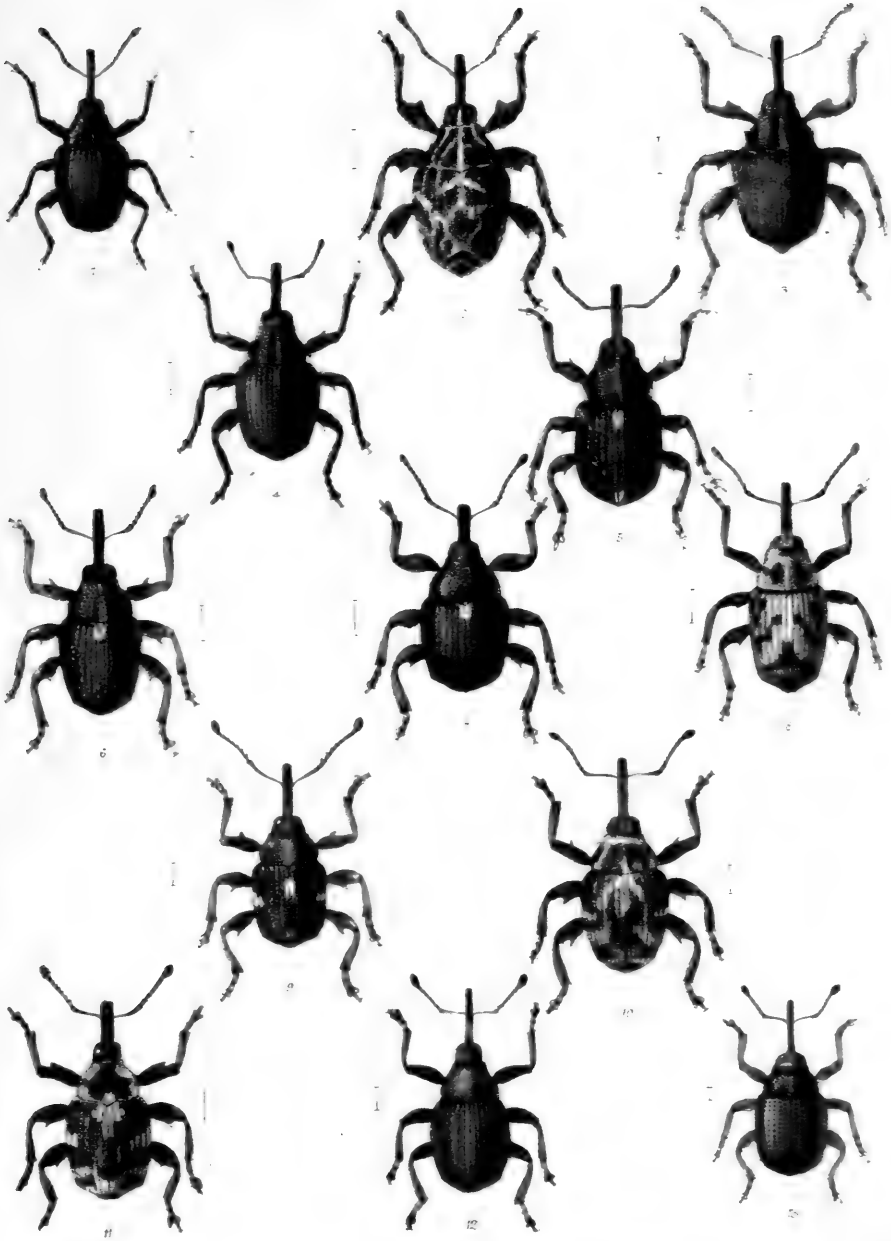

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PLATE CLXXIV.

FIG. 1. Ceuthorrhynchidius terminatus, *Herbst.*
2. ,, horridus, *F.*
3. ,, quercicola, *Payk.*
4. ,, troglodytes, *F.*
5. ,, chevrolati, *Bris.*
6. ,, Dawsoni, *Bris.*
7. Tapinotus sellatus, *F.*
8. Rhytidosomus globulus, *Herbst.*
9. Amalus hæmorrhous, *Herbst* (*scortillum* Herbst).
10. Rhinoncus pericarpius, *L.*
11. ,, gramineus, *F.* (*inconspectus*, auct.).
12. ,, perpendicularis, *Reich* (*subfasciatus* Gyll).
13. ,, castor, *F.*

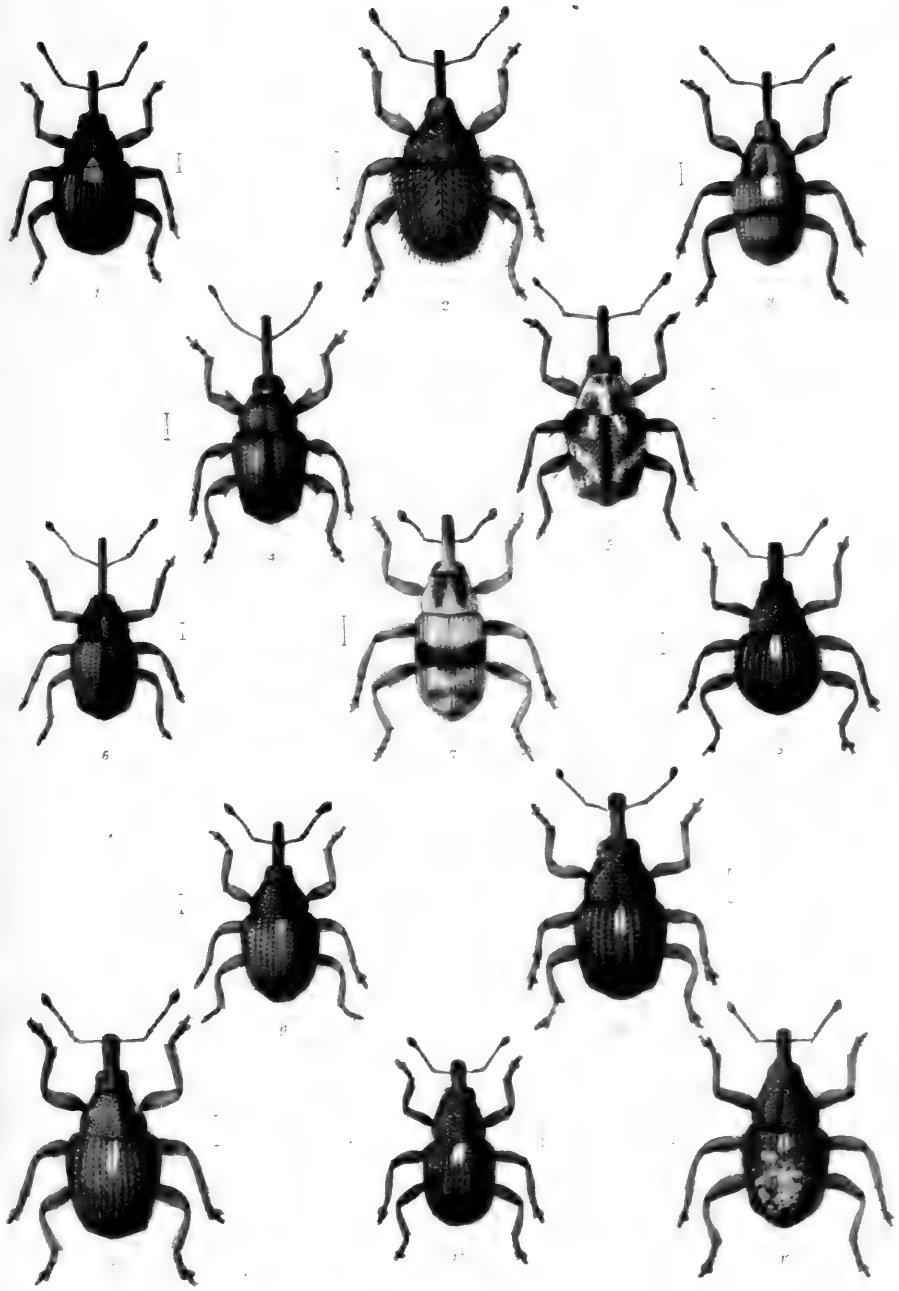

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PLATE CLXXV.

FIG. 1. Rhinoncus denticollis, *Gyll.*
1*a*. „ „ „ side view.
2. Eubrychius velatus, *Beck.*
3. Litodactylus leucogaster, *Marsh.*
4. Phytobius comari, *Herbst.*
5. „ quadritubereulatus, *F.*
6. „ quadricornis, *Gyll.*
7. Limnobaris T-album, *L.*
8. Baris laticollis, *Marsh.*
9. „ picicornis *Marsh* (*abrotani* Germ).
10. „ analis, *Ol.*
11. „ scolopacea, *Germ.*
12. Balaninus venosus, *Grav.*
13. „ nucum, *L.*

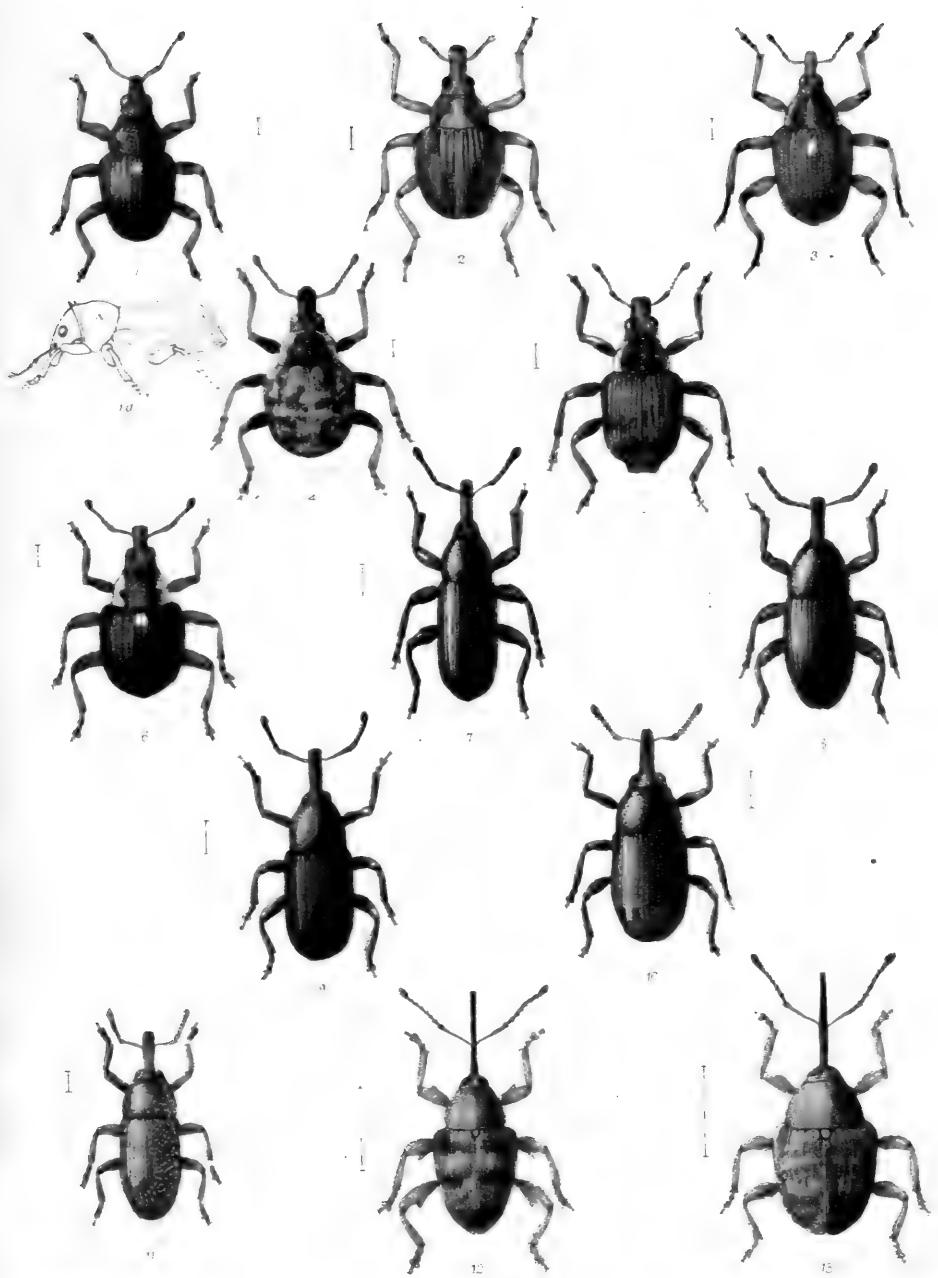

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PLATE CLXXVI.

FIG. 1. Balaninus turbatus, *Gyll.*
2. ,, betulæ *Steph.* (*cerasorum* Herbst).
3. ,, rubidus, *Gyll.*
4. ,, villosus, *F.*
5. ,, salicivorus *Payk.* (*brassicæ* Brit. Cat.).
6. ,, pyrrhoceras *Marsh*, male.
7. Calandra granaria, *L.*
8. ,, oryzæ, *L.*
9. Pentarthrum Huttoni, *Woll.*
10. Rhopalomesites Tardyi, *Curt*, male.
10*a*. ,, ,, ,, ,, rostrum.
11. ,, ,, ,, female.
11*a*. ,, ,, ,, ,, rostrum.
12. Cossonus ferrugineus, *Clairv.*
13. Rhyncolus lignarius, *Marsh* (*cylindrirostris* Ol.).

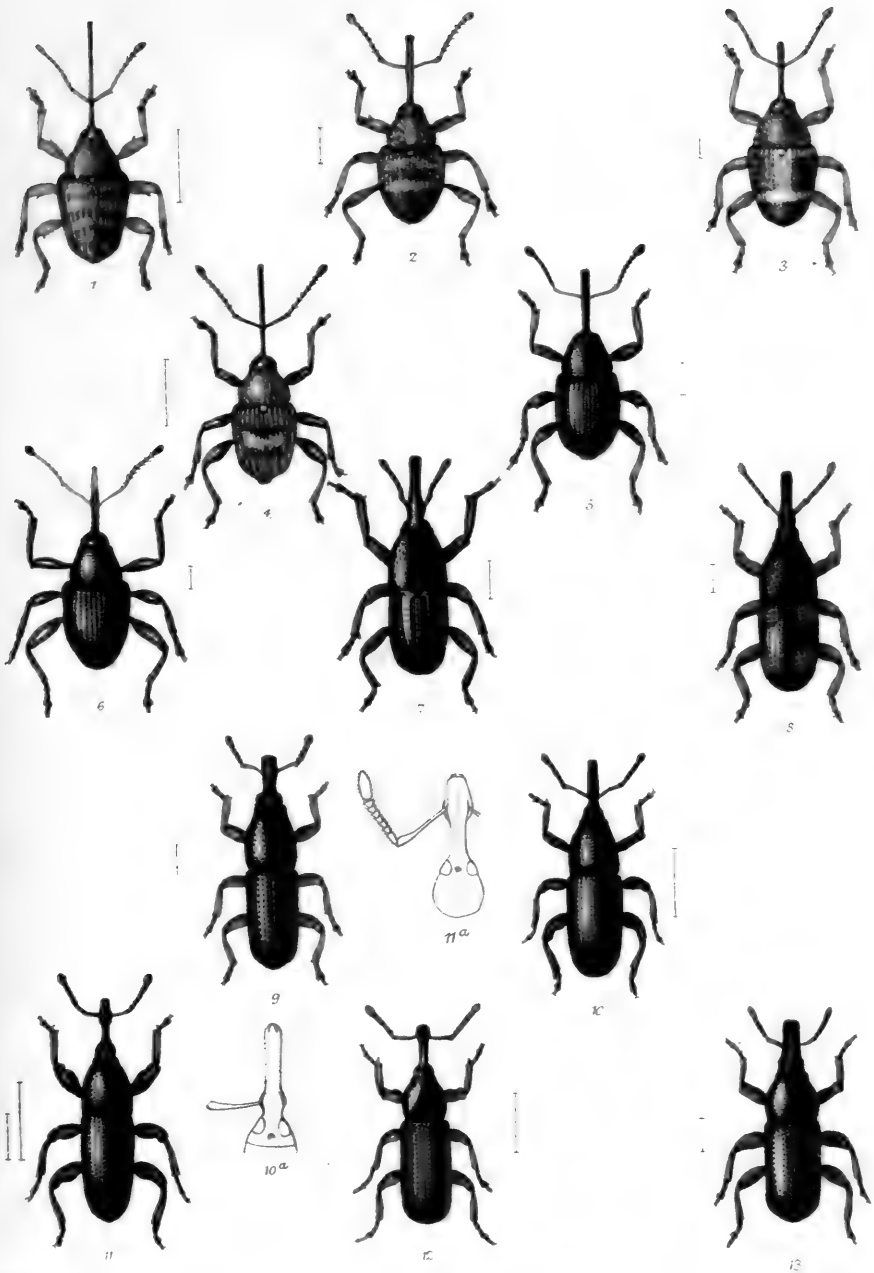

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PLATE CLXXVII.

FIG. 1. Rhyncolus ater L. (*chloropus*, F.).
2. Caulotrypis æneopiceus, *Boh.*
3. Codiosoma spadix, *Herbst.*
4. Magdalis phlegmatica, *Herbst.*
5. ,, carbonaria, *L.*
6. ,, armigera *Fourc.* (*atramentaria*, Marsh).
7. ,, pruni, *L.*
8. ,, barbicornis, *Latr.* male.
9. Scolytus Ratzeburgi, *Jans.*
10. ,, destructor, *Ol.*
11. ,, intricatus, *Ratz.*
12. ,, rugulosus, *Ratz.*
13. ,, multistriatus, *Marsh.*

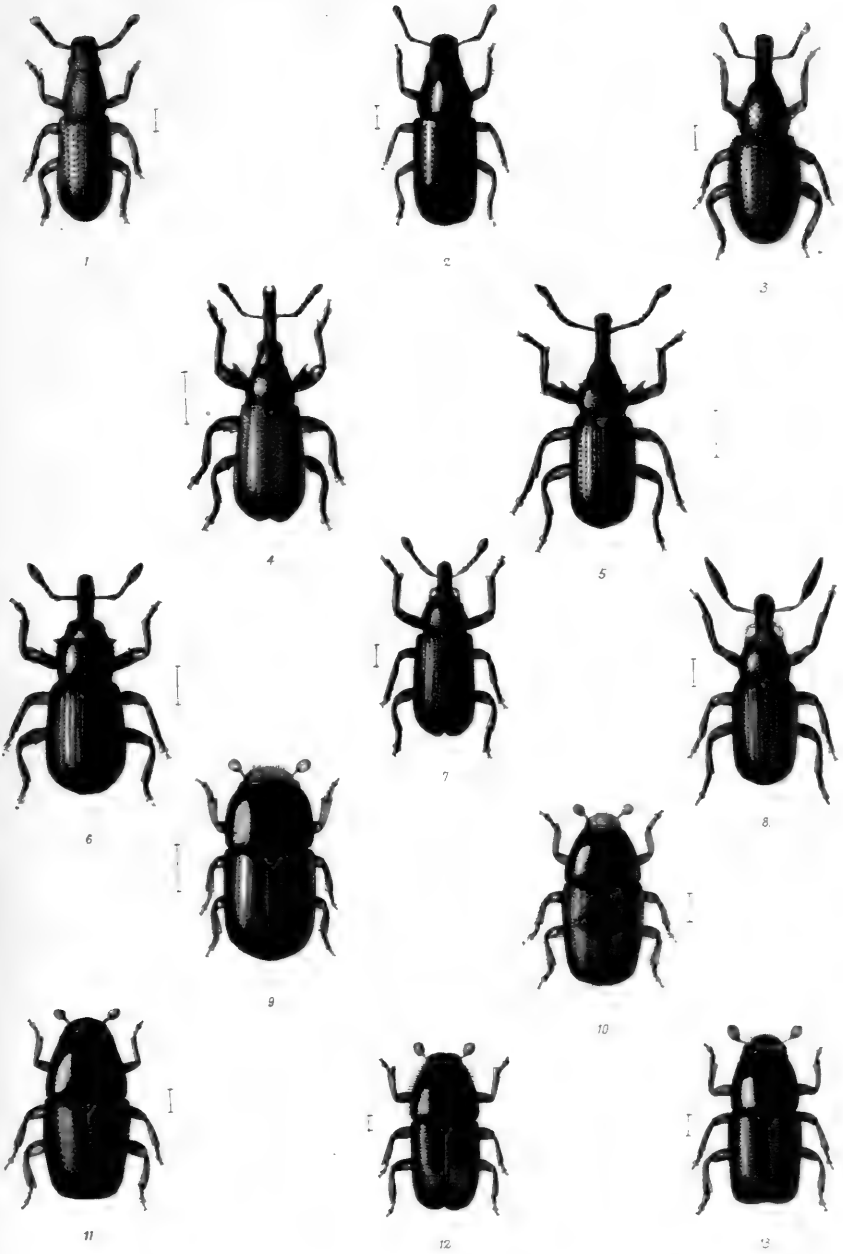

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PLATE CLXXVIII.

FIG. 1. Hylastes ater, *Payk.*
2. „ cunicularius, *Er.*
3. „ opacus, *Er.*
4. „ palliatus, *Gyll.*
5. Hylastinus obscurus, *Marsh.*
6. Hylesinus crenatus, *F.*
7. „ oleiperda, *F.*
8. „ fraxini, *Panz.*
9. „ vittatus, *F.*
10. Myelophilus piniperda, *L.*
11. Cissophagus hederæ, *Schmidt.*
12. Phlœophthorus rhododactylus, *Marsh.*
13. Hypothenemus eruditus, *Westw.*

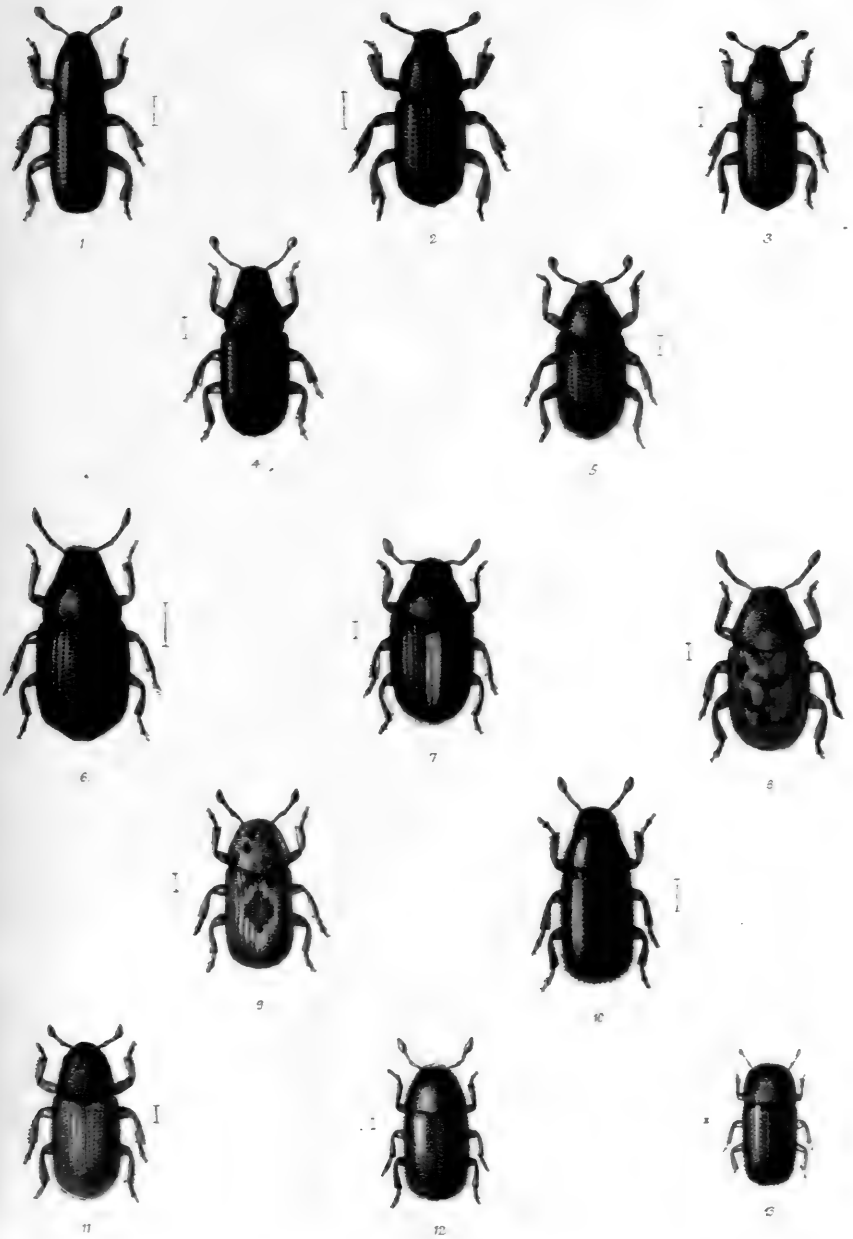

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PLATE CLXXIX.

FIG. 1. Cryphalus binodulus, *Ratz.*
2. „ tiliæ, *Panz.*
3. „ abietis, *Ratz.*
4. „ fagi, *Nord.*
5. Pityophthorus pubescens, *Marsh.*
6. Xylocleptes bispinus, *Duft.*
7. Dryocætes autographus, *Ratz.*
8. „ villosus, *F.*
9. Tomicus sexdentatus, *Börn* (*stenographus*, Duft.)
10. „ typographus, *L.*
11. „ laricis, *F.*
12. Pityogenes bidentatus, *Herbst.* (*bidens*, F.)
13. Trypodendron domesticum, *L.*

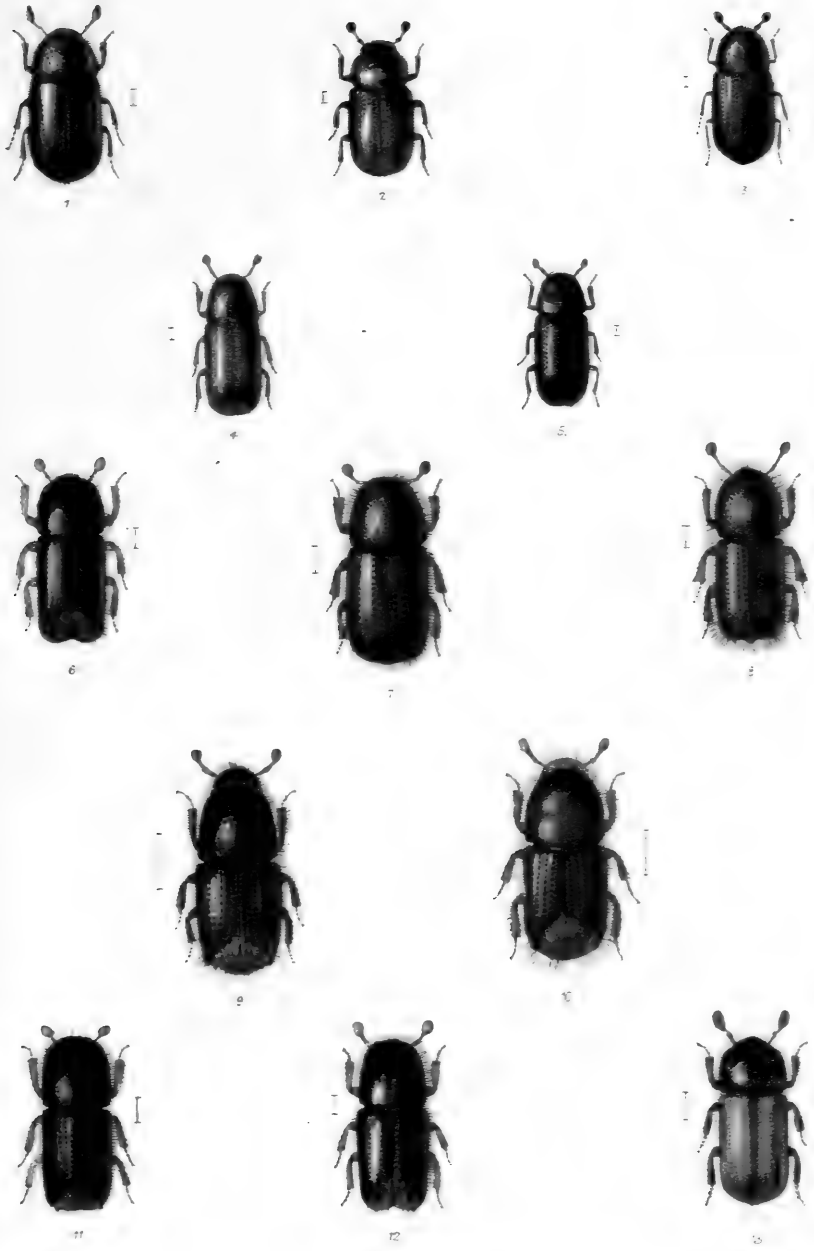

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PLATE CLXXX.

FIG. 1. Trypodendron quercus, *Eich.*

2. Xyleborus dispar., male.

3. „ „ female.

4. „ dryographus, male.

5. „ „ female.

6. Platypus cylindrus, *F.*

7. Stylops Dalii, *Curtis* (after Curtis).

7*a*. „ *a*, *b*. Larvæ inhabiting the abdomens of living Andrenæ, the heads being exserted between the segments.

7*b*. „ One extracted.

7*c*. „ Pupa inhabiting the same situation.

7*d*. „ Tarsus.

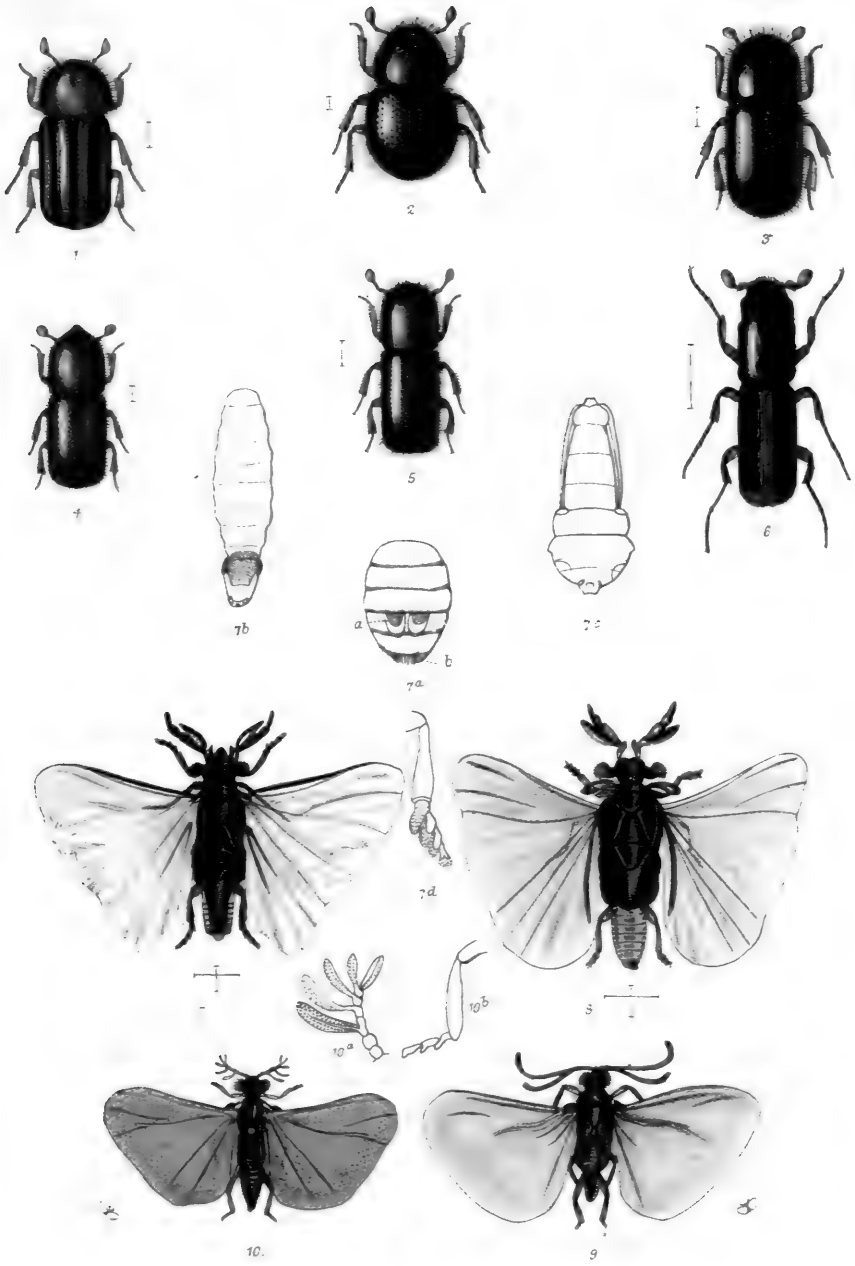
8. Stylops melittæ, *Kirby* (*Spencii* Pck) (after Westwood).

9. Elenchus tenuicornis, *Kirby* (*Walkeri* Curtis) (after Curtis).

10. Halictophagus Curtisii, *Dale* (after Curtis).

10*a*. „ „ Antenna.

10*b*. „ „ Posterior tarsus.



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COLEOPTERA.

HETEROMERA.

Although a large number of genera and several thousand species have been described as belonging to this group, yet we know comparatively little regarding it; it is the most anomalous and in many respects the least satisfactory of all the divisions of the Coleoptera; the chief character by which its members are distinguished, and from which it takes its name, is the fact that the anterior and intermediate tarsi are 5-jointed and the posterior tarsi 4-jointed; there are, however, many heteromerous beetles in the other large series, as, for instance, *Anisotoma*, *Acritus*, the male of *Rhizophagus*, &c., so that the character by no means holds good in all cases, and there is no other upon which it can be strictly defined; and yet it must be allowed after all that the Heteromera as a whole are easily separated from the other groups, and that very few foreign elements have ever been introduced amongst them; in general form they differ in an extraordinary degree, and seem to present affinities towards almost all the other groups; even in our very limited number of genera and species this is very obvious; thus *Rhinosimus* resembles certain Curculionidæ, while *Diaperis* and *Platydema* might be taken for Chrysomelidæ, and *Œdemera*, *Nacerdes*, *Lytta*, and *Pyrochroa* for Malacodermata; *Tribolium* again appears to be allied to the Cryptophagidæ, *Hypophlœus* to the Colydiidæ, and certain species of *Cistela* to the Longicornia; other species again are entirely anomalous both in their appearance and their life history; among these may be mentioned *Meloe Sitaris*, and *Metœcus*.

The following are the chief characters of the division as given by Thomson:—Anterior pairs of tarsi 5-jointed, posterior tarsi 4-jointed; anterior coxæ globose, ovate or conical, not transverse, contiguous or slightly distant at apex, posterior, as a rule, mobile; eyes usually kidney-shaped; maxillary palpi exserted, usually clubbed; antennæ usually moniliform and not geniculate; mandibles almost always bifid at apex; elytra entire, very rarely shorter than the abdomen; abdomen composed of five, very rarely six, ventral segments; epimera of mesothorax, as a rule, reaching intermediate coxæ. It will be seen from this account of the characters that there is not one, except the first, that is not liable to exceptions, and the first, as has been stated above, is found in other groups; it is therefore very difficult to determine the true position of

the series; the majority of authors appear to have placed it between the series that are, as a rule, pentamerous, and those which are tetramerous or pseudo-tetramerous (the Rhynchophora, Longicornia, and Phytophaga), not, as Dr. Horn remarks, that they have been supposed to have any special relationship to either, nor to be a link between them, but apparently from the fact that in the aggregate the amount of tarsal joints is one less than in the Pentamera and two more than in the Tetramera; others again have proposed to place them at the end of the order as being a sort of synopsis, in general appearance, of the whole; the best plan, however, appears to be to place them immediately before the Rhynchophora, which certainly appear to be properly placed last; they will then stand as an anomalous group at the end of the ordinary Coleoptera, and through the Pythidæ present a decided affinity towards the Curculionidæ.

The larvæ are almost as variable as the perfect insects, and in many cases are most curious and extraordinary both in forms and habits; they will be discussed under the various tribes and genera.

The series is well represented in Europe by about two hundred genera, which contain a large number of species, the genera *Asida*, *Pimelia*, and *Mylabris*, neither of which are represented in Britain, numbering upwards of two hundred between them; fifty-eight genera are found in Britain, but the species are comparatively very few, being only about one hundred and twenty in number; the classification is somewhat difficult from the fact that the characters that seem trustworthy are so liable to exceptions, and in many cases are not very obvious, although the insects to be distinguished are in many cases entirely different in general appearance; Thomson divides the Heteromera as a whole into two divisions, the Globicoxæ, which have the anterior coxæ globose or ovate, and the Conicoxæ, in which they are long, conical, and exserted, and I have, to a certain extent, followed his arrangement; the genus that I have felt most doubt about is *Scraptia*, which has been very differently placed by various authors; it seems, however, to be most closely allied to the Mordellidæ, and I have therefore placed it as a separate family near that group, rather than with the Pedilidæ, which are more closely allied to the Anthicidæ; in point of fact I have not adopted the family Pedilidæ at all, as *Xylophilus*, including *Euglenes*, appears to be better placed either with the Anthicidæ or in a separate family, and if we exclude this genus and *Scraptia*, we have no further British representatives of the family.

I. Anterior coxal cavities closed behind.
  i. Tarsal claws simple.
    1. Anterior coxæ globose, rarely oval, not prominent; penultimate joint of tarsi very rarely bilobed and spongy beneath . . . . . TENEBRIONIDÆ.
    2. Anterior coxæ conical-ovate, prominent, penultimate joint of tarsi bilobed and spongy beneath . . . . . LAGRIIDÆ.

ii. Tarsal claws pectinate . . . . . CISTELIDÆ. (*Alleculidæ.*)

II. Anterior coxal cavities open behind.
i. Anterior coxæ globose or ovate.
1. Head not suddenly constricted behind eyes.
A. Thorax subovate, or cordiform, narrowed in front and usually narrowed behind, often narrower at base than apex, and narrower at base than base of elytra . . . PYTHIDÆ.
B. Thorax not narrower at base than at apex, and not, or scarcely, narrower at base than base of elytra . . MELANDRYIDÆ.
2. Head suddenly constricted behind eyes; thorax not narrower at base than elytra.
A. Posterior tibiæ as long as the tarsi; tarsal claws with a rudimentary tooth at base; penultimate joint of tarsi strongly bilobed . . . . . SCRAPTIIDÆ.
B. Posterior tibiæ much shorter than the tarsi; tarsal claws usually plainly toothed; penultimate joint of tarsi simple . . . . . MORDELLIDÆ.
ii. Anterior coxæ long, prominent and conical.
1. Head strongly and suddenly constricted behind.
A. Thorax at base not narrower than base of elytra . . RHIPIDOPHORIDÆ.
B. Thorax at base plainly narrower than base of elytra.
a. Tarsal claws split from base to apex . . . . . MELOIDÆ.
b. Tarsal claws not split.
a*. Antennæ long, serrate or pectinate; head exserted, horizontal; size large . . . . . PYROCHROIDÆ.
b*. Antennæ moderate or long, filiform (in our species); head deflexed; size very small.
a†. Penultimate joint of the tarsi minute, hidden within the lobes of the preceding joint, which is strongly bilobed; head constricted immediately behind the eyes, which are large . . . . . XYLOPHILIDÆ.
b†. Penultimate joint of tarsi not minute, bilobed; head constricted at some distance behind the eyes, which are moderate or small . . . . . ANTHICIDÆ.
2. Head not strongly and suddenly constricted into a neck behind . . . . . ŒDEMERIDÆ.

TENEBRIONIDÆ.

This important family contains a very large number of genera and species, which are distributed over the whole surface of the globe; in the Munich catalogue, published in 1870, four thousand five hundred species are enumerated, but this number has been largely increased since that time, and is perpetually being added to; although their distribution is almost universal, yet in some large districts it appears to be very uneven, more especially in North America, where they form the characteristic feature of the Coleopterous fauna in California, but in the eastern portions of the continent are scarce; in Europe the family is represented by about one hundred and twenty five genera, and several hundred species, but in Britain only about thirty species, representing, however, some nineteen genera, have hitherto been discovered; these may be subdivided and classified under the tribes below mentioned, but it is obvious that with our very limited fauna any classification is un-

satisfactory. The following are the chief characteristics of the family :— Form very variable ; antennæ generally inserted under the sides of the head or at least under a small frontal ridge, thickened towards apex or slightly serrate, usually 11-jointed ; maxillæ with two lobes, palpi 4-jointed, mandibles short and robust, furnished with a basal tooth, entire or emarginate at tip ; elytra usually covering abdomen ; abdomen with five ventral segments, of which the first three are more or less closely connected ; anterior coxal cavities closed behind ; anterior coxæ globose, rarely oval, not prominent ; legs variable.

The larvæ of the Tenebrionidæ are elongate and cylindrical, and usually somewhat depressed ; they bear an exceedingly strong resemblance to the larvæ of *Agriotes*, &c., among the Elateridæ, the well-known "wire-worms ;" in fact the chief visible differences consist in the non-connate clypeus and large and plainly visible labrum, and also in the formation of the anal segment, which varies very much and is often very peculiar in the Elateridæ, but in the Tenebrionidæ is short and usually simple, often pointed, and terminates in two short warty prominences which are used for locomotion ; the antennæ and legs are short, and the segments, except very rarely, are of almost the same breadth throughout until the anal segment ; the prothorax is often longer and the meso- and metathorax shorter than the abdominal segments ; in both the larval and the perfect state the members of the family live on vegetable matter in various conditions, and certain species, notably the typical *Tenebrio molitor*, occasionally do great damage in granaries and meal-stores.

I. Front entirely corneous.
  i. First joint of posterior tarsi short, not, or scarcely, longer than second ; genæ sulcate . . . . . BOLITOPHAGINA.
  ii. First joint of posterior tarsi moderate or elongate, longer than second ;* genæ not sulcate.
    1. Tarsi spinose or setose beneath.
      A. Anterior tibiæ not, or scarcely, dilated ; apex of clypeus entire.
        a. Hind coxæ transverse, widely separated ; femora elongate . . . . . BLAPTINA.
        b. Hind coxæ oblique, not widely separated ; femora not elongate . . . . . CRYPTICINA.
      B. At least anterior tibiæ dilated.
        a. Apex of clypeus emarginate . . . . . OPATRINA.
        b. Apex of clypeus entire . . . . . TRACHYSCELINA.
    2. Tarsi (at all events the anterior pair in male) pubescent beneath.
      A. Eyes more prominent than sides of front . . . . DIAPERINA.
      B. Eyes less prominent than sides of front.
        a. Anterior coxæ rounded ; intermediate coxæ with trochantin ; third joint of antennæ long.
          a*. Clypeus not or only slightly emarginate ; all the tarsi pubescent beneath . . . . . TENEBRIONINA.
          b*. Clypeus deeply emarginate ; anterior tarsi of male pubescent beneath . . . . . PEDININA.
        b. Anterior coxæ subtransverse ; intermediate coxæ without trochantin ; third joint of antennæ short ULOMINA.
II. Front separated from clypeus by a distinct coriaceous band HELOPINA.

* In the genus *Diaperis* the first joint of the posterior tarsi is only a little longer than the second ; it may therefore, perhaps, be considered an exception, although the first joint is plainly longer in proportion than in the *Bolitophagina*.

BLAPTINA.

In this tribe the clypeus is entire, or nearly entire, at apex; the head is prominent and slightly narrowed behind the eyes; the metasternum is very short and the epipleuræ of the elytra are very large and broadly embrace the sides of the abdomen; the legs are long and the tibial spurs are distinct; the femora are elongate and considerably exceed the margin of the elytra, and the tarsi are channelled and setose beneath; three genera belonging to the tribe are found in Europe, of which one is represented in Britain; between this tribe and the *Crypticina* there intervene the large and important genera *Asida* and *Pimelia*, neither of which are found in this country.

BLAPS, Fabricius.

About one hundred and thirty species belong to this genus, of which more than forty are found in Europe, and the chief part of the remainder in Northern and Central Asia and Northern Africa; hardly any occur in the tropics, where they are replaced by allied genera; they are large, dark, repulsive-looking insects, and our common species *B. mucronata* is commonly known as the "churchyard beetle," owing to the fact that the members of the genus are often found in vaults, cellars, &c.; three species only occur in Britain, one of which is very rare; in the late Mr. W. Garney's collection there is a specimen of *B. gages*, L. (*gigas*, F.), which was originally in Mr. Griesbach's collection, and was formerly taken in the south of England, but it is an evident importation; the species have the three penultimate joints of the antennæ dull and rounded, and the last joint acuminate, the second being very short and the third very long, four or five times as long as second; the prosternum has no process behind the anterior coxæ, and all the pairs of coxæ, beginning from the anterior pair, become gradually more widely distant; the tarsi beneath are biseriately setose; the general sculpture is feeble.

The larva of *Blaps similis* is described and figured by Schiödte (De Metamorphos Eleutheratorum, x. p. 532, pl. vi. fig. 1); it is of a pale colour, with the head, legs, and ninth segment of the abdomen slightly ferruginous and the mandibles and claws pitchy; the shape is linear and very parallel but rather broader than in some of the allied larvæ; the prothorax is the longest segment, and the anal segment is mucronate at apex; the full-grown larva presents no traces of ocelli; it inhabits dark holes and corners, cellars, &c., and lives on vegetable matter.

I. Antennæ longer, with joints 4–7 oblong, more or less elongate.
  i. Form narrower; thorax distinctly narrowed behind; apical process of elytra longer . . . . . B. MORTISAGA, *L.*
  ii. Form broader; thorax slightly narrowed behind; apical process of elytra shorter. . . . . B. MUCRONATA, *Latr.*
II. Antennæ shorter, with joints 4–7 short oval and rounded; form broad . . . . . B. SIMILIS, *Latr.*

B. mortisaga, L. (*acuminata*, Dej.). Black, upper side rather dull, under-side shiny, moderately elongate; clypeus without smooth central

line, more prominent at anterior angles; antennæ with joints 4–7 oblong; thorax scarcely transverse, narrowed behind; elytra broadest in middle; metasternum transversely furrowed; legs long; allied to *B. mucronata*, but distinguished by its narrower form, and by having the thorax distinctly narrowed behind and the apical process of the elytra longer. L. 18–20 mm.

Male (female ? according to Thomson) with a fovea set with yellow hairs at the base of the second abdominal ventral segment.

Very rare, and somewhat doubtfully indigenous, as very many of the specimens that have stood in our old collections under this name must be referred to the succeeding species; Burton-on-Trent, in Mr. Worthington's brewery; recorded from Glanvilles Wootton, Dorset, and as common in houses in Exeter; but these records very probably must be referred to *B. mucronata*; Scotland, very rare, in outhouses, Tay and Moray districts; in Dr. Power's collection there is a specimen from Elgin, and two sent from Scotland by Mr. Hislop.

B. mucronata, Latr. (*obtusa*, Sturm, *teste* H. R. W.; *mortisaga*, Steph., Curt., Ol., *nec* L.; *Leptocolena mucronata*, All.). Broader than the preceding, obovate, upper surface dull, under surface more shining; clypeus with a central line, scarcely prominent at anterior angles; antennæ with joints 4–7 elongate and the penultimate joints short oval; thorax a little broader than long, with sides rounded and narrowed in front, scarcely narrowed behind, finely, rather diffusely and obsoletely punctured; elytra broadest behind middle, very finely punctured and somewhat coriaceous; metasternum transversely furrowed in middle; apical process of elytra short; legs long. L. 18–22 mm.

In cellars, stables, kitchens, churchyards, &c.; crawling about at night; generally distributed and common throughout the greater part of the kingdom; Mr. Bold remarks that it has been found in plenty in the Northumberland and Durham district down some of the deepest coal mines.

B. similis, Latr. (*fatidica*, Thoms.; *obtusa*, Curt., Thoms.; *Agroblaps similis*, Mots.). This species may at once be known from the two preceding by its broader form and by the structure of the antennæ, which are considerably shorter, and have joints 4–10 short oval and moniliform, the seventh being larger and broader than those contiguous to it; the clypeus has no smooth central line, and is scarcely prominent at the anterior angles; the thorax is hardly transverse, and has the sides subparallel and a little narrowed towards base; the elytra are broad and rather convex, widest about or a little behind middle, more plainly punctured than in the preceding species; metasternum with traces of a transverse furrow at sides only; sexual characters as in *B. mortisaga*. L. 18–22 mm.

In cellars, outbuildings, &c.; local and, as a rule, not common; London; Hertford; Kingsgate, on the sea shore (T. Wood); Dover; Hastings; Brighton; Hampshire; Weston-super-Mare; Cambridge; Scotland, in outhouses, rare, Solway district.

CRYPTICINA.

Four genera and twenty-three species belonging to this tribe are found

in Europe, of which one genus and one species occur in Britain ; they may be distinguished from the preceding by having the hind coxæ not widely separate, the femora not elongate, the epipleuræ of the elytra narrower, and the fact that the prosternum is furnished with a short process behind the anterior coxæ, and from the *Pedinina* and *Opatrina* by the entire clypeus, and by not having the anterior tibiæ dilated at apex.

CRYPTICUS, Latreille.

This genus contains upwards of thirty species, of which thirteen are found in Europe, and the remainder have been described from Syria, Algeria, the Canary Islands, Siberia, Ceylon, &c. ; they are small or moderate-sized insects, winged, with the antennæ and legs slender, and the third joint of the antennæ only one and a half times as long as the second ; the thorax is large and ample, a little broader than elytra, emarginate at base ; the upper surface is smooth and glabrous, and moderately convex.

The larva and pupa of *C. quisquilius* are described and figured by Schiödte (l.c. pp. 536, 586, pl. vii. fig. 1, 5) ; the larva is very long and slender, being thirteen times as long as broad (that of *Blaps similis* being only eight times longer than its breadth) ; the head is moderately large, and is furnished near each antenna with three very minute ocelli ; the prothorax is longer than the two following segments together, and the anal segment is moderately long and rounded at apex ; the front pairs of legs are comparatively long and stout, and are evidently fossorial ; the colour is almost entirely yellowish ; the pupa is much longer than broad, and is furnished at the sides of the segments with dentate excrescences or plates (termed by Schiödte "*laminæ motoriæ*") bearing long setæ ; the apex is terminated by two moderately long and sharp cerci ; the insect in all its stages is found in sandhills.

C. quisquilius, L. Subovate, convex, glabrous, black, rather shining, with the head and thorax very finely and the elytra less finely and more distinctly punctured ; antennæ rather long and slender ; head much narrower than thorax, which is large, and rather broader at base than elytra, and is furnished on disc with two more or less obsolete impressions ; elytra broadest a little behind middle, gradually narrowed to apex, with faint traces of striæ ; legs long, black or pitchy. L. 5–6 mm.

Male with the last joint of the maxillary palpi very large, sublunate, and the last ventral segment of abdomen truncately rounded at apex.

Female with the last joint of the maxillary palpi slightly securiform, and the last ventral segment of the abdomen semicircular.

Sandy places on the coast—at roots of grass, and in moss ; somewhat local, but not uncommon ; Southend ; Sheerness ; Felixstowe ; Brandon, Suffolk ; Great Yarmouth ; Hunstanton ; Dover ; Deal ; Sandwich ; Hastings ; Chesil Beach ; Weymouth ; Scilly Islands ; Rhyl, N. Wales ; Cleethorpes, Lincolnshire ; not recorded from the northern counties of England or from Scotland ; Ireland, Portmarnock near Dublin and Belfast district.

PEDININA.

Eleven genera and about one hundred and ten species belonging to this tribe are found in Europe, but only one genus and one species occur in Britain; they are by some authors included with the Opatrina, but differ in having at least the anterior tarsi of the male pubescent and not spinose beneath; in other points the two tribes very closely resemble each other.

HELIOPATHES, Mulsant.

In this genus the maxillary palpi have the last joint securiform, and the antennæ robust and more or less thickened towards apex; the posterior femora are moderately long, and the posterior coxæ are broadly distant; the anterior tibiæ are compressed and much dilated; upwards of fifty species have been described, of which about thirty are found in Europe, and the remainder in Northern and Central Asia, China, and Algeria.

The larva of *H. gibbus* very closely resembles that of *Crypticus quisquilius*, and does not require a separate description, as it only differs in being slightly broader, and in having the head, legs, and ninth segment of abdomen ferruginous; it is found in sandhills.

H. gibbus, F. (*Olocrates gibbus*, Muls.). Oblong-oval, convex, black, rather shining; head moderately large, closely and distinctly punctured, antennæ short, moniliform, pitchy red; thorax transverse, with sides slightly rounded, and narrowed behind, closely punctured, with obsolete impressions on disc; elytra with punctured striæ, and broad coarsely punctured interstices, the alternate ones being more or less strongly raised; the sculpture of the elytra is often somewhat rugose; legs stout and robust, pitchy black or pitchy red, anterior tibiæ dilated. L. 6–8 mm.

Male with the central portion of the abdomen slightly impressed at base; anterior tarsi with the three first joints dilated and tomentose beneath.

Sandy places on the coast; locally common; Southend; Lowestoft; Harwich; Deal; Dover; Isle of Wight, Sandown, &c.; Portsmouth; Chesil Beach; Dawlish and Exmouth; Burnham, Somerset; Weston-super-Mare; Swansea; Manchester, general, on the sandy coasts; Isle of Man; Scotland, very rare, Solway and Clyde districts; Ireland, Newcastle, co. Down, and Portmarnock.

OPATRINA.

The members of this tribe are distinguished by their excised clypeus, small labrum, short and stout antennæ which are thickened towards apex, and dilatedanterior tibiæ, as well as by the spinose under surface of all the tarsi; as above mentioned, they are closely allied to the Pedinina; ten genera are found in Europe, containing nearly fifty

species; of these two genera represented by two species are indigenous to Britain.

I. Last joint of maxillary palpi securiform; posterior coxæ more distant, with the portion of the first abdominal segment included between them truncate at apex . . . . . OPATRUM, *F.*

II. Last joint of maxillary palpi ovate; posterior coxæ less distant, with the portion of the first abdominal segment included between them pointed . . . . . MICROZOUM, *Redt.*

OPATRUM, Fabricius. (*Hopatrum*, auct.)

This is a large and extensive genus, containing upwards of one hundred and fifty species, of which twenty-five are found in Europe, and the remainder are very widely distributed, species occurring in Siberia, Japan, Ceylon, Madagascar, the Cape of Good Hope, the Gaboon district, St. Helena, Java, the Australian region, &c.; it does not, however, appear to be represented in North or South America; the species are scabrous and, for the most part, dull and obscure insects, and are found in sandy places, especially near the coast; they appear to be variable in several points.

The larva and pupa of *O. sabulosum* are described and figured by Schiödte (l.c. pp. 541, 585, pl. vii. fig. 15, 20); they much resemble those of *Crypticus*, but are somewhat broader, and the plates at the sides of the pupa are less plainly dentate and set with shorter setæ; the colour of the larva is fuscous above and pale beneath, with the mandibles and the apex of the claws pitchy.

O. sabulosum, Gyll. Oblong-oval, dull black, rough, often encrusted with sand and mud, not very convex; head transverse, much narrower than thorax, antennæ short and stout, much thickened towards apex, with the penultimate joints transverse, maxillary palpi with the last joint securiform; thorax transverse, with the sides slightly rounded, posterior angles projecting, very closely granulate; scutellum rather large; elytra with irregular rows of strong tubercles placed more or less widely apart; interstices very closely granulate; legs stout and robust, anterior tibiæ dilated, fossorial. L. 6–7 mm.

Male with the first three segments of the abdomen slightly impressed in middle.

Sandy places on the coast; locally common; Southend; Whitstable; Clacton-on-Sea; Hastings; Deal; Dover; Brighton; Portsmouth district; Isle of Wight, Sandown, &c.; Chesil Beach; Devon, general; Liverpool district; it appears to be common all along the south-eastern and southern counties of England, but has not been recorded from Scotland or Ireland; it is an extremely strong and stout insect, and very tenacious of life.

MICROZOUM, Redtenbacher.

The members of this genus considerably resemble the preceding, but are smaller and less roughly sculptured; they may be known from

Opatrum by the ovate last joint of their maxillary palpi; only three species appear to have been described, from Europe, Central Asia, and Algeria respectively.

M. tibiale, F. A small species, oblong oval, not very convex, dull black; head and thorax very closely sculptured; antennæ very short, much thickened towards apex; thorax transverse, with sides rounded in front, broadest before middle, with three impunctate spots on disc, and a rather deep impression on each side near base behind; elytra not very closely punctured, finely shagreened between punctures, and coarsely, but somewhat indistinctly, rugose; legs robust, all the tibiæ dilated towards apex and toothed externally, anterior tarsi very short. L. 3 mm.

Sandy places; as a rule on the coast, but also found inland; locally common; Esher and Wisley, Surrey; Southend; Lowestoft; Hunstanton; Deal; Dover; Hastings; Hayling Island; Portsmouth; Isle of Wight; Burnham, Somerset; Kidderminster; Swansea; Borth, near Aberystwith; Ripon; Liverpool; Manchester (general); not recorded from Scotland or Ireland.

TRACHYSCELINA.

The members of this family are oval or rounded insects, with at least the anterior tibiæ dilated and the apex of the clypeus entire; the antennæ are short and somewhat thickened towards apex, and the palpi are not dilated; the epipleuræ of the elytra are narrow; all the legs are stout, and the tarsi are setose beneath; four species and twelve genera are found in Europe, of which one genus represented by one species occurs in Britain.

PHALERIA, Latreille.

This genus contains more than thirty species, of which seven are found in Europe, and the remainder are widely distributed from Kamtschatka to Madagascar; species have been recorded from the Canary Islands, the Cape of Good Hope, Brazil, Chili, the Galapagos Islands, North America, &c.; the single British species may easily be known by its oval and convex form and light testaceous colour, as well as by its short antennæ and dilated anterior tibiæ.

The larva of *P. cadaverina* will be found fully described by myself in the Entomologists' Monthly Magazine, vol. xxv. p. 304; it is very closely allied to the larvæ of *Crypticus*, *Heliopathes*, *Opatrum*, and other *Tenebrionidæ*; it is found with the perfect insect in sand under sea-weed and shore refuse; when disturbed it feigns death, and lies perfectly motionless for some time; under a high power, however, it will be noticed that the antennæ and usually the legs are constantly quivering, and immediately the danger appears to be past, the insect turns quickly over and, burrowing rapidly in the sand, soon disappears from view. The following is an abridged description of the larva:—Length, 11-12 mm.; elongate, linear, scarcely narrower behind, of a lighter or darker ochreous colour, with the head dark brown, and the mandibles almost black; the claws also and spines of the legs are dark; head broad, ocelli black, rather large, three in number on each side, placed close together in a

somewhat oblique line, their separation being ill-defined; antennæ short, 3-jointed; body consisting of twelve segments, of which the prothorax is the largest, being about as long as the meso- and metathorax together; first eight abdominal segments much resembling one another; anal segment somewhat spoon-shaped, rounded at apex, with almost the whole upper surface occupied by a broad, somewhat rugose, shallow excavation, the apical margin of which is furnished with four small, but stout and distinct, dark tubercles; beneath the anal segment there is a plate furnished with two comparatively long fleshy prominences which serve as prolegs; legs short, but plainly visible from above, fossorial, terminated by a single claw. I am indebted for the opportunity of describing this larva to Mr. G. C. Bignell, who kindly sent me a colony of the perfect insect with two of the larvæ.

P. cadaverina, F. Oval, convex, testaceous, with a more or less distinct black spot on each elytron, which is very variable, sometimes occupying the greater part of the surface, and sometimes entirely absent; between these two extremes endless varieties occur; occasionally the spots are confluent at the suture; head subtriangular, distinctly punctured, antennæ short, thickened towards apex; thorax broader than long, with the sides subparallel behind, and gradually rounded and narrowed in front, very finely punctured, the punctuation being somewhat diffuse on disc, scutellum transverse; elytra with distinct striæ, interstices finely but plainly punctured; legs stout, anterior tibiæ dilated. L. 6–7 mm.

Sandy places on the coast; occurring beneath sea-weed and at roots of grass, *Sedum*, &c.; locally common; Southend; Harwich; Walton-on-Naze; Clacton-on-Sea; Hunstanton; Margate; Hastings; Dover; Hayling Island; Portsmouth; Isle of Wight; Bournemouth; Weymouth; Whitsand Bay, Plymouth; Dawlish; Barnstaple; Burnham, Somerset; Swansea; Barmouth; Lytham, Lancashire (Power).

BOLITOPHAGINA.

This tribe may be distinguished from all the other tribes belonging to the family by the short first joint of the posterior tarsi, as well as by the sulcate genæ; the antennæ are inserted in our genera beneath a strong frontal plate and are thickened towards apex, the intermediate joints being laterally produced; the tibiæ are linear, or slightly widened at apex, with the spurs small or obsolete; the tarsi are covered beneath with thin and short pubescence, and their last joint is longer than the preceding ones taken together; both the European genera are found in Britain.

I. Eyes completely divided; sides of thorax strongly crenulate	BOLITOPHAGUS, *Ill.*
II. Eyes not completely divided; sides of thorax not, or scarcely, crenulate	HELEDONA, *Latr.*

BOLITOPHAGUS, Illiger.

This genus contains about twenty species, of which three are found in Europe and the remainder are very widely distributed, representa-

tives occurring in Central Asia, North and South America, India, Burmah, New Zealand, &c.; the eyes are entirely divided by the frontal plate; the femora are long and project considerably beyond the sides of the elytra, and the anterior tibiæ are furnished with two spurs at apex, the intermediate and posterior pairs having one only; they are moderate-sized insects, of dull and obscure appearance, with the upper surface rather strongly sculptured, but almost without pubescence.

The larva and pupa of *B. reticulatus* are described and figured by Schiödte (l.c. pp. 545, 584, pl. viii. figs. 1, 8); the larva is white with the head and the dorsal portion of the prothoracic segment, as well as the legs, pale ferruginous; it is less linear than those belonging to the family that have been before described, being broadest about the middle; the prothorax is as long as the two following segments, and is constricted in the middle so that it appears divided; the abdominal segments are furnished on each side with setose prominences; the anal segment is small and conical, and terminates in two very short cerci; the anterior legs are shorter than the other pairs; the pupa is much longer than broad, narrowed to apex, with the plates at the sides of the abdominal segments bifid, and produced at each side, and bearing short setæ; the cerci are comparatively long and are pointed; the insect in all its stages is found in boleti.

B. reticulatus, L. (*crenatus*, F.). Oblong, rather convex, dull black, occasionally brownish; head large, almost semicircular in front, with the eyes prominent, completely divided; antennæ moderately long, robust, thickened towards apex, with joints 5–9 transverse and dentately produced internally; thorax transverse, strongly emarginate in front, with the anterior angles projecting, and the sides notched, very closely and strongly punctured; elytra deflexed and produced at apex, with deeply punctured striæ, which are comparatively feeble at apex, but become very strong towards sides, interstices after the first three or four next suture carinate; legs long and not thickened. L. 6 mm.

Male with joints 3–7 of the antennæ clothed internally with rather thick and long pilose pubescence, posterior tibiæ with distinct spurs.

Female with joints 3–7 of the antennæ clothed with very short pubescence, posterior tibiæ with the spurs more or less obsolete.

In fungi on birch and oak; very local and, as a rule, very rare; it has only been found in the Tay district of Scotland, Rannoch, &c.

HELEDONA, Latreille.

Two species only appear to be known as belonging to this genus, one from Peru, and one which inhabits Europe; they may be known from the preceding genus by their smaller size, and by the fact that the eyes are not completely divided, nor are the sides of the thorax distinctly crenulate; the larva of *H. agaricola* closely resembles that of *Bolitophagus reticulatus*, except that it is smaller, with all the segments transverse, and has the ninth dorsal segment of the abdomen broadly rounded behind and without appendages; it is found in boleti.

H. agaricola, F. A small, short, convex, oblong-oval species, dark

brown or reddish-brown, very dull, with the antennæ and legs ferruginous; head much narrower than thorax very closely sculptured, antennæ short and stout, much thickened at apex; thorax transverse, with the sides rounded and finely notched, very coarsely and granulosely punctured, anterior angles sharply projecting; elytra subparallel, gibbose behind, with the elytra sulcate, the sulci being punctured in rows, and with the interstices narrowly raised and furnished with rows of setæ; legs moderately long, not thickened. L. $2\frac{1}{4}$–3 mm.

Male with the forehead elevated into a tubercle near eyes, and the clypeus projecting in a small tooth on each side at apex.

In boleti on oak, &c.; very local, but occasionally found in numbers where it occurs; Richmond Park, Mickleham, Box Hill, Cobham Park, Merton, Chatham, West Wickham, Farnham; Hampshire; Bristol; Norfolk; Sherwood Forest.

DIAPERINA.

In this tribe the body is oval or rounded and winged; the head is sunk in the thorax as far as the eyes; the clypeus is entire and membranous at apex; the antennæ are more or less thickened; the thorax is narrowed in front, and is sharply margined; the tibiæ are straight and not dilated, and are furnished with small spurs, and the tarsi are pubescent beneath; there are seven European genera, of which four are represented in Britain; two, however, are extremely rare; in form and general appearance several of the members of the tribe closely resemble certain Chrysomelidæ.

I. Posterior tarsi with the first joint comparatively short	DIAPERIS, *Geoff.*
II. Posterior tarsi with the first joint elongate.	
i. Upper surface glabrous.	
1. Posterior coxæ not widely distant; thorax slightly emarginate at apex	PLATYDEMA, *Lap.*
2. Posterior coxæ widely distant; thorax strongly emarginate at apex	SCAPHIDEMA, *Redt.*
ii. Upper surface finely pubescent; posterior coxæ slightly distant	ALPHITOPHAGUS, *Steph.*

DIAPERIS, Geoffroy.

This genus contains four or five species, of which two, or three, if *D. bipustulata* is considered a separate species, are found in Europe, and the other two have been described from North America and Cayenne respectively; they are round oval and convex insects with the club of the antennæ elongate, 8-jointed, all the joints except the last being transverse; the tarsi are short with the first joint only a little longer than second, and the prosternum is very short.

The larva and pupa of *D. boleti* are described and figured by Schiödte (l.c. pp. 547, 585, pl. viii. fig. 14, 23); the larva is white with the head and legs ferruginous and the forehead fuscous, and is entirely membranous except the head and legs; it very much resembles the larva of *Bolitophagus*, but is rather broader (being only six

times longer than broad) and has the last segment simple, and the prominences at the sides of the abdominal segments without setæ; the prothorax also is transverse; the pupa is broad, the length being only about twice as great as the breadth, and is covered with rather strong setose tubercles; the cerci are very small and are curved; the insect in all its stages is found in boleti.

D. boleti, L. Ovate, very convex, glabrous, shining black, elytra with two waved yellow bands, one at base, and another behind middle, interrupted at suture, and with the apex also yellow; head much narrower than thorax, antennæ as above described; head and thorax finely and not very thickly punctured, the latter transverse, gradually narrowed in front, sinuate at base and slightly produced before scutellum; elytra with nine distinct rows of punctures on each, interstices minutely and sparingly punctured; legs moderately long, fourth joint of anterior tarsi very small, so that the tarsi appear to be 4-jointed. L. 6 mm.

Male with the last joint of the maxillary palpi oblong-oval and the thorax slightly emarginate in middle of anterior margin.

Female with the last joint of the maxillary palpi oval and the thorax not emarginate at apex.

In boleti, especially on birch; found in May and June; once taken in profusion at Barham, Suffolk, by the Rev. W. Kirby; Stephens also records it from near Hastings, and from Dalston Wood, Cumberland; I have always been under the impression that it has occurred in the New Forest, but cannot find any record; the species has not been found for many years, but it is quite possible that it may again be discovered.

PLATYDEMA, Laporte.

The members of this genus are distinguished from the preceding by the longer first joint of the tarsi, especially of the posterior pair, and also by having the prosternum deplanate between the coxæ; the last eight joints of the antennæ are thickened.

The larva of *P. dytiscoides* (*violaceum*) is described and figured by Schiödte (l.c. p. 550, pl. viii. fig. 25); it differs considerably from that of *Diaperis* in having no projections at the sides of the abdominal segments, so that it rather resembles the larvæ of *Opatrum* and *Heliopathes*; it gradually and gently tapers to the apex, which is mucronate and furnished at each side with a small prominence; the colour is fuscous with the abdomen pale fuscous, and the head and apex of abdomen pitchy; it is found under the bark of oak. The genus contains about eighty species, which are chiefly found in tropical countries, only four occurring in Europe; a considerable number are found in Brazil, Cayenne, &c., and representatives have been described from North and Central America, Cuba, Japan, Ceylon, Madagascar, and the Australian region; our single British species is extremely rare, and has only been found in the New Forest; it much resembles a *Chrysomela*.

P. dytiscoides, Rossi (*violaceum*, F.). Oblong oval, slightly convex, glabrous, shining, violaceous with the antennæ and legs pitchy, the

former lighter at base and apex; upper surface thickly and minutely punctured; head with a transverse impression at the base of the clypeus, much narrower than thorax; antennæ not reaching to the base of thorax, with the second joint the smallest, and joints 4–10 strongly transverse; thorax strongly transverse, base slightly produced before scutellum, posterior angles right angles; elytra somewhat acuminate at apex, with distinct rows of punctures, interstices minutely and rather sparingly punctured; legs moderate, tarsi with the first joint elongate. L. 6 mm.

Under bark; very rare; it has only occurred in the New Forest, where it has been taken by Dale, Stephens, Janson, Power, Turner, and others.

SCAPHIDEMA, Redtenbacher.

Two European species and one from North America have been described as belonging to this genus; they are ovate and moderately convex insects, considerably narrowed in front and behind; the thorax is deeply emarginate at apex, and has the anterior angles acutely produced, and the sides very strongly margined; the posterior coxæ are widely distant; the tibiæ and tarsi are slender, and the first joint of the posterior pair of the latter is elongate; the process of the prosternum is deplanate behind the coxæ and rounded at apex.

The larva of *S. metallicum* is described and figured by Schiödte (l.c. p. 552, pl. ix. fig. 10); it is much broader than any of those that have been previously described as belonging to the family, being only four times as long as broad; its colour is ferruginous above and pale beneath, with the hinder portions of the upper side of the segments paler; the head is broad with very short antennæ; the thorax is much longer than the succeeding segments; the abdomen is gradually narrowed behind, the last segment being very small and narrow, and furnished with two minute sharp-pointed processes; the legs are short; the larva is found in dead trunks of alder, &c.

S. metallicum, F. (*æneum*, Payk.). Ovate, convex, glabrous, very shining, upper side brassy or fuscous-brassy, under-side more or less ferruginous; head ferruginous, forehead flat, antennæ stout, thickened towards apex, pitchy-black or ferruginous, lighter at base and apex; thorax transverse, with sides gradually narrowed and rounded in front, and with strong ferruginous margins, anterior margin emarginate, with the angles projecting, punctuation fine and not close; elytra broader at base than thorax, somewhat acuminate at apex, with regular rows of rather strong punctures, interstices diffusely punctured; legs rather long, slender, clear red. L. 3–4½ mm.

In decaying branches and old stumps of trees; often by beating dead hedges; occasionally in flood refuse; local, but not uncommon in many districts; Croydon, Richmond, Ripley, Darenth Wood, Abbey Wood, Lee, Bexley, Wimbledon, Highgate, Horsell, Hainault Forest, &c.; Whitstable, &c.; Hastings; Netley; Alverstoke; Bath; Weston-super-Mare; Llangollen; Birmingham district; Salford Priors; Lichfield; Repton; Riseholme Park, Lincoln; Nocton, near Lincoln; Halifax; Leeds; Northumberland and Durham district, rare, Hartlepool, near Axwell Park, and Ryhope Dene; not recorded from Scotland or Ireland.

ALPHITOPHAGUS, Stephens. (*Phyletus*, Redtenbacher.)

Three species are mentioned in the Munich catalogue as belonging to this genus; they are distinguished from the preceding genera belonging to the tribe by having the upper surface finely, but plainly, pubescent; they are small oval and convex insects, with the last six joints of the antennæ thickened; the thorax is slightly emarginate at apex; the legs are slender, and the first joint of the posterior tarsi is elongate; one species only occurs in Europe, and the other two in North America and Ceylon respectively.

The larva and pupa of *A. quadripustulatus* are described and figured by Schiödte (l.c. pp. 555, 586, pl. ix. figs. 17, 25); the larva is very long and linear, twelve times longer than broad, of a pale ferruginous colour above and pale beneath; the antennæ have the second joint much broader than the penultimate; the head is as broad as the prothorax, which is nearly as long as the two succeeding segments together; the anal segment is conical, and terminated by two very minute processes; the segments are furnished on each side with long and fine setæ; the legs are short; the pupa is comparatively broad without setæ, except at sides and on the cephalic region; the insect in all its stages is found in meal, fragments of bread, &c., and has probably been imported into our country by commerce.

A. quadripustulatus, Steph. (*populi*, Redt.; *pictus*, Mén.). A small, subovate species, not very convex, moderately shining, very finely pubescent, of a rufo-ferruginous colour, with the suture of the elytra and two fasciæ black, one about middle, and one behind, somewhat variable in extent; head and thorax very finely punctured, the latter not strongly transverse, slightly emarginate in front, with the posterior angles right angles; elytra with distinct punctured striæ, interstices finely but distinctly punctured; antennæ and legs rufo-testaceous; the thorax is sometimes more or less pitchy. L. $2\frac{1}{2}$–3 mm.

In old flour, &c.; a cosmopolitan species; not common in Britain, but occasionally found in some numbers; London; Birdbrook and Maldon, Essex; Cambridge; it probably occurs, however, in many other localities, as it has been evidently imported on one or two occasions when it has been found.

TENEBRIONINA.

Ten European genera belong to this tribe, of which one only is found in Britain, from which, as being the most representative genus of the group, the whole family derives its name; the body is oblong and parallel-sided and rather depressed, the head prolonged and scarcely narrowed behind, and the front dilated at the sides and covering the base of the mandibles; the clypeus is truncate or very slightly and feebly emarginate; the eyes are free, not reaching the margin of thorax, and are transverse, emarginate and moderately finely granulated; the scutellum is transverse and truncate at apex; the elytra are entire, and the epipleuræ are narrow; the anterior coxæ are rounded, and the middle coxæ are furnished with a distinct trochantin; the legs are long with

the tibiæ terminated by small but stout spurs, and all the tarsi pubescent beneath.

TENEBRIO, Linné.

The members of this genus are distinguished from their allies by having the last joint of the maxillary palpi almost securiform, the elytra striate, and the anterior tibiæ curved; the third joint of the antennæ is elongate; there are about twenty species, of which five are found in Europe, and the remainder in North America, Africa, the Canary Islands, Ceylon, and the Australian district; as they are found in all their stages in meal and flour, their larvæ being the well-known "meal worms," they are often transported from one country to another by commerce.

The larva and pupa of *Tenebrio molitor* are described and figured by Schiödte (l.c. pp. 568, 587, pl. xi. figs. 6, 12); the larva is parallel, linear, and corneous, of a pale ferruginous colour, with the segments at margins, and the head, prothorax, and two last segments of the body a little darker than the remainder; the length is ten times greater than the breadth; the head is rather narrower than the prothorax, which is twice as long as the mesothorax; the anal segment is conical, and terminates in two very minute appendages; the legs are short; the pupa is much longer than broad, almost glabrous, with the plates at the sides of the segments tri- or quadridentate; the cerci are moderate, sharp and slightly curved outwards; the larvæ frequent bakehouses, corn mills, granaries, &c., and do much damage by devouring meal, bran, flour, &c.; as Westwood remarks, they are very destructive to shipbiscuits packed in casks, which, when opened, are found eaten through in holes by them; they form no cocoon, and emerge in the perfect state after being about six weeks in the pupal condition; they are greedily devoured by birds, and are accordingly bred by bird-fanciers, as they form an excellent food for several of the species that are difficult to rear.

I. Upper surface shiny; third joint of antennæ shorter . . . T. MOLITOR, *L.*
II. Upper surface dull; third joint of antennæ longer . . . . T. OBSCURUS, *F.*

T. molitor, L. Elongate, parallel-sided, rather depressed, moderately shiny, pitchy black, with the under-side ferruginous; head much narrower than thorax, closely punctured, antennæ inserted under a raised ridge, rather stout, reaching beyond the middle of thorax; thorax almost as long as broad with the sides slightly rounded, very closely punctured, with an oblique impressed fovea towards the base on each side; scutellum transverse; elytra more or less distinctly striated, with the striæ obscurely punctured, and the interstices very closely and finely punctured; legs ferruginous. L. 12–16 mm.

Male with the anterior tibiæ strongly curved; in the female they are slightly, but distinctly, curved.

In old flour, &c.; generally distributed and often only too common; it is in all probability an introduced species.

Immature specimens of this species are often met with; they are of a ferruginous or reddish-testaceous colour.

T. obscurus, F. Closely allied to the preceding, which it resembles in shape, size, and general appearance; it may, however, be at once re-

cognized by its very dull upper surface, and the very close sculpture, which on the elytra is almost coriaceous; the antennæ, moreover, have the third joint longer than in *T. molitor*, double as long as the fourth, and the striæ on the elytra are much more indistinct; in the male the tibiæ are moderately curved, but not so strongly as in the last-mentioned species. L. 12–16 mm.

In old flour, &c.; probably an introduced species; not uncommon in some localities, but of much rarer occurrence than *T. molitor*; London district, common (Champion); Whitstable; Dover; Hampshire; Devon; Birmingham; Carlisle; Northumberland and Durham district; Scotland, Forth district, Edinburgh; Ireland, Dublin; it occurs most likely in all our large towns, but I have no record from Liverpool or Manchester, although *T. molitor* appears to be general.

ULOMINA.

This tribe is closely allied to the Tenebrionina, but differs in having the anterior coxæ subtransverse, the intermediate coxæ without trochantin, and the third joint of the antennæ short; the head is, as a rule, received into the thorax as far as the eyes; the front is dilated; the antennæ are 11-jointed, and are more or less thickened; the epipleuræ of the elytra are narrow; the scutellum is usually more or less triangular; the tarsi have the last joint elongated about as long as the first, and are pubescent beneath; sixteen genera belonging to the tribe are found in Europe, one of which, *Latheticus*, is, however, an evident importation; of these six occur in Britain; Thomson separates off the genus *Hypophlœus*, Hellw. (*Corticeus*, Pill.), as a separate tribe, *Hypophlœina*, on the ground that the pygidium is exposed and the scutellum transverse; in *Palorus*, however, and some of the other genera the pygidium is not quite covered.

I. Antennæ longer than head.
  i. Eyes more or less strongly divided.
    1. Thorax strongly transverse; form oval or oblong oval, convex . . . . . ALPHITOBIUS, *Steph.*
    2. Thorax not, or only slightly, transverse; form elongate-oblong, more or less depressed or subcylindrical.
      A. Mandibles of male produced into a conspicuous horn . . . . . GNATHOCERUS, *Thunb.*
      B. Mandibles of male not produced into a horn . . TRIBOLIUM, *McL.*
  ii. Eyes entire, or very slightly emarginate.
    1. Elytra not truncate at apex, almost completely covering pygidium . . . . . PALORUS, *Duv.*
    2. Elytra truncate at apex, leaving the pygidium exposed . . . . . HYPOPHLŒUS, *Hellw.* (*Corticeus*, Piller.)
II. Antennæ very short, shorter than head . . . . . LATHETICUS, *Wat.*

ALPHITOBIUS, Stephens.

The members of this genus are oval or oblong-oval insects, and are

much broader than any of the species belonging to the following genera; the antennæ are thickened towards apex; the scutellum is triangular; the legs are moderately robust, and the anterior tibiæ are dilated towards apex; the last joint of the tarsi is strongly elongate; the genus contains about twenty species, of which six are found in Europe, and the remainder are widely distributed, representatives occurring in Japan, India, Ceylon, the Gaboon district, South America, the Sandwich Islands, &c.

The larva of *Alphitobius diaperinus* is described and figured by Schiödte (l.c. p. 565, pl. xi. fig. 1); in form it very closely resembles that of *T. molitor*, but has the sides of the segments furnished with setæ; the colour is pale ferruginous beneath and ferruginous above, with the central part of each segment darker, except in middle; the larva of *A. piceus* has the upper surface entirely pale ferruginous; the insects in all their stages live in meal, flour, and bran.

I. Thorax broadest at about base . . . . . A. DIAPERINUS, *Panz.*
II. Thorax broadest at or near middle . . . . . A. PICEUS, *Ol.*

A. diaperinus, Panz. (*mauritanicus*, Steph., Curt., *nec* F.). Ovate, convex, pitchy black above, reddish beneath; head narrower than thorax, distinctly punctured, antennæ short, thickened towards apex, pitchy, with the apex lighter; thorax transverse, broadest at base, with the sides slightly rounded and gradually narrowed in front, distinctly and not very closely punctured; scutellum triangular, closely punctured; elytra with distinct punctured striæ, interstices diffusely and rather strongly punctured; legs ferruginous. L. 5–5½ mm.

In flour, &c.; probably an introduced species; not common; London; Queenborough, Kent; Scarborough; Northumberland and Durham district; Scotland, in bakehouses, Solway and Clyde districts. Mr. Bold says that it appears to find a congenial climate in some of the deep hot coal mines of the Northumberland district, where it abounds in the stables, having probably been introduced in some of the horses' food.

A. piceus, Ol. (*mauritanicus*, F., *nec* Steph.; *fagi*, Panz.; *Uloma fagi*, Curt.). More oblong than the preceding, and, on the average, smaller, and easily distinguished by the shape of the thorax, which is more transverse with the sides rather strongly rounded and broadest in the middle; it is also more thickly and strongly punctured; the elytra are depressed on disc, with the striæ less evident than in the preceding species, and the interstices more closely punctured; legs red. L. 4½–5 mm.

In old flour; probably an introduced species; rather common; London district; Dover; Birmingham district; Rhyl; Scarborough; Manchester; Scotland, Solway district; it probably occurs in granaries in many other localities.

GNATHOCERUS, Thunberg.

The members of this genus are easily distinguished from the allied genera by having each of the mandibles of the male produced into a strong horn, which is curved inwards at apex; the last joint of the

maxillary palpi is somewhat securiform; the eyes are almost entirely divided; the antennæ are short, and gradually thickened towards apex; the general form is elongate oblong, and the elytra are much depressed; the genus contains three or four species from Europe, the Isle of France, and North America; they feed on meal and bran.

G. cornutus, F. (*Uloma cornuta,* Steph.). Oblong, elongate, but broader than *Tribolium,* which it much resembles, depressed, of a reddish-brown colour; thorax quadrate, gradually and slightly narrowed behind, with the posterior angles prominent and a small impression on each side at base, very finely punctured; elytra with fine punctured striæ, interstices minutely and closely punctured; antennæ and legs red. L. 3–4 mm.

Male with the mandibles very large and prominent, recurved and acute at the tip, resembling horns, margins of clypeus dilated, vertex with two small short horns.

In flour, bread, &c.; often seen crawling about bakers' shops; a cosmopolitan species; not uncommon; London; Norwich; Dover; Hastings; Hampshire; Birmingham; Scarborough; Manchester; Northumberland and Durham district, common; not recorded from Scotland, but it probably occurs.

The *v. læviusculus,* Steph., is paler, with the thorax less quadrate and the punctuation more minute.

TRIBOLIUM, McLeay.

This genus contains about half-a-dozen species, one or two of which are almost cosmopolitan, having been imported into various countries in meal and flour; they are small, elongate-oblong, and depressed insects with the mandibles simple, and the last joint of the maxillary palpi long oval; the eyes are about half divided; the antennæ are more or less thickened towards apex, and the elytra, as in the preceding genus, completely cover the abdomen.

The larva and pupa of *T. ferrugineum* are described and figured by Schiödte (l.c. pp. 563, 587, pl. x. figs. 18 and 21); the larva is linear and parallel, slightly narrowed towards apex, of a rufo-ferruginous colour above and paler below; the segments are furnished on each side with setæ, and the anal segment is very small and terminates in two short pointed appendages; the pupa is much longer than broad, and is set with rather short setæ; the plates at the side are strongly bifid, and the cerci are comparatively long and sharply pointed at apex.

I. Antennæ with the three last joints distinctly larger, forming a club . . . . . T. FERRUGINEUM, *F.*
II. Antennæ gradually narrowed to apex . . . . . T. CONFUSUM, *Duv.*

T. ferrugineum, F. (*castaneum,* Herbst.; *Stene ferrugineum,* Kirby). Elongate-oblong, parallel, depressed, reddish-yellow-brown or rufo-ferruginous; head and thorax thickly and finely punctured, the former large, but much narrower than thorax, the latter broader than long, with the sides subparallel; antennæ ferruginous, with the three

last joints forming a club, terminal joint paler; elytra with fine but distinct punctured striæ, interstices narrow, subcarinate, thickly punctured; legs ferruginous. L. 3–4 mm.

A cosmopolitan species; occurring in flour, &c.; often found in bakers' shops; occasionally it has been taken under the bark of old trees; common; London; Sheerness; Dover; St. Peter's, Kent; Hertford; Norfolk; Hastings; Hampshire; Birmingham; Burton-on-Trent; Scarborough; Manchester (abundant in cocoons of *Crisula trifenestrata* received from India for the Jubilee Exhibition, 1887, (Chappell)); Liverpool; Northumberland and Durham district; Scotland, Forth district.

T. confusum, Duv. Very closely allied to the preceding, but rather larger and broader, with the sides of the thorax a little more rounded in front, and the anterior tibiæ less acutely produced on the outer side; it may be easily known by having the antennæ gradually thickened to apex, the last five or six joints being wider than the preceding; the elytra have the punctured striæ less evident, and the minute punctuation of the interstices less regular; legs red. L. $3\frac{1}{2}$–$4\frac{1}{2}$ mm.

Of similar habits to the preceding, and often occurring with it, but not nearly as common; London; Hastings; Birmingham; Burton-on-Trent; Manchester; it probably occurs in many other localities.

PALORUS, Duval.

This genus has been by many authors included under *Hypophlœus* (*Corticeus*), but in structure and habitat is more closely related to *Tribolium*; from the former genus it may be distinguished by having the apex of the elytra rounded and covering, or almost entirely covering, the pygidium, and also by the eyes, which are smaller, rounded, and not kidney-shaped; the antennæ have the five last joints thickened; the entire eyes will at once separate the genus from *Tribolium*, in which genus they are strongly divided; two species are found in Europe, one of which occurs in Britain.

The larva and pupa of *P. melinus*, Herbst. (*depressus*, F.), are described and figured by Schiödte (pp. 561, 587, pl. x. figs. 12, 16); the larva is very like that of *T. ferrugineum*, except that the prothorax is shorter and somewhat transverse, and the apical segment is longer, with the pointed processes more minute; the colour, too, is paler ferruginous; it differs very much from that of *Hypophlœus* (*Corticeus*) *bicolor*, which is much broader; the pupa is narrower than that of *Tribolium*, and is set with longer setæ; the cerci, too, are shorter; the insect in all its stages is found in meal, bran, &c.

P. melinus, Herbst. (*depressus*, F.). Elongate-oblong, parallel-sided, depressed, rather shining, rufo-testaceous; head rather large, closely punctured; thorax subquadrate, very gradually and slightly narrowed behind, distinctly and not very closely punctured; scutellum transverse; elytra with fine but distinct rows of punctures, interstices minutely punctured; legs reddish-testaceous. L. $2\frac{1}{2}$ mm.

Under bark of oaks and elms; not common; London; Birdbrook, Essex; Hampshire; Swansea; Scarborough; Northumberland and Durham district; it sometimes occurs in flour, and Bold records it as taken in shops, and apparently introduced.

HYPOPHLŒUS, Hellwig. (*Corticeus*, Piller.)

This genus, including *Palorus*, contains about thirty species; of these about half occur in Europe, and the remainder have been described from Northern Africa and the adjacent islands, North America, Ceylon, Brazil, &c.; the species belonging to the genus *Hypophlœus* proper may be easily known by having the elytra truncate and the pygidium exposed; the general form is elongate-oblong or subcylindrical; the antennæ have the last seven joints thickened, all but the last one being strongly transverse; the last joint of the palpi is subovate, and the scutellum is transverse and truncate at apex.

The larva of *H. bicolor* is described and figured by Schiödte (l.c. p. 559, pl. x. fig. 8); it is rather broad, the length being only seven times greater than the breadth, smooth and shining, with fine and slender setæ; it is gradually narrowed from a little before apex, and the apical segment is small and not furnished with processes; the ocelli are two in number on each side, and are rather large and conspicuous; the prothorax is a little broader than long, slightly narrowed in front, and very finely constricted before middle; the pairs of legs are of about equal length; its habitat is in dead trunks of oak, so that it differs very much in this respect from that of *Palorus*.

I. Form elongate, subcylindrical; thorax much longer than broad; elytra moderately strongly punctured in distinct rows, unicolorous castaneous	H. CASTANEUS, *F.*
II. Form elongate-oblong, somewhat depressed; thorax only slightly longer than broad; elytra finely and more or less confusedly punctured, black, with the base broadly red	H. BICOLOR, *Ol.*

H. castaneus, F. (*cimeterius*, Herbst.). Elongate, subcylindrical, shining, chestnut-brown, with the thorax often darker, almost black; head thickly punctured; antennæ pitchy or ferruginous with the apex usually lighter; thorax subrectangular, considerably longer than broad, distinctly and rather closely punctured; elytra with fine punctured striæ, interstices minutely punctured; legs red. L. 4–5½ mm.

Male with the anterior tibiæ furnished with a large hooked spur; female with the anterior tibiæ slightly produced into a tooth at apex externally.

Under bark of beech and elm; very local and not common; New Forest; Plymouth; Sherwood Forest, where it has occurred in some numbers to Mr. Matthews, Mr. Blatch, Dr. Power, and others; Dunham Park, Manchester.

H. bicolor, Ol. A small but brightly coloured and conspicuous species; elongate-oblong, moderately convex, shining, of a testaceous red colour above, with the elytra except basal third black; under-side castaneous red, with the apex pitchy black; head subtriangular, finely punctured; thorax subquadrate, closely and finely punctured; elytra

closely and unevenly punctured in front with traces of fine striæ, the punctuation becoming obsolete behind; antennæ and legs red or ferruginous red. L. 3–3½ mm.

Under bark of elms; very local; London district, rather common, Camberwell, Kennington, Forest Hill, Lee, Chatham, Sydenham, Charlton, Wimbledon, Horsell, Epping Forest, Brockley, &c.; Norfolk; near Manchester, Dukinfield, under pine bark (Chappell).

LATHETICUS, Waterhouse.

This genus, which has comparatively recently been described by Mr. Waterhouse, appears to be an evident importation, and ought not perhaps to be considered indigenous; for the same reason, however, several of the other genera, whose members live on meal and flour, might with reason be excluded; the single species known may at once be distinguished by its very short antennæ, which are partially concealed by the clypeus which is almost as long as the rest of the head; the eyes are only slightly emarginate; the thorax is subquadrate, and the elytra are parallel-sided and depressed, and completely cover the abdomen; the first joint of the posterior tarsi, if viewed sideways, is evidently longer than the second, but if viewed from above appears almost equal to it.

L. oryzæ, Wat. A small testaceous or rufo-testaceous species, elongate-oblong, very linear and parallel, slightly shining; head large, finely punctured, together with eyes as broad as thorax, antennæ stout and extremely short, not or scarcely as long as head; thorax subquadrate, closely and finely punctured; elytra with fine rows of punctures, interstices minutely sculptured, very finely rugose, at least in parts; legs slender, clear reddish-testaceous. L. 2½ mm.

A cosmopolitan species; occurring in rice, flour, &c.; it has occurred in the neighbourhood of London; one example has been taken by Mr. Marsh at Lee, Kent, by sweeping; it ought perhaps to be excluded from the British list, but a considerable number of others might be excluded on the same grounds.

HELOPINA.

This tribe is represented by a large number of tropical genera; eighteen are assigned to it in the European catalogue of Heyden, Reitter, and Weise, but several of these are considered by most authors as merely divisions of the large genus *Helops;* the members of the tribe may be distinguished superficially by having the front separated from the clypeus by a distinct coriaceous band; they are large or moderate-sized oval or oblong-oval insects, with the eyes transverse, the front more or less dilated before eyes, and the antennæ gradually thickened towards apex; the epipleuræ of the elytra are narrow or moderate; the anterior coxæ are rounded, the middle coxæ are furnished with a distinct trochantin, and the posterior coxæ are not widely separated; the tibial spurs are short or very short, and the tarsi are pubescent beneath, the

anterior and intermediate pairs in the male being usually dilated; the legs, as a whole, are rather long, and the femora extend considerably beyond the sides of the body.

HELOPS, Fabricius.

In this genus the antennæ are long and rather slender, and the maxillary palpi have the last joint dilated and securiform; the third joint of the antennæ is four or five times longer than the second, and the penultimate joints are always longer than broad; the eyes are transverse and slightly emarginate; the thorax is transverse or subtransverse, almost truncate in front and behind, more or less strongly margined; the tibiæ are rather slender, but are gradually widened to apex, and have the apical spurs small or very small; the genus is allied to *Tenebrio*, but differs in its short metasternum, long antennæ, less elongate and more oval elytra, and other characters; it is very extensive in point of numbers, containing upwards of two hundred and fifty or three hundred species, of which about one hundred and twenty (if we include the subgenera) are found in Europe, and the remainder are widely distributed in Northern and Central Asia and Ceylon, Northern Africa and the Gaboon district, Cuba, the Australian region, &c.; only a few species, however, appear to have been met with in tropical countries.

The larva of *H. cæruleus* is described and figured by Schiödte (l.c. p. 571, pl. xi. fig. 15), and also by Westwood (Classification, i. p. 312, fig. 86, 20); it is found in the rotten wood of chestnut and other trees, and is elongate, linear and cylindrical, about ten times as long as broad, of a yellow colour with dark tubercles on the last abdominal segment; the prothorax is longer than broad, narrowed in front, and constricted before middle; the penultimate segment is rugose and the terminal one short, and armed with two divergent erect and acute spines;* the front pair of legs is longer than the intermediate and posterior pairs; Westwood records the fact of these larvæ doing damage to a window frame in which they had taken up their abode.

I. Last joint of antennæ obliquely truncate; front considerably dilated before eyes; thorax strongly margined, with sides much rounded in front (*Helops*, i. sp.) . . . H. CŒRULEUS, *L.*

II. Last joint of antennæ rounded; front slightly dilated before eyes; thorax narrowly margined at sides, with sides not or not strongly rounded in front (s.g. *Nalassus*, Muls.).

i. Colour pitchy brown; thorax not sinuate before base . H. STRIATUS, *Fourc.*

ii. Colour testaceous; thorax slightly sinuate before base . H. PALLIDUS, *Curt.*

H. cœruleus, L. A large and conspicuous species, broad and convex, nigro-cœruleus above, black beneath, moderately shining; head rugosely punctured, antennæ moderately long and robust; thorax subquadrate in the male, evidently broader than long in the female, with coarse raised margins, and with the sides rounded in front and rather strongly narrowed behind, punctuation thick and strong, in parts sub-

* This larva appears, if touched, to strike upwards or sideways with these spines; they seem therefore to be, in part at least, weapons of defence.

rugose; scutellum small, transverse; elytra obtusely acuminate at apex, with comparatively fine but rather deep punctured striæ, interstices rather strongly and closely punctured; legs black, elongate. L. 15–20 mm.

The male is narrower and smaller than the female, and has the thorax proportionately longer.

In decaying willows, &c.; occasionally on palings; very local; London district, not uncommon, Camberwell, Darenth, Greenwich, Putney, Barnes, Chiswick, Hammersmith (formerly common on old trees at night, S. Stevens), Lambeth, Belvedere, Southend, Gravesend, Sheerness, Epping Forest; Clacton-on-Sea; Aldborough, Suffolk; Shipley, near Horsham; Hastings; Dover; Portsea; Bristol; Swansea.

H. pallidus, Curtis (*testaceus*, Küst.; *Nalassus pallidus*, Muls.). Ovate, convex, pale testaceous, rather shining; head subtriangular, thickly punctured; antennæ long, often darker towards apex; thorax transverse, with sides slightly rounded and narrowed in front and very gradually and slightly narrowed behind, posterior angles somewhat projecting, punctuation close and fine but distinct; scutellum triangular; elytra with eight fine rather irregularly punctured striæ on each, suture ferruginous, interstices minutely punctured; legs testaceous, with the apex of femora and the claws ferruginous. L. 8–10 mm.

Sandy places on the coast; at roots of grass, often at some depth beneath the surface of the ground; very local, but not uncommon where it occurs; Deal; Clacton-on-Sea; Harwich; Southend; Hastings; Ryde; Swansea; Tenby; Barmouth (where it was first discovered by Mr. H. Walker and his brother); Wallasey, near Liverpool.

H. striatus, Fourc. (*caraboides*, Panz.; *Nalassus striatus*, Muls.). Oblong-oval, convex, shining, pitchy brown or pitchy black above, with a more or less distinct bronze reflection, under-side red brown; head subtriangular, thickly punctured, antennæ rather long; thorax broader than long, but not strongly transverse, with the sides gently rounded in some specimens, subparallel, thickly and rather finely, but distinctly, punctured, posterior angles obtuse; elytra with fine but distinct punctured striæ, interstices rather strongly and somewhat confluently punctured; antennæ and legs pitchy red, tarsi usually lighter. L. 6–10 mm.

Male smaller, narrower, and more oblong than female, with the anterior and intermediate tarsi dilated and pilose beneath.

Under loose bark; in rotten wood, moss, &c.; often about the roots of trees; on sugar at night placed on trees to attract moths; common and generally distributed from the midland districts southwards; rarer further north; not recorded from the Manchester or Liverpool districts; Northumberland and Durham district, "Gibside," Mr. John Hancock; Scotland, rare, on trees, Solway and Forth districts; Ireland, near Dublin and Carlingford, co. Louth.

LAGRIIDÆ.

According to the Munich catalogue this family contains fourteen

genera and one hundred and thirty species; over one hundred of these are comprised in the two genera *Lagria* and *Statira*, the latter of which appears to be confined to the New World; two genera only, *Lagria* and *Agnathus*, are found in Europe, and the latter of these has been added since the publication of Gemminger and Von Harold's catalogue; of the thirteen European species one only is found in Britain; in many points they resemble the Tenebrionidæ, but differ in having the anterior coxæ conical and prominent; the antennæ are 11-jointed, filiform, inserted under very small oblique frontal ridges; the thorax is narrower than the elytra, more or less cylindrical; the elytra are rounded at apex and entirely cover abdomen; the abdomen has five free ventral segments, of which the first four are more closely connected, a sixth being sometimes visible; the legs are slender, and the penultimate joint of all the tarsi is dilated and bilobed, and clothed beneath with a thick brush of hairs, which gives it a spongy appearance; the body is pilose.

LAGRIA, Fabricius.

This genus contains about seventy species, which are widely distributed throughout the Old World from Siberia to the Cape of Good Hope; the majority, however, occur in hot or tropical countries; the genus is not, apparently, represented in the New World, where its place is taken by *Statira*; about a dozen species are found in Europe; the single British species is in many districts exceedingly abundant.

The larva and pupa of *Lagria hirta* are described and figured by Schiödte (xi. pp. 526, 531, pl. xiv. 12, 21); the larva is moderately broad, the length being about five times as great as the width, parallel-sided, with a very small short head, and the last abdominal segment small, conical and finely bifid at apex; the segments on each side are furnished with tufts of hairs; the prothorax, which is gradually and slightly narrowed in front, is the longest segment, and the second and third abdominal segments are the shortest; the colour is rather light, with a central longitudinal fuscous band on each segment, which is often divided in the centre by a light band, and with a fuscous patch on each side; on the last two segments the central patch does not reach apex; the legs are comparatively long.

The pupa is moderately long, and is chiefly remarkable for the long broad clavate processes which project one on each side from all the abdominal segments except the two last; the whole surface is hairy.

L. hirta, L. Black, shining, villose, with the elytra pale testaceous, of soft and flexible consistency; head, together with eyes, broader than thorax in male, about as broad in female, sparingly punctured; thorax subquadrate, small, much narrower than elytra, with a broad central longitudinal impression, sparingly punctured, often almost smooth in middle; elytra rather closely, distinctly and subrugosely punctured, with faint traces of raised lines. L. 7–9 mm.

Male narrower, with the last joint of the antennæ three times as long as the preceding, and the eyes larger, projecting beyond sides of thorax.

Female broader, with the last joint of the antennæ twice as long as the preceding, and the eyes smaller, not or scarcely projecting beyond sides of thorax.

In hedges; on flowers, &c.; by beating and sweeping; rather local, but sometimes in profusion, generally distributed throughout the London and Southern districts, and not uncommon in the Midlands; rarer further north; Scotland very local, hitherto found only in the Moray district, but it probably occurs in several others; Ireland, Queenstown, Killarney, Waterford, Portmarnock, &c.

CISTELIDÆ (*Alleculidæ*).

This family, which has been by some authors included under the Tenebrionidæ, contains several genera, of which *Allecula, Cistela*, and *Omophlus* are the most important, but it is not of large extent; the species are widely distributed, but appear to be mostly attached to temperate and moderately warm climates; eight genera occur in Europe, containing about one hundred species, of which five genera, represented however by only seven species, are found in Britain; they differ from the Tenebrionidæ and Lagriidæ in having the tarsal claws pectinate, and from all the following families in the fact that the anterior coxal cavities are closed behind; the antennæ are usually long, filiform or more or less serrate, and are inserted behind the base of the mandibles; the maxillary palpi are 4-jointed, rather long and often much dilated at apex; the eyes are kidney-shaped; the coxæ are somewhat variable, but the posterior pair are usually contiguous, and the anterior pair subglobose; the epimera of the mesosternum reach the coxæ; the legs are usually long, the tibiæ being more slender than the femora and furnished with distinct spurs; the posterior tarsi have the first joint elongate, and the penultimate often bilobed.

Our British genera may be distinguished as follows:—

I. Abdomen composed of five ventral segments; mandibles emarginate; antennæ inserted just behind base of mandibles.
  i. Penultimate joint of tarsi not furnished with a membranous plate beneath.
    1. Anterior tarsi considerably shorter than the tibiæ; antennæ comparatively short and stout . . . . . MYCETOCHARES, *Latr.*
    2. Anterior tarsi as long or nearly as long as the tibiæ; antennæ long and slender . . . . . CISTELA, *F.*
  ii. Penultimate joint of tarsi furnished with a membranous plate beneath . . . . . ERYX, *Steph.*

II. Abdomen composed of six ventral segments; mandibles acute at tip; antennæ inserted at a little distance behind base of mandibles.
  i. Thorax not pilose, with posterior angles right angles; antennæ long and slender in both sexes . . . . . CTENIOPUS, *Sol.*
  ii. Thorax pilose, with posterior angles blunt or rounded; antennæ comparatively short and stout in female . . OMOPHLUS, *Sol.*

The nomenclature of the family is somewhat in a state of confusion,

as the new school for the revival of obsolete names have applied the name Cistelidæ to what we commonly know as the Byrrhidæ, and the name *Cistela* to the genus *Byrrhus*, or rather to the small genus *Cytilus*; it is, however, best to keep to the old names, unless we drop the term Cistelidæ altogether, and call the family Alleculidæ.

CISTELA, Fabricius. (*Pseudocistela*, Crotch.)

There is some doubt as to the true composition of this genus, and several authors divide it into three or four separate genera, while others also include under it the genus *Eryx*; the latter genus appears to be quite distinct, and I feel rather inclined to separate *Isomira*; as, however, *C. ceramboides* appears to be in some respects more closely allied to this sub-genus than to the *C. rufipes* group, and would also require to be divided off, I have thought it better to follow Heyden, Reitter and Weise, and others in keeping them together; the genus as here constituted is characterized by having the antennæ long and slender, filiform or serrate, with the last joint linear and elongate, and also by the short prosternum, the evidently margined thorax, which is often almost semicircular, and the more or less strongly securiform last joint of the maxillary palpi; the upper surface is in some cases glabrous, or almost glabrous, and shining, and in others evidently and closely pubescent.

The genus contains more than seventy species, which are very widely distributed; twenty-eight occur in Europe, and representatives have been described from North America, Ceylon, Madagascar, the Australian region, &c.; very few, however, are found within the tropics.

The larva of *C. ceramboides* is described and figured by Westwood (Classif. i. p. 310, fig. 36, 7); it is long, subcylindric and scaly, and resembles some of the larvæ of the Elateridæ; the antennæ are very short, 3-jointed, with a minute tubercle or retractile fourth joint at apex; the head is reddish, the mouth black, the first segment pale buff, and the remaining segments, except the last, dull greenish, with the posterior margin red; the last segment is of a buffish colour, conical, and without cerci or projections at apex; the larva from which the above description was drawn up was found by Mr. Griesbach in a pollard oak on Wimbledon Common.

The three British species may be distinguished as follows:—

I. Antennæ filiform, with the third joint not or not much shorter than fourth.
  i. Upper surface almost glabrous, shining; anterior tarsi with the first three joints slightly dilated (s.g. *Gonodera*, Muls.) . . . . . C. LUPERUS, *Herbst.* (*fulvipes*, F.)
  ii. Upper surface finely and thickly pubescent, rather dull; anterior tarsi simple (s.g. *Isomira*, Muls.) . . . . . C. MURINA, *L.*
II. Antennæ strongly serrate, with the third joint very short, fourth joint four times as long as third; upper surface finely pubescent; anterior tarsi simple (s.g. *Pseudocistela*, Crotch) . . . . . C. CERAMBOIDES, *L.*

C. luperus, Herbst. (*fulvipes*, F.; s.g. *Gonodera*, Muls.). Oblong-

oval, very shining, black, sometimes with an æneous tinge ; head closely punctured, antennæ long, pitchy or ferruginous with base lighter; thorax transverse, with sides rounded in front, distinctly and not very closely punctured, especially on disc, posterior angles obtuse, almost right angles; elytra strongly punctate-striate with the interstices sparingly punctured ; legs red, long and slender. L. 7–9 mm.

Male with the antennæ slightly serrate, the fourth joint one and a half times as long as the third, and the anterior tarsi rather plainly dilated.

Female with the antennæ filiform, the fourth joint only a little longer than the third, and the anterior tarsi slightly dilated.

The *v. ferruginea*, F., has the elytra and often more or less of thorax castaneous or ferruginous ; it occurs with the type.

On young hazel, oak, &c. ; often on flowers and by sweeping amongst grass ; local, but not uncommon in some districts ; Darenth and Birch Woods, Mickleham, Croydon, Bexley, Riddlesdown, Abbey Wood, Guildford ; Norfolk ; Hertford ; Wrabness, Essex ; Dover ; Hastings ; Portsdown Hill, near Portsea ; Coopers Hill, Gloucester ; Llangollen ; Matlock, Lovers' Walk. I know of no record further north than the last-mentioned locality, where I have taken it sparingly.

C. ceramboides, L. (s.g. *Pseudocistela*, Crotch). Oblong-oval, black with the elytra testaceous, not very shining, clothed with very fine and delicate silky pubescence; head finely and closely punctured, eyes variable in the sexes ; thorax rather broader than long, subconical, strongly and gradually narrowed in front, very finely and closely punctured, sinuate on each side at base, posterior angles almost right angles; elytra finely punctate-striate, interstices flat, very finely and closely punctured or alutaceous; legs long and slender. L. 9–11 mm.

Male with the antennæ longer than in the female and more acutely serrated, with the third joint one and a half times as long as the second ; eyes strongly prominent.

Female with the antennæ shorter and less acutely serrated, with the third joint twice as long as second ; eyes moderately prominent.

On oaks ; occasionally on Umbelliferous flowers ; the larva and sometimes the perfect insect is found in old decaying branches still remaining on the trees ; rare ; Camberwell, Chobham, Lee, Darenth Wood, Sydenham, Belvedere, Dulwich ; Hertford ; Leominster ; Cambridge ; Glanvilles Wootton, Dorset ; Sherwood Forest (Matthews and Sidebotham).

C. murina, L. (*sericea*, Drap. ; s.g. *Isomira*, Muls.). Oblong-ovate, subparallel, not very convex, rather dull, clothed with fine thick ashy pubescence, black or brownish-testaceous, or with the elytra testaceous and the thorax dark, margins of the latter sometimes ferruginous ; head closely punctured, antennæ long, red, with the apex of the joints often dusky ; thorax broader than long, with the sides regularly rounded and narrowed in front, very closely and finely punctured, posterior angles slightly acute ; elytra with indistinct stride, interstices very closely sculptured ; legs long, clear reddish-testaceous. L. $5\frac{1}{2}$–7 mm.

Male with the antennæ longer and the last joint linear; last ventral segment of abdomen broadly subtruncate at apex.

Female with the antennæ shorter and the last joint oblong; last ventral segment of abdomen rounded at apex.

On flowers, &c.; local, but common in many districts and generally distributed throughout England, although it appears to be more universal in the London and Southern districts, and rarer in the north; Scotland, local, maritime, Dee district. I have no record from Ireland, but it almost certainly occurs.

ERYX, Stephens. (*Prionychus*, Solier.)

This genus contains a few species, four of which are found in Europe; they may be known by having the penultimate joint of the tarsi furnished with a membranous lobe beneath; the antennæ are filiform, and have the third joint a little longer than the fourth; the thorax is semicircular, margined at base and sides, and with the posterior angles not produced; the larva is found in the vegetable mould of decayed oak trees, and very much resembles that of *Cistela ceramboides;* it is of a yellowish-white colour with the head ochreous and corneous (*v.* Westw. Class. i. p. 310).

E. ater, F. (♂ *melanarius*, Germ.). Oblong-oval, broad, rather convex, black, moderately shining, clothed with very short black pubescence; head thickly and distinctly punctured, antennæ moderately long and robust; thorax transverse, almost semicircular, gradually rounded from base and strongly narrowed in front, distinctly and not very closely punctured, with the posterior angles somewhat obtuse; elytra with rather fine punctured striæ, interstices distinctly and not very closely punctured; legs moderately long, pitchy or pitchy ferruginous, with the tarsi lighter; the male is a little narrower than the female, and has the anterior tarsi very slightly dilated. L. 10–13 mm.

In decaying willow, ash, &c.; nocturnal in its habits, being found on the trunks of willows, &c., at night; very local and, as a rule, rare; Coombe Wood, Forest Hill, Walthamstow, Stockwell (Surrey), Chatham, Putney, Hammersmith (old apple trees, formerly, S. Stevens); Windsor; Norwich; Cambridge; Leominster (Mrs. Hutchinson); Sherwood Forest (Sidebotham).

MYCETOCHARES, Latreille.

(*Mycetophila*, Gyllenhal; *Ernocharis*, Thomson.)

This genus contains about twenty species, which are almost entirely confined to Europe and North America; of the ten European species one only occurs in Britain; the short and stout antennæ and short tarsi will easily distinguish the genus from *Cistela*, which it resembles in having the penultimate joint of the tarsi not lobed beneath; the antennæ have the third joint a little longer than the fourth; the anterior coxæ are contiguous at apex, and the last joint of the maxillary palpi is slightly securiform.

The larvæ of *Mycetochares* much resemble those of *Eryx*; that of *M. bipustulata* has been found in rotten oak; it is furnished with two anal prolegs, but does not appear to present any marked peculiarity.

M. bipustulata, Ill. (♂ *scapularis*, Gyll.). Oblong, subparallel, clothed with rather long black pubescence, black, shining, with a bright yellow or reddish-yellow spot at each shoulder, variable in size; head deeply and rather diffusely punctured, antennæ comparatively short and stout, pitchy with the base red; thorax transverse, with the sides gently rounded, very slightly contracted towards base, broadest about or a little before middle, posterior angles obtuse, punctuation diffuse, deep and rather strong, base with an impression on each side; elytra with punctured striæ, interstices sparingly punctured; femora black or pitchy, tibiæ and tarsi clear red. L. $4\frac{1}{2}$–$5\frac{1}{2}$ mm.

Male more elongate than female, with the thorax less transverse, and less rounded at sides, and with the eyes larger and more prominent.

Under bark and in rotten wood of oak, cherry, &c.; rare; Esher, Peckham, Forest Hill, Coombe Wood, Ripley, Darenth Wood, Lee; Cambridge; Dover; New Forest; Swansea; Dunham Park, Manchester (Chappell).

CTENIOPUS, Solier.

This genus contains about a dozen species, seven of which occur in Europe, and the remainder in Siberia and Central Asia, and North America; they may be known from the preceding genera belonging to the family by having the abdomen composed of six ventral segments and the antennæ inserted at some distance behind the base of the mandibles; the third joint of the antennæ, which are long and slender, is about as long as or a little longer than the fourth; the mandibles are acute at the tip, and the last joint of the maxillary palpi is scarcely securiform; the thorax has the sides almost straight and gradually narrowed to the posterior angles which are nearly right angles; the tarsi, especially the intermediate and posterior pairs, are long and have the penultimate joint simple, and the anterior coxæ are narrowly distant at apex; our single species is very conspicuous by reason of its brilliant sulphur-yellow colour, which fades very much after death.

C. sulphureus, L. (♂ *v. bicolor*, F.). Oblong-oval, pale sulphureous yellow, dull; head finely punctured, eyes prominent, antennæ long, pitchy towards apex; thorax varying in the sexes, very closely and finely punctured, posterior angles obtuse, almost right angles; elytra with obsolete striæ, interstices very closely sculptured; legs long, tarsi often more or less pitchy. L. 6–8 mm.

Male more slender and narrower, with the thorax about as long as broad, slightly impressed on each side at base, and with the sixth ventral segment of abdomen deeply impressed, and emarginate at apex.

Female broader and more robust, with the thorax transverse, deeply

impressed on each side, and with the sides a little dilated before middle; the sixth ventral segment of abdomen is simple.

The male is very variable in colour, and the varieties are classed by Thomson as follows:—

a. Head, antennæ, palpi and anal segment black.
b. As the preceding, but with the thorax also black.
c. Fusco-sulphureous, with the legs bright sulphur-yellow, and the head, thorax, antennæ and palpi black.

In some specimens the tarsi and almost the whole of the antennæ are black.

A coast species; occurring on flowers, rushes, &c.; local, but common where it occurs; Deal; Dover; Folkestone; Hastings; Isle of Wight; Weymouth; Chesil Beach; Land's End; Lundy Island; Burnham, Somerset; Swansea; Tenby; Brandon, Suffolk; Hunstanton, Norfolk; Mr. Chappell records it from Kendal.

OMOPHLUS, Solier.

This is a rather large genus, containing upwards of sixty or seventy species, which appear to be confined to Europe, Northern and Central Asia, and the circum-Mediterranean districts; of the thirty-two European species only one occurs in Britain; it may be known from *Cteniopus* by the more transverse thorax, which is pilose and has the posterior angles obtuse or rounded, and the shorter and stouter antennæ.

O. armeriæ, Curt. (*amerinæ*, auct.; *pubescens*, Muls.). Oblong, elongate, depressed, shining black with the elytra testaceous-brown; head and thorax clothed with long hairs, the former rather coarsely punctured, the latter transverse, closely and finely punctured, uneven on disc, with the sides slightly rounded; antennæ black, pitchy towards base; elytra broader than thorax, clothed with very short pubescence, with shallow and more or less obsolete striæ, interstices very closely and distinctly punctured; legs rather long, black, apex of tibiæ, and the tarsi, ferruginous. L. 7–8 mm.

Male smaller and narrower than female, with the antennæ considerably longer.

On *Armeria maritima*; extremely local; I know of no locality except Weymouth, where it has been taken in some numbers on and near the Chesil Beach by Mr. Dale, Mr. Harris, Mr. Blatch and others.

MELANDRYIDÆ.

This family, according to the Munich catalogue, contains thirty-six genera and one hundred and twenty species; several have since been added, and, at present, twenty-two genera and fifty-six species have been found in Europe; the remainder are widely distributed, but only a comparatively small number occur in tropical countries. The following are the chief characteristics of the family:—Head not constricted behind,

received into the thorax as far as the eyes, which are either entire or emarginate; mandibles short; maxillæ with two flattened lobes, palpi 4-jointed, often long and more or less dilated; antennæ 11-jointed (except in *Conopalpus*, in which genus they are 10-jointed), usually filiform; thorax (in our species) as broad behind as base of elytra; mesosternum moderately long, side pieces attaining the coxal cavities; elytra covering abdomen, which is composed of five free ventral segments; legs usually long and slender; the species are variable in size and colour, and are found under bark, in rotten wood, or in fungi.

The family has by some authors been divided into several tribes; only two, however, are here adopted, as far as the British fauna is concerned; these may be distinguished as follows:—

I. Antennæ with the last four joints forming a very abrupt, strong and distinct club . . . . . TETRATOMINA.
II. Antennæ as a rule filiform or very gradually thickened, in one or two cases forming a rather strong but not abrupt club . . . MELANDRYINA.

TETRATOMINA.

This tribe contains only one genus, which may be known by the strong 4-jointed club of the antennæ; the palpi are short and not much dilated; the tibial spurs are small and the coxæ not contiguous; the species are small, or rather small, oval and convex insects, and live in fungi. Thomson classes them with the Mycetophagidæ, to which they bear a somewhat close relation.

TETRATOMA, Fabricius.

Seven species are contained in this genus, one of which is found in Kamtschatka, two occur in North America, and four in Europe; of these three are inhabitants of Britain, and may be distinguished as follows:—

I. Thorax red; elytra black, with a bluish or greenish reflection . . . . . T. FUNGORUM, *F.*
II. Upper surface entirely black, often with a slight greenish reflection . . . . . T. DESMARESTI, *Latr.*
III. Upper surface reddish or yellowish brown or testaceous, with more or less distinct black markings on elytra; size smaller . . . . . T. ANCORA, *F.*

T. fungorum, F. Oblong, subparallel, convex, shining, head black, thorax red, elytra deep blue, under-side reddish-testaceous; head subtriangular, rather coarsely punctured, with an impression on vertex, antennæ red with the club black; thorax very transverse, with the sides rounded and narrowed in front, coarsely and not very closely punctured; scutellum dark, almost pentagonal; elytra about as broad at base as thorax, coarsely and rather closely punctured; legs clear red. L. $3\frac{1}{2}$–$4\frac{1}{2}$ mm.

On fungoid growth on decaying trees, under bark, in rotten wood, &c.; local and, as a rule, not common; Putney, Richmond, Wimbledon, Coombe Wood, Erith (bred freely from a fungus, S. Stevens), Loughton, Cowfold, Sheerness; Hastings; New Forest; Llangollen; Cannock Chase; Repton; Sherwood Forest; Raincliff Wood, near Scarborough; Northumberland and Durham district, Twizell and Hetton Hall near Belford; Scotland, rare, Tweed district.

T. Desmaresti, Latr. Oblong, subparallel, black, with a greenish reflection, shining, clothed with fine yellowish pubescence; head distinctly punctured, antennæ entirely red, or fuscous with the base red; thorax transverse, with the sides rounded and narrowed in front and contracted a little before base, posterior angles obtuse, distinctly and rather strongly and coarsely punctured; elytra with the punctuation somewhat stronger and closer than that of thorax; legs clear yellowish-red. L. $3\frac{1}{2}$–4 mm.

In rotten wood of oak, willow, &c., impregnated with fungoid growth; rare; Beckenham, Kent (Power); Coombe Wood, Surrey (Gorham); Shirley; New Forest; Sherwood Forest (Matthews and Blatch); Raincliff Wood, near Scarborough (Lawson); Dunham Park, Manchester (Chappell).

T. ancora, F. Oblong, subparallel, moderately convex, shining, almost glabrous; head subtriangular, rather closely punctured, testaceous; antennæ testaceous, with the club fuscous; thorax transverse, with sides rounded, not much narrower in front than behind, rather strongly and not very closely punctured, testaceous, with the disc often reddish; scutellum transverse; elytra testaceous with variable black patches at apex, base and sides, or black with testaceous patches, rather coarsely and not closely punctured; under-side black or brownish-black; legs clear yellowish-red with the femora sometimes darker. L. $2\frac{1}{2}$–$3\frac{1}{4}$ mm.

In fungi on old stumps of fir, in rotten wood of beech, &c.; occasionally by sweeping and in moss; rare; Esher (Champion); Chatham (Walker); Darenth (Waterhouse); Highgate Wood; Loughton, Essex; Markfield, Leicestershire (Power); Raincliff Wood, Scarborough (Lawson); Agecroft, near Manchester (Chappell); Northumberland and Durham district; Scotland, scarce, but widely distributed; about Scotch fir; Solway, Tweed, Forth, Clyde, Tay, Dee, and Moray districts.

MELANDRYINA.

This tribe, if we include the genus *Clinocara*, Thoms., which certainly seems distinct, contains twenty-one European genera, of which twelve are found in Britain; another genus, *Serropalpus*, has been included by some authors, but not, apparently, on sufficient authority to render it entitled at present to be considered indigenous; the characters before given for the family will serve to distinguish the tribe, as it contains all the European genera except *Tetratoma*, which, as above stated, may be known by the very abrupt and strong 4-jointed club of the antennæ; the British genera may be distinguished as follows :—

I. Tarsal claws simple.
i. Anterior coxæ separated by the prosternum.

1. Spurs of posterior tibiæ very large.
   A. Antennæ short and stout, with rather strong, but gradual, fusiform club; maxillary palpi serrate, with the last joint very large, strongly securiform . . . . . ORCHESIA, *Latr.*
   B. Antennæ longer, more or less slender, with the last joints gradually thickened; maxillary palpi not serrate, with the last joint moderately large, almost ovate . . . . . CLINOCARA, *Thoms.*
2. Spurs of posterior tibiæ small . . . . . HALLOMENUS, *Panz.*

ii. Anterior coxæ contiguous.
1. Antennæ 10-jointed . . . . . CONOPALPUS, *Gyll.*
2. Antennæ 11-jointed.
   A. Posterior coxæ distant; frontal suture distinct; anterior trochantins distinct; head inclined, but not vertical . . . . . MELANDRYA, *F.*
   B. Posterior coxæ contiguous; frontal suture not distinct; head inflexed, often vertical.
      a. Prosternum very short and excavated before anterior coxæ.
         a*. Antennæ with the third joint not twice as long as second; penultimate joint of tarsi entire or almost entire.
            a†. Mesosternum short between intermediate coxæ, which are contiguous at apex; third joint of antennæ very small . . . . . ANISOXYA, *Muls.*
            b†. Mesosternum as long as intermediate coxæ, which are not contiguous at apex; third joint of antennæ larger, at least as long as fourth joint, and usually longer . . ABDERA, *Steph.*
         b*. Antennæ with the third joint twice as long as second; penultimate joint of tarsi bilobed PHLŒOTRYA, *Steph.*
      b. Prosternum long or comparatively long before anterior coxæ.
         a*. Mesosternum short between intermediate coxæ, which are contiguous at apex; antennæ with the third joint a little longer than fourth; elytra without striæ . . . . . XYLITA, *Payk.*
         b*. Mesosternum as long as intermediate coxæ, which are not contiguous at apex; antennæ with the third joint equal to or shorter than fourth.
            a†. Maxillary palpi with the fourth joint very broad, much broader than the second and third joints; elytra with more or less distinct striæ . . . . . ZILORA, *Muls.*
            b†. Maxillary palpi with the fourth joint scarcely broader than the second and third joints; elytra without distinct striæ . . . HYPULUS, *Payk.*

II. Tarsal claws split or toothed; mesosternum short between intermediate coxæ, which are contiguous at apex; male with the posterior femora usually thickened . . . OSPHYA, *Ill.*

ORCHESIA, Latreille.

This genus, taken in its wide sense as including *Clinocara*, contains about twenty-five species, which are found in Europe, North America,

Brazil, Chili, &c.; in its narrow sense it only includes two or three of the European species, which may be known by having the eyes very large and almost meeting behind on vertex, the rather stout club of the antennæ, the strongly enlarged securiform last joint of the maxillary palpi, and the more distinct spurs of the anterior tibiæ.

The larva and pupa of *O. micans* are described and figured by Schiödte (xi. pp. 582, 587, tab. xviii. 15, 26) and Westwood (Classification, i. p. 308, fig. 35, 23, 25); the larva is almost linear, about six times as long as broad, with only the head, dorsal segments of thorax and the legs corneous; the general colour is whitish, with the head pale yellow, the frontal margin and mandibles being ferruginous; the head is rather large, but much narrower than the prothorax, and the antennæ are very minute; the last segment is narrower than the preceding, without margins, almost semicircular, and quite simple at apex; the pupa is remarkable for having the prothoracic shield dilated on each side, and covering the head, and furnished with strong "styli motorii," each terminated by a fine seta, and also for the size of the rudimentary elytra, which entirely cover the hind legs; the apex is terminated by a bunch of rather sharp more or less curved protuberances.

As remarked by Professor Westwood, the insect, in its early stages, differs considerably from the typical Melandryidæ, and approaches *Mordella*, which latter genus it resembles in its shape and the curious skipping shrimp-like motions of the imago; in other points, however, it presents closer affinities with the Melandryidæ, although it may perhaps be regarded as a genus somewhat intermediate.

O. micans, Panz. (*picea*, Herbst.). Elongate, not very shining, thickly clothed with short shining silky yellowish pubescence, fuscous or pitchy brown, gradually lighter towards apex, under-side pitchy or reddish-brown; head small, eyes very large approximate on vertex, antennæ short, with the last joints forming a fusiform club; thorax almost semicircular, sinuate and slightly impressed on each side at base, very closely and finely punctured; elytra at base as broad as thorax, very gradually narrowed behind, obtusely rounded at apex, raised at suture, with very fine and close, somewhat asperate, sculpture; legs ferruginous or brownish-yellow, first joint of posterior tarsi about as long as all the following. L. 3–4 mm.

Male with the anterior tarsi dilated, and the club of the antennæ larger.

In fungoid growth on old trees; local and, as a rule, not common; Darenth Wood; Westerham, Kent, bred from a hard fungus on beech (?) in abundance, Gorham; Cowley; Chingford; Cobham; Dover; New Forest; Swansea; Llangollen; Barmouth; Cambridge; Repton; Northumberland and Durham district, "bred from a fungus (*Polyporus radiatus*) growing on alder near Wooler," J. Hardy; Scotland, Tay district, Aviemore.

Small light-coloured varieties occasionally occur; the species is somewhat variable both in size and colour. In Dr. Power's collection there is one of these varieties taken in some numbers by Turner in agarics at Windsor; I thought it might possibly be a different species, but Herr Reitter considers it to be merely a variety.

CLINOCARA, Thomson.

This genus contains about half-a-dozen European species, of which two occur in Britain; they may be known from *Orchesia* by having the eyes distant behind, the antennæ more slender, the maxillary palpi not serrate, with the last joint somewhat ovate and only slightly securiform; the anterior tibiæ have indistinct spurs; in general appearance and habits they much resemble *Orchesia*, with which they have usually been included.

I. Elytra pitchy-black or brown, without yellow bands, unicolorous or obscurely lighter towards base and apex; antennæ less evidently thickened towards apex . . . . C. TETRATOMA, *Thoms.*

II. Elytra dark with waved yellow bands; antennæ more evidently thickened towards apex . . . . . C. UNDULATA, *Kr.*

C. tetratoma, Thoms. (*minor*, Walk.; *sepicola*, Ros.; *micans*, var. b., Zett.). Smaller and darker than *Orchesia micans*, which it very closely resembles, and from which it may at once be known by the longer and much more slender antennæ, of which the last four joints are slightly thickened, and by the much stronger impressions on each side of the base of the thorax; pubescence short, very thick, and fine; punctuation extremely close and fine, subrugose or asperate; elytra sometimes lighter at shoulders and towards base; head small, deflexed, eyes not approximate on vertex; thorax as broad as elytra, transverse, much narrowed in front; elytra gradually narrowed towards apex; legs pitchy-red or brownish, first joint of posterior tarsi at least as long as all the following; under-side pitchy. L. $2\frac{1}{2}$–3 mm.

In fungoid growth on old trees; occasionally by sweeping; very local and, as a rule, rare; Caterham (Champion); Birdbrook, Essex (Power); Glanvilles Wootton (one specimen, Wollaston); New Forest; Bewdley (Blatch); Gumley, Market Harborough (Matthews, in some numbers); Repton, near Burton-on-Trent (W. Garneys); Spridlington, near Lincoln (Wollaston); Scarborough and Pickering, Yorkshire Lawson); Northumberland and Durham district, near Gosland, Swalwell, and at Morpeth; also at Rothley (Power); Scotland, rare, on flowers of mountain ash, Clyde, Tay, Dee, and Moray districts, Lanark, Braemar, Aviemore, &c.

I believe the synonymy above given to be the correct one, but I have not actually seen a specimen of Thomson's *C. tetratoma*; *Orchesia minor* does not appear in the last European catalogue.

C. undulata, Kr. (*fasciata*, Thoms., *nec* Payk.). Elongate, rather depressed on disc, somewhat acuminate behind, thickly clothed with silky yellowish pubescence; head red, very finely punctured, antennæ red, or pitchy with base and apex red, with the last four or five joints thickened, less slender than in *C. tetratoma*, but longer and much less thickened than in *O. micans*; thorax red in front, testaceous with more or less obscure dark markings behind, sometimes almost entirely testaceous, very finely and somewhat rugosely punctured, with the sides strongly rounded and narrowed in front, and with a plain impression on

each side at base; elytra testaceous with the apex and irregular bands and markings black, sculptured as thorax; legs yellow or ferruginous, with the femora often darker; the sculpture of this and the preceding species almost presents the appearance of very minute scales. L. $3\frac{1}{2}$–4 mm.

Male with the first four joints of the anterior tarsi dilated, and the spurs of the anterior tibiæ more distinct than in female.

Under bark, in fungoid growths, and in rotten wood of decaying beeches, &c.; it has also been found on the flowers of the white-thorn; very local and, as a rule, rare; Chatham (taken by Mr. Champion and Mr. J. J. Walker in plenty); Cobham Park; Tonbridge; New Forest; Sherwood Forest (Blatch); Scarborough (Lawson); the species is very active in its movements, and in consequence is rather difficult to capture; the only specimen I have ever seen alive (under bark in the New Forest) was gone immediately before I could secure it.

HALLOMENUS, Panzer.

This genus contains eight or nine species, of which three are found in Europe, four in North America, and one in Sierra Leone; our single British species much resembles *Orchesia* in general appearance, but may be at once known by the small spurs of the posterior tibiæ; the third joint of the antennæ, which are filiform, is very large, being longer than the first joint; the last joint of the maxillary palpi is somewhat securiform; the thorax is deeply impressed with a fovea on each side at base; the elytra are elongate with traces of striæ, and the legs are slender and rather elongate.

H. humeralis, Panz. (*binotatus,* Quens.; *bipunctatus,* Payk.). Elongate, depressed on disc, narrowed behind, clothed with fine and silky fuscous-yellowish pubescence, and with extremely close and fine subrugose punctuation, as in *Clinocara;* head brown or reddish-brown, antennæ moderately long, filiform, with the two basal joints narrower than the succeeding, colour brownish with the base clear yellow; thorax reddish-testaceous with two longitudinal dark bands, or spots, not reaching base or apex, sides strongly narrowed in front, base slightly sinuate on each side and furnished above each sinuation with a short longitudinal impression, posterior angles right angles; elytra as broad at base as base of thorax, brown or fusco-testaceous with a pale reddish spot at each shoulder; under-side reddish-testaceous, with the breast darker; legs pale yellowish-red, first joint of posterior tarsi at least as long as all the others taken together. L. 4–5 mm.

In fungoid growth on old trees, in rotten willow, &c.; has been taken on palings; rare; Forest Hill; Lee; Charlton (old fence, S. Stevens, and twenty specimens taken by Lewis and Power, Sept. 3, 1860); Northumberland and Durham district, rare, Long Benton; Scotland, rare, in *Trametes pini,* &c., Tay and Dee districts.

CONOPALPUS, Gyllenhal.

This genus may be at once known by its 10-jointed antennæ, which are elongate and filiform with the second joint small and the third about

as long as the fourth; the head is rather strongly but not suddenly and sharply constricted behind the eyes; the maxillary palpi have the last joint rather long and cultriform, and the last joint of the labial palpi is lunate; the lateral margin of the thorax is broad and somewhat elevated; the legs are long and slender, with the penultimate joint of the tarsi strongly bilobed.

The larva and pupa of *C. testaceus* are described and figured by Schiödte (xi. pp. 573, 587, t. xvii. figs. 16, 24); the larva is somewhat cylindrical, almost parallel, about eight times as long as broad, membranous, with the head, legs, and apex of the last segment of abdomen corneous; the general colour is whitish with the head yellow and the frontal margin narrowly pale ferruginous; the segments are separated by deep incisions, and by the membranes called by Schiödte the "præterga" and "postterga," and bear three slightly raised warty setose prominences on each side; the last segment of the abdomen is rather long, conical and produced into a truncate point, but there are no cerci; the pupa is not strongly narrowed behind, and bears moderately long "styli motorii" which are furnished at apex with a long slender seta; the apex is terminated by two curved cerci; the larva mines dead boughs of oak.

Two species only appear to belong to this genus, of which one is found in Britain.

C. testaceus, Ol. (♀ *flavicollis*, Gyll.; *Vigorsi*, Steph., *nec* Muls.). Elongate, moderately convex, but depressed on disc, rather shining, testaceous, clothed with thin pale pubescence; head testaceous or dark with the front testaceous, distinctly punctured, eyes black, prominent, antennæ long, 10-jointed, black with the three first joints yellowish-red; thorax transverse, strongly narrowed in front, broadest behind middle and thence narrowed to base, rather closely and distinctly punctured; elytra subparallel, a little widened behind, obtusely rounded at apex, rather coarsely and in part almost subrugosely punctured; legs long and slender, clear yellowish-red. L. 5–7½ mm.

V. Vigorsi, Steph. Black with the thorax, mouth, palpi, labrum and legs reddish-testaceous; antennæ as in the type form.

In dead boughs of trees, rotten wood, &c.; rare; Forest Hill, Shooter's Hill, Coombe Wood, Ripley, Cobham, Richmond Park, Wimbledon; Hertford; Windsor; Lewes; Glanvilles Wootton; New Forest; Bretby Park and Wood, near Repton, Burton-on-Trent; Sherwood Forest; Dunham Park, Manchester; the variety is very rare, and has occurred in Sherwood Forest and in Cumberland.

The second European species, *C. brevicollis*, Kr. (*Vigorsi*, Muls., *nec* Steph.), has not occurred in Britain, the dark variety of *C. testaceus* with red thorax having been mistaken for it; I am indebted to Herr Reitter for authentic specimens of the species, which is less than half the size of *C. testaceus* (being about the size and shape of *Luperus flavipes*), with longer antennæ, of which the second and third joints are very short and equal in length, whereas in *C. testaceus* the third joint is rather long and about three times as long as the second; the elytra are shining blue or bluish-black and the under-side is black, the thorax, base of antennæ and legs being clear reddish-testaceous.

(SERROPALPUS, Hellenius.)

This genus contains four species, two of which are found in Chili, and the other two, which appear now to be classed together, in Europe; *S. barbatus* (*striatus*) also occurs in North America, where it has been described as *S. obsoletus*, Hald. The following are the chief characteristics of the genus:—Head vertical, eyes large, coarsely granulate, labrum small, mandibles short and stout; antennæ long, not shorter than half the body, 11-jointed, with the second joint the smallest; maxillary palpi serrate, large, with the fourth joint lunate; thorax narrower at apex than at base, with the posterior angles acute and the sides not margined in front; scutellum truncate at apex; prosternum short before anterior coxæ; mesosternum as long as intermediate coxæ; elytra with more or less distinct striæ; posterior legs long, with the tarsi longer than the tibiæ.

S. barbatus, Schall. (*striatus*, Hellen.). Elongate, parallel-sided, convex, dull, thickly clothed with pale pubescence, entirely brown with the antennæ and legs testaceous; thorax narrowed in front, very closely punctured; scutellum truncate at apex; elytra long, with more or less distinct striæ, interstices rugosely punctured. L. 12–16 mm.

Under bark of spruce fir; found in Norway and Sweden, France, Prussia, Austria, and Bavaria, and perhaps a native of Britain; only two specimens have, however, been hitherto recorded, one taken in a warehouse in Leicester by Mr. I. Plant (*v.* Ent. Ann. 1872, 76), and another recorded by Mr. Blundell of Luton in 1882 (Entomologist, xv. 286), as probably taken near Newmarket. Mr. Blundell kindly wrote to me with regard to the latter capture; the insect may possibly have been indigenous, but in all probability was an imported specimen, as it is hardly possible that so conspicuous a species would have escaped observation, if it had established itself in the middle of England, and no further specimens have occurred.

MELANDRYA, F.

This, the typical species of the family, contains about seven species, which are confined to Europe, Northern Asia, and North America; three are found in Europe, of which two occur in Britain, one of these being extremely rare; they are large or moderately large dark-coloured insects, with the thorax narrowed in front and margined behind at sides; the antennæ are rather short but slender; the elytra are long, subparallel, distinctly striated; the legs are somewhat elongate, but moderately stout, and the anterior trochantin is conspicuous; the mesosternum is much shorter than the intermediate coxæ, and the penultimate tarsal joint is slightly bilobed; the upper surface is very finely pubescent and shining.

The larva and pupa of *M. caraboides* are described and figured by Schiödte (xi. pp. 565, 586, t. xvii. 1 and 15); the larva is cylindrical, about six times longer than broad, membranous, with the head and legs alone corneous, whitish with the head and legs yellowish; the head is very large, and the prothorax cordate and

broader than any of the other segments; the segments are incised at the joints, but are very narrowly separated by membrane; the seventh and eighth abdominal segments are smooth on disc, and the last segment is very short, without cerci; the pupa resembles in shape that of *Conopalpus*, but has the "styli motorii" smaller and not terminated by setæ; the larva is found in dead oaks, beeches, alders, &c., in which it forms galleries.

I. Thorax without central furrow; elytra with striæ reaching from base to apex . . . . . M. CARABOIDES, *L.*

II. Thorax with distinct central furrow; elytra smooth at base, but with deep striæ behind . . . . . M. DUBIA, *Schall.* (*canaliculata*, F.)

M. caraboides, L. Black, elytra often with a bluish or greenish reflection, shining, clothed with short and fine black pubescence, palpi, apex of antennæ, anterior tarsi entirely or at apex, and last two joints of the other tarsi, reddish-yellow; head rather finely punctured, antennæ comparatively short; thorax a little broader than long, strongly narrowed in front, broadest a little before base, moderately strongly punctured, with a strong basal impression on each side; elytra depressed, a little broader at base than thorax, often bluish or greenish, with somewhat obsolete striæ, interstices convex, punctuation very close, subrugose; legs long. L. 10–14 mm.

In old willow stumps, &c.; local, but rather common in some districts; London district, somewhat common, Norwood, Darenth Wood, Lee, Charlton, Dulwich, Sevenoaks, Belvedere, Tonbridge; The Holt, Farnham; Hastings; Dover; Holm Bush, Brighton; New Forest; Portsea; Glanvilles Wootton; Swansea; Llangollen; Knowle, near Birmingham; Repton; Norbury, Cheshire; Dunham Park and Agecroft, near Manchester; Northumberland and Durham district; Ireland, Malahide near Dublin.

M. dubia, Schall. (*canaliculata*, F.). Smaller on the average than the preceding, and more parallel-sided; it may be known by the fact that the thorax has a deep central furrow, and that each elytron has four strong longitudinal striæ or sulci which are obliterated at base, the interstices being convex and raised; colour black, with a bluish reflection, pubescence short, black, punctuation fine on head and thorax, fine and subrugose on elytra; antennæ and legs black, with the apex of the former and more or less of the tarsi testaceous or brownish-red. L. 10–12 mm.

Under bark of decaying oaks, &c.; one of the rarest of the British beetles; I only know of three specimens; one of these was taken by Mr. Bentley, as recorded by Curtis, flying near Brockenhurst in the New Forest in 1823; one was met with by Turner in the New Forest during the first season he collected, and is now in Mr. S. Stevens' collection; and the third was sent with some beetles to Mr. Harris of Burton-on-Trent from the same locality, with a few common things, by Mr. Golliver of Brockenhurst, in the autumn of 1877; the species, therefore, is evidently still to be found in its old locality.

ANISOXYA, Mulsant.

Two European species and one from North America belong to this

genus, which may be known by the very short mesosternum and the very small third joint of the antennæ; the prosternum is very short before the anterior coxæ; the maxillary palpi have the last joint securiform; the thorax is not transverse and has the sides rather sharply, although narrowly, margined as far as the anterior angles; the intermediate tibiæ are stout and armed at apex with strong spurs, and the posterior are terminated by small, but distinct, spurs; our single species is very rare, and much resembles in general appearance a small *Orchesia* or *Clinocara*.

A. fuscula, Ill. (*tenuis*, Rosenh.). A small and inconspicuous species, resembling in shape a small *Clinocara;* elongate, convex, but slightly depressed on disc, scarcely shining, very finely and subrugosely punctured, clothed with silky yellowish-grey pubescence, colour fuscous-brown or castaneous with the front of the head and the anterior margin of thorax testaceous; antennæ reaching to about base of thorax, submoniliform and not or scarcely thickened, fuscous with base testaceous; thorax about as long as broad, with sides rounded and narrowed in front; elytra as broad at base as base of thorax, subparallel for two-thirds of their length, and thence gradually narrowed to apex; legs slender, yellow. L. 2–2½ mm.

In dead twigs, &c.; rare; Darenth Wood, Forest Hill, Putney, Lee, Horsell (Champion, Power and others); Warwick; New Forest and Barmouth (W. G. Blatch).

ABDERA, Stephens.

This genus contains six species, all of which are found in Europe; two of these, *A. affinis* and *A. flexuosa*, were separated off under the genus *Carida* by Mulsant, who is still followed by Thomson and other authors; the latter genus, however, hardly seems to be really distinct; the members of the genus *Abdera* are small, elongate insects with more or less distinct yellow bands on the elytra; the mesosternum is as long as the intermediate coxæ, and the prosternum is very short before the anterior coxæ; the thorax is variable in length, but usually produced and rather strongly rounded in front; the last joint of the maxillary palpi is slightly securiform; the legs are slender and moderately long, and the penultimate joint of the tarsi is almost, or quite, entire.

The larva and pupa of *A. flexuosa* are described and figured by Schiödte (xi. pp. 578, 587, t. xviii. 6 and 14); the larva is parallel with the segments, except the hinder ones, a little incised at their joints, of a membranous consistency, except the head and legs, which alone are corneous; the colour is whitish with the head and legs pale yellow and the frontal margin ferruginous; the head, which is moderately large, prothorax and eighth and last segments of abdomen are smooth on the surface; the last segment is small, almost semicircular, and quite simple at apex; the prothorax is rather large and narrowed in front with all the angles rounded; the sides of the segments are furnished with setose warty prominences; the pupa is remarkable for having very small "styli motorii" on the pronotum only; on the rest of the body they are absent; the apex of the abdominal region is terminated by four curved prominences; the larva lives in boleti.

The four British species may be distinguished as follows:—

I. Thorax with the sides margined almost to apex; prevailing colour darker. (*Abdera*, i. sp.)
  i. Thorax about as long as broad; upper surface finely sculptured.
    1. Thorax dark in middle, with the basal and apical margins more or less broadly yellow . . A. QUADRIFASCIATA, *Steph.*
    2. Thorax entirely dark, with the apex sometimes obscurely lighter . . . . . A. BIFASCIATA, *Marsh.*
  ii. Thorax transverse; upper surface rather strongly sculptured . . . . . A. TRIGUTTATA, *Gyll.*
II. Thorax with the sides not margined in front; prevailing colour lighter (*Carida*, Muls.). . . . . A. FLEXUOSA, *Payk.*

A. quadrifasciata, *Steph.* Elongate, parallel-sided, moderately convex, very closely finely and subrugosely punctured, clothed with silky yellowish pubescence; head varying from brown to reddish-testaceous, labrum yellow, antennæ rather long and slender, reaching at all events to base of thorax, dark, with base and apex yellow; thorax about as long as broad, with the disc dark, and the anterior and posterior margins more or less broadly testaceous; scutellum transverse; elytra black with two common waved reddish-yellow bands, under-side reddish or brown; legs red or yellowish-red. L. $2\frac{1}{4}$–$3\frac{1}{2}$ mm.

In decaying hornbeam, also in the short half-rotten stumps left on various trees where boughs have been broken off; occasionally by sweeping; rare; Coombe Wood (Rye); Cobham Park (Champion); Tonbridge (Horner); Headley Lane, Esher, on fence (Gorham); New Forest; Shropshire; Dunham Park, Manchester (Chappell).

A. bifasciata, Marsh. (*biflexuosa*, Curt.). Closely allied to the preceding, but less convex, and easily distinguished by its colour, which is pitchy black or black, with the base of the antennæ yellowish, and the elytra with two fasciæ which are narrower and more waved than in *A. quadrifasciata;* the upper surface is shining and clothed with yellowish pubescence; punctuation very close and fine, subrugose; legs ferruginous, tarsi lighter at apex. L. $2\frac{1}{4}$–$3\frac{1}{2}$ mm.

Female longer than the male, with the thorax broader in proportion.

In dead boughs of oak and ash trees; sometimes by beating and sweeping; rare; Esher, Wimbledon, Ripley, Forest Hill, Shirley, Ashtead, Cobham, Darenth, Birch Wood, Highgate, Southgate, Wimbledon (Champion, Power and others); New Forest (beaten by myself from a high hedge near Brockenhurst, in July 1877, from which I obtained *Apion sorbi, Conopalpus testaceus*, &c.; also taken by Mr. Blatch); Glanvilles Wootton; I also have specimens sent me by Dr. Chapman in a box containing beetles taken chiefly, if not entirely, in Herefordshire and Monmouthshire.

A. triguttata, Gyll. A delicate little species which may at once be distinguished from the two preceding by its transverse thorax, which is somewhat constricted in front, and the much stronger sculpture of the upper surface, which is distinct and rugose, and stronger on the elytra than on the thorax; the pubescence is fine and silky; the general colour

is brownish-black or brownish, but varies, and is sometimes testaceous brown; a patch near apex and a common band before middle are obscurely testaceous and lighter than the rest of the elytra, but are often more or less obsolete; legs brownish or reddish-testaceous with the femora darker. L. 2–2¾ mm.

Under bark of decayed trees; rare; it has hitherto only been found in Scotland in the Dee and Moray districts; Mr. Champion has taken it in some numbers at Aviemore.

A. flexuosa, Payk. Elongate, less parallel than the preceding species, dull, very finely and subrugosely punctured, clothed with fine silky pubescence, of a bright reddish-yellow colour with a broader or narrower band across disc of thorax, and two common waved bands across elytra (of which the front one is the narrower) black; head black, antennæ rather long and moderately stout, dark, with base and apex yellow; thorax slightly transverse, narrowed in front, with a slight central channel and a small fovea on each side at base; elytra about as broad at base as base of thorax, with sides slightly rounded; legs yellow, or reddish-yellow. L. 3–3½ mm.

In boleti, especially on alders and sometimes willows; very local and, as a rule, rare; Cambridge and Peterborough (Stephens); Hampshire (Moncrieff); Scarborough (Lawson); Teesdale (Blatch); Northumberland and Durham district, "In *Polyporus radiatus* growing on alder, near Wooler," Mr. T. Hardy; Scotland, in *P. radiatus* on alder, rare, Solway, Tay, and Moray districts; it occasionally occurs in numbers when found.

PHLŒOTRYA, Stephens. (*Dircæa*, F., *sec.* auct.)

Three species are contained in this genus, two of which occur in Europe,* and one has been described from Brazil; our single British species is a long and rather a large insect, although it varies considerably in size; the maxillary palpi are somewhat serrate, with the last joint elongate-securiform; the antennæ are filiform, with the third joint quite twice as long as the second, which is short; the prosternum is very short before the anterior coxæ; the thorax is longer than broad, with the front produced and rounded, and the elytra are elongate; the intermediate coxæ are not contiguous; the legs are slender with small, but distinct, tibial spurs, and the penultimate joint of the tarsi is bilobed.

The larva of *P. rufipes* is described by Westwood (Classification, i. p. 307); it is whitish, elongate, and scaly, convex and thickest at the middle and tail; the head is semiglobose, with short 3-jointed antennæ; anterior legs large, posterior pairs much smaller; last segment furnished with two sharp horny appendages, curved upwards; this larva bores into the solid wood of old oak, in which the perfect insect is also found.

P. rufipes, Gyll. (*Stephensi*, Duv.; *tenuis*, Hampe; *Dircæa*

* The second European species, *P. Vaudoueri*, Muls., appears to be considered by some authors as synonymous with *P. rufipes*.

rufipes, Thoms.). Elongate, convex, subcylindrical, very variable in size, slightly shining, clothed with fine silky pubescence, colour nigro-fuscous, or brownish, in somewhat immature examples more or less castaneous; head sunk in thorax as far as eyes, very closely sculptured, antennæ moderately long, reddish-testaceous, with the apical joints or centre often darker; thorax longer than broad, very closely and rugosely punctured, with a slight impression on each side at base; scutellum transverse; elytra long, subparallel, gradually narrowed towards apex, closely and rugosely punctured, but with the sculpture less close than that of thorax, so that the surface is more shining; at each shoulder there is a longitudinal fovea, and on the disc there are more or less distinct traces of raised lines; legs long, yellow or reddish-yellow, first joint of the posterior tarsi at least as long as all the others taken together. L. 8–13 mm.

In decaying oak, &c.; very local and, as a rule, rare; Brasted, near Sevenoaks, Kent; Leatherhead, Surrey; Dulwich; Windsor Forest; Tunbridge Wells; New Forest; Sherwood Forest; Dunham Park, Manchester.

I have retained the name of *Phlœotrya* for our British species, but the genus cannot well be separated from *Dircæa*, F.; the species known as *D. lævigata* is really a *Xylita*, and may be known from *Dircæa* (*Phlœotrya*) by having the intermediate coxæ contiguous; there is, however, great confusion as to the synonymy of the genera, and this has been increased by the fact that several of the European Melandryidæ occur in North America, and have been renamed and redescribed by American authors.

XYLITA, Paykull. (*Dircæa*, Gyll., Redt., *nec* F.)

According to the Munich catalogue, this genus contains four species, three of which are found in Europe, and one in Chili; they are moderate-sized insects, with the second joint of the antennæ small, and the third a little longer than the fourth; the maxillary palpi have the last joint securiform; the mesosternum is short between the intermediate coxæ, which are contiguous; the thorax is almost as long as broad; the elytra are not striated; the tibial spurs are small but distinct, and the penultimate joint of the tarsi is bilobed; the single British species is very scarce.

X. lævigata, Hel. (*discolor*, F.; *buprestoides*, Payk.). Elongate, moderately convex, somewhat depressed on disc, rather thickly clothed with thick silky pubescence, usually brown or brownish-black, with the base of the antennæ, and the tarsi, testaceous, and the elytra lighter than the thorax; the thorax, however, is often fuscous or blackish, and the elytra fusco-testaceous; upper surface moderately shiny, with very close rugose punctuation; antennæ moderately long, gradually and slightly thickened towards apex; thorax about as long as broad at base, strongly narrowed towards apex in almost a straight line, widest about a

third from base, and thence rather strongly contracted to base, the sides forming an angle; scutellum transverse; elytra as broad at base as thorax, subparallel, gradually and slightly narrowed at apex; legs variable in colour. L. 6–9 mm.

Under bark and in old trees; rare; found only in Scotland, Highlands, Tay, Dee and Moray districts, Aviemore, Rannoch, &c.

ZILORA, Mulsant.

This genus contains three species, one from North America, and two which are found in Europe; the single British species is confined to Scotland, and was added to our list by Dr. Sharp and Dr. Buchanan White in 1871; it is closely allied to *Xylita*, from which it differs in its coarser punctuation, striated elytra, and also in the fact that the third joint of the antennæ is shorter than the fourth; the intermediate coxæ, moreover, are not contiguous; the thorax has the sides acutely margined, strongly narrowed in front, and is deeply impressed on each side at base; the last joint of the maxillary palpi is very broad and securiform; the tibial spurs are small but distinct, and the tarsi are rather shorter than the tibiæ.

Z. ferruginea, Payk. (*sericea*, Sturm; *obscura*, F.). Elongate, subparallel, moderately convex, clothed with rather coarse greyish or greyish-yellow pubescence; colour reddish-brown, or reddish-castaneous, with the shoulders and part of head and thorax sometimes a little lighter; head subtriangular, uneven, rather coarsely sculptured, antennæ rather robust, ferruginous; thorax about as long as broad at base, strongly narrowed in front, broadest behind middle and thence a little narrowed to base, with traces of a central furrow, and with a strong impression on each side at base, rather strongly punctured, the punctuation being rather sparing on disc; elytra a little broader at base than thorax, subparallel, with more or less distinct striæ, coarsely and somewhat rugosely punctured; legs ferruginous or reddish-testaceous. L. 6–7 mm.

In *Polyporus abietinus* on dead Scotch fir; also under bark of the same tree; extremely local; Scotland, Dee and Moray districts; it was first discovered in Britain by Dr. Sharp and Dr. Buchanan White at Braemar, in June, 1871.

HYPULUS, Paykull.

Three species are contained in this genus, of which two occur in Europe and one in North America; they are rather small insects, with the elytra banded with yellow; the antennæ are comparatively short and robust with the second joint short and the third equal to, or shorter than, the fourth; the thorax is about as long as broad, with sides unmargined; the mesosternum is as long as the intermediate coxæ; the elytra are not striated; the legs are rather long and the penultimate joint of the tarsi

is bilobed; the maxillary palpi have the last joint ovate or almost ovate, slightly cultriform, and scarcely broader than the second and third joints.

The larva of *H. bifasciatus* (which has not occurred in Britain) is described and figured by Schiödte (xi. 569, t. xviii. 1); it is about six times longer than broad, and is gradually narrowed from the prothorax which is very large to the apex; the apical segment of the abdomen is simple; the head and legs alone are corneous, these parts being yellow and the rest of the body whitish; the frontal margin is also narrowly ferruginous; the antennæ, as in most of the allied larvæ, are very minute; this larva mines dead hazel and ash, and probably differs but little from that of our species, which is attached to the oak.

H. quercinus, Quens. Elongate, moderately convex, clothed with silky and rather shining yellowish pubescence, head and thorax black or pitchy, elytra yellow-testaceous, with the scutellary region, a patch on each side before middle, a waved band behind middle, and the apex black; these markings are somewhat variable; under-side brown or yellowish; head finely punctured, antennæ rather stout, red; thorax about as long as broad, very closely punctured, but less finely than head, with sides rounded in front and sinuate before the posterior angles which are sharp and rather projecting; scutellum transverse; elytra a little broader at base than thorax, gradually narrowed behind, more coarsely punctured than thorax, rather shining; legs reddish-testaceous, first joint of posterior tarsi about as long as the rest taken together. L. 4–6 mm.

Male with the anterior femora clothed with white pubescence beneath, the anterior tarsi dilated, and the elytra more parallel and the antennæ longer than in female.

Female without pubescence on the anterior femora, and with the anterior tarsi scarcely dilated, and the elytra a little dilated in middle.

In decaying oak, &c.; occasionally by sweeping; rare; Darenth and Coombe Woods, Godstone (Surrey) and Wood Ditton, (Stephens); Darenth (Waterhouse); Plumstead Wood, one specimen by sweeping (S. Stevens); Rusper, near Maidstone (one specimen "in wet stuff," Gorham); Leigh Woods, Bristol (in stump, E. Wheeler).

OSPHYA, Illiger. (*Nothus,* Olivier.)

The members of this genus may be easily known from all the other genera belonging to the family by the split or appendiculate tarsal claws and the very strongly thickened and curved posterior femora of the male; the head is inflexed and the eyes rather large and plainly emarginate; the last joint of the maxillary palpi is strongly securiform, and of the labial palpi almost cyathiform; the thorax is transverse with all the angles rounded; the elytra are rather long and depressed, and the body is soft and finely pubescent above; the female closely resembles certain species of *Telephorus* in general appearance; the genus contains five species, four of which are found in Europe and one in North America.

O. bipunctata, F. (*præusta,* Ol.; ♂ *clavipes,* Ol.). Elongate, depressed, clothed with close greyish pubescence; male greyish-black with the front of head, borders of the thorax and a longitudinal line on the latter of varying width, and sometimes absent, yellowish-red; the elytra are also sometimes narrowly yellowish-red at margins; female with the thorax red, with the margins yellowish, and with two spots of varying size, rarely absent, on disc; elytra brownish-red, sometimes with the apex, and rarely with the external margins, black; head finely punctured, antennæ long and slender, dark with the base yellow; thorax almost transverse-oval, all the angles being rounded, closely and finely punctured; scutellum triangular; elytra at base a little broader than thorax, subparallel, and more coarsely punctured than thorax; legs reddish-testaceous, with the apex of the femora, and more or less of the tibiæ, and the tarsi, black. L. 5–10 mm.

Male with the posterior femora more or less strongly thickened or simple; female with the posterior femora always simple; the colour of the sexes is variable in some instances.

On the flowers of the white-thorn; rare; Monks Wood, Cambridge, where most of the British specimens have been taken; Windsor; Weston-on-the-Green, Oxon, May 1830 (Matthews); Scarborough (G. A. Wright); according to Curtis they stick so fast to the bushes that they are detached with great difficulty, and this may partly be the reason of their being so seldom seen.

PYTHIDÆ.

This is a small family, containing about a dozen genera and fifty or sixty species; the genus *Mycterus* is included under the Pythidæ by some authors, and by others under the Melandryidæ or Œdemeridæ; if we include it under the Pythidæ, the family is represented in Europe by six genera and twenty-five species, of which four genera and ten species occur in Britain; the majority of the species appear to occur in Europe and North America; a few, however, are found in Chili, New Guinea, Tasmania, &c. The following are the chief characteristics of the family:—Head prominent, free, eyes entire, maxillæ with flattened ciliate lobes, maxillary palpi moderate; antennæ 11-jointed, filiform or slightly thickened towards apex; thorax narrowed at base, with the sides not margined; anterior coxæ more or less conical, usually contiguous; mesosternum moderately long; elytra rounded at apex, covering abdomen; legs moderate, tibiæ slender with the spurs small but distinct, claws simple; abdomen with five free ventral segments; the species vary very much in size and shape.

The following two tribes may be thus distinguished:—

I. Intermediate coxæ with trochantin; side pieces of mesosternum reaching the intermediate coxæ; form large, much depressed . . PYTHINA.

II. Intermediate coxæ without trochantin; side pieces of mesosternum not reaching the intermediate coxæ; form smaller, more or less convex.

i. Thorax more or less strongly narrowed at base; upper surface shining, usually smooth; size small . . . . . SALPINGINA.
ii. Thorax broadest at base; upper surface clothed with a pollen-like pubescence; size moderate; (facies of *Larinus*) . . . . MYCTERINA.*

PYTHINA.

The single genus *Pytho* is contained in this tribe; it may be known by the large size and very depressed form, and by the fact that the intermediate coxæ have conspicuous trochantins, and that the side pieces of the mesosternum attain the intermediate coxæ; the head is not produced into a rostrum in front, but is somewhat long before the eyes.

PYTHO, Fabricius.

This genus contains seven or eight species, which are found in Europe and North America; our single British species is confined to Scotland, where it is found very locally under bark of pine and fir; the antennæ are rather short and stout with the third joint longer than the fourth, and they are inserted at some little distance in front of the eyes; the maxillary palpi have the last joint slightly securiform, but scarcely broader than the penultimate joint; the elytra are rather strongly striated and very flat; the legs are moderately long.

The larva of *P. depressus* has been taken in Scotland, and I have before me a specimen given me by Dr. Sharp; it is about 24 mm. in length, of a dirty yellowish colour (probably lighter in life), with very short legs and antennæ, of which the last joint is minute and subulate; the head is large, semicircular, and somewhat produced in front; the remainder of the segments are of much the same size and shape, and a large deep furrow runs down the centre of all of them until the last, which is slightly narrowed and furnished with two very strong slightly incurved appendages, which are setose at apex; the margin between these bears on its dorsal surface a row of small dark papillæ; the surface of the larva is glabrous, and there are no setæ or prominences at the sides of the segments; it occurs under bark of fir and pine.

P. depressus, L. Elongate, rather broad, enlarged behind, very flat, glabrous and shining; mouth, antennæ, tibiæ, and tarsi reddish-testaceous; head, thorax, scutellum, breast, and femora black; elytra blue-black or steel-blue, sometimes violet; abdomen brown, or with the sides and posterior portion often reddish-testaceous, usually entirely reddish-testaceous in the male; the sides of the thorax are sometimes reddish, and occasionally part of the elytra; head rather large, coarsely and diffusely punctured, impressed in front, antennæ stout and rather short; thorax transverse, with sides rounded in front and gradually narrowed behind, with a central furrow and a strong impression on each side, diffusely and not strongly punctured; scutellum almost semicircular, smooth; elytra dilated behind, with nine sulciform punc-

* These characters apply simply to the genus *Mycterus*; the position and composition of the tribe is by no means settled.

tured striæ on each, which do not reach base or apex; a considerable space at base is smooth or slightly punctured and shining; legs rather long. L. 9–13 mm.

Male with the three first joints of the anterior tarsi dilated and pubescent beneath, and with part of the sixth ventral segment visible.

Under bark of Scotch fir; very local; Scotland, Highlands, Tay and Dee districts, Rannoch and Aviemore.

SALPINGINA.

The members of this tribe are small, but in some cases brightly coloured and rather conspicuous insects; they may be known by the absence of the trochantin of the intermediate coxæ, and the fact that the side pieces of the mesosternum do not reach the coxæ; the genus *Rhinosimus* has the head produced into a strong rostrum; our three genera may be distinguished as follows:—

I. Head not produced into a distinct rostrum.
  i. Antennæ with the three last joints forming a less distinct club, eighth joint as large as, or not much smaller than, ninth; thorax with sides not denticulate . . . . . SALPINGUS, *Gyll.*
  ii. Antennæ with the last three joints forming a more distinct club, eighth joint much smaller than ninth; thorax with sides finely denticulate . . . . . , LISSODEMA, *Curt.*
II. Head produced into a strong rostrum . . . . . RHINOSIMUS, *Latr.*

SALPINGUS, Gyllenhal.

About twenty species are contained in this genus, nine of which are found in Europe, and the remainder in Algeria, Madeira, Madagascar, North America, Chili, &c.; the head is produced in front, but cannot be called rostrate, although some authors say of the species "caput rostro brevi;" the antennæ are somewhat variable, the club being more distinct in some species than in others; the thorax is cordiform, much narrower at base than the elytra, which are square at the shoulders and rounded at apex, and completely cover the abdomen; the legs are moderate; four species have, until quite recently, been regarded as British, but a fifth, *S. mutilatus*, has lately been added by Mr. G. C. Champion; it appears to be very hard to distinguish satisfactorily between *S. ater* and *S. æratus*, and, as far as our collections are concerned, the two species seem to have been entirely confused; the value of the impressions on the thorax as a distinguishing character appears to be in several cases very small; our species may be roughly separated as follows:—

I. Mandibles short and not exserted; labrum short.
  i. Size larger; colour castaneous; reflexed margin of elytra narrow from the apex of the third ventral segment . . . . . S. CASTANEUS, *Panz.*
  ii. Size smaller; colour black or bronze; reflexed

margin of elytra very narrow from base of abdomen.

1. Colour bronze; legs more or less red; average size larger . . . . . S. ÆRATUS, *Muls.* (*æneus*, Steph.)

2. Colour deep black; egs black, tarsi often pitchy; average size smaller . . . . . S. ATER, *Payk.*

II. Mandibles long and much exserted.

i. Size smaller; labrum shorter, reddish-testaceous; frontal region flattened . . . . . S. MUTILATUS, *Beck.*

ii. Size larger; labrum longer, ferruginous or pitchy red; frontal region not flattened . . . . . S. FOVEOLATUS, *Ljungh.*

S. castaneus, Panz. (*piceæ*, Germ.). Elongate, subparallel, castaneous-brown or ferruginous, glabrous and shining; head triangularly produced in front, coarsely punctured, labrum short, eyes black, prominent, antennæ moderately long, gradually thickened towards apex, ferruginous with base often paler; thorax subcordiform, about as broad in front as head, gradually narrowed behind, thickly and rather coarsely punctured, with an indistinct impression before middle of sides, and a more or less distinct transverse impression at base; elytra with not very regular rows of rather strong punctures, more or less confusedly punctured at base; legs ferruginous or reddish-testaceous. L. $3\frac{1}{2}$–4 mm.

In decaying fir branches; occasionally by sweeping under fir trees; local, but rather common where it occurs; Esher, Shirley, Norwood, Weybridge, Mickleham, West Wickham, Chatham, Crohamhurst; Hastings; Leominster; Coleshill, near Birmingham; Cannock Chase; Repton; Manchester district (general in pine trees); Northumberland and Durham district, rare; Scotland, on dead branches of Scotch fir, Solway, Tweed, Forth, Tay, Dee, and Moray districts.

S. æratus, Muls. (*æneus*, Steph.). Brassy black, or lighter or darker bronze, shining and glabrous; head rather finely punctured, eyes prominent, antennæ red, with the last joints thickened and forming a club which is dark; thorax subcordiform, closely and distinctly, but somewhat variably punctured, with an impression on each side before and behind middle, which are not always distinct; elytra subparallel, somewhat confusedly punctured at base, with rather regular rows of moderately strong punctures, interstices very finely alutaceous, shining; legs more or less red or ferruginous; there is usually an impression on each elytron towards base; Stephens, however, expressly says that his *S. æneus* has the elytra without foveæ. L. $2\frac{1}{2}$–3 mm.

Under bark and in dead twigs of fir trees; it has also been captured on walls and palings; not common; Forest Hill (Marsh); Southgate; Dulwich (Stephens); West Wickham; Gravesend; Sheppy and Sittingbourne, Kent (Champion); Polegate (Waterhouse); New Forest (Champion); Dawlish; Plymouth, Whitsand Bay (Walker); Norfolk; Knowle, near Birmingham (Blatch); Holy Island (Walker); Northumberland and Durham district (*S. ater*, not common; *S. æratus*, Yetholm (Crotch)); Scotland, rare; *S. ater*, Solway, Tweed, Clyde, Forth, Tay, Dee, and Moray districts; *S. æratus*, very rare, Tweed district, found at Ginich by Mr. Hislop; Ireland, near Dublin (Power); with the exception of those specially mentioned as

referring to *S. æratus*, all the localities above given have been recorded as for *S. ater*, but I believe that they must be referred to the present species, if *S. æratus* and *S. ater* are really distinct.

S. ater, Payk. As far as I can make out, this species can only be said to differ from *S. æratus* in its colour, which is deep shining black, with the legs also black, the tarsi being more or less pitchy, and the base of the antennæ reddish; it is said to differ in the impressions of the thorax, and in the fact that the elytra sometimes have a fovea near base, but these are quite unreliable characters; the elytra also are said to have the rows of punctures regular to base, but they are quite as regular in some specimens of *S. æratus;* in fact the latter species differs considerably in punctuation, and in the case of two type German specimens from Herr Reitter now before me, one has the thorax considerably more strongly punctured than the other; in a type specimen of *S. ater* sent me by the same entolomogist the thorax appears to be a little more narrowed behind and more even and regularly punctured than is the case with the general run of *S. æratus*, but in all points, including colour, shape and punctuation, intermediate examples appear to occur, and I feel strongly inclined to regard the species as synonymous, and merely varieties of one species. L. $2\frac{1}{2}$–3 mm.

Of all the specimens I have seen one only appears to be related to the type *S. ater*, and this was taken by Mr. Champion at Aviemore, Inverness-shire.

S. mutilatus, Beck. (*virescens*, Muls., *nec* Lec.; s.g. *Colposis*, Muls.). In general appearance somewhat resembling at first sight a specimen of *Rhinosimus planirostris;* greenish-bronze, very shining, with the mandibles long and exserted, the labrum and other mouth parts reddish-testaceous, and the antennæ fuscous with reddish-testaceous base, gradually thickened towards apex; eyes very prominent; thorax short, subcordiform, rather diffusely punctured; elytra with shoulders well marked, much broader at base than base of thorax, with sides slightly dilated and rounded behind, and with rather regular rows of moderately strong punctures, and an impression on each before base; legs testaceous. L. 2–$2\frac{1}{2}$ mm.

In dead twigs, &c.; rare; it has only been taken at Caterham and at Gomshall near Dorking by Mr. G. C. Champion; in the former place he took a few examples by sweeping *Mercurialis perennis* under old beech trees in the autumn.

This species is distinguished from the three preceding by the long exserted mandibles, the broadly flattened and almost concave frontal region of the head, the shorter thorax and more strongly impressed elytra, the very shining upper surface, the greenish-bronze colour, the reddish-testaceous labrum, &c.; and from *S. foveolatus*, which it more nearly resembles in the structure of the mandibles, by the shorter and narrower rostrum, the differently coloured oral organs, the flattened frontal region, the differently formed labrum, the smaller size, the more

shining and differently coloured upper surface, &c. (*vide* Ent. Monthly Mag. xxiii. 160).

In making the above record, Mr. Champion suggests the possibility of the occurrence of *S. Reyi* and *S. exsanguis* in this country; the former is very closely allied to *S. castaneus*, and the latter to *S. ater* and *S. æratus*; *S. Reyi* has been taken in abundance in France in the dead branches of fruit trees.

S. foveolatus, Ljungh. (s.g. *Rabocerus*, Muls.; *Sphæriestes*, Kirby). Bronze-black, with the mouth parts, base of antennæ, and tarsi, ferruginous, shining; head slightly narrower than thorax, eyes prominent; antennæ with the sixth joint broader than the preceding, and a little narrower than the five last joints, which are of about equal thickness; thorax transversely cordate, deeply and rather closely punctured, with an impression on each side behind middle, and sometimes another indistinct one before middle; elytra with rows of punctures, confusedly punctured at base, with a deep fovea on each towards base. L. 4–4½ mm.

Rare; by sweeping under beeches and elms, &c.; Coopers Hill, Gloucester (Blatch); Robins Wood, Repton; Scarborough; Northumberland and Durham district, "Hetton Hall, near Belford," W. B. Boyd, Esq.; "Near Wooler," Mr. T. Hardy; Scotland, Cramond (Stephens); Roxburghshire (Boyd).

LISSODEMA, Curtis.

This genus contains five species, three of which are found in Europe, and the other two in Chili and Tasmania respectively; they are very closely allied to *Salpingus*, with which they are included by Thomson, but are distinguished by having the club of the antennæ more abrupt, the mandibles not toothed on their inner side, and the sides of the thorax slightly denticulate; the latter character, however, is not very obvious.

The larva of *L. quadripustulata* is described and figured by Perris (Larves des Coléoptères, p. 300, pl. ix. f. 319); it is yellowish-white with the head reddish, and presents no striking peculiarity; the apical segment is emarginate almost in a circle, the lobes being very slightly produced and terminating in two recurved points; the pupa is rather elongate.

I. Thorax subovate, with the anterior angles not reaching the eyes; elytra with two reddish-yellow spots on each; size smaller . . . . . L. QUADRIPUSTULATA, *Marsh.*

II. Thorax subquadrate, with the anterior angles reaching the eyes, which are large; elytra unicolorous; size larger . . . . . L. CURSOR, *Gyll.* (*Heyanum*, Redt.)

L. quadripustulata, Marsh. (*denticolle*, Gyll.). A small species; head and thorax reddish-testaceous, dull, very closely and finely punctured, the latter a little longer than broad, broadest before or about middle, with the sides very feebly denticulate; elytra rather shining, black or fuscous with a broad spot at base of each (often meeting at suture), and another at apex, yellow, subparallel, with distinct but

somewhat irregular punctured striæ, which become obsolete towards base and apex, and with the reflexed margin narrowed almost from the first ventral segment; prosternum red, breast and abdomen fuscous; legs red. L. 2–2½ mm.

In dead twigs of white-thorn, fir, &c.; also under bark; very local; London district, rather common; Forest Hill, Ripley, Camberwell, Battersea, Coombe Wood, Darenth Wood, Chatham, Cobham, Lee, Esher, Claygate, Hampstead, Southend, &c.; Tunbridge Wells; Sittingbourne; Kingsgate; Hastings; New Forest; Glanvilles Wootton; Malvern (one specimen bred from pine twigs with a large number of *Pityophthorus micrographus*); Salford Priors; Knowle and Smallheath, Birmingham; Repton, Burton-on-Trent.

L. cursor, Gyll. (*Heyanum,* Redt.). Larger than the preceding, and easily distinguished by having the elytra unicolorous reddish or brown, without yellow patches, and by the subquadrate thorax, the anterior angles of which reach the eyes; the thorax has the sides evidently denticulate, and the disc closely and finely punctured; the rows of punctures on the elytra are more regular, and the reflexed margin is narrowed from the base of the abdomen; the general colour is lighter or darker reddish-castaneous; legs red. L. 3 mm.

Under bark, in dead twigs, &c.; very rare; first taken at Ockbrook, Derbyshire, by Archdeacon Hey; Mickleham; Forest Hill (Marsh); Headley Lane; Wilmslow near Manchester, taken by Mr. Broadhurst (Chappell).

RHINOSIMUS, Latreille.

This is an exceedingly distinct genus, which may at once be known from all our other Heteromera by having the head prolonged into a rostrum, which is variable in length and is more or less dilated, and depressed at apex; the antennæ are long, and are inserted either at or in front of the middle of rostrum; the thorax is more or less cordate, broader than the head, about half as broad at base as the elytra, which are ovate and convex, and furnished with distinct rows of punctures; the legs are slender; the genus contains about fourteen or fifteen species, of which five are found in Europe, three occurring in Britain; the remainder are widely distributed, representatives occurring in Northern Asia, North America, Chili, New Guinea, &c.; *R. viridipennis* is included by several authors under *Salpingus.*

The larva of *R. viridipennis* (*roboris,* F.) is described by Erichson (Archives de Wiegman, 1847, i. p. 287); it is linear, semicylindrical and depressed, with the integuments chiefly membranous and furnished with scattered hairs; the head is rather depressed, with five ocelli on each side; the prothorax is the longest segment, and the last segment is narrower than the rest, and is furnished at apex with two short broad horns which are terminated by two sharp slender hooks; the anal appendage is tubiform and retractile, and forms a proleg.

I. Rostrum longer and more distinctly dilated at apex; antennæ inserted between middle and apex of rostrum; vertex of head greenish-black; thorax red . . . . R. RUFICOLLIS, *L.*

II. Rostrum shorter, subparallel, less distinctly dilated at apex; antennæ inserted at middle of rostrum.
  i. Head, together with rostrum, and thorax entirely red; elytra dark . . . . . R. VIRIDIPENNIS, *Steph.*
  ii. Upper surface entirely bronze, with the rostrum reddish-yellow . . . . . R. PLANIROSTRIS, *F.*

R. ruficollis, L., *nec* Panz. (*roboris,* Payk.). Shining and glabrous, rostrum and thorax clear reddish-testaceous, vertex of head and elytra greenish or greenish-black, sometimes bluish, under-side reddish, with the metasternum pitchy; rostrum rather long, strongly dilated at apex; antennæ inserted in front of middle of rostrum, fuscous with base reddish-testaceous; eyes prominent; thorax strongly cordiform, diffusely and rather deeply punctured, and with a deep fovea on each side at base; elytra much broader at base than base of thorax, with shoulders well marked, widest behind middle, with distinct rows of punctures, alternate interstices with rows of punctures set widely apart; legs reddish-testaceous. L. $2\frac{1}{2}$–4 mm. Occasionally the metasternum is testaceous.

Under bark, in dead twigs, &c.; local; London district, rather common; Mickleham, Forest Hill, Putney, Darenth Wood, Lee, Enfield, Westerham, West Wickham, &c.; Dover; Hastings; New Forest; Portsmouth; Glanvilles Wootton; Edgbaston, Sutton, and Yardley, Birmingham; Hopwas Wood, Tamworth; Repton; Scarborough; Withington, Cheshire; Agecroft and Dunham Park, Manchester; Northumberland and Durham district; Scotland, rare, Solway, Clyde, and Dee districts; Ireland, Armagh, Westport co. Mayo, &c.

R. viridipennis, Steph. (*ruficollis,* Panz., *nec* L.; *Salpingus rufcollis,* H. R. W., &c.). This species at first sight very much resembles the preceding, but may at once be known by its entirely reddish-testaceous head and rostrum, and especially by the very much shorter, broader, and differently shaped rostrum, which has caused several authors to place it with *Salpingus;* in this case, however, *R. planirostris* might also be removed to the same genus, as it is intermediate as regards shape of rostrum between the two species; antennæ inserted about middle of rostrum, fuscous, with base testaceous; thorax less strongly narrowed behind than in *R. ruficollis,* L., diffusely and coarsely punctured; elytra bluish-green with distinct rows of punctures; meso- and metasternum greenish-brown; abdomen red-brown; legs reddish-yellow. L. 2–$3\frac{1}{2}$ mm.

Under bark, in dead hedges, &c.; local; London district, not common, but widely distributed; Mickleham, Sanderstead, Forest Hill, Caterham, Shirley, Darenth Wood, St. Mary Cray, Shooter's Hill, Loughton, &c.; Aylsham, Norfolk; Littlington and Quy Fen, Cambridge; Kingsgate; Dover; Hastings; New Forest; Portsmouth; Devon; Llangollen; Midland districts, generally distributed; Scarborough; Withington, Cheshire; Northumberland and Durham district; Scotland, rare, Dee district; not recorded from Ireland, but it almost certainly occurs.

R. planirostris, F. (*Spinolæ,* Costa). Æneous, with the rostrum reddish-testaceous; head rather closely punctured, rostrum broad, some

what dilated at apex ; antennæ inserted at about middle of rostrum pitchy with base red ; thorax rather feebly cordiform, deeply and not very closely punctured ; elytra with distinct rows of punctures, alternate interstices with rows of punctures placed rather widely apart; legs reddish-testaceous ; under-side red, pitchy red or pitchy. L. 2–3 mm.

Under bark, in dead twigs, moss, &c. ; often by sweeping and beating; common and generally distributed throughout England and Wales; Scotland, Solway, Forth, Tay, and probably all or nearly all the districts; Ireland, Dublin, Armagh, Belfast, and probably general.

MYCTERINA.

This is a small tribe, whose composition is uncertain; several authors include under it the genus *Lacconotus*, which differs from *Mycterus* in not having the head prolonged into a rostrum ; the latter genus forms a very strong connecting link between the Heteromera and the Rhynchophora ; any one who was not acquainted with the structural differences would at once regard *M. curculionoides* as a weevil very near the genus *Larinus*, which it further resembles in having the upper surface covered with a yellowish pollen-like pubescence ; the tribe has been variously assigned to the Pythidæ, Œdemeridæ, and Melandryidæ. I have here placed it provisionally under the former ; the point is not important as far as the British fauna is concerned, as our single species is doubtfully indigenous.

MYCTERUS, Clairville.

This genus contains seven or eight species, of which four are found in Europe, and the remainder in North and Central America ; it is, as before stated, as far as outward appearance goes, extremely closely related to the Curculionidæ, with which it is further connected by the form of the intermediate coxæ and scutellum ; it is however separated, of course, from them by the heteromerous tarsi, and further, to a less extent, by the filiform antennæ and the buccal organs ; the larvæ probably live in the roots and stems of the *Carduaceæ* and *Umbelliferæ*, on which the perfect insects are found.

M. curculionoides, F. Elongate oval, convex, black, covered with close greyish, yellowish or reddish pubescence, and besides with a yellowish fugitive pollen-like pubescence, which is renewable during life ; head produced into a strong broad rostrum, eyes moderate, slightly projecting, antennæ 11-jointed, inserted at some distance in front of eyes, third joint elongate, last joint apparently divided into two ; thorax transverse with sides subparallel behind, and rounded and narrowed in front, broadly bisinuate at base where it is broadest ; the upper surface is closely, distinctly, and shallowly punctured, and there is a trace of a central furrow at all events at base ; scutellum large ;

elytra plainly broader at shoulders than base of thorax, subparallel, gradually narrowed a little before apex, coarsely sculptured; legs slender, pitchy black, apex of tibiæ furnished with two short spurs; under-side clothed with thick silvery pubescence, especially on abdomen. L. 6–7 mm. (excluding rostrum).

Female with the abdomen more convex than in the male, and the antennæ shorter and a little more thickened towards apex.

On Carduaceæ and Umbelliferæ; very rare and doubtfully indigenous; Stephens' record is, "Extremely rare in Britain. I possess a pair that were captured near Kingsbridge by the late Mr. Cranch; others are in the collection of the British Museum, taken at the same time, in June 1815." Mr. Rye (British Beetles, p. 172) records it as once taken in England by Mr. T. V. Wollaston, but gives no locality; there is, or was, a specimen in Mr. Crotch's collection, which, perhaps, is the one referred to by Mr. Rye.

The records are so doubtful that I had omitted the species from this work, until I received a specimen which Mr. Sidney Olliff kindly sent me with a note to the following effect:—"It was, I believe, captured in the vicinity of Oxford in 1882, or thereabouts; the specimen was in a small collection of Oxford beetles given me by Mr. M. Gunning; unfortunately, Mr. Gunning, who was unacquainted with the rarity of his capture, had no recollection of the precise locality where this particular specimen was found, although he had an impression that it was found on a thistle head, but he was positive in his assertion that all his captures were from Oxford, and that no specimens had been added from other sources." As will be gathered from what has been said, further evidence is still needed to prove that the beetle is really indigenous; in my record of the specimen from near Oxford (Ent. Monthly Mag. xxvi. 86) I am made by a printer's error to say "it deserves a 'prominent' admission to our lists," whereas the word I really used was "provisional;" such a provisional admission it certainly has a claim to quite as much as many other species.

ŒDEMERIDÆ.

This family contains upwards of fifty genera, and between two hundred and three hundred species; they are for the most part elongate, slender and delicate insects, and are often very brightly coloured; in the perfect state they frequent flowers; their wings are large, and they are quick fliers, but their other motions are comparatively slow; they are widely distributed, but are, as far as is at present known, much more characteristic of temperate than of tropical countries; some of the species bear a strong superficial resemblance to the Telephoridæ; they have been placed by some authors near the Cantharidæ; but they appear to be allied much more closely to the Pythidæ and Melandryidæ. The following are the chief characteristics of the family:—Head inclined, large, more or less narrowed behind eyes, inserted in thorax by a broad neck; eyes variable, sometimes very large, not reaching the base of the mandibles which are flattened and bifid at apex; antennæ long, or very long, nearly always

slender and filiform; thorax narrower at base than elytra, not margined; anterior coxal cavities broadly open behind, confluent; elytra elongate, covering abdomen, with more or less distinct raised lines; abdomen with five free ventral segments, the sixth sometimes visible in the male; legs long or moderately long, penultimate joint of tarsi bilobed; posterior femora very strongly thickened in the males in some genera.

Thirteen genera, represented by nearly eighty species, are found in Europe; of these four genera and only six species occur in Britain.

I. Maxillary palpi with the last joint oblong, as broad or as a little broader than the preceding, not or slightly securiform; head produced in front.
  i. Eyes round, entire; posterior femora of male very strongly thickened in some species, in others simple . ŒDEMERA, *Ol.*
  ii. Eyes kidney-shaped.
    1. Antennæ 11-jointed in both sexes, with the third joint five or six times as long as the second; posterior femora of male considerably thickened; all the tibiæ with two apical spines . . . . . ONCOMERA, *Steph.*
    2. Antennæ 12-jointed in the male and 11-jointed in the female, with the third joint about three times as long as the second; posterior femora of male not thickened; anterior tibiæ with one apical spine . . NACERDES, *Schmidt.*

II. Maxillary palpi with the last joint plainly securiform, broader than the preceding; eyes oval, slightly emarginate in front; posterior femora of male not thickened; head not, or scarcely, produced in front . . . . . ISCHNOMERA, *Steph.* (*Asclera*, Schmidt.)

ŒDEMERA, Olivier. (*Necydalis*, Fabricius.)

Between thirty and forty species are known as belonging to this genus; no less than twenty-eight are found in Europe, and the remainder occur in Siberia, Kamtschatka, Japan, Persia, and Algeria; a considerable number have the posterior thighs strongly dilated in the male; the head is considerably prolonged in front, and the antennæ are inserted at a considerable distance behind the clypeus near the eyes; their first joint is shorter than the third, and the second joint is very short; the eyes are round; the maxillary palpi have the last joint oblong and obliquely truncate at apex; the thorax is deeply foveate on disc; the elytra are more or less divaricate at apex; the legs are rather long, and the tibiæ are furnished with very short spurs.

The larva and pupa of *O. virescens*, which is considered by some authors as synonymous with *O. lurida*, are described and figured by Schiödte (xi. pp. 546, 547, t. xvi. 14 and 17); the larva is about nine times as long as broad, with the head and thoracic segments more or less corneous, and is of a light colour; the head is large, a little broader than the prothoracic segment, which is larger than the meso- and metathoracic segments; the segments are incised at the joints, and are setose at the sides; the apical segment is transverse, rounded, and simple; the legs are comparatively long; this larva is found under the bark of trees; the pupa is long with the cephalic region subquadrate, and with a prominence at each side of the apex of the thoracic region; it is terminated by two small curved cerci.

I. Posterior femora of male very strongly thickened; colour bright emerald-green, bluish or reddish, shining . . . . O. NOBILIS, *Scop.*
II. Posterior femora of male not or scarcely thickened; colour dark sage-green, dull . . . . . O. LURIDA, *Marsh.*

O. nobilis, Scop. (*cærulea*, L.). Elongate, shining, bright green, bluish-green or blue, sometimes reddish or coppery; head subtriangular, closely and rugosely punctured, eyes prominent, antennæ long and slender, dark, metallic at base with the under-side of the basal joints yellow; thorax a little longer than broad, widest before middle, uneven, rugosely punctured; scutellum small; elytra separately narrowed from base to apex, divaricate, closely and rugosely punctured, with strong raised lines; legs long, dark, more or less metallic. L. 8–9 mm.

Male with the posterior femora very strongly thickened, and the posterior tibiæ strongly thickened.

On flowers, &c.; generally distributed, and common in many localities, in the London, south-eastern and southern districts; Essex; Suffolk; Gloucester; Bewdley Forest; Swansea; Tenby; Barmouth; Conway; it is rare in the midlands and western Welsh counties, and has not been recorded from further north.

O. lurida, Marsh. Of a dull sage-green colour, sparingly clothed with fine pubescence, very closely and rugosely punctured; apart from its colour it is easily distinguished from the preceding by having the elytra only slightly narrowed separately at apex; the thorax is scarcely longer than broad, more coarsely punctured than elytra, uneven, with a more or less distinct central furrow; the raised lines on the elytra are distinct. L. 6–7 mm.

Male with the posterior femora scarcely thickened, the fifth ventral segment of abdomen deeply emarginate, and the posterior tibiæ armed with a hooked spur.

Female with the posterior femora not thickened, and the fifth abdominal segment entire.

Grassy places; on flowers; by sweeping, &c.; local; London district, rather common, Mickleham, Caterham, Reigate, Sevenoaks, Lee, Darenth Wood, Dulwich, Esher, Cowley, Weybridge, Chatham, &c.; Dover; Hastings; Portsea; Isle of Wight; Devon; Bath; Swansea; Barmouth; Cotswold Hills; Bewdley Forest; Durham.

ONCOMERA, Stephens. (*Dryops*, Fabricius.)

This is a small genus, containing about half-a-dozen species, three being found in Europe, one in Algeria, and one in Japan; our single British species is a long and rather conspicuous insect, of very delicate consistency and slender form; it is found very locally on ivy bloom; the head is considerably produced before the eyes, which are large and kidney-shaped; the antennæ are filiform, 11-jointed in both sexes, long and very slender, with the second joint very short, and the third and following very long, the last being comparatively short; the thorax is oblong, constricted at base, much narrower than the elytra, which are of a coriaceous

texture and are divaricate at apex; legs long, femora of male strongly thickened.

O. femorata, F. (♀ *calopoides*, Germ.). Livid-brown, rather pale, with the forehead, sides of thorax, base of abdomen and a ring before apex of femora dark brown or black-brown; head considerably produced in front, antennæ very long and slender; thorax longer than broad, somewhat narrowed behind, closely punctured except on centre of disc, testaceous with the sides broadly black, the black colour often spreading over the greater part of the disc; scutellum light; elytra long, subparallel, divaricate at apex, closely punctured, with three or four raised lines on each; legs long, testaceous with the femora more or less infuscate. L. 12–16 mm.

Male with the posterior femora much thickened and the posterior tibiæ strongly curved.

On ivy bloom and occasionally on sallows; found both in spring and autumn; local, but not rare in many districts; it is nocturnal in its habits, and sometimes comes to sugar placed on trees to attract moths; Ripley (Surrey), Mickleham, Darenth Wood, Reigate, Tunbridge Wells, Westerham, Chatham; Oxford; Reading; Dover; Hastings; Arundel; Shipley, near Horsham; Lewes; Isle of Wight; Glanvilles Wootton; Brixham; Exeter; Bath; Leominster; it has not been recorded from further north.

NACERDES, Schmidt.

This is a moderately large and very widely distributed genus, its range extending from Siberia to Madagascar and Brazil; the species, however, are chiefly found in temperate climates, and only two or three have been described from the New World; only one of the fifteen European species is found in Britain; it is a long reddish insect with a black tip to the elytra, and very strongly resembles certain species of *Telephorus*; it may be known by the 12-jointed antennæ of the male; the eyes are oblique and kidney-shaped; the maxillary palpi have the last joint oblong, obliquely truncate at apex, and about as long as the penultimate; the thorax is slightly narrowed behind, and is much narrower at base than elytra, which are long and subparallel; the posterior femora of the male are not thickened.

The larva of *N. melanura* is described and figured in two positions (viewed from above and sideways) by Schiödte (xi. p. 540, t. xvi. 1 and 2); it is seven or eight times as long as broad, and is much narrower in front than behind, to a slight extent resembling some of the larvæ of the Buprestidæ; the head and legs alone are corneous, and the colour is white with the last-mentioned parts yellowish, and the clypeus, mandibles and palpi pale ferruginous; the head is large, being nearly as broad as the prothorax, which together with the next four segments is uneven and furnished with a hump or knob on the centre of the dorsal surface; the legs are moderately long; the remaining abdominal segments are simple and of different lengths, the last being narrower and without cerci; all the segments are setose at the sides; the "prætergæ" and "postergæ," or the membranes joining the segments, are very evident; the larva lives in dead wood, especially oak, and mines galleries

N. melanura, Schmidt (*lepturoides*, Thunb.). Elongate, subparallel, reddish-testaceous, with the apex of elytra, femora, breast and abdomen black, rarely entirely fuscous; head with eyes as broad as thorax, antennæ long and slender; thorax rather shining, cordiform, more so in male than in female, in the former sex being furnished with a black spot on each side, closely and distinctly punctured except on centre of disc; scutellum truncate behind; elytra dull, parallel, very closely punctured, clothed with short and fine yellowish pubescence, with traces of raised lines. L. 7–12 mm.

Male with the antennæ 12-jointed, the last ventral segment of abdomen bilobed, and the centre of forehead and spots on thorax fuscous.

Female with the antennæ 11-jointed, the last ventral segment of the abdomen broadly and slightly emarginate, and the thorax unicolorous.

On old posts and timber on the sea shore and near the mouths of large rivers; sometimes introduced further inland with timber; rather common locally; Surrey Canal and Peckham (probably introduced with timber); Harwich; Doverscourt; Walton-on-Naze; Chatham; Sheerness; Gravesend; Southend; Deal; Dover; Folkestone; Hastings; Portsmouth; Southampton (about rotten railway sleepers); Isle of Wight; Devonshire, Plymouth, &c.; banks of Humber and Severn; Borth, Wales; Bridlington jetties; Manchester; Northumberland and Durham district, Sunderland, and on the wing near South Shields; Ireland, Glasnevin Gardens, Dublin.

ISCHNOMERA, Steph. (*Asclera*, Schmidt)

The members of this genus may be known by the strongly securiform last joint of the maxillary palpi, and the oval, almost round, eyes, which are very slightly emarginate in front; the antennæ are filiform and elongate with the third joint about twice as long as the second; the head is scarcely produced before antennæ; the thorax is rather strongly narrowed at base, and the elytra are long and parallel-sided; the legs are long and the claws plainly toothed at base; all the tibiæ are armed with two spurs at apex; the genus contains about fifteen species, six of which occur in Europe, and the remainder in Japan, North America, Cuba, the Australian region, &c.; two are inhabitants of Britain.

The larva and pupa of *I. cærulea* are described and figured by Schiödte (xi. pp. 545—547, t. xvi. 11, 12 and 13); the larva so closely resembles a rather small larva of *N. melanura*, that it might well be mistaken for it; it appears chiefly to differ in having the head rather narrower and more exserted, the prothorax more produced in front, and the first three abdominal segments angled in middle of sides; the remaining segments, also, are more conical; the pupa differs considerably from that of *Nacerdes*, having the cephalic region rounded, and being thickly furnished with stout setose "styli motorii," which are almost absent in the latter pupa; the larva mines dead wood.

I. Thorax green, or bluish-green, unicolorous with elytra . I. CŒRULEA, *L.*
II. Thorax bright red or yellowish-red . . . . . I. SANGUINICOLLIS, *F.*

I. cœrulea, L. Elongate, parallel-sided, blue-green or blue, a little shiny; head large, eyes large and prominent projecting beyond anterior angles of thorax, front distinctly but rather finely and not very closely

punctured, antennæ long, dark, with the under-side of the first two joints yellow, base of palpi yellow; thorax about as long as broad, slightly cordiform, with sides rounded and widened before middle, and contracted behind, closely punctured towards base, less closely in front; scutellum impressed; elytra very closely and somewhat rugosely punctured, with three entire raised lines on each. L. 7–8 mm.

Male with the last joint of the maxillary palpi longer and the pygidium more elongate than in female.

In rotten wood of ivy, willow, elm, &c.; occasionally by sweeping herbage; I have found it on a road and about an old wall; local, and rather scarce, but somewhat widely distributed; London district, not uncommon, Hammersmith, Greenwich, Darenth Wood, Belvedere, Faversham, Esher, Richmond, Sheerness, Chatham, Whitstable; Norfolk; Suffolk; New Forest (in numbers); Glanvilles Wootton; Whitsand Bay, Plymouth; Fordlands, Devon, on *Umbelliferæ*; Swansea; Leamington; Repton, Burton-on-Trent (one or two specimens); I know of no locality further north.

I. sanguinicollis, F. More elongate and duller than the preceding, from which it may be at once distinguished by the colour of the thorax, which is bright reddish-testaceous; antennæ dark or partly ferruginous, with the under-side of the basal joints reddish-yellow; thorax subcordiform, with strong impressions, closely punctured, dilated a little before middle and narrowed behind; scutellum rather large, very closely punctured; elytra dull sage-green, clothed with greyish pubescence, with three entire raised lines; legs rather long, dark. L. 8–10 mm.

On flowers and in decayed trees; rare; Coombe Wood (Stephens); Richmond Park (Turner); Windsor Forest, on hawthorn blossom in May (S. Stevens); New Forest and Bristol (Stephens); Sherwood Forest, on mountain-ash flowers (Blatch); Ireland (Stephens).*

PYROCHROIDÆ.

This is a very small family, containing only about half-a-dozen genera and twenty species, which are found with one or two exceptions in Europe, Northern Asia, and North America; two genera, *Pyrochroa* and *Dendroides*, occur in Europe; the former of these is represented in Britain by three conspicuous species, one of which is very common, and is well known to the most casual observers of insects; they are easily distinguished by their size and colour and very elegant serrate or pectinate antennæ; the head is exserted, horizontal or almost horizontal, strongly constricted a short distance behind the eyes, which are emarginate; antennæ 11-jointed, inserted before eyes; thorax narrower at base than elytra, with the sides not margined; anterior coxal cavities broadly open behind and confluent, prosternum long before the anterior coxæ, which are furnished with a distinct trochantin; metasternum long, with narrow side pieces; elytra wider than abdomen, rounded at apex; abdomen with five free ventral segments, a sixth visible in the male; legs long, penultimate joint bilobed, claws simple.

* Mr. W. F. Blandford has quite recently (June, 1890) taken a single specimen on haw-thorn blossom in the New Forest, where it had not occurred for many years previously.

PYROCHROA, Geoffroy.

The characters given for the family will serve to distinguish this our single British genus, except that it may be added that the maxillary palpi are long with the last joint elongate securiform, the antennæ have the second joint about one-third as long as the third, and the posterior tarsi have the first joint elongate; the genus is the largest in point of numbers of those belonging to the family, and contains about a dozen species; three of the four European species are found in Britain, and the remainder have been described from Northern Asia and North America, one species having been taken in Java.

The larva of *P. serraticornis*, Scop. (*rubens*, Schall.), has been described and figured by several authors; a detailed description, with figure, is given by Westwood (Classification, i. p. 288, fig. 32, 11); I have also a specimen before me taken by myself in Nocton Wood, near Lincoln, in a rotten stump; it is long and linear, of a dirty ochreous colour, with the head, thorax, and apical segments corneous; the head is large, with short antennæ and comparatively long palpi of about the same length as the antennæ; the segments are transverse and incised at the articulations; the prothorax is short quadrangular, but the mesothorax and metathorax, especially the former, are much narrowed in front; the penultimate segment is very long, the preceding segment being short; the apical segment is situated at right angles to the penultimate, and is furnished with two strong corneous spines projecting upwards, and several small setose warty prominences on margin; the legs are stout and strong, and terminate in a simple claw; there is a fine central furrow running down the middle of the segments; the head and tail are darker than the rest of the body; the pupa is dirty white with the rudimental wings and wing covers very short.

The larvæ of our other two British species, *P. coccinea* and *P. pectinicornis* are figured by Chapuis and Candèze (Larves des Coléoptères, pl. vii. figs. 3 and 4); and beautiful figures of the larva and pupa of *P. coccinea* are given by Schiödte (xi. pl. xv. 1, 10); these larvæ resemble that of *P. serraticornis* in general appearance, but differ in the shape of the thoracic segments and the anal appendages. Ahrens, who described the larva of *P. coccinea*, is inclined to believe that the larva is three years in attaining the full size, while the pupa state only continues fourteen days; the pupa is remarkable for excrescences at the sides of the thoracic segments.

I. Head strongly dilated behind eyes; antennæ of male pectinate or serrate; size larger.
  i. Head black . . . . . P. COCCINEA, *L.*
  ii. Head red . . . . . P. SERRATICORNIS, *Scop.*
II. Head scarcely dilated behind eyes; antennæ of male flabellate; size smaller . . . . . P. PECTINICORNIS, *L.*

P. coccinea, L. Head black, thorax and elytra bright scarlet clothed with short and thick unicolorous pubescence; head subtriangular, dilated behind eyes, impressed in male, impressed with the impression furrowed in female; antennæ long, black; thorax transverse-oval, nearly twice as broad as long, with a more or less distinct central furrow; scutellum black; elytra dilated behind, with well-marked shoulders, together with thorax very closely and finely sculptured; legs black, rather long, claws red. L. 14–17 mm.

Male with the antennæ rather strongly pectinate, the forehead with a broad deep impression, and the fifth ventral segment of the abdomen emarginate at apex, the sixth being conspicuous.

Female with the antennæ not strongly pectinate, subserrate, the forehead with a shallow furrowed depression, and the fifth ventral segment of the abdomen rounded at apex.

Under bark of decaying oak, &c., where it may be found in all its stages; occasionally found on grass stems; very local, but has occasionally been found in numbers where it occurs; Darenth and Birch Woods; Epping Forest; New Forest; Llangollen.

P. serraticornis, Scop. (*rubens*, Schall.; *purpurata*, Müll.; *satrapa*, Schrank.). Not so large as the preceding, which it strongly resembles in general appearance; it may, however, be at once known by its red head; the head is more strongly impressed in the male than in the female; the thorax is transverse, oval, or with the anterior angles slightly marked; the elytra are much as in the preceding species; the antennæ are not pectinate, but strongly serrate in the male and subserrate in the female. L. 9–12 mm.

On flowers, grass stems, &c.; its earlier stages are passed in rotten wood of oak, beech, willow, &c.; often on pathways in summer; generally distributed and common from the midland counties southwards, and sometimes very abundant; less common further north; not recorded from Scotland, and I have had as yet no record of its occurrence in Ireland, but it almost certainly occurs.

P. pectinicornis, L. Considerably smaller than either of the preceding; head black with the labrum and mandibles reddish-brown, and sometimes the middle of the forehead of the same colour; thorax and elytra reddish-testaceous, clothed with unicolorous silky pubescence, the former with a central black patch of greater or lesser extent; head uneven; thorax transverse, strongly narrowed and sinuate before posterior angles, finely and closely punctured; scutellum dark; elytra somewhat dilated behind, very closely punctured, with distinct traces of raised lines; antennæ and legs black. L. 7–8 mm.

Male with the antennæ flabellate and the fifth ventral segment of the abdomen slightly emarginate at apex, the sixth being conspicuous; the vertex of the head also is deeply foveolate on each side.

Female with the antennæ pectinate, the vertex of head even, and the sixth ventral segment of the abdomen not conspicuous.

In birch stumps; very local; only found in Scotland, Highlands, Dee and Moray districts, Braemar, &c.

SCRAPTIIDÆ.

The position of the genus *Scraptia* has been much disputed; by the shape of the head and thorax, and in fact by its general appearance it seems to be naturally related to the Mordellidæ, but a considerable number of authors have classed it with the Melandryidæ; Gyllenhal placed the single species known in his time under the Serropalpidæ, as belonging to the tribe *Dircæa*. Dr. Horn and Dr. Leconte regard the genus as forming a family Scraptiina of Melandryidæ, and Stephens places it in

the same family between *Abdera* and *Hallomenus*; Thomson classes it with *Conopalpus* as a tribe Conopalpina of the Serropalpidæ, which latter family is by many writers regarded as only a part of the Melandryidæ. Heyden, Reitter, and Weise again place it with *Euglenes*, *Xylophilus*, *Pedilus*, *Steropes*, and *Phytobænus* under a separate family Pedilidæ, and in this they are followed by some authors; the genus seems to fall most naturally under the Mordellidæ, and the species superficially bear a strong resemblance to *Anaspis*; it must, however, be admitted that in some points it is more closely allied to the Melandryidæ, and under all circumstances it seems to be the best plan to form a family Scraptiidæ for the reception of *Scraptia* and *Trotomma* and Wollaston's genus *Pseudoscraptia*; the species are so extremely rare that it is very difficult to obtain a specimen for dissection, and further study of the species is necessary before any final conclusion can be come to in the matter; the arrangement, however, which I have here followed seems to be the best provisional one that can be made, as it places the genus in a position between the Melandryidæ and Mordellidæ without connecting it with either. The family may be characterized as follows:—Head more raised than the anterior margin of the thorax, strongly contracted immediately behind eyes; upper surface depressed; antennæ filiform; eyes deeply emarginate; maxillary palpi more or less strongly securiform; thorax transverse; scutellum distinct; posterior coxæ shorter than the first ventral segment; spurs of anterior tibiæ distinct; posterior tibiæ as long as the tarsi; penultimate joint of tarsi strongly bilobed; claws simply toothed at base, the teeth being rudimentary; insects small and very delicate.

SCRAPTIA, Latreille.

About twenty-five species are contained in this genus, of which eight are found in Europe, and the remainder chiefly in North and South America; one, however, has been described from Ceylon; the characters above given will serve to distinguish the genus; the antennæ have the second and third joints small; the mandibles are bifid at apex; the scutellum is triangular; the elytra are subparallel, rather depressed and almost coriaceous, not fitting tightly to the sides of the abdomen, which is composed of five segments; the legs are slender and delicate.

The larva of *S. fuscula* (*minuta*, Muls.) is described and figured by Perris (Larves des Coléoptères, p. 341, pl. x. f. 371); it is white with a slight yellowish tinge, linear and elongate, with the prothoracic segment the longest, and is chiefly remarkable for the very long last segment of abdomen; this segment is as long as the three or four preceding segments, and is very thickly set with fine long setæ; it is almost spoon-shaped, and is quite simple at apex; Perris, in discussing the questions raised concerning the position of the genus, remarks that the larva seems to offer no points of comparison with *Mordella* and *Mordellistena*, but nevertheless appears to be somewhat allied to that of *Anaspis*, from which, however, it differs totally in the formation of the last segment; the larva and the perfect insect appear to be, at all events to a certain extent, myrmecophilous.

I. Third joint of antennæ and first joint of posterior tarsi longer; eyes not contiguous to posterior margin of head . . . . . S. DUBIA, *Ol.* (*fusca*, Latr.)

II. Third joint of antennæ and first joint of posterior tarsi shorter; eyes contiguous to posterior margin of head . . . . . S. FUSCULA, *Müll.* (*minuta*, Muls.)

S. dubia, Ol. (*fusca*, Latr.). Subparallel, rather depressed, clothed with fine silky pubescence, finely, very closely, and, on the elytra, somewhat asperately punctured; head and thorax brown, elytra brownish-yellow or testaceous, antennæ brownish; eyes separate from posterior margin of head; thorax very transverse, about twice as broad as long, strongly narrowed in front with two rather feeble impressions at base; elytra about four times as long as thorax; under-side fuscous; legs pale brown or testaceous, tibiæ and tarsi reddish. L. $3\frac{1}{2}$–4 mm.

In rotten wood, hard fungus on trees, &c.; very rare; near Windsor (Stephens); Glanvilles Wootton, Dorset, a single specimen taken by Mr. Curtis in a window of the house, June 25th, 1842.

S. fuscula, Müll. (*minuta*, Muls.; *nigricans*, Steph.). In shape, general appearance, punctuation and pubescence very closely allied to the preceding, but on an average smaller, with the third joint of the antennæ and the first joint of the posterior tarsi shorter, and the eyes contiguous to the posterior margin of the head; head black or brown; thorax testaceous, very transverse, with two distinct basal impressions; elytra and under-side testaceous or brownish-yellow; legs livid testaceous. L. $2\frac{1}{2}$ mm.

In hard woody fungus on trees, in rotten wood, &c.; sometimes on the wing; very rare; Ripley, Surrey (Stephens); Purley and Esher (Power); Exwick, Devon, by sweeping ivy, July 1863 (Parfitt); Mr. W. Garneys took a specimen of *Scraptia* some years ago at Repton, Burton-on-Trent, which must, I think, be referred to this species.

MORDELLIDÆ.

This family contains about a dozen genera and between three and four hundred species; the genus *Mordella* is very widely distributed, but the remaining members of the family are chiefly found in Europe and North America, a small proportion only being found within the tropics or in the Southern Hemisphere; some authors include the Rhipidophoridæ with the Mordellidæ, but it seems more correct to separate them. The following are the chief characteristics of the family:—Body more or less arched or convex; head vertical, often inserted very low, strongly and suddenly constricted immediately behind eyes, connected with thorax by a very small neck; antennæ slender, filiform or slightly serrate, inserted before eyes; maxillary palpi with the last joint securiform; thorax trapezoidal or semicircular, as wide at base as elytra, anterior coxal cavities large, open behind; mesosternum short; elytra narrowed behind, without striæ and with the epipleuræ very narrow or absent, tip of abdomen not covered; abdomen with five or six ventral segments, often

produced into a strong style at apex; legs rather slender, posterior tarsi very elongate, often nearly twice as long as the tibiæ, which are furnished with long spurs; this formation, taken together with the apical style, gives to many species the power of leaping; in size, colour, and pubescence the different members of the group are very variable.

The family falls naturally into the two following tribes :—

I. Anterior coxæ broadly distant at base, intermediate coxæ broadly distant; pygidium produced into a strong style . . . . . MORDELLINA.
II. Anterior coxæ almost contiguous at base, intermediate coxæ slightly distant; pygidium not produced into a style . . . . . ANASPINA.

MORDELLINA.

This tribe contains by far the greater majority of the species belonging to the family; they are, as a rule, larger and stouter than the members of the second tribe, and may at once be known by the styliform process of the pygidium; the general shape is more or less cuneiform, and the body is convex and arched, the head being inserted very low; the intermediate tibiæ have the spurs absent or small, and the posterior tibiæ are short, dilated and triangular; the hind coxæ are very large, and the tarsal claws are cleft to the base with the upper portion pectinate; three of the five European genera are represented in Britain; they may be distinguished as follows:—

I. Scutellum larger, subrectangular, broadly emarginate at apex; process of abdomen shorter and more obtuse . . TOMOXIA, *Costa*.
II. Scutellum smaller, transversely triangular or semicircular; process of abdomen nearly always longer and sharper.
  i. Antennæ obtusely serrate from the fifth joint; episterna of metasternum elongate-triangular; eyes more finely granulated . . . . . MORDELLA, *L.*
  ii. Antennæ very obtusely serrate, almost filiform; episterna of metasternum elongate-linear; eyes more coarsely granulated . . . . . MORDELLISTENA, *Costa*.

TOMOXIA, Costa.

This is a small genus containing about half-a-dozen species, of which only one occurs in Europe; the remainder have been described from North America and New Caledonia; they resemble *Mordella*, but have the scutellum larger and quadrangular, and the anal style shorter and blunter; the eyes are large and somewhat hairy, and the antennæ are slender and rather short, and obtusely serrate from the fifth joint; the intermediate tibiæ have the spurs absent or very minute; our single species bears a strong superficial resemblance in the shape and general appearance to *Mordella fasciata*, but may be easily known by several of the characters just mentioned.

The larva and pupa of *T. biguttata* (*bucephala*, Costa) are described and figured by Schiödte (xi. pp. 589, 591, t. xv. 12 and 21); the larva is cylindrical, about seven

times as long as broad, of a membranous consistency, with the head, legs, and dorsal portion of the ninth abdominal segment corneous; these last-mentioned portions of the body are yellowish, the rest being white, with the exception of the apex of the maxillæ and labium, the frontal margin, and certain tubercles on the ninth abdominal segment, which are ferruginous; the head is exserted, quadrate; the prothorax is roughly cordate, furnished at base with minute groups of tubercles; the mesothorax is very short; the remaining segments are similar, and are slightly incised at their joints; the eighth abdominal segment is smooth on disc, and the ninth is nearly as broad as the eighth, rather long, gradually rounded and produced into a moderately strong style, which is obsoletely bifid at apex and serves as a proleg; neither the antennæ nor the legs are visible from above, the former being very minute, and the latter rudimentary; the pupa is rather thickly set with minute short conical "styli motorii," and is terminated by two rather strong cerci; the larva is found mining in old beech and other wood.

T. biguttata, Gyll. (*bucephala*, Costa). Black or pitchy black, clothed with silky pubescence, which in some parts is concolorous with the upper surface and in other parts lighter, the base of the elytra, a spot behind the middle of each, and a more or less elongate sutural patch being most conspicuous; punctuation very close, somewhat asperate; head broad, antennæ slender, reaching about to the base of thorax, dark with the basal joints obscurely lighter; thorax transverse, strongly bisinuate at base; elytra gradually narrowed to apex, and separately rounded obtusely at apex; anal process pointed, truncate at apex, shorter than in *Mordella;* legs black. L. $4\frac{1}{2}$–$6\frac{1}{2}$ mm.

Male with joints 5–10 of the antennæ oblong-triangular, and the femora and anterior tibiæ clothed with white pubescence on their inner side.

Female with the antennæ shorter and joints 5–10 oval-triangular, anterior legs not pilose.

In decaying trunks of willows, oaks, and other kinds of deciduous trees (löfskogar of Thomson); also found on Umbelliferæ; rare; all the recorded specimens appear to have been obtained in the New Forest, with the exception of one that was taken by Mr. Dale off his garden hedge at Glanvilles Wootton on June 23rd, 1870.

MORDELLA, Linné.

This genus is a large and extensive one, containing upwards of one hundred and fifty species; of these only fifteen occur in Europe, and it is much more widely represented in the tropics and the Southern Hemisphere than any of the other genera of the family, a large proportion being found in South America, and several in the Australian region; species have also been described from Ceylon, Tahiti, &c., and the genus ranges as far north as Siberia; it is apparently, therefore, general in its distribution; the characters mentioned under *Tomoxia* will serve to distinguish it from that genus; it is very closely allied to *Mordellistena*, but the latter genus may be known by having the thorax at least as long as broad, the antennæ more filiform, the eyes evidently more coarsely

granulated, and the fact that the episterna of the metasternum are elongate-linear, and not triangular.

I. Upper surface with the pubescence forming spots and bands; antennæ less distinctly serrate from fifth joint; tarsal claws serrate and armed with a slender tooth almost reaching apex . M. FASCIATA, *F.*
II. Upper surface with even pubescence; antennæ more distinctly serrate from fifth joint; tarsal claws not distinctly toothed . . M. ACULEATA, *L.*

M. fasciata, F. Black, with the suture and a variable band before and behind middle of elytra thickly pubescent, the pubescence being grey or yellowish-grey; sometimes the front band takes the form of an oblique patch at each shoulder; antennæ dark with base red, longer and stouter than in *Tomoxia;* thorax transverse with the borders clothed with grey pubescence, strongly bisinuate at base, very finely sculptured; scutellum almost semicircular; elytra gradually narrowed from apex to base, separately rounded obtusely at apex, very closely sculptured; anal process long and pointed; legs black, posterior spurs ferruginous. L. 5–7 mm.

Male narrower than female, with the pygidium and anal style more elongate.

On flowers of *Umbelliferæ*—in woods, &c.; it passes its earlier stages under bark and in rotten wood; very local, but occasionally found in abundance; Mickleham, Maidstone, Bearsted; Sittingbourne, Strood, Chatham; Canterbury; Dover; Abbots Wood; Hastings; Lewes; New Forest; Exeter; Swansea; Monks Wood, Cambridgeshire.

M. aculeata, L. Black, clothed with fuscous or fuscous-grey pubescence, which is unicolorous on the upper side; the metathorax and base of the segments of the abdomen are usually silvery white; punctuation close; antennæ black, lighter at base; thorax much broader than long; elytra at base slightly narrower than base of thorax, gradually narrowed behind, obtusely rounded separately at apex; anal spine very long; legs black, anterior femora often testaceous. L. 4–6 mm.

On flowers; rare; Ripley, Surrey (Stephens) (Mr. Champion thinks this may be in error); Westerham, Kent, frequent (Gorham); Glanvilles Wootton, of occasional occurrence on guelder roses in May and June (Dale); Stephens also records it from Hertford, Monks Wood, near Swansea (common), and Scotland; the species is common in France, and appears to be very variable to judge by the number of named varieties; the same may be said of *M. fasciata.*

MORDELLISTENA, Costa.

This genus is also an extensive one, containing more than a hundred species, about one-third of which are found in Europe; the remaining species, however, with the exception of half-a-dozen or so from Chili and Ceylon, appear to be chiefly confined to North America; the distribution of the genus is therefore very different to that of *Mordella;* it is very closely allied to the latter genus, under which the distinctions between them have already been alluded to; the sub-genera *Mordellochroa,*

Emery, *Mordellistena* i. sp., and *Tolida*, Mulsant, have been adopted by some authors; of our six British species, one, *M. abdominalis*, belongs to *Mordellochroa*, which appears to be chiefly distinguished by the absence of spurs at apex of intermediate tibiæ; the remainder belong to *Mordellistena* proper; in several of these, however, the intermediate apical spurs appear to be very minute, or else to be easily broken off, as in several of my specimens I can hardly, if at all, distinguish them.

The larva of *M. pusilla* is found in the stems of *Marrubium vulgare* (the common horehound); it is of a yellowish colour, with rudimentary legs, and covered with short black hairs; the apical segment is terminated by a short double black spine; it is found in winter feeding on the pith of the stems; it changes into a pupa in June, and the imago appears in July (Westwood, Classif. i. p. 294); the larva of *M. pumila* is remarkable for having strongly raised prominences on the front abdominal segments.

I. Thorax wholly or in part yellowish, yellowish-brown or reddish.
  i. Elytra unicolorous black; thorax of male black with base brownish-yellow, of female bright red; abdomen red; intermediate tibial spurs obsolete and scarcely visible (s.g. *Mordellochroa*, Emery) . . . . . M. ABDOMINALIS, *F.*
  ii. Elytra black with yellow patches at shoulders, often extended down the sides; disc of thorax at least dark; abdomen black . . . . . M. HUMERALIS, *L.* *v. lateralis*, Ol.
  iii. Upper surface entirely yellowish-brown, often obscurely darker towards apex of elytra; under surface concolorous with the upper, or with the abdomen, in part at least, darker . . . . . M. BRUNNEA, *F.*
II. Upper and under surface unicolorous black.
  i. Thorax with the basal margin strongly sinuate on each side, space between sinuation narrow and more strongly produced before scutellum.
    1. Process of pygidium long and sharp; posterior angles of thorax more acutely produced . . . . . M. PUMILA, *Gyll.*
    2. Process of pygidium short and blunt; posterior angles of thorax less acutely produced . . . . . M. BREVICAUDA, *Boh.*
  ii. Thorax with the basal margin slightly sinuate on each side, space between sinuation broad and less strongly produced before scutellum; posterior angles of thorax almost obtuse . . . . . M. PARVULA, *Gyll.* *v. inæqualis*, Muls. (*pusilla*, Redt.)

M. abdominalis, F. (♂ *ventralis*, F.; s. g. *Mordellochroa*, Emery). Elongate, clothed with fine silky pubescence, very closely and finely sculptured; thorax broader than long, much narrowed in front, posterior angles obtuse; scutellum triangular; elytra gradually narrowed behind, somewhat longer in male than in female; anal process long and pointed, black with the base red; claws feebly denticulate. L. $3\frac{1}{2}$–$4\frac{1}{2}$ mm.

Male black, including thorax, except base, with the mouth, base of antennæ, tibial spurs and abdomen red or reddish-testaceous, the latter fuscous in the middle; anterior femora and tibiæ brownish or yellowish-

brown, the others black ; anterior tarsi yellow-testaceous, the others partly reddish ; antennæ with the fourth joint about one and a half times as long as third ; maxillary palpi with the last joint securiform.

Female black, with the thorax and abdomen red or yellowish-red ; mouth, base of antennæ, anterior legs, and part of tarsi reddish-testaceous ; antennæ with the fourth joint scarcely longer than third ; maxillary palpi with the last joint oblong, slightly securiform.

On flowers of *Umbelliferæ*, &c. ; in and near woods ; not common ; Caterham, Ripley, Mickleham, Coombe Wood, Darenth Wood, Chatham, Sevenoaks, Bearsted near Maidstone, Cowfold, Guildford ; Strood ; Wrabness, Essex ; Abbots Wood ; Folkestone ; Hastings ; New Forest ; Glanvilles Wootton ; Swansea.

M. humeralis, L. Black, or fuscous, clothed with silky yellowish pubescence, with the base of the antennæ, front and sides of thorax, a large patch at each shoulder, and the legs testaceous or rufo-testaceous ; base of femora and part of posterior tibiæ and tarsi fuscous ; the pubescence, as Thomson observes, has a slight violaceous reflection ; punctuation very fine ; antennæ moderately long ; head transverse, straight at base ; thorax transverse, strongly bisinuate at base, posterior angles obtuse but almost right angles ; scutellum obtusely triangular ; elytra not as broad at base as thorax, gradually narrowed behind, separately rounded obtusely at apex ; anal process long, slender and pointed ; posterior tibiæ with three fuscous strigosities before apex ; claws slightly denticulate. L. 3–4 mm.

Male with the last joint of the maxillary palpi almost triangularly securiform, and the lateral border of thorax and spot at shoulders well determined.

Female with the last joint of the maxillary palpi oblong-securiform, and the yellow colour on thorax and elytra not well defined, thorax sometimes entirely yellow (*M. lateralis, pars*).

On flowers of *Umbelliferæ*, &c. ; rare ; Esher and Claygate ; Sevenoaks, Brentford, and Horsell (Power) ; Hertford ; Maidstone (Gorham) ; Glanvilles Wootton, very rare (Dale) ; Tewkesbury and Trench Woods (Blatch).

V. lateralis, Ol. (*M. lateralis*, auct. ; *variegata*, F.). This variety, which has by so many authors been regarded as a separate species, can hardly be considered distinct ; the fuscous strigosities at the apex of the posterior tibiæ are a little shorter and less oblique, and the proportional length of the third and fourth joints of the antennæ is said to be different, but the latter character is very uncertain ; the only real difference lies in the colour, and this is so variable in both *M. humeralis* (especially in the female) and *M. lateralis* that it can hardly be regarded as a distinctive character ; the yellow spot at the shoulders of the elytra is extended towards apex, and leaves only the suture and the sides dark, and the dark colour of the thorax extends further along base ; the antennæ and legs are entirely or almost entirely testaceous ; sometimes the elytra appear to be almost entirely yellow with the exception of the apex. L. 3–3¾ mm.

On flowers of *Umbelliferæ*, &c.; very local and, as a rule, scarce, but not so uncommon as the type form; London district, not uncommon (Champion); Mickleham, Caterham, Claygate, Ripley, Lee, Darenth Wood, Chatham, Sevenoaks, Bearsted near Maidstone, Purley; Ryde (Power).

M. brunnea, F. (*humeralis*, var., Muls.; *meridionalis*, Costa). Brownish-testaceous or rufous-brown, clothed with silky pubescence; antennæ long, usually more or less fuscous towards apex; head straight at base, eyes large, black; thorax about as long as broad, very finely punctured, strongly bisinuate at base, posterior angles obtuse; elytra gradually narrowed behind, very closely, and finely, but somewhat distinctly sculptured; anal process long, slender and pointed; legs testaceous, posterior tibiæ and first and second joints of posterior tarsi with fuscous strigosities; the apex of elytra and abdomen are often more or less infuscate, and a variety occurs in which the elytra are entirely fuscous-black, the head and thorax obscurely testaceous and the abdomen brown. L. $3\frac{1}{2}$–$4\frac{1}{2}$ mm.

On flowers of *Umbelliferæ*, &c.; I have also taken it early in August by beating high hawthorn hedges; very local and, as a rule, scarce; London district, not uncommon, Claygate, Coombe Wood, Ripley, Forest Hill, Croydon, Chatham, Horsell, Eltham, Darenth Wood, Crohamhurst near Godalming; Hertford; Ashwicken, Cambridgeshire; New Forest; Swansea (on hawthorn); Bircham Newton, Norfolk (a few specimens beaten by myself from a hawthorn hedge, Aug. 1877); Bewdley Forest (Blatch).

M. pumila, Gyll. (*stricta*, Costa). Elongate, narrow and linear, black, somewhat shining, clothed with very fine silky pubescence, which has a violet reflection; antennæ black, rather long, with the second and third joints about equal; thorax as long as broad, with the base strongly bisinuate and produced in a slightly emarginate lobe before scutellum, posterior angles somewhat acute; elytra narrow, subparallel, compressed laterally, very closely sculptured; anal process long, slender and pointed; legs black, posterior tibiæ and joints of tarsi with distinct oblique strigosities. L. 3–4 mm.

Male smaller and narrower, with the fourth joint of the antennæ much narrower than the fifth.

Female a little broader, with the fourth joint of the antennæ a little narrower than the fifth.

By sweeping flowers, &c.; not uncommon locally; London district, common, Shirley, Caterham, Mickleham, Reigate, Ripley, Coombe Wood, Birch Wood, Darenth Wood, Chatham, Sheerness, Bearsted near Maidstone; Bushey; Hertford; Wrabness, Essex; Folkestone; Hastings district, Bopeep (in plenty Aug. 1867 (Power)), &c.; Eastbourne; Isle of Wight; Glanvilles Wootton; Nettlecomb, Somerset; Devon, Barnstaple and other localities; Swansea; Horning Fen and Aylsham, Norfolk; I know of no record from further north, or from the midland counties.

M. brevicauda, Boh. (*subtruncata*, Muls.). Closely allied to the preceding, which it resembles in colour and general appearance, but less shining, with the thorax a little shorter and less strongly sinuate on each

side at base, and the posterior angles not acute; the chief character, however, lies in the anal spine, which is short and blunt and more or less truncate at apex; the posterior tibiæ, moreover, are marked with four oblique strigosities instead of with three only as in *M. pumila*. L. 3–4 mm.

On flowers, &c.; especially in chalky districts; very local, but occasionally common where found; Mickleham, Reigate, Caterham, Maidstone, Chatham; Folkestone; Eastbourne; it appears to be confined to the London and South-eastern counties.

M. parvula, Gyll.; *v. inæqualis,* Muls. Smaller than the two preceding, which it resembles in colour and general appearance; it is easily distinguished from both by its plainer and coarser pubescence and the very slight sinuation at each side of base of thorax, the space between the sinuations being much broader and shorter; in the type form the posterior angles of the thorax are obtusely rounded, and the anal process is thick, conical and acuminate, about half as long again as the anus or hypopygidium; the var. *inæqualis*, however, appears to be the only variety of the species that occurs in Britain, and this has the anal process twice as long as the hypopygidium, and the posterior angles of the thorax scarcely rounded, the size also being a little larger; the posterior tibiæ are furnished with three strongly oblique strigosities, the first being very large and traversing almost the whole side of the tibiæ. L. $2\frac{1}{2}$–3 mm.

On *Artemisia maritima*, and probably on *A. vulgaris;* rarely on flowers; very local, but occasionally taken in numbers; Weybridge; Thames Ditton; Bushey; Sheerness (in abundance, Champion and Walker); Deal; Folkestone; Sandown; Hants; Glanvilles Wootton.

It is worthy of note that not a single species of the *Mordellidæ*, except those belonging to the genus *Anaspis*, has been recorded from further north than the midland counties, and the majority are confined to the southern districts.

ANASPINA.

The species belonging to this tribe are small and delicate insects, without an anal style; the body is rather fusiform than cuneiform or wedge-shaped as in the Mordellina; the hind coxæ are not very large; the posterior tibiæ are armed with strong spurs; the thorax has the sides not margined in front; the eyes are slightly emarginate and coarsely granulated, and the elytra have the epipleuræ, which in the preceding tribe are absent, narrow but evident; three genera, *Pentaria*, *Cyrtanaspis*, and *Anaspis*, are found in Europe, the latter of which is represented in Britain by several species.

ANASPIS, Geoffroy.

About seventy species are comprised in this genus, of which thirty-nine or forty are found in Europe, and nearly all the remainder in North America and Northern Asia; the Australian region has furnished one species; the characters given for the tribe will serve to distinguish the

genus; the antennæ are filiform, or slightly moniliform towards apex, with the third joint elongate; the scutellum is triangular, and the elytra finely strigose transversely; the species are found in flowers, and are very variable in colour; the appendages or "laciniæ" of the third ventral segment in the male present very important distinguishing characters.

The larva of *A. flava* is described and figured by Perris (Larves des Coléoptères, p. 335, pl. x. f. 363); it is 6 mm. in length, white with the head reddish; the head is quadrate, with comparatively long antennæ, and the prothorax is also subquadrate, longer than the following segments; the last segment is long and very deeply bifid, the lobes being each terminated by a hook which is long and sharp and curves backward over the segment; there is a small anal appendage invisible from above, which serves as a proleg.

I Thorax black.
- i. Elytra black, unicolorous.
  - 1. Antennæ longer, with joints 6–10 increasing gradually in length, not moniliform.
    - A. Intermediate and posterior femora entirely, or almost entirely, black.
      - a. Forehead, in part at least, yellow; size larger; apical appendages of third ventral segment in male narrow, curved inwards towards apex, but not widely separated . . A. FRONTALIS, *L.*
      - b. Forehead black; size smaller; apical appendages of third ventral segment in male narrow and parallel . . . . . A. PULICARIA, *Costa.* (*forcipata*, Muls.)
    - B. Intermediate femora entirely, and posterior femora almost entirely, yellow; apical appendages of third ventral segment in male short and stout and strongly curved inwards, enclosing an almost circular space . . . . . A. GARNEYSI, *Fowler.*
  - 2. Antennæ shorter with joints 6–9 subglobose in the male and submoniliform in the female, of about equal size, scarcely as long as broad or transverse.
    - A. Average size larger; last joint of antennæ proportionately shorter; male with two linear appendages reaching from the third to the fifth ventral segments of abdomen . . . . . A. RUFILABRIS, *Gyll.*
    - B. Average size smaller; last joint of antennæ proportionately longer; male without appendages to the third ventral segment of abdomen A. MELANOSTOMA, *Costa.* (*monilicornis*, Muls.)
- ii. Elytra black, with a bright yellow patch at each shoulder; antennæ long, not moniliform . . . A. GEOFFROYI, *Müll.*

II. Thorax red or testaceous.
- i. Antennæ longer, with the penultimate joints longer than broad, at all events in the male.
  - 1. Elytra and head black . . . . . A. RUFICOLLIS, *F.*
  - 2. Elytra and head testaceous or brownish-testaceous, the former sometimes darker towards apex and base . . . . . A. SUBTESTACEA, *Steph.*
- ii. Antennæ shorter with the penultimate joints moniliform, transverse or subtransverse in both sexes; head red or testaceous.

1. Elytra variable in colour, blackish or brownish, but without spots . . . . . A. FLAVA, *L.* (*v. thoracica*, L.)
2. Elytra very light testaceous with obscure dark spots . . . . . A. MACULATA, *Fourc.*

A. frontalis, L. (*assimilis*, Snell.). Elongate, subfusiform, black, clothed with very fine fuscous-grey silky pubescence, with the base of the antennæ, front of head, and the anterior legs, except more or less of upper margin, yellow or reddish-yellow; the whole of the coxæ are often more or less ferruginous; head very finely punctured, antennæ rather long, with joints 6–10 gradually increasing in length and not moniliform; thorax not much broader than long, narrowed in front, with the posterior angles almost right angles, sculpture very fine; elytra transversely strigose, the sculpture being distinct, but finer than in the allied species and much stronger than that of thorax; tibial spurs testaceous. L. $2\frac{3}{4}$–4 mm.

Male with the antennæ longer than in female, the anterior tarsi with the first joint transverse, slightly dilated, and the second and third joints oblong, strongly dilated; the third ventral segment of the abdomen is narrowly emarginate in the middle, and is furnished with two narrow laciniæ or appendages which are approximate at base, and gradually diverge and curve inwards towards each other at apex; these appendages almost reach the apex of the abdomen.

Female with the antennæ slightly thickened towards apex, abdomen simple.

On flowers of white-thorn, by sweeping among grass, &c.; common and generally distributed throughout the kingdom.

The yellow colour of the front of the head is variable, extending sometimes over a greater and sometimes a lesser extent of surface; a variety occurs on the Continent (*A. lateralis*, F., *nec* Thoms.), in which the yellow colour extends to the front and sides of thorax; I have not, however, seen any British examples.

A. Garneysi, *Fowler.* In size, shape, and general appearance closely resembling *A. frontalis*, from which it may be known by the somewhat longer and more slender antennæ and more evident sculpture, which is intermediate between that of *A. frontalis* and *A. rufilabris*; the legs also are differently coloured, the anterior pair being clear yellow, with the exception of the apex of the femora which is dusky above; the intermediate and posterior femora are also entirely, or almost entirely, yellow, the tibiæ being more or less variegated; the tarsi are fuscous; the antennæ are long and slender with the joints much longer than broad; the thorax is scarcely broader at base than its length from base to apex; the chief difference, however, lies in the male characters; in this sex the third segment is much elongated, and is furnished with two rather stout and widely separated appendages, which are strongly curved

inwards towards one another, and enclose between them an almost circular smooth and shiny space; these appendages reach quite to the apex or extend a little beyond it; the anterior tarsi are not strongly dilated. L. $2\frac{3}{4}$–$3\frac{1}{2}$ mm.

On flowers, &c.; taken in some numbers by Dr. Power at Ditton, Horsell, Cowley, and Claygate, and set aside by him as a new species under the name of *A. variegata*, but never, apparently, described; as, however, there is already a *Mordellistena variegata*, F., I have, in order to avoid confusion, adopted a new name, and called it after the late Mr. W. Garneys, a mutual friend of Dr. Power and myself, to whom I owe the fact that I ever studied Coleoptera at all. Mr. Blatch has, I believe, taken it at Tewkesbury. The only species I can find which may compare with this one is *A. nigripes*, Bris., which also has the ventral appendages in the male strongly divergent and curved, but in this species, as its name implies, the legs are entirely or almost entirely black, the thorax is shorter and the appendages narrower.

A. pulicaria, Costa (*forcipata,* Muls.). Smaller than any of the other black species; in general appearance resembling a small *A. frontalis*, from which it may be known by its lesser size, and the characters of the male, in which sex the laciniæ of the third segment are rather short, straight and parallel, and not curved inwards towards one another at apex; the male characters and the darker legs (the anterior pair alone being mostly yellow, and the rest black) will distinguish it from *A. Garneysi*, and the finer sculpture and less moniliform antennæ will separate it from *A. rufilabris*. L. $1\frac{1}{2}$–$2\frac{3}{4}$ mm.

On flowers, &c.; locally common; Shirley, Mickleham, Esher, Darenth Wood, Chatham, Chingford, Dulwich, West Wickham, Cowley, &c.; Dover; Hastings; Brockenhurst; Glanvilles Wootton; South Wales; Needwood, near Burton-on-Trent; Repton; Northumberland district, Wallington. In Dr. Power's collection there are some very small specimens taken at Esher; the species has not been recorded from Scotland or Ireland, but has probably been overlooked in many localities.

A. rufilabris, Gyll. (*atra,* F.; s.g. *Nasipa,* Emery). Elongate, subfusiform, black, or pitchy black, clothed with brownish or greyish silky pubescence, with the labrum, base of antennæ, and tibial spurs testaceous, and the greater part of the anterior legs, and the posterior pair in part, rufescent or pitchy; antennæ short, moniliform, more strongly so in male than in female; thorax about one-third broader than long, evidently strigose, especially at sides, with the posterior angles somewhat acute; elytra distinctly and comparatively strongly strigose transversely; in some specimens the legs are black or nearly black, and in others the greater part of the head and sides of thorax are pitchy or even reddish. L. $2\frac{1}{2}$–$3\frac{1}{4}$ mm.

Male with the anterior tarsi with the first joint transverse, slightly dilated, and the second and third joints strongly dilated, and with the third ventral segment of the abdomen furnished in middle with two nearly straight laciniæ, approximate at base, and slightly divergent behind, not reaching the apex of abdomen.

Female with the tarsi not dilated, and the abdominal segments simple.

On flowers, &c.; occasionally by beating dead twigs; local, but not uncommon in many districts, although, apparently, often overlooked; Darenth Wood, Leith Hill, Mickleham, Cowley; Portsea; New Forest; Glanvilles Wootton; Sutton Park and Solihull, near Birmingham; Repton, Bretby Wood (on wild cherry blossom); Dunham Park, Manchester; Northumberland and Durham district, Wallington and several other localities; Scotland, common in flowers, Solway, Tay, Dee, Moray, and probably other districts; it is most likely not uncommon in Ireland, and may be considered to be generally distributed, although somewhat local, throughout the greater part of the kingdom.

This species much resembles *A. frontalis*, but may be known by its shorter and stouter moniliform antennæ, and evidently stronger sculpture, as well as by the straighter and narrower appendages of the third ventral segment in the male.

A. melanostoma, Costa (*monilicornis*, Muls.; s.g. *Nasipa*, Emery). Very like the preceding, but less elongate, and distinguished by having the thorax not or scarcely strigose, and the sculpture of the elytra very obsolete, as well as by the fact that the third ventral segment of the abdomen in the male bears no laciniæ, being simple as in the female; the antennæ are rather stout and moniliform, with the second joint small, and joints 5–10 subtransverse; the thorax, moreover, is shorter than in *A. rufilabris*, and has the posterior angles less acute and more nearly right angles; the formation of the antennæ and the absence of ventral appendages in the male will separate it from *A. frontalis*; the colour of the legs is somewhat variable; in the male the fifth ventral segment is split to base, and the anterior tarsi are dilated. L. $2\frac{1}{2}$–3 mm.

On flowers, &c.; one specimen in Dr. Power's collection taken at Darenth Wood on June 3, 1860; many years ago Mr. Crotch expressed it as his opinion that it would occur in Britain; it appears to be found in most of the districts of France, and is rare, according to Thomson, in Norway and Sweden; it is very likely not uncommon in Britain, and may often have been passed over partly through its likeness to *A. frontalis*, and partly owing to the difficulty of determination occasioned by the absence of the appendages in male; the split fifth segment, however, is a good character; Mr. Crotch considers Thomson's character of the nearly smooth thorax and obsoletely strigose elytra to require further confirmation, and adds, as an additional character to separate it from *A. rufilabris*, the fact that the first joint of the anterior tarsi is equal to the second, whereas in the last-named species it is much shorter.

A. Geoffroyi, Müll. (*fasciata*, Forst.; *humeralis*, F.; *biguttata*, Rossi). Black, with a large bright yellow patch at each shoulder, which varies in size and sometimes covers the greater part of the elytra; occasionally there is a small spot also behind the middle of each elytron; the pubescence is more scanty than is usually the case in the species belonging to the genus; antennæ long, somewhat thickened towards apex, not moniliform, black with the base yellow, mouth and palpi yellow; thorax transverse, very finely sculptured; elytra very finely and closely strigose transversely; legs variable, dark or more or less testaceous. L. $2\frac{1}{2}$–3 mm.

Male without laciniæ at apex of third ventral segment of abdomen,

and with the fourth segment produced in the middle behind and the fifth deeply cleft; anterior tarsi moderately dilated.

On flowers, &c.; local and not uncommon in some districts; London district, rather common, Darenth Wood, Mickleham, Penge, Ripley, Forest Hill, Dulwich, Chingford, West Wickham, Chatham, Sheerness, &c.; Dover; Hastings; Portsea; New Forest; Glanvilles Wootton; Bristol; Swansea; Hertford; Cambridge; Norfolk; Suffolk; Midland districts, generally distributed; Lincoln; Whitby; Manchester; Northumberland and Durham district, rare, but widely distributed; Scotland, not common, Solway, Tweed, Forth, and probably other districts.

A. ruficollis, F. Black, thickly clothed with silky greyish pubescence, with the mouth parts, base of antennæ, thorax, and the greater part of the legs reddish-testaceous; the tarsi, apex of tibiæ and sometimes part of femora are infuscate; thorax broader than long, very finely strigose transversely; elytra subparallel, bluntly rounded at apex, rather more strongly strigose than thorax; the antennæ are longer in the male than in the female, and in both sexes are comparatively long; in the latter the penultimate joints are as long as broad, and in the former they are evidently longer than broad; the head is said to be occasionally rufous, but I have seen no British specimens of this variety. L. $2\frac{1}{2}$–$3\frac{1}{4}$ mm.

Male with the third ventral segment of the abdomen strongly and broadly produced and narrowly emarginate at apex, with appendages reaching the fifth segment and curved internally, fourth segment with two smaller appendages; anterior tarsi scarcely dilated.

On flowers of white-thorn; common and generally distributed throughout Eng'and and Wales, but probably less common towards the north, as it appears to be only occasional in Scotland, where it l as hitherto occurred solely in the Solway and Forth districts, although it most likely will be found throughout the southern counties; Ireland, Dublin, Armagh, Belfast, and probably general.

A. flava, L., *v. thoracica,* L. (*flava,* Thoms.; s.g. *Nasipa,* Emery). Elongate, yellow, or yellow-testaceous, with the apical portion of the antennæ, and the breast and abdomen, blackish or pitchy black; elytra variable, in our British specimens pitchy black or pitchy yellow brown; in the type form they are yellow, or yellow with apex broadly or narrowly fuscous; the legs also are variable in colour, being usually entirely yellow, but sometimes more or less fuscous, especially the posterior pair; the antennæ are short, thickened towards apex and with the penultimate joints distinctly moniliform; the thorax is nearly as long as broad, very finely sculptured, with the posterior angles slightly obtuse; the elytra are very finely, but distinctly, strigose transversely; the upper surface is clothed with rather strong silky yellowish pubescence. L. $2\frac{3}{4}$–$3\frac{1}{4}$ mm.

Male with the abdomen without appendages, the fifth segment cleft, and the anterior tarsi dilated.

On flowers, &c.; local, but somewhat widely distributed; London district, not uncommon, Ripley (Surrey), Darenth Wood, Claygate; Thames Ditton; Hastings; New Forest; Devon; Knowle, near Birmingham; Repton; Northumberland and Durham district, apparently rare; Scotland, rare, Solway district.

There is a considerable amount of confusion with regard to this species, and, as far as I know, we only possess as British the variety *thoracica*, L., which has the head and thorax testaceous yellow and the elytra dark; it resembles *A. ruficollis*, but the latter species has the head black; it is possible that the variety of this latter species with the head red, which has not yet been recorded as British, may be standing in some collections under *A. thoracica*; if so, it may be known by its longer antennæ, which are not moniliform, shorter thorax, and the presence of appendages in the male; it is also quite possible that the type *A. flava* may be confused with *A. subtestacea*; the antennæ, however, of this latter species are much longer and not moniliform, with the penultimate joints distinctly longer than broad, and the male characters are different; Mulsant (Coléoptères de France, Longipèdes, p. 110 and 113) much increases the confusion by completely separating *A. thoracica* from *A. flava*, on the ground that the former has the penultimate joints of the antennæ in the male distinctly longer than broad, and in the female scarcely, if at all, transverse; it is obvious, therefore, that Mulsant's *A. thoracica* cannot be the same as the insect which we ordinarily consider as the *A. thoracica* of Linné, and that it stands in fact in the genus *Anaspis* proper, and not in the sub-genus *Nasipa* of Emery, in which the latter author places *A. flava*; Emery (Essai Monographique sur les Mordellides, p. 21, L'Abeille, tome xiv.) refers the *A. thoracica* of Mulsant at all events in part to *A. confusa*, a new species of his own; this is very likely the true explanation of the difficulty, and as it is very probable that this species occurs in Britain (the localities given being Europe boréale et moyenne), it may perhaps be of service to append his description.

(*A. confusa*, Emery (*A. thoracica*, Muls., Longipèd, p. 110 (*ex parte*). —*A. lateralis*, Thoms. Skand. Col. vi. p. 302, ♂).

Black, silky, with the head, thorax, base of antennæ, and legs rufotestaceous, posterior femora usually fuscescent; thorax not one and a half times broader than long; antennæ with the joints gradually and slightly narrowed towards apex, with the penultimate joints feebly subconical in the male, and more distinctly so in the female. L. $2\frac{1}{3}$–$3\frac{1}{3}$ mm.

Male with the third segment of the abdomen produced behind, with the appendages approximate, and nearly straight at base, and slightly curved inwards at apex, passing beyond the apex of the abdomen, fourth segment small, with less conspicuous, depressed appendages, fifth segment foveolate, incised at apex.)

M. Emery is also of opinion that a portion of Mulsant's *A. thoracica* may perhaps have to be referred to his *A. Costæ*, a species of his subgenus *Nasipa*, which closely resembles *A. flava*, but differs in having the fourth segment of the abdomen in the male furnished with appendages, which are longer than in any other species of *Anaspis*, and reach to the apex of the appendages of the third segment;

it also has the thorax a little broader, and the antennæ more evidently moniliform, but these are scarcely appreciable differences.

I have at some length discussed the question of *A. thoracica*, as it will serve to show the difficulties that are to be found in the genus *Anaspis*; if any student would thoroughly take up the question and work it, he might probably add three or four more of the recognized species belonging to the genus to the British list.

A. subtestacea, Steph. Testaceous or fusco-testaceous, with the apex of the antennæ, or the whole of the antennæ, except base, and also the abdomen, and sometimes base and apex of elytra dark; occasionally the abdomen is in part or wholly testaceous; pubescence fine and rather close; antennæ rather long, not moniliform, with all the joints evidently longer than broad; thorax nearly as long as broad, very finely sculptured, posterior angles not obtuse, almost right angles; elytra rather long, somewhat pointed at apex, very finely strigose transversely, the sculpture being nearly as fine as on thorax; legs testaceous. L. 3–3½ mm.

Male characters peculiar, the second ventral segment of the abdomen being furnished with two linear appendages, which are very long; from the apex of the third segment there arises a vertical plate furnished with a tooth beneath, and divided behind into two lobes which reach the apex of the fifth segment; the fourth segment bears two short appendages, and the fifth is deeply cleft and bilobed; the anterior tarsi are dilated.

On flowers, &c.; local, but not uncommon in many districts; London district rather common, Sevenoaks, Darenth Wood, Croydon, Caterham, Shirley, Coombe Wood, Forest Hill, Birch Wood, West Wickham, Crohamhurst, &c.; Suffolk; Hastings; New Forest; Glanvilles Wootton; Devon; South Wales; Tewkesbury; Knowle; Buddon Wood, Leicestershire; Repton, Burton-on-Trent; Dunham Park, Manchester; Northumberland and Durham district, rather uncommon (Bold); not recorded from Scotland or Ireland.

A. maculata, Fourc. (*melanopa*, Forst.; *obscura*, Marsh.; *bipunctata*, Bon.; *pallida*, Marsh.). Pale testaceous, clothed with fine silky yellowish-grey pubescence, with the apex of the antennæ, breast and abdomen black; the scutellary region, a common sutural spot at apex and a round or transverse patch on the disc of each elytron before middle are more or less plainly fuscous; in some specimens the spots before middle are alone present (*v. bipunctata*, Bon.), and in others all the spots are absent (*v. pallida*, Marsh.); the antennæ are considerably thickened towards apex, with the penultimate joints moniliform and transverse or subtransverse; thorax a little broader than long, very finely sculptured, with the posterior angles almost right angles; elytra very closely and finely strigose transversely; legs pale testaceous. L. 2¼–3 mm.

Male with the anterior tarsi dilated, and with the third segment of the abdomen produced in middle and furnished with two appendages which are approximate, and reach the apex of the abdomen; fourth segment short, emarginate in middle; fifth segment foveolate in the middle and slightly emarginate at apex.

On flowers of white-thorn, &c.; it has also been bred from woody excrescences on the trunks of birch trees; common and generally distributed throughout the kingdom.

The chief season for the genus appears to be at the end of May and the beginning of June, when the white-thorn is in blossom; in fact all blossoming trees appear at this season of the year to attract certain of the species in profusion.

RHIPIDOPHORIDÆ.

About fifteen genera and one hundred species belong to this genus; they are widely distributed throughout the greater part of the world, both in tropical and temperate countries, and range from Siberia to South Africa, India, and Brazil; seven genera represented by thirteen species occur in Europe, of which one only is found in Britain; the family forms the second group of Mulsant's Longipèdes, the first group being the Mordellides; some authors have included them in a tribe under the family Mordellidæ; certain of the genera are in the larval state parasitic upon Hymenopterous insects, and *Rhipidius pectinicornis*, a continental species, is parasitic on the orthopterous *Blatta germanica*.

The following are some of the chief characteristics of the family:—Elytra narrow and acuminate, strongly divaricate at apex, not covering the wings; head vertical, strongly constricted behind eyes, which are oval and entire; antennæ 11-jointed (except in certain females in which they are 10-jointed), pectinate or flabellate in the males, often serrate in the females; thorax as broad at base as elytra; scutellum hidden or almost hidden; mesosternum short, metasternum large; legs, as a rule, long, anterior coxæ large, conical, and contiguous, spurs of tibiæ usually distinct; claws bifid at apex.

METŒCUS, Gerstäcker.

This genus contains only one species, which has by some authors been included under *Rhipidophorus* (*Rhipiphorus*); it appears to be very variable, no less than nine varieties being mentioned by Heyden, Reitter, and Weise in the last European catalogue. Besides the characters above given the following may be mentioned for the genus:—Head small, deflexed, almost flat on its upper surface, antennæ inserted on small frontal protuberances between the eyes, which are small; thorax very deeply and broadly channelled in centre, and produced at base into a very strong lobe which covers the large scutellum; intermediate coxæ distant; anterior tibiæ without distinct spurs; tarsi longer than the tibiæ, with large bifid claws; abdomen with six visible ventral segments; the larva of *M. paradoxus* is found in the cells of wasps' nests, and it is probable that the female deposits her eggs in the already formed cells, her abdomen being long and acuminated and suited to the purpose.

The life history of *M. paradoxus* will be found very fully discussed in the Annals and Magazine of Natural History for October, 1870, by Dr. Algernon Chapman, to whom I am indebted for the following observations :—The young larva appears to resemble the young campodeiform larva of *Meloë;* it is a little black hexapod, about $\frac{1}{2}$ mm. in length, broadest about the fourth segment and tapering to a point at the tail; the head is triangular with a pair of 3-jointed antennæ, and the legs are much like those of the larva of *Meloë;* the tibiæ end in two or three claws, which support and are obscured by a large transparent pulvillus or sucker of about twice their length; each abdominal segment is furnished with a very short lateral spine pointing backwards, and the last segment is terminated by a large double sucker similar to those of the legs; the history of the laying of the egg and of the way in which the young larva enters the wasps' nest does not appear as yet to be fully understood, and, as far as I know, no wasp has been observed infested by the larvæ of *Metœcus*, as the *Andrenæ* are by the young *Meloë* larva; we do know, however, that when the young larva in the wasps' nest finds a wasp grub suited to its taste, it makes its way into the interior, probably entering at the back of the second or third segment; after feeding within the larva and largely increasing in size (3 to 4 mm.), it emerges from the body of its victim and casts its skin; after this it becomes shorter and thicker and loses length by the curving forwards of the head, which is very marked in the full-grown larva, and does not exist before its emergence from the wasp's body; at this stage the larva is found lying like a collar immediately under the head of the wasp grub, and it is attached to it by the head, and appears to feed upon its juices; when it has reached a length of 6 mm. it changes its skin for a second time, and gradually the whole of the wasp larva, even to the head and jaws, disappears, being devoured by the voracious parasite; the perfect beetles emerge about two days after the wasps in the same row of cells, and it is a curious fact that the wasps, which appear to investigate everything that appears unusual in the cells, with a view to remove any dead pupæ, are, apparently, quite as satisfied with a living *Metœcus* larva as with one of their own pupæ; the full-grown larva, as described by Dr. Chapman, is very like a *Crabro* or *Pemphredon* larva; it is of a whitish colour, much flattened, especially in front, with a very small head and with the last two segments smaller than the rest, the last being the smallest and apparently divided into two and furnished with a very distinct rounded anal tubercle; several of the other segments are also armed with tubercles, which appear to assist in holding the wasp grub; the length is 11 mm.

The larva of *Rhipidophorus bimaculatus*, F. (*Emenadia larvata*, Schrank.), has been found in the root and stem of *Eryngium campestre*, which it perforates in a vertical direction; the female lays her eggs in the neck of the root, and the larva hatches in March; the insect, when full grown, works its way out of the stem about the end of June, and forms a cocoon, about the size of a nut, attached to the stem, in which it changes to a pupa; the perfect insect appears in July; the habits of this

insect (which has not occurred in Britain) are, therefore, apparently totally different to those of *M. paradoxus;* Professor Westwood, however, is of opinion that the larva may after all be parasitic upon some other larva which resides in the stems of the *Eryngium*.

M. paradoxus, L. (♂ *v. apicalis,* Gradl.). Moderately elongate, rather dull, black, with the sides of the thorax broadly yellow, elytra testaceous with the apex black in male, black in the female; head deflexed, almost flat, closely punctured, antennæ varying in the sexes; thorax a little narrower in front than the head, produced in a strong lobe over scutellum, with a very broad and deep central furrow, which is smooth, sides and other parts closely punctured; elytra very strongly narrowed and divaricate towards apex, closely and somewhat asperately punctured, with the shoulders well marked; legs black, elongate, spurs of tibiæ and claws red or testaceous. L. 10–12 mm.

Male with the elytra testaceous, black at apex, the antennæ bipectinate, the sixth segment of the abdomen conspicuous, and the anterior femora obtusely toothed beneath in middle.

Female with the elytra black, sometimes yellow at shoulders, the antennæ simply pectinate, and the abdomen yellow with the sixth segment not conspicuous.

In the nests of *Vespa vulgaris* and *V. rufa;* rarely found on flowers; rare; Coombe Wood and Godstone, Surrey (Stephens); Cambridge; Netley; Glanvilles Wootton, very rare; Llangollen; Monmouth and Hereford district; Leominster (Mrs. Hutchinson); Redditch; Repton; Scarborough; Selby, near Leeds; Northumberland and Durham district, not common; Scotland, very rare, Clyde and Forth districts.

ANTHICIDÆ.

The characteristics of this family, as here constituted, may be described as follows:—Head rather large, deflexed, strongly constricted at some distance behind the eyes, which are elliptical and entire, and rather coarsely granulated; antennæ filiform; maxillary palpi with the last joint securiform; neck very small, punctiform; thorax narrower at base than elytra, with the sides not margined, narrowed towards base; elytra not striated, pygidium somewhat exposed; abdomen composed of five free ventral segments, the first being much longer than the second; posterior coxæ somewhat distant, intermediate coxæ almost contiguous, but separated at apex; tarsi with the penultimate joints bilobed, claws simple; species small.

The family contains about a dozen genera and between four and five hundred species; of these, however, considerably more than half belong to the genus *Anthicus;* they are very widely distributed throughout the world from Siberia to the Australian region; they appear, however, to occur in greater numbers in temperate than in tropical countries; seven genera, represented by about one hundred and fifty species, occur in Europe; of these two genera and ten species are found in Britain.

I. Thorax prolonged over the head into a stout horn; last joint of antennæ longer . . . . . NOTOXUS, *Geoff.*

II. Thorax not prolonged over the head into a horn; last joint of antennæ shorter . . . . . ANTHICUS, *Payk.*

NOTOXUS, Geoffroy.

The species belonging to this genus may be easily known by the peculiar prolongation of the anterior portion of the thorax over the head into a strong horn,* and the longer last joint of the antennæ; they are about fifty in number, and are very widely distributed, representatives occurring in North America, Siberia and Central Asia, Egypt, Algeria and the Cape of Good Hope, the Australian region, &c.; of the thirteen European species only one is found in Britain; it is a very common insect in sandhills near the coast in many localities.

N. monoceros, L. Moderately convex, clothed with scanty villose whitish pubescence, rather shining, rufo-testaceous, with the head, thoracic horn and more or less of thorax fuscous-black or fuscous, and the elytra with varying black spots or markings; as a rule, the scutellary region, a patch on each side often confluent with this, the middle of suture, and a patch on each side behind middle are black; the markings, however, are very variable, and a not uncommon variety occurs in which the elytra are entirely black except apex; head rather large, narrowed behind, antennæ long, filiform, rufo-testaceous; thorax convex, rounded in front and narrowed behind, with the horn obsoletely serrate at sides, thickly punctured; elytra subparallel, truncate at apex, closely and distinctly punctured; legs moderately long, rufo-testaceous. L. $3\frac{1}{2}$–4 mm.

Male with the thoracic horn more parallel-sided than in the female.

Sandy places; at roots of grass, in moss, &c., both inland and on the coast; somewhat local, but not uncommon and widely distributed; Stephens records it as found in lanes on oaks; I have only found it on sandhills near the sea. London district, not uncommon, Shirley, Wisley, Woking, Richmond, Coombe Wood, Blackheath, Southend, Whitstable; Clacton-on-Sea; Deal; Dover; Hastings; Portsea; Portsmouth; Burnham, Somerset, in profusion; Bristol; Kidderminster; Bewdley; Swansea; Barmouth; Harwich; Cromer; Hunstanton; Mablethorpe, Lincolnshire; Banks of Irwell, Manchester; Liverpool district; Scotland, maritime, Tweed and Forth districts.

ANTHICUS, Paykull.

This is a very large and extensive genus, containing more than three hundred species, which appear to be found in almost all quarters of the world; no less than one hundred and fifty occur in Europe, of which nine are represented in Britain; they are small insects, and at first sight many of them bear a strong resemblance to certain species of ants by reason of their large head and narrow thorax; they are very variable in colour, a large number being unicolorous black or brown, and many being rather brightly variegated with red or yellowish markings; they

* Abnormal specimens occur rarely, in which the horn is divided and forked.

may at once be known from *Notoxus* by not having the thorax produced into a horn over the head, and by the shorter last joint of the antennæ; some of the unicolorous black species are rather difficult to distinguish; the genus is by certain authors divided up into several sub-genera.

I. Anterior tibiæ not produced into a spine at apex externally; tibial spurs small or indistinct (*Anthicus*, i. sp.).
  i. Head rounded at base.
    1. Front of thorax narrower, scarcely as broad as head; sides less strongly narrowed behind . . A. HUMILIS, *Germ.*
    2. Front of thorax broader, at least as broad as, or broader than, head; sides more strongly and suddenly narrowed behind . . . . . A. SALINUS, *Crotch.*
  ii. Head straight or almost straight at base.
    1. Elytra reddish-brown or light brown at base, darker towards apex.
      A. Male with the posterior tibiæ not dilated; elytra rather flat, obsoletely impressed at base A. FLORALIS, *L.* (*v. quisquilius*, Thoms.)
      B. Male with the posterior tibiæ very strongly and spathulately dilated externally at apex; elytra convex, not impressed at base . . . . A. INSTABILIS, *Schmidt.*
    2. Elytra black or brownish-black, unicolorous or with at most an obscurely lighter patch at shoulders.
      A. Form narrower; thorax evidently longer than broad.
        a. Thorax shorter and broader; eyes larger; femora red . . . . . A. ANGUSTATUS, *Curt.*
        b. Thorax longer and narrower; eyes smaller; femora black . . . . . A. TRISTIS, *Schmidt.* (*v. Schaumi*, Woll.)
      B. Form broad and convex; thorax scarcely longer than broad . . . . . A. SCOTICUS, *Rye.*
    3. Elytra black, with distinct and well-defined red markings . . . . . A. ANTHERINUS, *L.*

II. Anterior tibiæ produced into a strong spine at apex externally; all the tibial spurs rather large and quite distinct; size large; colour testaceous, with a small dark spot on each elytron (s.g. *Eonius*, Thoms.) . . A. BIMACULATUS, *Ill.*

A. humilis, Germ. (*nigrinus*, Zett.). Elongate, variable in colour, the upper surface being entirely black or black-brown, unicolorous, or with part of the thorax and one or two bands or patches on each elytron ferruginous red or reddish-testaceous; pubescence greyish, scanty but comparatively coarse; headoval, moderately large, rounded at base, rather strongly punctured; antennæ long, reddish; thorax subcordiform, considerably longer than broad, but scarcely as broad as head, dilated in front and narrowed behind, distinctly punctured, with two well-marked tubercles at base; scutellum triangular, very small; elytra oval, or elliptical, about three times as broad at base as base of thorax, with close and deep punctuation; legs testaceous, femora and more or less of tibiæ dark. L. 2–3 mm.

Salt marshes; running about on wet mud; often beneath seaweed and flood refuse; not uncommon locally; Gravesend, Sheerness, Chatham, Whitstable, Southend; Deal; Portsmouth; Ryde; Lymington; Weymouth.

A. salinus, Crotch. Very closely allied to the preceding, from which it may be distinguished by having the front of thorax broader, at least as wide as, or wider than, head, with the sides more strongly and suddenly narrowed behind, and also by its more delicate and close punctuation; colour unicolorous black, upper surface clothed with grey pubescence; thorax very closely and finely punctured, comparatively dull; elytra more shiny, with the punctuation slightly rugose in parts; legs reddish, with femora pitchy. L. 2–2½ mm.

In salt marshes; very local, and as a rule rare; Gravesend; Chatham; Lymington Salterns (abundant in spring); Overton, Hampshire; Portsmouth district; Portland.

A. floralis, L. Rufo-testaceous, rather shining, with the posterior two-thirds of the elytra, and usually the head and abdomen, dark; the femora and the disc of thorax are also often more or less infuscate, so that the general colour is sometimes dark with the base of elytra, antennæ, tibiæ and tarsi reddish; head straight or almost straight at base, very finely punctured; antennæ comparatively stout; thorax in front about as broad as head, finely punctured, with two small tubercles in the middle of its front portion separated by a more or less distinct furrow which extends for a greater or less length on the disc of the thorax; elytra much broader at base than base of thorax, closely and finely punctured, the punctuation being evidently finer than in most of the allied species. L. 3–3½ mm.

Male with the pygidium convex and exserted.

In haystack refuse, manure heaps, hotbeds, &c.; often in gardens; generally distributed and common throughout England and Wales; it is probably generally distributed in at least the southern half of Scotland, but has only been recorded as yet from the Forth district; Ireland, Dublin and Belfast, and probably general.

V. quisquilius, Thoms. (*basilaris*, Say.). This variety, which by Thomson and other authors is considered a separate species, differs from the type in being less shining, and considerably more closely punctured, and especially in having the two tubercles on the front of the thorax absent; in other respects it almost exactly resembles the ordinary form; as it occurs with the type and appears to be quite as common and generally distributed, and as, besides, the size of the tubercles in *A. floralis* appears to be variable, I cannot but think that it must be regarded as only a variety.

A. instabilis, Schmidt. Fuscous, pitchy-brown, or dark red-brown, with the elytra lighter towards base; the colour, however, is variable, as in the preceding species, and the specimens are lighter or darker; pubescence greyish, coarser and more distinct than in several of the allied species; head with the base slightly rounded, but not nearly as

much so as in the two first species, rather distinctly punctured, with a smooth line in middle behind; antennæ moderately long and slender, red; thorax in front at least as broad as head, much narrowed behind, distinctly and not very closely punctured; elytra oval, broadest about middle, comparatively strongly punctured, with the shoulders almost rounded; femora dark, tibiæ and tarsi reddish-testaceous. L. 3–3¼ mm.

Male with the posterior tibiæ very strongly and spathulately dilated externally at apex.

Salt marshes; in refuse, &c.; often beneath decaying seaweed; locally common; Gravesend, Southend, Sheerness, Whitstable; Margate; Hastings; Sandown; Southampton; Wivenhoe.

A. angustatus, Curt. Pitchy or dark brown, with yellowish pubescence which is very distinct and rather coarse; head comparatively long, rounded at base, somewhat produced before eyes, rather strongly punctured, with a smooth, more or less interrupted, central line; antennæ moderately long, red; base of head and thorax often red or reddish, disc of latter dark; the colour, however, is variable; thorax obovate, about as wide in front as head, and thence gradually and slightly narrowed behind, distinctly punctured; elytra subparallel, closely and rather strongly punctured; legs red, femora scarcely darker; the entirely red legs and the obovate shape of the thorax will distinguish this species from all our others except *A. scoticus*, from which it may be known by the narrower and more parallel form and evidently longer thorax; it is very distinct and easily separated from our other members of the genus, but I am not at all sure that it is not synonymous with one of the many allied European species. L. 2–2¾ mm.

Salt marshes, and on the beach under seaweed; rare; Gravesend; Southend; Wrabness (Essex); Hastings; Portsmouth district; Ventnor, Isle of Wight (rare on the beach); Portland; Bristol.

A. scoticus, Rye. Leaden black, dull, thickly clothed with rather shining greyish pubescence, antennæ and legs lurid-testaceous or almost entirely pitchy; head broad, with the base truncate, strongly and closely and somewhat rugosely punctured, with an impunctate central line; thorax short and broad, almost transverse and subglobose, closely punctured, but not so strongly as head; elytra much broader than thorax, truncate at base, comparatively short and broad, with close, rather strong, and in some places almost confluent punctuation; the species is closely allied to *A. angustatus*, but may be easily known by its broader and stouter build, the shorter thorax, and the generally darker colour of the upper surface, legs and antennæ; the colour appears to be variable, as my single specimen has the legs and antennæ entirely red, and the base of the elytra towards shoulders with a tendency to become obscurely reddish. L. 2½–3 mm.

Very local; Scotland, Forth, Clyde, and Dee districts; Paisley (Morris Young);

Ruchills near Edinburgh and Aberdeenshire (A. Murray); Loch Leven (Boswell Syme, Waterhouse and Power).

A. tristis, Schmidt; *v. Schaumi,* Woll. (*ater,* Steph. ?). Rather elongate and narrow, moderately shiny, pubescent; head slightly rounded behind, as long as broad, finely punctured, eyes small, antennæ rather long; thorax considerably longer than broad, gradually and rather strongly narrowed behind, more distinctly punctured than the head; elytra long, oblong-ovate, with sides slightly rounded, closely and rather strongly punctured; legs rather stout, femora thickened; in the type form of *A. tristis,* which does not occur in Britain, the colour is pitch-black, with the antennæ, base of thorax, and a humeral patch and a fascia behind middle on each elytron, red or reddish; the antennæ also and the legs, except femora, are red; the insect is very variable in colour, but only the *var. Schaumi* appears to occur in our country; this is black with an obscure reddish patch, often obsolete or almost wanting, at each shoulder, the antennæ are often fuscous towards apex, and the tibiæ are occasionally more or less dark, as well as the femora; in general appearance this variety much resembles *A. angustatus* and *A. salinus,* but the shape of the head, which is much less narrowed behind, and the much closer punctuation of the elytra will easily distinguish it; the shape of the thorax, which is rather strongly cordiform, will serve to separate it from *A. angustatus;* the antennæ seem to be somewhat variable in length in different specimens. L. $2\frac{1}{2}$–3 mm.

Salt marshes; very local, but occasionally in numbers where it occurs; Lymington Salterns (Blatch); Portland; Chesil Beach (abundant, Walker and others); some authors identify it with the *S. ater* of Stephens, which he records as from hedges, and as found in the London district, Wrabness Essex, Bristol, Southend, and the Isle of Portland; as far, however, as I know, it is exclusively a coast species.

A. antherinus, L. A very pretty and conspicuous species; rather robust, dull, thickly clothed with greyish pubescence, black, or pitch-black, with the base of the antennæ and more or less of tibiæ and tarsi ferruginous or pitchy brown; elytra with a large spot near shoulder and an oblique band behind middle red or yellowish-red; the latter is generally extended upwards and downwards along suture; the markings are, however, somewhat variable, and rarely the posterior band is absent; head large, thickly punctured, almost straight at base, very closely and finely punctured, eyes depressed; antennæ long and rather stout; last joint of maxillary palpi securiform; thorax comparatively short, subcordiform, gradually and not strongly narrowed behind, very closely and finely punctured as head; elytra long and rather broad, with the sides moderately rounded, closely and distinctly and somewhat rugosely punctured, the punctuation becoming obsolete behind; legs robust, with the femora dilated. L. 3–4 mm.

Male with the head and thorax broader, and the femora more strongly dilated, especially the posterior pair, which are almost always terminated

at base with a little spine; according to Thomson the anterior and posterior trochanters are slightly prominent in the form of a tooth.

In moss, haystack and vegetable refuse, decaying seaweed, &c.; often by sweeping hedges, &c., in early summer; somewhat local, but generally distributed, and, as a rule, common from the midland counties southwards; much rarer further north; in fact I know of no record from any place in England north of Repton, Burton-on-Trent, nor has it been recorded from Scotland; it probably occurs in Ireland.

A. bimaculatus, Ill. (*Eonius bimaculatus*, Thoms.). Larger and more convex than any of the preceding species; pale testaceous, rather dull, clothed with fine whitish pubescence, with the metasternum and abdomen, and a small spot on each elytron behind middle near suture fuscous; the elytral spots are sometimes obsolete or almost absent, and sometimes are enlarged and meet at suture; head broad and rather large, rounded behind, very finely and closely punctured, with a more or less distinct smooth raised central line; eyes black, moderately prominent; antennæ rather long, reaching to middle of body; thorax short, cordiform, as broad at least as the head, and about as broad as long, very closely and finely punctured; elytra oval, broad, and very convex, slightly narrowed behind, punctuation very close, but not so fine as on thorax; legs moderately long, with the femora somewhat dilated. L. 4–5 mm.

On sandhills; very rare; first taken by Mr. J. Chappell at Southport, Lancashire, in the summer of 1859, and afterwards by Mr. Harris, of Burton-on-Trent, at Wallasey, Cheshire, in the same district; it has occurred very sparingly.

XYLOPHILIDÆ.

Although I feel very averse to multiplying tribes and families more than can be possibly helped, I have, after much consideration, adopted this family of Thomson's, to include the genus *Euglenes*, Westwood, which is now apparently considered as synonymous with *Xylophilus*, Latr., and is divided by Mulsant and other authors into the genera *Olotelus*, *Anidorus*, *Euglenes*, and *Aderus*; Lacordaire classes the genus with the Pedilidæ, but certain modern writers place it with the Anthicidæ; the Pedilidæ, as ordinarily constituted, are, at the best, a very weak family; the Pedilina bear a rather strong affinity to the Anthicina in the fact of having the head strongly constricted at a considerable distance behind the eyes and in other points, but it must be admitted that they differ in certain other particulars, and approach the Xylophilidæ in their more or less emarginate eyes and in having the hind coxæ approximate; Dr. Horn and Dr. Leconte solve the difficulty by including under the Anthicidæ all the Anthicites and Pedilides of Lacordaire, with the exception of *Scraptia*, which they place under the Melandryidæ; if, however, *Scraptia* is to be placed under the latter family, then *Euglenes* certainly ought to follow suit, especially as through

its mouth organs it is allied to *Conopalpus*, and still more closely to *Osphya*; the Xylophilidæ, however, possess one striking peculiarity which separates them from *Scraptia* and from all the allies with which they have been associated, and that is the extremely small and simple penultimate joint of the tarsi, which is concealed between the strong lobes of the antepenultimate joint, so that the tarsi at first sight appear to be 4-4-3-jointed; the first two segments, moreover, of the abdomen are connate; the intermediate coxæ are slightly and the posterior more broadly distant; the head is suddenly constricted immediately behind eyes which are large, kidney-shaped, and coarsely granulated; the antennæ are filiform, rarely serrate or flabellate, long or very long, inserted in a slight sinuation of the eyes; the thorax is much narrower at base than the elytra, and has the sides unmargined; the legs are rather slender, and the tibiæ are furnished with small spurs; the claws, which are toothed in the Pedilina, are simple.

(After I had sent the first part of this volume to the press, Mr. Champion kindly sent me a proof of the part of the "Biologia Centrali-Americana" containing the Xylophilidæ; I was much pleased to find that he also had separated the family as distinct on just the same characters that I had made use of, viz. the fact that the first two segments of the abdomen are connate, and the structure of the tarsi; I have not in any point altered the above remarks on the family, which I wrote about two years ago (in 1888), but I have been enabled to add several particulars regarding the distribution, &c., of the genus, for which I have adopted the name *Xylophilus* instead of *Euglenes*, following Mr. Champion in preference to certain European authorities: Mr. Champion remarks that "many authors place *Xylophilus* and *Scraptia* in the same group or family; but these genera are not closely allied, though they have the head very similarly formed.")

XYLOPHILUS, Latreille. (*Euglenes*, Westwood.)

The characters given above will serve to distinguish the genus, but the peculiar shape of the maxillary and labial palpi must be noticed, as they have the last joint much enlarged and widened, and almost cyathiform or cup-shaped. I cannot, however, say whether this has been found to be a character universal in all the species that have been discovered; the antennæ have the second joint small; the posterior femora are flattened beneath, and the posterior tarsi have the first joint longer than the rest taken together; the genus contains at present just about a hundred species, of which twenty-three occur in Europe, thirty-six in Central America, sixteen in the United States, and the remainder in Algeria, Japan, Ceylon, the Australian region, &c.; the Central American species have recently been described by Mr. Champion, who says that no species belonging to the genus has hitherto been described from America south of Texas or Florida, and that of the thirty-six species discovered by him nearly two-thirds are represented by single specimens only; it is therefore probable that at least double this number inhabit Central America, and that most likely they are especially abundant in the northern part of South America; Mr. Champion says,

"The rarity of these insects is well known; they require special working for, and are not often obtained by chance collecting. So far as my own observations go, they are chiefly found in oak-woods at elevations of from 3000 to 8000 feet; a considerable number of those collected by myself were beaten from the decaying branches of oak." The earlier stages of the *Xylophili* are apparently passed in rotten wood.

I. Antennæ with the second and third joints small, transverse, about equal in length; eyes nearly reaching posterior margin of head	X. POPULNEUS, *F.* (*pygmæus*, De G., *nec* Muls.)
II. Antennæ with the third joint plainly longer than second, especially in the male.	
i. Eyes scarcely emarginate, separated by a distinct interval from posterior margin of head; thorax about as long as broad	X. NEGLECTUS, *Duv.*
ii. Eyes plainly emarginate, nearly reaching posterior margin of head; thorax broader than long	X. OCULATUS, *Gyll.* (*pygmæus*, Muls., *nec* De G.)

X. populneus, F. (*pygmæus*, De G., *nec.* Muls.; *boleti*, Marsh.). Testaceous with the head and abdomen fuscous, dull, obsoletely punctured, clothed with rather thin pale pubescence, with a patch towards base of elytra and a fascia about middle more or less denuded; head with eyes as broad as or a little broader than front of thorax; antennæ varying in the sexes; thorax transverse, usually with a curved impression at base; elytra much broader at base than thorax, with the shoulders well marked, subparallel, rounded behind; legs moderately long, testaceous. L. $1\frac{1}{2}$–2 mm.

Male with the antennæ longer than half the body, joints 4–10 plainly longer than broad.

Female with the antennæ shorter than half the body, joints 4–10 subquadrate.

In old trees, dead hedges; also on flowers, &c.; not common; Dulwich, South Lambeth, Putney, Ripley, Stockwell, Darenth Wood, Lee, Lewisham, Finchley, Wanstead, Weybridge, Horsell, Loughton, Sheerness, Southend; Birch Wood, beaten out of old oaks (S. Stevens); Eynsham, Oxon.

X. neglectus, Duv. (*nigripennis*, Villa). Testaceous or reddish-yellow, with the under-side, except prosternum, fuscous, and the elytra slate-coloured, except the shoulders and hinder portions which are reddish-yellow; it may be known from *X. populneus* by the longer third joint of the antennæ and longer thorax, and by having a distinct space between the eyes and the posterior margin of the head; from *X. oculatus* it may be separated by the two latter characters, as well as by having the eyes scarcely emarginate, and also by the general colouring. L. $1\frac{1}{2}$–2 mm.

Old wood, &c.; extremely rare; Wandsworth (Waterhouse); New Forest (two specimens, Crotch, one specimen, Power); I believe that it has also been taken in the latter locality by Mr. Janson.

X. oculatus, Gyll. (*pygmæus*, Muls., *nec* De G.). Head and thorax fuscous black, the latter sometimes brownish, elytra fusco-testaceous; pubescence pale, fine and rather thin; punctuation close, more distinct on elytra than on thorax; head together with eyes broader than front of thorax; eyes distinctly, but not deeply, emarginate; thorax transverse, impressed on either side at base with a transverse, somewhat curved furrow; elytra subparallel, rather plainly and rugosely, but very closely, sculptured; antennæ and legs ferruginous or reddish-testaceous. L. $1\frac{1}{2}$–2 mm.

Male with the antennæ very long, longer than the whole body, with the third joint twice as long as second; the anterior tibiæ are terminated by a short hooked spine, and the posterior femora are somewhat thickened.

Female with the antennæ short, scarcely longer than half the body, with the third joint a little longer than second; tibiæ and femora simple.

In decaying white-thorn, oak, willow, &c.; very local and, as a rule, rare; Lee (Douglas and Scott); Forest Hill; Woking; Claygate, Esher, Horsell, Birch Wood and Purley (Power); Birch Wood (S. Stevens); Windsor and Suffolk (Stephens); Devon; Sherwood Forest; Dunham Park, Manchester (Chappell).

MELOÏDÆ (*Cantharidæ*).

This family contains some of the most interesting and at the same time we may say the most useful of the Coleoptera; there is nothing hardly, more strange to be found in the history of insects than the transformations of *Meloë* and *Sitaris*, and medicine is much indebted to the genera *Lytta* (*Cantharis*) and *Mylabris* for their vesicatorial or blistering qualities, for which even in these days no effectual substitute appears yet to have been discovered; the family is rather a large one, containing upwards of fifty genera and a thousand species, which are very widely distributed throughout the world, from Siberia to the Cape of Good Hope, India, Chili and Peru, and the Australian region; the majority of species, however, occur in the tropics or the adjacent countries; some of the genera are very extensive in point of numbers, *Mylabris* and *Lytta* (*Cantharis*) each containing between two and three hundred species; there has been considerable confusion caused as to the nomenclature of the family by the fact that Linnæus applied the term *Cantharis* to *Telephorus*, although the name had been used for the blister beetle for a long time previously in medicine; several modern authors, moreover, apply the name *Mylabris* to *Bruchus*, and substitute *Zonabris* for *Mylabris;* it is perhaps the best course to adopt the term Meloïdæ for the family instead of Cantharidæ, and to drop the term *Cantharis* altogether, but the change of name as regards *Mylabris* cannot without great difficulty and confusion be admitted. The members of the family Meloïdæ differ considerably from one another in shape, colour, and general appearance; the following are the chief characters which they possess in common :—Head vertical, strongly and suddenly

constricted at some distance behind eyes, which are variable and finely granulated; antennæ 11-jointed (in our genera), inserted before the eyes at the sides of the front; thorax narrower at base than elytra, not margined, prosternum short; elytra variable; abdomen composed of six free ventral segments; legs long or moderately long, with distinct tibial spurs; tarsi compressed, with the penultimate joint not bilobed, and with the claws split; larvæ in several species assuming successively several forms, "in the first of which it is a very small active Pediculus-like parasite infesting bees of different genera, and is called a triunguline" (Horn and Leconte).

The family is divided into two tribes by some authors, but as *Sitaris* seems to be in several respects a connecting link between *Meloë* and *Lytta*, it seems best not to divide them too sharply. Sixteen genera and about one hundred and sixty species occur in Europe, of which three genera, represented by nine species, are found in Britain.

I. Side pieces of meso- and metasternum covered by the elytra, the inflexed portion of which is very broad; elytra abbreviated and imbricate; metasternum short . . . . MELOË, *L.*

II. Side pieces of meso- and metasternum not covered by the elytra, the inflexed portion of which is narrow; metasternum long.

i. Elytra short and narrow, almost rudimentary, strongly divaricate . . . . . SITARIS, *Latr.*

ii. Elytra long, covering abdomen, parallel-sided and not divaricate . . . . . LYTTA, *F.*

MELOË, Linné.

This genus contains rather more than seventy species, the majority of which are found in cold and temperate countries; species have, however, been described from Northern Africa, Madeira, Madagascar, Mexico, &c.; they are large and conspicuous insects, with a peculiar facies, and may easily be known by the crumpled-looking divaricate and imbricate elytra and exposed abdomen, which is often extremely enlarged in the female and contains thousands of eggs; the antennæ are thick, submoniliform, and more or less strongly thickened in middle in some species; the head is large with the eyes small; the thorax is small, being often narrower than the head; the elytra are broadly inflexed over the side pieces of the abdomen, and the metasternum is short; the species vary in size, the females being usually much larger than the males, and the colour also is more or less variable; they are extremely sluggish in their motions.

The transformations of *Meloë* are described by Thomson (Skand. Col. vi. 340), and notices of the young larva have been given by many authors; Kirby described it as *Pediculus melittæ*, Dufour as *Triungulinus tricuspidatus*, and Newport published an important monograph on the question of its changes, with plates, in the Transactions of the

Linnean Society, vol. xx.; a figure of the young larva of *M. cicatricosus* is given by Chapuis et Candèze (Larves des Coléoptères, pl. vii. fig. 6), and of this same or another species by Westwood (Classification, i. f. 296, 21); I have three of them before me as I write, which were kindly given me by Dr. Sharp, who found a number of them two or three years ago; they are extremely small, orange-yellow insects, something like a large *Ptinella* at first sight, elongate and subparallel, with a large head, and with the thoracic segments much longer than the abdominal segments; these latter are widest at the fourth and are very gradually narrowed towards the apex, which is terminated on each side by two very long hairs which are nearly as long as the abdomen; the legs are very long (a peculiarity to which the insect owes its great activity), and terminate in a single claw on each side of which there is a slender hook-like process, so that the apex of the legs appears trifid; this contrivance enables the larva to cling tight to the bee to which it has gained access; these larvæ are slow in their motions when hatched, but soon grow active, and if a hair be presented to them they spring upon it with great rapidity. Mr. Rye has given a good account of the history of the larva (British Beetles, 1st Edition, p. 169), which may with advantage be here quoted; it is apparently taken from the same source as Thomson's account:—"The female of *Meloë* deposits from two to four separate batches of minute yellow eggs, some thousands at a time, though the number diminishes with each laying. These eggs are glued together, and deposited in small holes in the ground, dug by the parent beetle. After an interval of from three to six weeks the young larvæ above described hatch out; they appear to remain torpid for some time; but when once roused by sufficient warmth, exhibit extraordinary activity in traversing low plants, chiefly *Ranunculaceæ* or *Chicoraceæ*. From these they attach themselves, often in great numbers, to the hairy covering of bees as they settle on the flowers of their temporary lodgings; and also, sometimes, to certain hairy *Diptera*, or two-winged flies, which closely resemble wild bees. In the latter case it is an unfortunate attachment for the larvæ, as the *Diptera* make no nest or provision for their offspring, so that the would-be parasite necessarily perishes of starvation; and it is probably the chance of this, added to the many fortunate contingencies required before the larvæ can be safely landed within reach of their food, that causes such an enormous number of eggs to be laid by the parent beetle. When carried by the unconscious bee to its nest, the *Meloë* larva devours the eggs therein contained, changes (without leaving the cell of the latter) into a second form,—not unlike the larva of a Lamellicorn beetle in miniature, being arched, cylindrical, with toothed mandibles and stout legs,—and then subsists on the food intended by the bee for its own young. After some time this second form of the larva changes its outer covering, which is not entirely shed, but remains wrinkled together at the hinder apex of its body: it is then arched, distinctly composed of thirteen segments,

attenuated at the extremities, and motionless. From this 'false pupa' (and probably after passing the winter) a third form of the larva appears similar to the second;" after this, however, we know no further: we can only judge from the analogy of *Sitaris* that it changes into an ordinary pupa, from which the perfect insect emerges; the curious fact, however, is, that the large unwieldy imago is usually found on a common or meadow or hedgerow far away apparently from any bees, and that we have no idea how it makes its way to these situations from the nest in which it must have undergone its final transformation: another curious fact about the genus is that certain species appear in large numbers in a certain place, and then as suddenly disappear; this has been observed by Mr. Champion in the case of *M. cicatricosus;* if a number are confined together, they attack and mutilate each other with considerable violence. Of the twenty-eight species which are found in Europe, seven occur in Britain; one only can be called common, and several are extremely rare and have only been met with in one or two localities; they may be distinguished as follows:—

I. Antennæ thickened in middle, distorted in the male (e.g. *Cnestocera*, Thoms.).
  i. Thorax at least as long as broad; elytra wrinkled or shagreened.
    1. Head and thorax more coarsely and closely punctured; thorax without distinct transverse impression at base; colour blue black . . . . . M. PROSCARABÆUS, *L.*
    2. Head and thorax less coarsely and rather diffusely punctured; thorax with a distinct transverse impression at base; colour rather bright blue . . . M. VIOLACEUS, *Marsh.*
  ii. Thorax a little broader than long; head and thorax with fine scattered punctures; elytra punctured . . M. AUTUMNALIS, *Ol.*
II. Antennæ not thickened in middle, and not distorted in male (*Meloë*, i. sp.).
  i. Head not much broader or larger than thorax.
    1. Colour blue-black, not metallic . . . . . M. CICATRICOSUS, *Leach.*
    2. Colour, especially of thorax, more or less metallic M. VARIEGATUS, *Donov.*
  ii. Head much broader and larger than thorax, which is very small
    1. Thorax closely and rugosely punctured, with sides not rounded . . . . . M. RUGOSUS, *Marsh.*
    2. Thorax diffusely and simply punctured, with sides rounded . . . . . M. BREVICOLLIS, *Panz.*

M. proscarabæus, L. Black, with a slight bluish or violet reflection; antennæ and legs bluish-black; head broader than thorax, with anterior and posterior margins straight or almost straight, strongly and somewhat rugosely punctured; thorax subquadrate, with more or less obsolete impressions on disc, punctuation much the same as that of head; elytra short, rugose; abdomen very thickly and finely rugose; legs stout. L. 12–42 mm.

Male with the sixth and seventh joints of the antennæ dilated and compressed, and more or less angularly inflexed; the elytra also in this sex are comparatively longer.

Found crawling about on heaths and commons, meadows, grassy banks, roadsides, pathways near the coast, &c., especially in early spring; common and generally distributed throughout the greater part of England, but less common further north; Scotland, not common, Solway, Forth, Clyde, Tay, Dee, and Moray districts; Ireland, near Dublin, and probably widely distributed.

V. cyaneus, Muls. This variety, which was considered by Mulsant to be a separate species, is usually smaller than the type form, with a purplish-violet metallic head and thorax, the punctures of which are not so coarse, and with less rugose elytra; the base of the thorax is almost straight, whereas in the type form it is evidently, although feebly, emarginate, and there is a more or less evident longitudinal depression on the thoracic central line behind the middle; from *M. violaceus* this insect may be known by the decidedly shorter thorax (of which the base is not nearly so deeply emarginate, and has no transverse channel), the black elytra and body, and the more metallic head and thorax.

Rare; Isle of Man (Rev. R. P. Murray); Sutton, near Birmingham (Mr. W. G. Blatch).

M. violaceus, Marsh. (*rufipes*, Bremi). Closely allied to the preceding, from which it may be known by being entirely of a bright bluish or violaceous colour, and the less coarse and more diffuse punctuation of the head and thorax; the latter is also quite differently shaped, being longer and narrower, gradually rounded in front and narrowed behind, and furnished at base (which is rather strongly emarginate) with a distinct transverse impression; the elytra are rather shallowly rugose; the male characters are the same as in *M. proscarabæus*. L. 12-36 mm.

Roadsides, commons, heaths, &c., in early spring; local and much less common than the preceding species, and in some districts decidedly rare; London district, rather common, Mickleham, Caterham, Esher, Chatham, Strood, Cowley, Reigate, &c.; Dover; Hampshire; Glanvilles Wootton; Swansea; Barnwood, near Gloucester; Sutton and Knowle, near Birmingham; Repton, Burton-on-Trent; Withington and Barton, Cheshire; Scotland, rare, Dee and Argyle districts; Ireland, Dublin, Wicklow, Belfast, &c.

M. autumnalis, Ol. Bluish, bluish-green or blue with various reflections, smooth, shining, and sparingly punctured on head and thorax, the latter about as long as broad, rounded for its anterior fourth part and thence subparallel to base; posterior angles blunt, base broadly emarginate, with a transverse furrow before margin, disc with a longitudinal central furrow; elytra with scattered punctures which are larger and more shallow than those of thorax, and are sometimes more or less rugose; legs more or less metallic, moderately stout. L. 8–14 mm.

Male with the antennæ longer than in female, and joints 3–7 of the antennæ gradually more compressed than in the preceding; last ventral segment of abdomen truncate and subemarginate.

On grassy banks, pathways, &c.; especially near the coast; in the autumn; very

rare; Dartford (Stephens); Ramsgate (Newman); Exmouth and Tavistock, Devon (Stephens); Cambridge (Power).

M. cicatricosus, Leach. Head and thorax black or bluish black, elytra bluish black; head and thorax closely and strongly punctured, the intervals being closely rugose; antennæ rather long and stout, not thickened in middle; thorax about as broad as head, evidently broader than long, with the anterior angles pronounced and raised, the sides subparallel, and the base broadly emarginate and furrowed before margin; there is a fine central line on disc and on either side towards margin a rather deep fovea; elytra with closely set flat shining tubercles, the intervals between these being closely rugose; abdomen finely rugose; legs rather long and stout, bluish black or black. L. 12–32 mm.

Male with the antennæ longer than in female, and the last ventral segment of the abdomen semicircularly emarginate.

Grassy banks, &c.; near the coast; in early spring; extremely local, but sometimes abundant where it occurs; Southend; Margate and St. Peter's, Kent (T. Wood); Ramsgate (in great profusion, Champion); Deal (Syme); Dover (C. G. Hall); Mr. Champion has remarked that the species is only to be found while the sun is out, and that if cloudy not a specimen will be seen: it seems strange that such large and conspicuous insects can so soon disappear without leaving a trace behind them of their place of refuge.

M. variegatus, Donov. Of an obscure metallic greenish colour, with the margins of head and thorax coppery red, and the abdomen with the segments more or less coppery red at apex; the reflections are more or less greenish, coppery or violet; head and thorax very closely and rugosely punctured, the punctuation being strong and more or less confluent; thorax longer than broad, with the sides subparallel and the base broadly emarginate; elytra sculptured in rough flat tubercles, the interstices being closely rugose; abdomen rugose; legs robust, bright coppery red. L. 14–30 mm.

Male with the last ventral segment semicircularly emarginate.

Female with the last ventral segment angularly emarginate in the centre and curved on each side of the emargination.

On grassy banks and pathways near the coast in early spring; very rare; Isle of Thanet, between Broadstairs and Ramsgate (Stephens); Ramsgate (T. Wood); Margate (three specimens in 1882, T. Wood); Dover (C. G. Hall).

M. rugosus, Marsh. (*rugulosus*, Brull.). This and the succeeding species may be known by their comparatively small size and narrow transverse thorax, which is considerably shorter than the head; dull black or greyish black, with the head and thorax closely and very coarsely punctured, the former large and the latter small and transverse; antennæ comparatively slender, rather long; thorax with the angles rounded, slightly narrowed behind, broadly emarginate at base, slightly furrowed before basal margin; elytra very coarsely coriaceous or rugose with the intervals finely wrinkled; legs long and comparatively slender, black or pitchy red. L. 10–18 mm.

Grassy banks, &c.; in the vicinity of nests of *Anthophora;* very rare; Southend (Smith and Gorham); Prittlewell, Essex (Power); meadows near Margate (Stephens); Broadstairs (T. Wood); Tavistock and Exmouth, Devon (Stephens); a specimen was some years ago brought to a friend of mine from a southern locality by one of his clerks, who said that it was abundant in the place in which he discovered it; as he was not a Coleopterist he only brought back one specimen; the species like *M. cicatricosus* is probably gregarious.

M. brevicollis, Panz. A very distinct species, short, broad and convex, black-blue, or dark-blue, or nigro-violaceous, glabrous and rather shining; head large, rather deeply and diffusely punctured, antennæ short and stout, thickened towards apex, with joints 4–8 transverse; thorax very short, much smaller than head, strongly transverse, with sides and angles rounded, diffusely punctured, strongly depressed towards base, which is broadly emarginate, disc with a fine central furrow; elytra coarsely, rugosely and rather shallowly sculptured; abdomen very finely rugose; legs rather stout, blue black. L. 10–20 mm.

Sandy heaths; very rare; Dartford (Spiers); Ockham Heath, near Ripley (Surrey); Christchurch, Tavistock, and Windsor (Stephens); Frensham, near Boundstone (Surrey), in May, Reigate Heath, Faversham, Plymouth and Cornwall (Power); Chobham (Saunders); Weymouth (Harris); Glanvilles Wootton (Dale); Plymouth (Bignell).

SITARIS, Latreille.

This genus contains thirteen species, which, with one exception, are found in Europe; one occurs in Algeria; the following are their chief characteristics:—head large, antennæ rather short and stout and gradually thickened towards apex, inserted before eyes; behind the eyes, which are transverse and slightly emarginate, the head is a little dilated and then suddenly constricted; thorax narrower than elytra; scutellum large; elytra broad at base, but becoming rapidly narrow and attenuated, strongly divaricate and disclosing the wings which are ample; legs moderately long.

The transformations of this genus are very interesting, and have been carefully worked out in the case of *S. muralis* by M. Fabre (Ann. des Sci. Nat. sér. 4, tome vii.); his figures and the chief part of his description will be found in Sir John Lubbock's work on "the Origin and Metamorphoses of Insects," (Nature Series, 1874) pp. 30–33; the changes appear to be much the same as in the case of *Meloë;* the small larva, which, in its active state, has to fasten itself upon the bee, of which the insect is a parasite, differs very considerably from the small *Meloë* larva, being shaped like an elongate peg-top, with the greatest width at the metathoracic segment; the head is large and subquadrate, and the antennæ, which are very short in *Meloë*, are very long and slender; the apex of the body is terminated by two long and fine setæ; the legs are shorter than in the larva of *Meloë*, but are evidently formed on the same analogy, their inner side being set with strong setæ, and each of the femora bearing a fine seta, which is almost as long as the femur and

tibia together; the claws are long sharp and simple; this arrangement evidently answers the same purpose as the apparently trifid claw of the *Meloë* larva; the perfect female deposits her eggs at the entrance of the galleries of certain mason bees belonging to the genus *Anthophora;* the young larvæ hatch out at the end of September or beginning of October; they remain in a sort of lethargic state until the following April, without taking food and without changing either in form or size; at this time, however, they become more active, and attach themselves to the male *Anthophora,* which emerge from the pupæ sooner than the females; it is a very curious fact that some sort of instinct seems to teach them that they are wrong, and, watching their opportunity, they pass from the male to the female bee; M. Fabre, on examining several cells of the *Anthophora,* found that in some the egg of the bee floated by itself on the surface of the honey; in others on the egg, as on a raft, sat the larva of *Sitaris;* evidently then at the moment the egg is laid the parasitic larva springs upon it; the egg is devoured after eight days, and on the empty shell the *Sitaris* undergoes its first transformation, and the slim active larva changes into a white fleshy grub, with the under side so much inflated and distended that it floats easily on the honey with its spiracles raised above it and its mouth just resting on the surface; in this state it remains until the honey is all consumed; it then contracts and changes into a state called by M. Fabre a pseudo-pupa or false chrysalis; its shape in this condition is oval, and it has a solid corneous envelope, and in colour, consistency, and immobility somewhat resembles a Dipterous pupa; it remains in this state for a varying time and then assumes the form of an ordinary fleshy larva, with the upper surface convex, the spiracles on the lower side of the body, and the head and short antennæ and legs distinct; after all these changes it turns into a pupa of much the ordinary type, and in the month of August the perfect insect makes its appearance, having taken nearly two years to pass through all these transformations.

S. muralis, Forst. (*humeralis,* F.). Black, fuscous-black or black-brown, with the base of the elytra and the base of the first joint of the posterior tarsi yellow-testaceous; the elytra are often lighter than the head and thorax; head large, dilated somewhat behind eyes, thickly, rugosely, and strongly punctured; antennæ varying in length in the sexes; thorax subquadrate, with sides subparallel and base truncate, diffusely and coarsely, but somewhat variably, punctured with a central depression and line; scutellum large, subtruncate or slightly emarginate behind; elytra broad at base and gradually narrowed to a point behind, strongly divaricate, more or less coriaceous, rugosely punctured, the punctuation becoming much finer behind; wings ample, visible from above; legs moderately long and stout, black, with the tibiæ and tarsi often more or less pitchy. L. 7–12 mm.

Male with the antennæ much longer than in female and gradually

narrowed towards apex, and the legs more elongate; last ventral segment of abdomen longitudinally cleft, and penultimate segment emarginate.

Female with the antennæ much shorter, slightly thickened towards apex, and the legs less elongate; last ventral segment of abdomen entire.

In and about the nests of *Anthophora*; rare, but has once or twice been found in some numbers; old wall at Hammersmith (S. Stevens); Weston on the Green, Oxfordshire, in nests of *Anthophora retusa* (Matthews); Stephens records it from Kent, Chelsea, New Forest, Oxford, Devonshire and Warwickshire.

LYTTA, Fabricius. (*Cantharis*, auct *nec* L.)

This is a very large and extensive genus, containing about two hundred and fifty species, which are very widely distributed, and range from Siberia to South Africa, India and Brazil; the majority, however, are found in warm or tropical countries; they are remarkable for their vesicant or blistering properties, and are widely used in medicine; the type of the genus is *L. vesicatoria*, which is the only species found in Britain: it is, however, very rare in this country, but its ordinary name, the "Spanish fly," shows that its home is in the south of Europe, where it is found in great abundance about the middle of summer, frequenting the ash, privet, syringa, lilac, &c., and emitting a very powerful odour; only nine other species occur in Europe; the important genus *Mylabris* (*Zonabris*, Har.), is not represented in our country; it contains upwards of three hundred species, of which between forty and fifty occur in Europe; several of the species have vesicatory properties, but they do not appear to be quite as strongly developed as in *Lytta*.

The species of *Lytta* are elongate and elegant insects, which in many cases are very brightly coloured; they may at once be known from *Meloë* and *Sitaris* by the long parallel-sided elytra, which have a straight suture and are not divaricate, being at most a little parted at apex; the head is large, and the antennæ filiform, with the second joint very small; the eyes are transverse and slightly emarginate; the palpi have the last joint ovate; the thorax is not margined and is transverse and gradually narrowed behind; the scutellum is large and inserted in the neck of the elytra; the legs are long with the last tarsal joint cylindrical and not bilobed; in the males the anterior tibiæ are furnished at apex with a very strong broad spur, and the first joint of the tarsi is notched so as to enable the insect, with the help of the spur, to retain hold of the antennæ in the female; the anterior tibiæ in the female terminate in two spurs, and the first joint of the tarsi is not emarginate; the peculiar principle of the insect is termed Cantharidin, and, as recorded by Westwood, on the analysis of Robiquet, is a white substance in small crystalline plates, insoluble in water, but soluble in boiling alcohol; owing to its volatility and very active properties great care has to be taken in its preparation;

it is even said to be imprudent to sleep under trees on which the insects are abundant; taken internally Cantharidin appears to be a dangerous irritant poison.

Loschge (Beitrag zur Gesichte der Spanischen Fliege in Naturforschen, t. 23, 1788, p. 37–48) gives an account of the first stages of the insect, which is quoted by Mulsant (Vésicants, pp. 159, 160); he, however, describes a minute larva which is lemon-yellow when it emerges from the egg and soon changes to a brownish colour, and by its activity and general structure appeared to be probably parasitic upon certain Hymenoptera, like the larva of *Meloë;* according to Latreille (quoted by Westwood, Classification I. p. 301) the larvæ "reside underground and feed upon the roots of vegetables, and are produced from a mass of agglutinated eggs; they have the body soft, and of a yellowish-white, composed of thirteen segments, with two short filiform antennæ, and six short scaly feet;" there seems, however, to be some confusion with regard to the life history of the insect, which requires further clearing up.

L. vesicatoria, L. Elongate, parallel-sided, shining, of a bright golden-green colour, sometimes with bluish or coppery reflections, underside more or less coppery, and more smooth and shining than the upper side; head broad, wider behind, with a strong central furrow, diffusely punctured; antennæ dark, metallic-green at base, longer in male than in female; thorax transverse, about as broad in front as head, gradually narrowed in a straight line to base, punctured much as head, anterior angles marked and somewhat raised; elytra parallel, bluntly rounded at apex, finely and closely rugose, with two rather feeble but distinct raised lines on disc of each; legs long, metallic. L. 12–20 mm.

Male with the antennæ longer than half the body, with joints 3–10 linear; the anterior tibiæ armed with one broad spine, and the first joint of the anterior tarsi strongly emarginate internally; the last segment of abdomen is also deeply incised.

Female with the antennæ shorter than half the body, with joints 3–10 oblong, and the anterior tibiæ armed at apex with two spines; the last segment of the abdomen is entire or very slightly emarginate.

On privet, ash, &c.; rare in Britain; Colchester, near which town it has been taken in some numbers by Mr. Grapes and others; Cambridge (Crotch); Hampshire (Moncrieff); Stephens records it from "Cheltenham, Bottisham (near Cambridge), Hitcham, and near London."

RHYNCHOPHORA.

The Rhynchophora form a series which is apparently isolated from the rest of the Coleoptera; it must, however, be admitted that it is hard to separate them on any single character, and some few genera bear a superficial resemblance to members of the ordinary groups of the order; thus, for instance, the Rhinomaceridæ, by the presence of a labrum and normal flexible palpi as well as by the 11-jointed and non-

geniculate, antennæ, appear to be allied to the Mycterina and Salpingina, and certain of the Otiorrhynchidæ seem to have a strong analogy with the higher Tenebrionidæ, as pointed out by Dr. Leconte (Rhynchophora of America North of Mexico, Introduction, p. xiv.); the Rhynchophora, as their name implies, are roughly distinguished by the presence of a rostrum or snout, but this is absent or more or less rudimentary in the Platyrrhinidæ and Scolytidæ and is, on the other hand, present in certain of the Heteromera (as *Mycterus* and *Rhinosimus*); according to Leconte (l. c. p. xii.) "Rhynchophorous Coleoptera are those in which the posterior lateral elements of the head and prothorax coalesce on the median line of the under surface of the body, so as to unite by a single suture." Dr. Sharp, however, has lately pointed out (Trans. Ent. Soc., London, 1889, Part I. p. 41) that this definition does not hold good in the case of the Attelabidæ and certain of the Rhynchitidæ, and that in fact in other families besides these the apices of the epimera are not conjoined (l. c. p. 42, note); we are therefore obliged to give up the character (which has been adopted by Bedel and others), as not being by any means universal, and no other single distinguishing character appears as yet to have been discovered.

The series contains a very large number of species; in the Munich Catalogue (1871-2), nearly 12,000 are mentioned, of which 10,000 belong to the Curculionidæ; the number of species now described must be at least 15,000, and Dr. Sharp is of opinion that the number of those existing must be 100,000, and may very probably reach 150,000; they appear to be the most archaic and the least developed of the Coleoptera; the oldest known members of the order appear to consist in great measure of Curculionidæ, and from the Carboniferous period onwards the Rhynchophora are found to be increasingly numerous in all the geological strata; with regard to this point Leconte (l. c. p. vii.) makes the following remarks: "I have previously expressed my opinion that the Rhynchophora, being the lowest type of Coleoptera, are therefore geologically the oldest. Regarding then the fixity of insect types, as shown by the resemblance of ancient forms to those of the present time, the uniformity in food and manner of life, and the immense number of genera in this complex, with which we are dealing, we have a right to expect that there will be a proportionally larger survival of unchanged descendants of those species or genera which were first introduced. We will, therefore, have a more perfect series of connecting forms than can be found in other orders of insects, whose methods of life expose them to the influences of destruction or modification by external circumstances"; the presence of the more perfect series of connecting forms seems to be a fact and not merely a theory, and it is due in great measure to this that it is so difficult to divide the group in any way satisfactorily.

The following may be mentioned as the chief characters:—Head usually prolonged before the eyes into a rostrum or beak, which is some-

times nearly as long as the body (*Balaninus*), but is sometimes rudimentary or absent (Platyrrhinidæ and Scolytidæ); the mouth organs are situated at the apex of the rostrum, which is therefore not a mere trunk or appendage; labrum usually indistinct, but sometimes distinct; eyes, as a rule, entire; antennæ sometimes straight, but usually geniculate, with the scape or first joint long, inserted as a rule in foveæ or channels at the sides of the rostrum called "scrobes," generally clavate at apex; thorax very rarely margined at sides, with the epimera of the prosternum usually meeting at apex, but sometimes separated by a centrosternal piece; anterior coxal cavities closed behind; elytra usually striate; abdomen composed of five ventral segments, of which the first two are, as a rule, connate and immoveable; tarsi apparently tetramerous, but really 5-jointed, the first three joints being always present (the third more or less strongly bilobed), the fourth always rudimentary and very rarely visible, and the last joint or onychium being almost always present but occasionally absent (as in *Anoplus*); posterior coxæ usually distant, anterior not transverse; tibial spurs fixed and not moveable, or wanting.

With regard to the Classification of the Rhynchophora it must be admitted that it is in a very unsatisfactory state; the characters of the families and genera are as yet very ill-defined, and the various divisions are still in quite a rudimentary condition so far as a general knowledge of their chief points of distinction is concerned; we are therefore at liberty to adopt provisionally any characters that may assist the student to separate the divisions, and it does not make much difference whether we regard them as tribal, generic or sub-generic; as a matter of scientific fact, for instance, the number of joints to the funiculus of the antennæ is, taken alone, not a sufficient basis for a genus, but by some authors it has been regarded as of the first importance, and we may use it, in the present state of our knowledge, either as generic or sub-generic, or even as merely specific.

It may perhaps be of advantage, in this connection, to give the chief points of some of the classifications of the group that have been put forward by different authors; the first writer who gave very special attention to the Rhynchophora was Schönherr, whose work "Genera et Species Curculionidum" (Paris, 1833—1845) is one of the most laborious and valuable monographs of the order Coleoptera that has ever been published; he divides the Curculionidæ into two great divisions, the Orthoceri and the Gonatoceri; the Orthoceri he defines as follows:—"Antennæ not broken, that is, not geniculate at the second joint; scape or basal joint not strongly elongate; rostral scrobes, properly so called, scarcely existent"; under this group are classed the Bruchides, Anthribides, Attelabides, Rhinomacerides, Apionides and Rhamphides, besides the Brenthides and other groups not represented in Britain; the Gonatoceri are thus characterized:—"Antennæ geniculatæ (in nonullis tamen indistincte, quorum scapus etiam brevior, sed semper

in scrobe rostrali insertus); scape usually elongate, nearly always (*sæpissime*) inserted in a channel or scrobe at the sides of rostrum" (vol. i. p. 7); the latter definition, however, is not very satisfactory, and its wording is somewhat contradictory.

In the "Skandinaviens-Coleoptera," vol. x. p. 147 (1868), Thomson divides the group Rhynchophori into eight families, which he places under two "stirpes"; Stirps I. contains the Bruchidæ, Anthribidæ, Rhinomaceridæ, and Attelabidæ, and is characterized as having "the abdomen with the ventral segments immoveable, the second being about equal to the third, and the pygidium nearly always exposed; antennæ straight, 11-jointed; posterior coxæ contiguous or not widely distant; tarsal claws usually bifid"; the remaining families, forming Stirps II., are the Apionidæ, Curculionidæ, Cossonidæ, and Tomicidæ, which are defined as having "the abdomen with the three last ventral segments moveable, and the two first connate, the second nearly always much longer than the third; antennæ nearly always broken and clavate; posterior femora usually far exceeding the margin of the elytra."

In 1876 Dr. Leconte and Dr. Horn published their well-known work on "The Rhynchophora of America North of Mexico," which had been preceded by smaller works on the same subject (1874–1875); in these publications they endeavour to prove that the Rhynchophora are the most archaic forms of the order Coleoptera, that they are isolated from all the other forms, and that they are "restricted to a more uniform type of organization than is exhibited in the normal Coleoptera; but at the same time being represented by an immense number of species the generic modifications are very varied" (l. c. p. vii.); taking all these circumstances into consideration, these authors hold that the proper place for the section is at the end of the order, and in this I quite agree with them, and have adopted for them this position; as, however, Dr. Leconte observes (l. c. p. ix.) they were not the first to propose this alteration, which was first put forward by Lorenz Oken (Elements of Physiophilosophy, translated by Alfred Tulk, London, Ray Society, 1847). Leconte and Horn define the Rhynchophorous Coleoptera as "those in which the posterior lateral elements of the head and prothorax coalesce on the median line of the under surface of the body, so as to unite by a single suture"; in this definition they are followed by Bedel, whose work "Faune des Coléoptères du Bassin de la Seine, Tome vi. Rhynchophora (1888)" will be often alluded to during the remainder of the present volume; Dr. Sharp, however, has recently pointed out (Trans. Ent. Soc. London, 1889, Part I. pp. 42* and 47) that this definition does not hold good, at all events as far as the prosternum is concerned, for in the Attelabidæ the apices of the epimera are widely separated by a piece which he calls the centro-sternal piece, and in the Rhynchitidæ this centro-sternal piece, although small, is in many cases present.

* On page 42, line 7, there is an unfortunate erratum, "absent" being printed for "apparently absent."

The following table shows the method of subdivision as given by Leconte and Horn (l. c. p. xv.): it rests chiefly on the structure of the pygidium, and the presence or absence of a peculiar ridge on the inner surface of the elytra, into which the ascending margin of the metathoracic epimera and ventral segments fit.

I. Pygidium alike in the male and female, formed of a single piece; elytra without lateral fold on inner surface . . . . . HAPLOGASTRA.
i. Labrum distinct, mandibles flat, simple . . . . RHINOMACERIDÆ.
ii. Labrum wanting.
1. Mandibles flat, toothed on outer and inner edge . RHYNCHITIDÆ.
2. Mandibles stout, pincer-shaped . . . . . ATTELABIDÆ.
II. Pygidium unlike in the male and female, formed of two distinct segments; elytra with an acute lateral fold on the inner surface . . . . . ALLOGASTRA.
i. Antennæ with annulated or solid club.
1. Tarsi narrow, setose; prosternum excavated . . (BYRSOPIDÆ.)
2. Tarsi dilated, usually with a brush of hair beneath.
A. Mandibles with deciduous tip, bearing a scar OTIORRHYNCHIDÆ.
B. Mandibles without scar, usually pincer-shaped CURCULIONIDÆ.
ii. Antennæ with ten or eleven distinct joints . . . (BRENTHIDÆ.)
III. Pygidium alike in the male and female, formed of a single piece; elytra with a distinct lateral fold on the inner surface . . . . . HETEROGASTRA.
i. Pygidium vertical or declivous.
1. Antennæ geniculate, clubbed; labrum wanting; last spiracle covered by ventral segments . . . CALANDRIDÆ.
2. Antennæ straight; labrum distinct; last spiracle not covered by ventral segments; pygidium deeply notched to receive sutural apex of elytra . . . ANTHRIBIDÆ.
ii. Pygidium horizontal, smaller.
1. Antennæ geniculate, clubbed; terminal edge of last ventral segment acute, surrounding the last dorsal; tibiæ generally compressed and serrate SCOLYTIDÆ.
2. Antennæ straight, with annulated club; maxillæ very large, palpi and ligula feeble . . . . . APIONIDÆ.

Although the table is of considerable value, yet it can hardly be regarded as altogether accurate; as pointed out by Bedel, the genus *Apion*, which is placed in the Heterogastra, has the pygidium in the male composed of two segments as in the Allogastra, and some of the Haplogastra, as, for instance, *Byctiscus*, have the lateral fold on the inner surface of the elytra as fully developed as in the Allogastra, and doubtless several other exceptions could easily be discovered.

In discussing the question of the Classification of the Rhynchophora we can hardly omit some reference to the work of Lindeman (Bull. Mosc. LI., 1876, pp. 159, &c.); this author separates the families on the presence or absence of a mechanical digestive apparatus in the gizzard; this is wanting in the Anthribidæ, Bruchidæ, Rhinomaceridæ, Attelabidæ and Apionidæ, but is possessed by the remaining tribes; it ordinarily consists of longer or shorter plates (Kauplatte), (usually

furnished with bristles or bristly tubercles and cross raised lines) continued behind into two longer or shorter lobes (Kaulade); these are sometimes bordered on their inner edges by a rather broad raised bristly margin (Kaubürste); the families may be divided as follows (pp. 160–161).

I. Digestive apparatus consisting only of the lobes, without plate.	
i. Lobes without bristly raised margins (bürsten)	CURCULIONIDÆ.
ii. Lobes with bristly raised margins . .	RHYNCHŒNIDÆ.
II. Digestive apparatus consisting of the lobes, and a front portion or plate of unequal length with the lobes, this portion being furnished with bristly tubercles (borsten) or cross raised lines	RHYNCOLIDÆ and HYLESINIDÆ.
III. Digestive apparatus consisting of lobes and a plate, which are of equal length.	
i. Lobes without bristly raised margins .	SCOLYTIDÆ.
ii. Lobes with bristly raised margins . .	TOMICIDÆ.

I have just mentioned this Classification, which appears to give valuable results, but is obviously beyond the ordinary student of the Coleoptera; at the same time it is certain that the internal as well as the external structure of the various groups and families requires far more consideration than has hitherto been bestowed upon it.

In the present state of our knowledge the work on the group by Bedel before alluded to (p. 104) appears to me to be the most valuable that has yet appeared, and I have made considerable use of it; he has, however, missed the important character of the presence of a centrosternal piece in the Attelabidæ and certain of the Rhynchitidæ, and his figure of the prosternum of *Attelabus* (=*Cyphus*, Pl. I. fig. 5) seems to be incorrect; he appears also to be wrong in removing *Nanophyes* from its connection with *Cionus* and placing it with *Apion* (although it must be allowed to be somewhat a transitionary genus) and in classing together so many genera under *Ceuthorrhynchus* and *Amalus;* in the latter case perhaps we ought rather to say that he is premature; in fact I was inclined to follow him at first in this respect, but after some consideration have rewritten portions of my work and again separated them, as too much synthesis is apt to confuse the student, and in the present state of our knowledge it is quite immaterial which course we adopt as far as scientific accuracy is concerned. With regard to Bedel's nomenclature I cannot in many cases see that the numerous radical alterations are necessary; I have always agreed with Dr. Sharp in his views regarding the changes so (apparently) unnecessarily introduced into the European catalogue of Heyden Reitter and Weise (vide Vol. I. Preface, p. vi.), and on this point cannot do better than quote his remarks under the genus *Attelabus* (Trans. Ent. Soc. 1889, Part I. p. 52):—

"Quite recently Bedel has found in the fact that by the earlier authors various genera were mixed under *Attelabus,* a pretext for

changing the names, and rendering the entomological literature of the last 80 years—so far as relates to these insects—useless, or worse than useless, some hundreds of synonyms being created by this apparently simple change. The 100 species at present called *Apoderus* are each and all to become *Attelabus;* the 100 species of *Attelabus* are each and all to become *Cyphus;* and the thirty species of *Cyphus* are to become *Neocyphus* Bedel. In addition to this the numerous genera and subgenera of *Apoderus* and *Attelabus* described by Jekel will become a means of rendering the confusion more confounded;" after a few more remarks Dr. Sharp adds, "I reject the change proposed by Bedel as being a source of the greatest confusion, and as offering no advantage whatever to compensate for this."

In classifying the various families it appears more satisfactory to adopt the character taken from the formation of the maxillary palpi (Bedel, l. c. p. 3) than to lay too much stress upon the presence or absence of a rostrum, as in certain of the Platyrrhinidæ the rostrum is as little developed as in the Scolytidæ; the character may be objected to as not being very evident, but it is easy to dissect out the mouth parts from the apex of the rostrum with a fine needle ground to an edge, in any of the Curculionidæ; it must, however, be remembered that we know very little at present regarding the exotic allies of the Rhinomaceridæ, and that intermediate forms leading from *Rhinomacer* (which is one of the most interesting of the Rhynchophora) up to the Rhynchitidæ may very likely be discovered.

In the present state of our knowledge and as far as the British fauna is concerned, the division of the families adopted by Bedel (l. c. p. 3) is perhaps as good as any that has been suggested; the characters are in some measure the same as Thomson's, but the latter author lays more stress on the relative length and mobility of the ventral segments; the Platypodidæ are, however, best regarded as a section of the Scolytidæ; later on in his work (p. 315) Bedel adopts this arrangement; by several authors the Bruchidæ are included under the Rhynchophora, but their position has been before discussed (Vol. iv. p. 257).

I. Maxillary palpi resembling those of the majority of the *Coleoptera*, not rigid; labrum distinct; antennæ straight.
  i. Anterior coxæ globose, slightly exserted; pygidium bare . . . . . PLATYRRHINIDÆ.
  ii. Anterior coxæ conical; pygidium covered . . . . . RHINOMACERIDÆ.

II. Maxillary palpi rigid, short and conical, tapering to a point; maxillæ very broad; labrum as a rule indistinct.*
  i. Rostrum always distinct, more or less elongate; legs not fossorial; anterior tibiæ (in our species) not denticulate externally . . . . . CURCULIONIDÆ.
  ii. Rostrum absent or rudimentary; legs fossorial; anterior tibiæ more or less strongly denticulate externally . . . SCOLYTIDÆ.

* Bedel says of this section "labrum very rarely distinct, and in that case the legs fossorial"; in *Attelabus*, however, the question of the labrum seems doubtful.

The larvæ of the Rhynchophora do not call for any particular remark: their chief characters are given by Erichson (Archives de Wiegman 1842, I. p. 373) and Chapuis et Candeze (Cat. des Larves des Coléoptères, p. 195), and may be summed up as follows:—Head corneous, rounded, with the mouth directed inferiorly; ocelli wanting or present in small number on each side; antennæ very short, usually quite rudimentary; labrum distinct; mandibles strong and hard, often obtusely toothed at apex; maxillæ and maxillary palpi variable; thoracic segments often somewhat more developed than the following; abdominal segments nine in number, usually furnished with transverse folds, often narrowed towards apex; anal segment not projecting and hardly ever furnished with traces of appendages; legs, as a rule, absent, sometimes represented by tubercles, and occasionally somewhat developed; these larvæ are usually more or less curved but are rarely straight, as in the case of those that mine leaves (as *Orchestes*); the general colour is whitish or yellowish with the head dark, but some larvæ are more or less variegated; they are all, as far as is known, vegetable feeders, with the exception of the larvæ of *Brachytarsus*, which are parasitic on species of *Coccus* as will be hereafter noticed; occasionally certain species do great damage to various plants and trees.

In all measurements given for the Rhynchophora it must be remembered that the rostrum is not included, and that the length is taken from the head at the base of the rostrum to the apex of the elytra or pygidium.

PLATYRRHINIDÆ (*Anthribidæ*).

The members of this family are usually regarded as connecting the Rhynchophora and the Longicornia through *Macrocephalus* (*Anthribus*) and *Lamia;* they are very variable in size and general appearance, and may be distinguished from all the other Rhynchophora with the exception of the Rhinomaceridæ by having the maxillary palpi normal and flexible, and also by having the labrum distinct and at the same time the legs non-fossorial; the antennæ are straight and are terminated by a three-jointed club, which is usually, but not always, abrupt; sometimes they are very long, especially in the males; the rostrum is very short and broad and scarcely produced, and is furnished with short transverse scrobes; the mandibles are flattened, and are curved, pointed or emarginate at apex; the pygidium is exposed and the epipleuræ of the elytra are distinct; the anterior coxæ are globose, slightly exserted and separated, and the posterior coxæ are contiguous or slightly distant; the tarsi have the third joint almost concealed within the second, except in the Urodontidæ, which are not represented in Britain, although *Urodon rufipes* has been erroneously admitted to a place in our lists; the family contains more than a hundred genera and between four and five hundred species, of which ten genera and about fifty species have been found in Europe; of these five genera, represented by only eight species, occur in Britain, and several of these are very rare insects.

The Brenthidæ, a large and important tropical family of the Rhynchophora, which are represented in Europe by only two species, neither of which occur in Britain, are usually placed near the present family: they are chiefly remarkable for their very long narrow body, and slender,

and, in many cases, very long rostrum; they are perhaps representatives of one of the most archaic forms of the Coleoptera. The Anthribidæ, as represented in our fauna, may be divided into the two following tribes:—

I. Antennæ inserted at the sides of the rostrum, with the point of insertion invisible from above	PLATYRRHININA.
II. Antennæ inserted on the upper surface of the rostrum, with the point of insertion visible from above	CHORAGINA.

PLATYRRHININA.

This tribe contains nearly all the members of the family and includes the Anthribina and Brachytarsina of Thomson; the species are variable in size, and especially in the length of the antennæ, but they are closely allied by reason of their very short and broad rostrum, and by having the antennæ inserted at the sides of the rostrum with the point of the insertion invisible from above.

It appears best to adopt the names here used for the tribe and family in preference to Anthribina and Anthribidæ, as the name *Macrocephalus* is with advantage employed for the insect known to us as *Anthribus albinus*, the generic name *Anthribus* having been in part referred to *Brachytarsus* by some authors; the six* European genera belonging to the tribe are represented in Britain, with the exception of *Phænotherion* and *Cratoparis*.

The larvæ of nearly all the Curculionidæ are feeders on vegetable substances; a notable exception is, however, furnished by the species of *Brachytarsus*, the larvæ of which are parasitic on various Cocci.

The British genera may be distinguished as follows:—

I. Thorax without a distinct transverse ridge before base.	
i. Rostrum not bilobed; antennæ short; anterior coxæ contiguous; size small	BRACHYTARSUS, *Schönh.*
ii. Rostrum strongly bilobed in front; antennæ long, especially in male; anterior coxæ distant; size large	MACROCEPHALUS, *Ol.* (*Anthribus*, Brit. Ent.)
II. Thorax with a distinct transverse ridge before base.	
i. Thorax with a strong dilatation at sides and with the transverse keel before base interrupted in middle; size large	PLATYRRHINUS, *Clairv.*
ii. Thorax without dilatation at sides and with the transverse keel before base not interrupted; size small	TROPIDERES, *Schönh.*

* *Enedreutes Schönh.* is here regarded as a part of *Tropideres*: a long description of the larva of *Enedreutes oxyacanthæ* is given by Perris (Larves des Coléoptères, 355—7).

BRACHYTARSUS, Schönherr.

This genus contains upwards of twenty species, of which nine are found in Europe and the remainder in North America, Siberia and Brazil: they are small, short, thickset insects, which vary considerably in size and colour; the antennæ are short, with distinct three-jointed club, and the tibiæ are stout and dilated towards apex; the thorax at base is sinuate on either side and has no transverse keel before base; the larvæ, as has been observed above, are parasitic on certain species of *Coccus*, and undergo their transformations under the dry skin or cocoon of the females; the larva of *B. fasciatus* has been found parasitic on *Lecanium genevense* on the white-thorn, and on *Pulvinaria carpini* on the hornbeam: it has also been found with Cocci on *Spiræa salicifolia;* the larva of *B. varius* has been found under the cocoon of *Lecanium racemosum* (= *abietis*) on the pine.*

I. Striæ coarse; lateral border of thorax marked throughout; prevailing colour of elytra brick-red . . . . . B. FASCIATUS, *Forst.*
II. Striæ comparatively fine; lateral border of thorax marked towards posterior angles only; prevailing colour of elytra pitchy-black . . . . . B. VARIUS, *F.*

B. fasciatus, Forst. (*scabrosus*, F.). Short oval, convex, dull; head black, rather large, with eyes prominent, rugosely punctured; thorax black, transverse, with the sides rounded, and narrowed in front, the lateral border marked throughout, and the posterior angles somewhat strongly produced, punctuation rugose; elytra reddish, variegated with black and whitish oblong spots, scutellary region fuscous, punctured striæ coarse, interstices finely rugose; antennæ and legs black; the colour is somewhat variable, the dark patches being larger in some specimens than in others. L. 3–4 mm.

In decaying white-thorn and elm; local, but sometimes found in abundance. Lee (Kent), Richmond, Highgate, Peckham, Weybridge, Chobham, Putney, Camberwell, Ripley, Wimbledon, Forest Hill (where Mr. Champion once took it in the greatest profusion in white-thorn blossom in May); Hertford; Dover; Portsmouth (out of decayed furze); Wood Ditton, Cambridge; Weston, Oxon; Northampton; Swansea; Llangollen; Cannock Chase; Repton; Bretby Wood near Repton; Barton Moss, Cheshire; Nocton near Lincoln.

B. varius, F. (*variegatus*, Fourc.). Very like the preceding, but easily distinguished by the much finer striæ of the elytra and the fact that the lateral border of the thorax is marked towards posterior angles only, as well as by the colour, which is black with ashy lines on the thorax and ashy subquadrate or oblong patches on the interstices of the elytra; the markings on the thorax are, however, very often rubbed and scarcely apparent; the thorax, too, is longer and the second joint

* Mr. R. Newstead, Curator of the Grosvenor Museum, Chester, has quite recently (August, 1890) sent me a specimen of *B. varius* with the following remark: "I have just bred it from a new Coccid (*Lecanium distinguendum*, Douglas), which I discovered this year at Delamere Forest on *Vaccinium*."

of the antennæ is twice as long as the third, whereas in *B. fasciatus* it is scarcely longer. L. 2½–4 mm.

In decaying white-thorn, and also on firs and hazels; local; London district, rare, Darenth, Forest Hill, and Ripley (Surrey); Portsmouth district; New Forest; Llangollen; Northampton; Repton, Bretby Wood (on firs, in some numbers and very variable in size); Nocton near Lincoln; Scotland, local, amongst old hazel bushes; Solway district; Stephens records it as common in the north and in Scotland, but I know of no localities in that country except the one last mentioned.

MACROCEPHALUS, Olivier (*Anthribus* Schönherr).

This genus contains one large and conspicuous European species which may at once be known by the fact that the antennæ are nearly as long as the body in the male; it thus forms a transition between the Longicornia and the Rhynchophora; the rostrum is deeply incised at apex; the third joint of the antennæ is much longer than the second and the club is not abrupt; the eyes are emarginate; the thorax has no distinct transverse keel before base and the anterior coxæ are evidently separated; the species is found in rotten wood.

M. albinus, L. Oblong, subcylindrical, dusky brown, sometimes almost black, with the rostrum, forehead, anterior margin of thorax, apex of elytra and a larger or smaller spot on each towards suture thickly covered with white scales; extreme apex of elytra with a fuscous spot; antennæ dark with the eighth and base of the ninth joints white; thorax with the sides slightly rounded and narrowed in front, with three tubercles on disc, arranged horizontally; elytra with punctured striæ, coloured as above, and further with more or less distinct series of black silken tufts, somewhat widened behind; legs rather long annulated with brown and white pile. L. 7–10 mm.

Male with the antennæ not or scarcely shorter than the body.

Female with the antennæ comparatively short, not reaching much beyond base of thorax.

In decaying trees, especially oaks, willows, and birches; very local and, as a rule, rare; London district, very rare, Ashford (Kent), Eltham, Darenth Wood, Gravesend; formerly in Kensington Gardens; Abbots Wood; Folkestone; Guestling near Hastings; Dorset; Norfolk; Bewdley Forest, where Mr. Stevens says it was formerly common; it does not, however, appear to have been met with by Mr. Blatch, who has collected so much in this locality; abundant near Newcastle (G. Wailes); in Mr. Bold's catalogue there is a note to the effect that it used to be met with in plenty at Gibside, but none have been taken for many years past; Mr. Wailes' specimens are probably the ones referred to.

PLATYRRHINUS, Clairville.

This genus is represented by one large species, which is found in fungi on old ash trees, and also in decaying beech, birch, and alder; it is the largest representative of the family that occurs in Europe; the antennæ are short and terminate in a well marked three-jointed club; the eyes are round and entire and the rostrum is not bilobed; the thorax has a strong projection on each side a little behind middle and the keel

before base is interrupted; the elytra are oblong, parallel-sided and rather depressed.

P. latirostris, F. A very large and conspicuous species, oblong, depressed; rostrum (except apex), head, scutellum, apex of elytra and some indistinct wavy bands on the same, abdomen and part of legs clothed with ashy scale-like pubescence (or as Thomson calls it 'subsquamose'); upper surface dull and rugose, elytra with raised lines; thorax about as long as broad with sides slightly and evenly rounded and produced into a lobe at about middle and with a raised transverse carina before base; elytra broader at base than thorax, parallel-sided, very broadly and bluntly rounded at apex; legs moderately long. L. 9–12 mm.

Male with the abdomen longitudinally impressed in middle, the antennæ with joints 3-4 elongate and the eighth subovate.

Female with the abdomen without impression, and the antennæ with joints 3-4 shorter, the eighth being round.

In fungi (*Sphæria*) on trees, especially on old beech and ash trees; rare; Stephens records it as rare in the London district, but I know of no captures in recent years; not uncommon near Cheltenham (Rye); Salford Priors (Blatch); Bristol; Ugbrooke Park near Chudleigh, Devon (Bowring); Swansea (occasionally on ash trees); Scotland, extremely rare, Tay district (Sharp); it probably occurs in intervening localities; Mr. Rye (British Beetles, 1st Ed. p. 179) says "it lives upon *Sphæria* and other fungi growing on ash trees, &c., burrowing also in the rotten wood, or lurking under loose bark, and having a particularly comical way of elevating itself by its front legs, though usually of sedate appearance."

TROPIDERES, Schönherr.

This is rather a large genus, containing nearly fifty species, of which about a dozen are found in Europe; the remainder are very widely distributed, representatives having been described from Cuba (in which island no less than twelve species have occurred), Java, Mauritius, Isle of Bourbon, Calcutta, Ceylon, Tahiti, North America, South Africa, Tasmania, &c.; they are comparatively small, robust insects, and somewhat resemble *Brachytarsus* in general appearance; they are, however, easily distinguished from the latter genus by the distinct uninterrupted transverse raised keel before base; the eyes are entire and the antennæ comparatively long, attaining at least to the base of the thorax; the anterior coxæ are scarcely distant; the first joint of the tarsi is much longer than the second.

The larvæ of *T. albirostris*, *T. sepicola*, and *T. niveirostris* are described by Perris (Larves des Coléoptères, p. 360-361); they are thick white grubs with the head reddish and the legs somewhat developed, but do not call for any particular remark; they burrow into the dead branches of oak, hornbeam, poplar, &c.

The three British species are extremely rare, and are represented in very few collections; they may be distinguished as follows:—

I. Thorax without tufts of raised hairs on disc.
  i. Thorax plainly bifoveolate on disc; rostrum larger and more dilated at apex . . . . . T. ALBIROSTRIS, *Herbst.*

ii. Thorax without impressions on disk; rostrum shorter, scarcely dilated at apex . . . . . T. NIVEIROSTRIS, *F.*

II. Thorax with two tufts of raised hairs towards the middle of disc . . . . . T. SEPICOLA, *F.*

T. albirostris, Herbst. Oblong, dusky black; rostrum comparatively long with white squamose pile; eyes somewhat approximating on forehead; antennæ black; thorax narrowed in front, with an elevated and scarcely undulated, almost straight, carina at base, moderately punctured, disc with two plain foveæ and two others more or less obsolete; elytra with a whitish patch at scutellum, and a large white patch at apex, the latter variegated with black; towards the suture there is a series of velvety black tufts; legs dark, annulated with white. L. 4–5½ mm.

In dead wood of beech, oak, and certain species of poplar; extremely rare; on palings near Norwich (Stephens); I know of no other record and the species, perhaps, requires further confirmation as indigenous; it has occurred in Sweden, Central Europe, and Eastern Siberia.

T. niveirostris, F. Allied to the preceding, from which it may easily be known by its much shorter rostrum, which is scarcely dilated at apex, and by having the thorax even and not foveolate; dusky black, with the antennæ pale ferruginous, and the rostrum and head, scutellum, and apex of elytra thickly clothed with snowy scales: there are also patches of ashy pubescence on the thorax and elytra, intermingled on the latter with velvety black patches; the basal carina or raised line on thorax is slightly sinuate at the sides; legs variegated with white pile, tibiæ and tarsi more or less ferruginous. L. 3½–4½ mm.

Male with the antennæ longer and the posterior tibiæ with a hook at apex.

In dead branches of oak, hazel, beech, and lime; by beating dead hedges and faggot stacks in woods; very rare; New Forest, June, 1831 (Hope); Coombe Wood and Shirley (Stephens); Darenth Wood (Champion); near Farnham, Surrey (Power); West Wickham (Power); Buddon Wood, Leicester, September 10th, 1860 (Plant).

T. sepicola, F. (*ephippium*, Boh.). Allied to the preceding, but easily distinguished by the fact that the thorax has two black fascicles or tufts of raised pile on the middle of disc, and the elytra a common velvety-black dorsal patch, which is usually large; the general colour is black variegated with ashy; the antennæ are red, with the third joint shorter than the fourth; the elevated basal keel of the thorax is almost straight, and the eyes are broadly distant on the forehead and somewhat prominent. L 3½–4½ mm.

In woods, in dead branches of oak and hornbeam; extremely rare; a single example was found on August 18th, 1856, by Mr. F. Plant, of Leicester, "in a decayed oak-bough, of which he carried home a bag full for examination from Buddon Wood, near Quorndon, Leicestershire" (Ent. Annual, 1857, 84).

CHORAGINA.

This tribe contains a few genera of which *Choragus* alone is indigenous

to Europe, the single species of *Arœocerus*, which is found on the Continent, being evidently an importation; they may be known from the preceding tribe by having the antennæ inserted on the upper surface of the rostrum with the point of the insertion visible from above: the rostrum is very short.

CHORAGUS, Kirby.

Five species are comprised in this genus, three from Europe and two from North America; one only is found in Britain; it is a small dark insect with the body subcylindrical and the elytra rather strongly sculptured; the larva is described at length by Perris (l. c. p. 358); it burrows into dead wood of whitethorn and chestnut, but its galleries are not extensive as during the four or five months of its life they only attain a length of 7–8 mm.; the chief peculiarity of the genus is that its members have the power of leaping strongly developed, a fact from which it derives its name.

C. Sheppardi, Kirby. Oblong, subcylindrical, very finely pubescent, black or fuscous black, with the base of antennæ, and the tibiæ and tarsi ferruginous, the former being often partially dark; antennæ with the two first joints thick, 3–8 slender, 9–11 forming a club; eyes entirely lateral, forehead broad; thorax dull, narrowed in front, sculpture extremely close, consisting of very minute round, slightly raised tubercles, base with a strong straight sharply raised transverse carina; elytra slightly shining, with rows of coarse punctures, pygidium exposed, interstices very finely sculptured; legs moderate, tarsi rather stout. L. $1\frac{1}{2}$ mm.

In dead twigs in hedges, &c.; also sitting on the trunks of trees on or near the roots; rare; Chatham, Sevenoaks, Claygate, Ripley, Cowley, Kegworth, Chatham, Croydon; Barham, Suffolk; Newmarket Heath; Littlington, near Cambridge; Kingsgate, near Margate (where I have taken several specimens in a small plantation with the Rev. T. Wood, all sitting at the base of trunks of trees); Deal (on several occasions); Salford Priors, near Evesham; Repton, Burton-on-Trent; Ripon; Dunham Park, Manchester; the species resembles a *Cis* or *Dryophilus* and is probably often passed over; it may be easily known by its power of leaping.

RHINOMACERIDÆ (Nemonychidæ, H. R. W.).

This family, which is extremely limited, containing as it does three genera, each represented by a single species, forms a transition between the Platyrrhinidæ and the Curculionidæ; to the former it is allied by having the maxillary palpi normal and flexible, the labrum distinct and the antennæ straight, while by the more developed rostrum and general appearance its members approach the Rhynchitina; certain of the species, moreover, bear a strong analogy to some of the Heteromera, as for instance *Rhinosimus* and *Mycterus;* in the Curculionidæ proper the maxillary palpi are quite abnormal, being rigid and conical, with the

joints gradually diminishing in size, and the labrum is indistinct; in the Scolytidæ, in which the formation of the maxillary palpi is much the same as in the Curculionidæ, the labrum is sometimes distinct, but in this case the legs are nearly always more or less fossorial; from the Platyrrhinidæ the present family is distinguished by the long loose club of the antennæ, the more developed rostrum, which has no scrobes, the conical anterior coxæ, the completely covered pygidium, and the equal length of the segments of the abdomen.

Of the three genera *Nemonyx*, *Dædycorrhyncus* and *Rhinomacer*, the last only is found in Britain; from the first of these genera it may be distinguished by its simple tarsal claws, and from the second by the absence of epipleuræ and the very strongly developed labrum.

RHINOMACER, Fabricius (*Cimberis*, Des Gozis).

This genus contains four species, one of which occurs in Europe and the other three in North America; they are found on the male blossoms (chatons) of the pine, in which the female lays its eggs; they are rather long, slender insects, and bear a resemblance to some of the narrower species of *Rhynchites*; some modern authors apply the name of *Cimberis* to the genus, and assign the name *Rhinomacer* to *Byctiscus*; this, however, causes considerable confusion.

R. attelaboides, F. Elongated, brassy-black, thickly clothed with long ashy or yellowish pubescence, antennæ and legs red, tarsi more or less fuscous; rostrum dilated at apex, antennæ long and slender, with very gradual three-jointed club; eyes prominent; thorax at least as long as broad, subcylindrical; elytra long, somewhat depressed, parallel-sided, considerably broader at base than thorax, closely and distinctly punctured; legs long. L. $3\frac{1}{2}$–5 mm.

Male with the anterior tibiæ evidently curved on their inner side, and the last four joints of the antennæ with white pubescence; abdomen without special fringes of hair.

Female with the anterior tibiæ almost straight, and the third and fourth ventral segments of abdomen furnished in middle with a row of thick yellow hairs.

On Scotch fir; very local, and apparently confined to the north of England and Scotland; Studley Park, Ripon (Waterhouse); Carlisle (Heysham); Scotland, local, Solway, Tweed, Forth, Tay, Dee and Moray districts (Moffat, Alvie, Braemar, Aviemore, Inverness, &c.).

CURCULIONIDÆ.

This family contains by far the majority of the Rhynchophora; its members may be distinguished from those of the two preceding families by the formation of the maxillary palpi, which are short, rigid and conical; the more or less strongly developed rostrum will distinguish them from the Scolytidæ, from which, moreover, they differ in the fact

that the anterior tibiæ are not denticulate on their outer margins; it is very hard, however, to define the family satisfactorily, and still harder to divide it into satisfactory sub-families or tribes; the genera may, with one or two exceptions, be arranged fairly naturally under the four following sub-families:—

I. Trochanters long, widely separating the coxæ and femora; antennæ nearly always straight . . . . . APIONINÆ.
II. Trochanters short, upper and lower angles of coxæ reaching or almost reaching femora.*
  i. Antennæ straight; intermediate coxæ oblique; epimera of prosternum often separated by a centro-sternal piece ATTELABINÆ.
  ii. Antennæ nearly always geniculate; intermediate coxæ rounded; epimera of prosternum meeting at apex.
    1. Mandibles provided externally at apex with a corneous appendage, which usually falls off as soon as the insect emerges from the pupa state, but always leaves a cicatrix or scar behind . . . . . BRACHYRHININÆ.
    2. Mandibles without corneous appendage or cicatrix . CURCULIONINÆ.

SUB-FAM. **Attelabinæ.**

This sub-family of the Curculionidæ contains two important tribes, the Attelabina and the Rhynchitina, which are very widely distributed throughout the world, and contain about a dozen genera, comprising a considerable number of species which in many cases are brightly coloured and conspicuous insects that inhabit various trees and often do very considerable damage by rolling the leaves as cases for their larvæ, or by depositing their eggs in young fruit that has just set; they may be known by having the anterior coxæ conical-cylindrical, exserted and contiguous, the central projection of the first ventral segment acuminate at apex, and the segments of the abdomen uneven in length, the last being very small; the intermediate coxæ are oblique; the antennæ are straight, with the scape more or less short, and the pygidium is almost always exposed; the two tribes may be distinguished as follows:—

I. Epimera of mesosternum widely separated from the intermediate coxæ; apices of prosternal epimera separated by a broad centro-sternal piece; external border of the mandibles simple; all the tibiæ toothed on their internal margin . . . . . ATTELABINA.
II. Epimera of mesosternum almost reaching the intermediate coxæ; apices of prosternal epimera meeting or separated by a narrow centro-sternal piece; external border of the mandibles cut out into large teeth; tibiæ, as a rule, simple on their internal margin . . . . . RHYNCHITINA.

ATTELABINA.

This tribe contains a few genera, which have, however, been very

* In *Nanophyes* the construction of the trochanters appears to resemble that of *Apion*, but it is so closely connected with *Cionus* that it can scarcely be separated from it, and must therefore be regarded as an exception.

much multiplied by one or two authors; the most important of these are *Apoderus* and *Attelabus*, which are represented in Europe by two and four species respectively, and in Britain by single species; they differ from the Rhynchitina by having the tarsal claws connate and thickened at base, and by the formation of the mandibles and the intermediate coxæ; their life history is much the same as that of the Rhynchitina; the females lay their eggs sometimes under the epidermis of the leaves, and sometimes simply on the leaves, attaching them to their surface by a viscous substance, and then roll the leaves over them into cases, inside which the larvæ feed, the shape of the cases varying with the species, as in *Rhynchites;* in all cases the final transformations appear to take place underground.

I. Head oval, strongly constricted behind; second joint of antennæ very short, about a third the length of the first; intermediate coxæ broadly distant	APODERUS, *Ol.* (*Attelabus*, Bedel.)
II. Head subquadrate, not constricted behind; second joint of antennæ not much shorter than first; intermediate coxæ only slightly distant	ATTELABUS, *L.* (*Cyphus*, Bedel.)

APODERUS, Olivier (*Attelabus*, Bedel).

This genus contains about a hundred species, which are widely distributed in the Old World: the majority occur in Eastern Asia and the adjacent islands, but they range from Kamtschatka to Ceylon and Madagascar and the Cape of Good Hope, and representatives occur in Sumatra, Borneo, &c.: outside of the tropics the species become less numerous, and Europe possesses no peculiar species; they are easily distinguished by the curious form of the head; in the males the head is evidently narrower and more contracted behind than in the females and less oval, and the anterior tibiæ are more slender and less enlarged at apex: in the females, moreover, the anterior tibiæ are furnished with a second terminal claw; Thomson (Skand. Col. vii. 27) says, "Mas.: tibiis apice intus unco armatis; Femina: tibiis unco nullo": as, however, I have taken the sexes together, I can confirm M. Bedel's statement (l. c. p. 22): the females have two distinct terminal claws to the anterior tibiæ and the male one large one. Bedel remarks that the Swedish authors, usually so exact and accurate, have all through the Attelabidæ assigned the male characters to the females, and *vice versa:* although this does not seem to be always the case, yet it must be borne in mind by all students who are working the group with the help of Thomson's "Skandinaviens Coleoptera."

A. coryli, L. (*avellanæ*, Steph.). Black, almost glabrous, thorax and elytra, and more or less of femora, except base and apex, bright red; head variable in the sexes as above stated, long, channelled, constricted into a neck behind, which is closely and distinctly punctured; thorax

longer in the male than in the female, with the anterior margin emarginate, and the sides straighter and less rounded, in both sexes with a deep central furrow at right angles to a transverse basal furrow; often there is an oblong black spot on disc; scutellum large, transverse, shining black, punctured at base and raised behind; elytra depressed, much broader than thorax, dehiscent at apex, with shoulders very strongly marked, and with strong rows of punctures, interstices finely sculptured, second and fourth raised towards base; legs long, femora clavate, with teeth not apparent. L. 6–7 mm.

On young hazels; local, but not uncommon where it occurs; it is very conspicuous as it sits on the leaves in the sun; Chatham, Darenth Wood, Leith Hill, Mickleham, Hampstead, Sheppy; Hastings; Portsmouth district; Southampton; Glanvilles Wootton; Fordlands and Barnstaple, Devon (in the latter locality occasionally on birch (Rev. H. Matthews)); Swansea; Cambridge; Malvern; Bewdley, &c.; Repton, Burton-on-Trent; Langworth Wood near Lincoln; Cawood, Yorkshire; Northumberland and Durham district, scarce, Castle Eden Dene; Scotland, rare, Solway, Tweed and Forth districts; it is never abundant, but apparently occurs in most of the large Midland and Mid-eastern woods in June and July.

ATTELABUS, Linné (*Cyphus*, Thunberg *sec* Bedel).

This genus comprises about a hundred species which are distributed very widely over the surface of the globe both in temperate and tropical countries, but are much more characteristic of the latter, the species being especially numerous in Tropical America; they form a transition between the Attelabina and the Rhynchitina, and may easily be known from *Apoderus* by the subquadrate head, which is not pedunculate, the narrowly separated intermediate coxæ, and the fact that the epimera of the metasternum are rudimentary and glabrous and covered by the elytra, whereas in *Apoderus* they are long and pubescent and not covered.

A. curculionoides, L. (*Cyphus nitens*, Scop.). Black, smooth and shining, with the thorax and elytra bright red or reddish testaceous; head not constricted into a neck at base, rostrum somewhat dilated towards apex, antennæ short, with a rather long, three-jointed, club; thorax a little broader than long, diffusely and finely punctured; scutellum large, black; elytra with rows of rather shallow punctures, interstices with scattered punctures; legs long, femora clavate, tibiæ denticulate on their inner side. L. 4–6 mm.

Male with the anterior tibiæ armed with a single corneous curved hook, situated at the apical internal angle; abdomen with tufts of reddish hairs at the sides of the central line.

Female with the anterior tibiæ armed with two curved hooks at apex; abdomen glabrous.

On young oaks, &c.; somewhat local but widely distributed; London district, common, Chatham, Darenth Wood, Shooters Hill, Mickleham, Woking, Croydon, Westerham, Chobham, Sandhurst, Dulwich, Abbey Wood; Norfolk; Suffolk; Dover;

Dallington Forest, Hastings; New Forest; Lords Wood and Shirley Warren, Southampton; Portsdown Hill, Portsmouth; Devon; Swansea (somewhat doubtful); Llangollen (on oak and hazel); Forest of Dean (on chestnut); Bewdley, Sutton Park, Birmingham, Robin's Wood, Repton and other midland localities; Burnt Wood, Staffordshire; York; Ripon; Scarborough; Delamere Forest; Northumberland and Durham district, rare, near Gilsland and at Twizell; Scotland, rare, Tweed and Forth districts; it probably occurs in Ireland, but I do not know of any record; this species seems very generally distributed, especially in the Midland counties, and is recorded by many collectors as common, but I have never yet seen it alive.

RHYNCHITINA.

This tribe contains a few genera of which by far the most important is *Rhynchites;* its members are distinguished from the Attelabina by having the external border of the mandibles cut out into large teeth, and by the free tarsal claws, which in most cases are appendiculate, and also by the fact that the epimera of the mesosternum almost reach the intermediate coxæ and the apices of the prosternal epimera either meet or are separated by a small and narrow centro-sternal piece; the prosternum is very short before the anterior coxæ; a large number of the species are brilliantly coloured and very conspicuous insects; our three British genera have been by many authors united under *Rhynchites*, but must be regarded as separate.

I. First ventral segment of the abdomen lobed on each side between the posterior coxæ (the outer portion of which is covered and concealed) and the side pieces of the metasternum; upper surface glabrous or only finely pubescent towards apex of elytra . . . . . BYCTISCUS, *Thoms.*

II. First ventral segment of the abdomen not lobed, so that the posterior coxæ appear larger and more transverse and visibly attain to the side pieces of the metasternum; upper surface pilose or pubescent.

i. Apices of prosternal epimera meeting; abdomen with the pygidium only exposed; vertex of head not or scarcely constricted behind . . . . . RHYNCHITES, *Schneid.*

ii. Apices of prosternal epimera narrowly separated by a centro-sternal piece; pygidium and propygidium as a rule exposed *; vertex of head large, strongly constricted behind . . . . . DEPORAUS, *Lesch.*

BYCTISCUS, Thomson (*Rhinomacer*, Geoffroy, *nec* F.).

The species belonging to this genus may be distinguished by the formation of the posterior coxæ and of the first ventral segment of the abdomen; the thorax is subglobose and is armed on each side in the male with a long produced spine; the upper surface is glabrous or almost glabrous; they are found on various trees; the female rolls the leaves into the form of a cigar and lays her eggs in the dwelling thus con-

* In *Deporaus mannerheimii*, as pointed out by Dr. Sharp, the male has only the pygidium exposed (Trans. Ent. Soc. London, 1889, Part I. p. 70.)

structed for them: in some cases several leaves are joined together with the same object; the method adopted by the insect appears to depend on the size of the leaves; our two species (which are the only two that occur in Europe *) are very conspicuous and handsome insects; they may be distinguished as follows:—

I. Elytra with scanty whitish pubescence at apex; upper and under surface of the same colour (green, golden-green, bluish-green or violet), or if different, with the underside green; forehead simply impressed . . . . . B. BETULETI, *F.* (*alni*, Müll.)

II. Elytra entirely glabrous; upper surface green or golden-green, under surface dark blue; forehead with a deep broad channel . . . . . B. POPULI, *L.*

B. betuleti, F. (*betulæ*, L., † *alni*, Müll.). Upper surface golden-green or deep blue; in the former case the under side is golden-green and in the latter either green or unicolorous with the upper side; legs coppery, or golden-green, or deep blue; head and rostrum rather strongly sculptured, forehead simply impressed; thorax very convex, distinctly, regularly, and moderately thickly punctured, with a longitudinal central channel; scutellum moderate; elytra sericeous, finely pubescent behind, with not very regular rows of punctures and the interstices thickly and finely punctured; legs moderately long. L. $4\frac{3}{4}$–7 mm.

Male with a long projecting spine on each side of the front of thorax.

In woods on young birch and hazel; very local, but not uncommon where it occurs; Darenth Wood (Power from 1858—1875, Champion, &c.); Westerham, Kent; Hastings; Portsmouth district; Southampton; Glanvilles Wotton (very rare); Swansea; Bretby Wood, Repton; Baron Wood, Cumberland, and Scotland (Stephens); it is not, however, recorded by either Bold or Sharp in the Northumberland and Durham and Scotch Lists.

B. populi, L. Entirely glabrous, upper side bright golden-green or coppery, under side, legs, and rostrum violet-blue, antennæ black; it is very closely allied to the preceding, but is smaller, and may be known by the colour of the under surface, and also by having the forehead furnished with a broad deep channel; the elytra, moreover, have no pubescence behind, and the funiculus of the antennæ is evidently longer; in the male the thorax is spined as in the preceding species. L. 4–5 mm.

On young aspens; very local, but not uncommon where it occurs; London district, not uncommon, Putney, Darenth and Lee Woods, Blenden (Kent), Coombe Wood, Epping Forest; Hastings district; Fordlands, Devon.

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* Thomson formed the genus for the reception of these species, but Dr. Sharp has lately recorded five from Japan, and says that he is acquainted with others from China, the Indo-Chinese Peninsula and East India.

† This name ought to be adopted were it not for the confusion caused between this insect (*Curculio betulæ*, L.), and *Deporaus betulæ*, which is the *Attelabus betulæ* of Linné.

RHYNCHITES, Schneider.

This genus, taken in its wide sense, contains at present upwards of a hundred or more species, which are mostly found in the Northern Hemisphere; they have, however, a very wide range as representatives have been described from South Africa, Ceylon, Java and Sumatra, Cuba, Brazil, Chili, &c.; in all probability the genus will be found to be a very large one and to be spread over all the warm and temperate regions of the world; the greater part of the species are pubescent and brightly coloured, and very often strongly metallic; they are chiefly found in spring and early summer on whitehorn hedges, and flowering shrubs or trees: the larvæ, which do not call for any particular remark, live in cases formed by the female by rolling leaves into the shape of a cigar or trumpet, or by joining leaves together; this is not, however, the case with all species, as in some the female deposits her eggs in the freshly set fruits of certain *Pomaceæ* or *Amygdalaceæ*, or in the young shoots of oak, beech, &c.; in all cases she appears to cut partly through the stem, so that the fruit or leaves or shoots fall at about the time at which the larva is ready to undergo its further transformations, which take place underground; the genus, as here limited, is distinguished by the transverse posterior coxæ, which reach the episterna of the metasternum, and by the membranous penultimate segment of the abdomen; the antennæ are rather slender, with a loose three-jointed club. The sexual differences are variable; in some species the rostrum is longer in one sex than in the other, in others it is curved in the male and straight in the female, or *vice versâ*, and in others again the thorax in the male is armed on each side with long projecting spines.

Twenty-seven species are found in Europe of which about half occur in Britain; two of these, however, are extremely rare and have not been taken for very many years; they may be distinguished as follows:—

I. Body behind thorax short and stout, only about one and a half times as long as broad.
  i. Elytra not metallic, dark scarlet or bright brick-red with the suture often darker . . . . . R. AEQUATUS, *L.*
  ii. Elytra metallic.
    1. Elytra thickly and irregularly punctured between the rows of larger punctures; size large.
      A. Surface of rostrum almost entirely metallic; thorax with a strong projecting spine on either side in front in the male . . . . . R. AURATUS, *Scop.*
      B. Surface of rostrum, at all events behind, traversed by a raised black keel; thorax without a spine at sides in either sex . . . R. BACCHUS, *L.*
    2. Elytra smooth or with regular rows of small punctures between the rows of larger punctures.
      A. Elytra without a scutellary stria.
        a. Colour purplish or purplish-red with a metallic coppery tinge; size larger . . . R. CUPREUS, *L.*

b. Colour blue . . . . . R. CŒRULEUS, *De G.* (*conicus*, Ill.)

B. Elytra with a scutellary stria.

a. Ninth stria of elytra entire and prolonged as far as the tenth stria.

a*. Elytra with a small additional row of punctures near shoulder between the ninth and tenth rows; insect blue; rostum comparatively short . . . . R. MINUTUS, *Herbst.* (*germanicus*, auct.)

b*. Elytra without an additional row of punctures near shoulder; elytra bronze, rarely bluish-bronze; rostrum long . . R. ÆNEOVIRENS, *Marsh.*

b. Ninth stria of the elytra abridged and united to the tenth considerably before apex.

a*. Head not sensibly narrowed behind; thorax more finely punctured, without central furrow; temples not prominent at sides; interstices of elytra with single rows of punctures . . . . . R. INTERPUNCTATUS, *Steph.* (*alliariæ*, Brit. Cat.)

b*. Head sensibly narrowed behind; thorax more coarsely punctured, with central furrow; temples prominent at sides; interstices of elytra, as a rule (but not always), without distinct punctuation . . . . . R. PAUXILLUS, *Germ.*

II. Body behind thorax more elongate, at least twice as long as broad.

i. Length 1½–3½ mm.; head short; pubescence not, or scarcely, visible if viewed sideways.

1. Anterior tibiæ not produced into a tooth internally at apex; rostrum shorter (if compared in the same sex); thorax subparallel . . . R. NANUS, *Payk.*

2. Anterior tibiæ produced into a tooth internally at apex; rostrum longer (if compared in the same sex); thorax widened behind middle . . R. UNCINATUS, *Thoms.* (*tomentosus*, Gyll., *sec.* Bedel.)

ii. Length 4–6 mm.; head rather long; pubescence plainly visible, if viewed sideways, much raised and villose.

1. Striæ of elytra entire; size smaller; colour usually bright blue . . . . . R. SERICEUS, *Herbst.* (*ophthalmicus*, Steph.)

2. Striæ of elytra effaced or obsolete behind; size larger; colour usually greenish-blue . . R. PUBESCENS, *F.*

R. auratus, Scop. A large and conspicuous species, greenish or golden coppery, with the anterior parts and base and sides of elytra more or less crimson, clothed with long whitish pubescence, antennæ and tarsi black; rostrum moderately long, forehead strongly punctured; thorax as long as broad, closely and strongly punctured, with an indistinct central furrow; elytra with not very regular rows of punctures, interstices very closely and rugosely punctured; legs moderately long. L. 8–9 mm.

Male with the thorax armed on each side in front with a strong sharp projecting spine.

On *Prunus spinosa* in hedges; the larva lives in the kernel of the stones; extremely rare as British; recorded by Marsham as taken in numbers at Crayford in Kent; Mr. S. Stevens possesses a specimen from Donovan's collection, "taken in Kent by Marsham," and in Dr. Power's collection there is one from Mr. Walton; I know of no record in recent years.

R. Bacchus, L. Upper surface of a brilliant crimson coppery, golden coppery, or purple colour, clothed with long fuscous pubescence, underside duller; head deeply punctured, rostrum long, carinated, at all events at base; thorax longer than broad, gradually narrowed in front, closely and coarsely punctured, with an obsolete central furrow, sides in front simple in both sexes; elytra much broader at base than thorax, rounded and gaping at apex, with irregular rows of deep punctures, interstices closely rugose; legs long, femora clavate, coppery; tibiæ fuscous coppery; tarsi and antennæ black. L. 6–8 mm.

On various fruit trees, especially the apple, also on *Prunus spinosa*, and on the young shoots of the vine; in June; very rare; Crayford and Birch Wood, Kent (Stephens); Birch Wood, taken by Lady Maryon Wilson in 1795 (Power); Mr. S. Stevens has sent me the following note regarding the species "taken at Birch Wood by B. Standish, and seen alive by myself at the time some thirty years ago; the specimen was purchased by Mr. Walton from Mr. Standish, and at Mr. Walton's sale was purchased by me. I believe this is the last capture of this insect in England."*

R. cupreus, L. Upper surface obscurely purplish-æneous, rather dull, clothed with fine pale pubescence, underside dull brassy black; head long, thickly punctured, eyes not prominent; rostrum rather stout, irregularly sulcate at base; thorax subconical, closely and rather strongly punctured, with an obsolete smooth central line; scutellum rather large; elytra with deeply and coarsely punctured striæ, interstices rugose or rugosely punctured; legs brassy black, tarsi black. L. 4–5 mm.

Male with the rostrum shorter than in the female.

On the flowers of the mountain ash; also on whitethorn, apple, sloe, &c.; very local; London district, rare, Darenth Wood and Epping (Stephens); Black Park, Surrey (abundant on mountain ash, July 14th and 15th, 1855 (Power); Dallington Forest, Hastings; Hampshire; Sherwood Forest (S. Stevens, and abundant in flowers of mountain ash (Blatch)); Scarborough; Baron Wood (Cumberland); Northumberland and Durham district; Scotland, very rare, Solway district (Sharp); Pitlochry, in some numbers (A. Beaumont).

R. æquatus, L. (*purpureus,* L.). Obscurely æneous, very thickly punctured, clothed with long pale fuscous pubescence, elytra red with the suture nigro æneous in front; head and thorax closely and distinctly

* This is probably the specimen referred to by Mr. Walton as taken by Mr. Standish near Cracking Hill, Birch Wood, on the 24th of September, 1843, off the oak underwood, and seen alive by Mr. Douglas.

punctured, the latter subcylindrical with an obsolete dorsal furrow, eyes prominent; elytra much broader than thorax, ample, almost subquadrate, with coarsely punctured striæ, interstices distinctly punctured; legs rather long, mostly red, femora brassy, tarsi and sometimes part of tibiæ pitchy. L. $2\frac{1}{2}$–4 mm.

Male smaller, with the rostrum about as long as head and thorax.

Female larger, with the rostrum long and curved, twice as long as head and thorax.

On the flowers of the whitethorn; common and generally distributed in the London, southern and midland districts, but I know of no record further north than Repton, Burton-on-Trent (where I have taken it very sparingly), except "Edinburgh (Stephens)," which may be in error, as it is not in Bold's or Sharp's lists.

R. æneovirens, Marsh (*obscurus*, Gyll.). Upper surface brassy-green or æneous, clothed with fine ashy pubescence; head short, distinctly punctured, eyes scarcely prominent, rostrum long, black, slightly æneous at base, antennæ black; thorax rather dull, almost as long as broad, very closely punctured; elytra shining, greenish-æneous, rarely coppery or bluish, with very deeply and coarsely punctured striæ, interstices finely sculptured; underside and legs black, femora more or less æneous; the head and thorax are sometimes entirely black. L. 3–4 mm.

On young oaks, hazel, &c.; in woods and hedges; local, but not uncommon; Hampstead, Darenth Wood, Whitstable, Faversham, Chatham, Epping Forest, Cowfold, Loughton, the Holt, Farnham; Hertford; Windsor Forest; Guestling, near Hastings; New Forest; Glanvilles Wootton; Llangollen; Suffolk; Knowle; Bewdley; Repton; Burnt Wood, Staffordshire; Sherwood Forest; York; Scarboro'; Heysham; Scotland, scarce, on oak trees, Solway, Tweed and Moray districts.

The variety with bluish elytra is the *R. fragariæ*, Gyll.; I have not seen a British specimen, but it is included in Waterhouse's catalogue.

R. cœruleus, De G. (*conicus*, Ill.). Deep blue, shining, clothed with long upright fuscous pubescence, which is very evident; antennæ rostrum and legs black or blue black, femora deep blue; thorax longer than broad, with sides almost straight, coarsely punctured; elytra with deep punctured striæ, interstices flat with fine punctures, scutellary stria wanting; legs moderately long. L. $2\frac{1}{2}$–3 mm.

On various *Pomaceæ*; sometimes it does considerable damage to pear trees; also on the flowers of the whitethorn; local, but not uncommon; Darenth Wood, Sheerness, Shooters Hill, Mickleham, Cowfold, Horsell, Boundstone; Hastings; New Forest; Glanvilles Wootton; Swansea; Wood Ditton and Littlington, Cambridge; Redgrave Fen; Weston, Oxon; Knowle, Repton and other midland localities; Northumberland and Durham district, rare; not recorded from Scotland.

The very strong raised pubescence, absence of a scutellary stria, and deep cyaneous blue colour will separate this from our other allied species.

R. minutus, Herbst. (*germanicus*, auct.). Very like the preceding, but of a more greenish blue colour, with the thorax more widened

behind, evidently shorter in proportion, and much more closely and finely punctured; central furrow wanting; pubescence shorter and less raised; elytra with a scutellary stria and with deeply punctured striæ, and the interstices very finely punctured, often almost smooth, ninth stria entire and prolonged as far as the tenth stria; legs black or blue-black. L. 2–2½ mm.

On young trees in woods, especially oaks; often found by sweeping herbage; very widely distributed and common in many localities, but local in the midlands and rarer further north; Scotland, scarce, but found in the Solway, Tweed, Forth, Clyde, Moray, and probably other districts.

R. interpunctatus, Steph. (*alliariæ*, Brit. Cat.). Extremely closely allied to the preceding, and rather hard in some cases to distinguish from it; it may, however, be known by having the ninth stria of the elytra abridged and united to the tenth considerably before apex; from *R. cæruleus* it may be known by the more finely-punctured thorax and less evident pubescence, and from *R. pauxillus* by the absence of a central furrow on thorax which is less coarsely punctured, as well as by the shape of the head, which is not sensibly narrowed behind, and the fact that the interstices of the elytra are furnished with single rows of punctures. L. 2–2½ mm.

On young trees, in woods and hedges; not common; Darenth Wood; Birch Wood; New Forest; Glanvilles Wootton; Swansea; Ireland, near Dublin, &c.

There is considerable confusion regarding this insect which stands in our collection as *R. alliariæ*, a name which has been applied to allied species; I cannot, therefore, be sure of the localities; some authors state that it has no scutellary stria, but according to Bedel this is present, and such is the case with a specimen of mine from Dr. Power's collection.

R. pauxillus, Germ. Closely allied to the three preceding species, but easily distinguished by the deep central furrow on the thorax; it may further be separated from *R. interpunctatus* as above stated, from *R. minutus* by having the ninth stria of the elytra abridged and united to the tenth considerably before apex, and from both by the coarser punctuation of the thorax; from *R. cæruleus* the less evident pubescence and the presence of a scutellary stria will serve to distinguish it; the interstices are almost smooth. L. 2–2½ mm.

On various *Pomaceæ*, especially the medlar; also on the sloe; it also has been taken on young oaks, hazels, &c.; rare; Darenth Wood (Champion); Shirley, on whitethorn hedges (S. Stevens); Littlington, Cambridge (Power); Knowle, near Birmingham (Blatch); Northumberland and Durham district, very rare; Scotland, very rare, Solway district, "Kirkpatrick-Juxta. Rev. W. Little. Murray's Cat."

These four species appear to present great difficulties to students of the group, but *R. minutus* and *R. interpunctatus* are the only ones that could be confounded; the rostrum is longer in these and, in fact, in most of the species of the genus, in one of the sexes, according to Thomson

the female; in this he appears to be correct, although one or two authors seem inclined to refer the longer rostrum to the male.

R. nanus, Payk. (*planirostris*, F. *nec* Desbr.). A small elongated and narrow species, of a greenish-blue colour, shining; almost glabrous; forehead obsoletely punctured, rostrum rather smooth; thorax subcylindrical and subparallel, coarsely punctured, without central channel; elytra with strong punctured striæ, interstices narrow, finely substrigose transversely; anterior tibiæ simple at apex, intermediate with a small hook at apex in one sex, apparently the male; legs rather long and slender. L. $1\frac{1}{2}$–2 mm.

On young birches in woods; somewhat local, but common where it occurs, and generally distributed from the southern districts to the north midland districts; rarer further north; Northumberland and Durham district, not common; the Scotch record is "Solway, Tweed, and Moray districts," but Dr. Sharp adds a note to the effect that he has never seen a Scottish specimen and thinks it very probable that the specimens should be referred to the following species: it has been taken in Ireland.

R. uncinatus, Thoms. (*planirostris*, Desbr., *nec* F., *tomentosus*, Gyll., *sec.* Bedel). Extremely like the preceding, with which it has been very often confused, but easily distinguished by having the anterior tibiæ produced into a tooth internally at apex, by the rostrum being longer (if compared in the same sex) and the thorax evidently widened behind middle; the forehead and rostrum, also, are more plainly punctured, and the thorax is more regularly punctured and has an obsolete central channel, which, however, is not always very evident; the legs are nigro-cœruleous, and the tarsi have the first joint elongate. L. $1\frac{3}{4}$–$2\frac{1}{2}$ mm.

On aspens, willows, young oak, hazel, birch, &c.; local and not common, although sometimes met with in some numbers where it occurs; Darenth Wood, Esher, Mickleham, Horsell, Wimbledon, Weybridge, Chatham, Chertsey, Woking, Maidstone; Lords Wood, Southampton; New Forest; Bewdley; Cannock Chase; Knowle, near Birmingham; Chat Moss; Strettord, near Manchester; Northumberland and Durham district, somewhat rare, but from several localities; Scotland, scarce, Solway and probably other districts.

R. sericeus, Herbst. (*ophthalmicus*, Steph.). Deep-blue, rarely greenish-blue, or violet blue, shining, with outstanding fuscous pubescence; rostrum very short, sulcate at base; head large, diffusely punctured, eyes prominent; thorax with sides rounded and somewhat dilated about middle, coarsely punctured, sometimes obsoletely furrowed in centre; scutellum small; elytra with moderately coarsely punctured striæ which reach apex, interstices with smaller punctures; antennæ black; legs blue-black, slightly pilose. L. 4–$5\frac{1}{2}$ mm.

On young birch, hazel, &c.; in woods; very local, but sometimes not uncommon where it occurs; Darenth Wood; Coombe Wood; Bewdley Forest; Scarborough; Scotland, very rare, Forth district.

R. pubescens, F. Greenish-blue, or blue, shining, thickly clothed with very long, outstanding, fuscous hairs; rostrum short, sulcate at base;

head finely punctured; thorax with the sides rounded and dilated, disc moderately, closely, and regularly, but not strongly punctured, with a more or less distinct central furrow; scutellum rather small; elytra with rather shallow punctured striæ, the punctures being moderately strong towards base and obsolete at apex, which is almost smooth; antennæ black; legs unicolorous with body, rather strongly pubescent. L. $6\frac{1}{2}$–$8\frac{1}{2}$ mm.

On young hazel, birch, oak, &c; in woods; not common but rather widely distributed from Lincolnshire southwards; it appears often to occur by single specimens; Darenth Wood; Coombe Wood; Epping Forest; Chobham; Westerham, Kent; Monks Wood; Hastings district; Lords Wood, Southampton; New Forest; Portsmouth District; Fordlands, Devon; Bewdley; Coventry; Robins Wood and Bretby Wood, Repton; Langworth Wood, Lincoln; I know of no locality further north.

This is a large and conspicuous species and may easily be known by its size, very strong villose pubescence, and by the fact that the striæ of the elytra become obsolete at apex.

DEPORAÜS, Leach.

This genus, as characterized by Bedel and Sharp, includes two British species, of which one, *D. megacephalus*, was regarded by Stephens and Leach as belonging to *Rhynchites* proper; they are, however, very closely allied in several points, and the characters of the genus as now constituted are more satisfactory than those assigned to it by the old authors; a third species, *D. tristis*, occurs in France; the females roll up cases of leaves for their larvæ, as in the other genera.

I. Elytra greenish-blue; shape narrower and more elongate; male with the posterior femora not dilated . . . . . D. MEGACEPHALUS, *Germ.*
II. Insect entirely black; shape broader and less elongate; male with the posterior femora strongly dilated . . . . . D. BETULÆ, *L.*

D. megacephalus, Germ. (*constrictus*, Gyll., *lævicollis*, Steph., *Mannerheimi*, Hummel). Black, or greenish-black, with the elytra greenish-blue, clothed with thin and fine greyish pubescence; rostrum dilated at apex, sulcate at base; head large, together with eyes a little broader than thorax, vertex long, diffusely and plainly punctured; thorax subovate, rounded at sides, closely and rather finely punctured; elytra much broader than thorax, with deep and regular punctured striæ, interstices slightly convex and obsoletely punctured in rows; legs blue-black with the tarsi scarcely shorter than the tibiæ and the first joint elongate; in the male the rostrum is shorter than in the female. L. 3–4 mm.

On young birches; in woods, &c.; local, but not uncommon where it occurs; Darenth Wood, Woking, Birch Wood, Coombe Wood, West Wickham; Wrabness, Essex; Hastings; Faygate, Sussex; Bewdley; Cannock Chase; Knowle; Bretby Wood, Repton; Halifax district; Barton Moss and Chat Moss; Stretford district, near Manchester; Northumberland and Durham district ("Durham," Ormsby's Durham); Scotland, local on birch, Solway, Tweed, Forth, Moray, and probably other districts.

D. betulæ, L. Entirely of a deep black colour, rather shining, clothed with fine fuscous pilose pubescence; head large, distinctly punctured; thorax with sides rounded, rather thickly and very distinctly punctured, with an obsolete central furrow; elytra broad, a little depressed in front, much broader than thorax, with deeply and coarsely punctured striæ, interstices with an obscure series of punctures; legs moderately long and stout. L. 3–5 mm.

Male with the posterior femora strongly dilated and crenulate beneath, and the rostrum shorter than the thorax.

Female with the posterior femora simple, and the rostrum about as long as thorax.

On birch, alder, hornbeam, hazel and beech; chiefly, however, on young birches; more or less common and generally distributed throughout the kingdom.

Sub-fam. **Apioninæ.**

The members of this tribe are small insects, which, as a rule, are easily recognized by their peculiar facies; they are chiefly distinguished by the formation of the trochanters, which are large, truncate at apex and rather widely separate the coxæ and the femora; this is more noticeable in the hinder pairs; the following characters may also be noticed: head prominent, not narrowed behind eyes; antennæ 11-jointed, nearly always straight, with a 3-jointed, ovate, pubescent club, which is pointed at apex; rostrum variable; thorax truncate in front, subcylindrical or gradually narrowed from base to apex; anterior coxæ conical and contiguous, exserted, posterior coxæ rather broadly distant; elytra deeply striate, covering the pygidium; abdomen with the second segment much longer than the third; episterna of metasternum linear and elongate; legs rather long and moderately stout; femora usually more or less clavate, tibiæ truncate at apex without spurs, tarsi dilated, claws simple, toothed, or bifid: the sub-family contains the single genus *Apion;* M. Bedel, as before remarked, adds to it the genus *Nanophyes,* which is, however, more correctly retained near *Cionus,* although it must be allowed that through the formation of the trochanters it bears a strong analogy to *Apion.*

APION, Herbst.

This is a very large and important genus, which is very widely distributed throughout the world; it is, however, much more characteristic of temperate than of tropical climates, and a large number of the species appear to frequent maritime rather than inland districts: according to the Munich catalogue published in 1877, the number of known species is three hundred and seventy-seven, but a considerable number have since been added; about fifty for instance, chiefly from North America, are recorded in the Zoological Record for 1884 (vol. xxi. Ins. 95); no less than about two hundred and fifty occur in Europe, of which about

seventy-five inhabit Britain; in point of numbers, therefore, it is our largest genus next to *Homalota*; the genus ranges from Siberia to South Africa and New Caledonia, and species have been described from India, Ceylon, Brazil, Cuba, Java, &c., but, as before remarked, comparatively few have hitherto been found within the tropics; they are small or very small insects, which differ very much in colour and pubescence, and to a certain extent in general form, but they all have a sort of family likeness, so that it is easy, except in a few instances, to determine the genus from the external appearance of the species; in the typical form the rostrum is long, slender and curved, and the body is narrow in front and dilated behind, the general shape being that of a pear attached to its stalk; in the extreme forms, however, the rostrum becomes very short and straight or almost straight, and the body is subparallel; between these two extremes are found infinite variations; the antennal scrobes are foveiform, or, if near the head, more or less linear; the antennæ are inserted at various distances from the head, sometimes quite close to the base of the rostrum, but rarely in front of its central portion; in the old tables given for the subdivision of the genus this insertion of the antennæ will be found used as one of the chief characters, but, although useful in some instances, it is extremely confusing and of no practical use in others; the antennæ are variable, but have rather a long scape and the first joint of the funiculus longer and, as a rule, broader than the second; the club is very distinct, 3-jointed; important characters are found in the rostrum, which is very variable; the thorax is variable in length, conical or subcylindrical, rarely suborbicular; the scutellum is sometimes small, sometimes moderate, and occasionally large, and is often furnished with furrows or foveæ and occasionally with carinæ at base; the sculpture of the thorax and elytra is, as a rule, very distinct; the former, however, is sometimes almost smooth, and the latter very rarely have the striæ almost effaced; the legs, except in one or two groups, are long, with the femora slightly dilated at apex, the tibiæ usually straight, and the tarsi moderately long, with the first joint about equal to or somewhat longer than the second, and occasionally very much longer; the first and second segments of the abdomen are almost connate and longer than the two following; rarely a sixth segment is visible; the colour is very variable, but is usually black or leaden black, or metallic-blue or greenish-blue; some species, however, are more or less testaceous or brownish, and one group has the whole body of a bright scarlet or yellowish-red colour; one of our largest and handsomest species, *A. limonii*, presents a beautiful purple-red metallic tint; the colour of the legs affords very important characters, the "red legged" group with dark bodies being a well-known crux of all students of British Coleoptera; the pubescence varies very much in the different species, sometimes covering the whole body, and in many cases being scarcely perceptible; in some cases the upper surface is glabrous or almost glabrous, and the under surface is very thickly pubescent.

The sexual differences are often remarkable; as a rule the males may be distinguished from the females by their shorter and more robust rostrum, which is often more strongly punctured and more evidently pubescent; the sexes, however, in many species differ in special particulars, as the colour of the rostrum, antennæ and legs, and sometimes of the elytra, the dilated or curved tibiæ, certain modifications of the scape or funiculus of the antennæ, and also of the tarsi, metasternum and abdomen, &c.; these will, however, be noticed more particularly under the various species.

The larvæ of the genus *Apion* are small fleshy white or yellowish-white grubs with corneous heads, which do not differ much from the ordinary Rhynchophorous larvæ and call for no special notice; they are found in flower-heads, and in the seed-vessels of plants, sometimes in the pods, leaf-stems or stalks, and they undergo all their transformations in the same place in which they were originally hatched; according to M. Bedel it is very rarely that the larvæ betray their presence externally by any swelling of the vegetable tissues (as is so often the case with *Mecinus* and other genera); the larva of *A. minimum*, however, which is the only species that feeds on the Salicaceæ, lives under the willow leaves, according to Perris, in galls formed by *Nematus*, or, according to Kaltenbach, in the galls of certain Diptera; considerable speculation has been caused by the fact that large numbers of certain species (such as *A. craccæ*, *A. Gyllenhali*, &c.) have been found congregated upon various trees, such as the oak and ash, having apparently deserted their ordinary food plants; the reason of this is unknown; M. Bedel suggests that the insects are merely seeking shelter against heat or cold, but it appears probable that they may be assembling simply with a view to migration from one district to another.

The majority of our species of *Apion* live on different leguminous plants (more especially *Trifolium*, *Vicia*, *Genista*, *Ulex*, and their allies); occasionally certain species do considerable damage to clover-fields, riddling and destroying both the leaves and seed pods; it is hard to suggest any really useful remedy, but a badly infested field should be thoroughly cleaned and all the refuse carefully burnt towards the end of the year; the waste portions near the hedges should also be, if possible, grubbed up and cleaned, as the Apions are not very particular as to the species of Leguminous plants which they attach themselves to, and will find support on various wild vetches before again attacking the cultivated portions; for the next season the field and those around it should if possible be planted with a crop not liable to the attacks of the insects; as, however, the species are, for the most part, provided with powerful wings, no precautions can really be of much avail against an invasion.

Besides the *Leguminosæ*, various other families of plants are attacked by different species: a list is given by M. Bedel (l. c. p. 203), which is here quoted as far as it relates to the British species:—

Malvaceæ: *æneum*, *radiolus*, *rufirostre*, *malvæ*.
Crassulaceæ: *sedi*.
Compositæ: Cynarocephalæ (thistle tribe), *carduorum* and allies, *onopordi*.
Corymbiferæ: *stolidum*, *confluens*, *sorbi*, F. (*lævigatum*,

Bedel, *&c.*), *Hookeri*, *brunneipes*, Bedel, &c. (*lævigatum*, Kirby).

Labiatæ: (Mentha) *flavimanum*; (Thymus) *atomarium*.

Staticaceæ: *limonii*.

Polygonaceæ: (Rumex) *miniatum*, *cruentatum*, *sanguineum*, *frumentarium* (*hæmatodes*), *rubens*; *violaceum*, *hydrolapathi*; *curtirostre* (= *humile*, Germ.), &c.

Buxaceæ: (Mercurialis), *semivittatum*, *pallipes*.

Urticaceæ: *urticarium* (*vernale*).

Salicaceæ: *minimum*.

With regard to *A. simile* there seems to be a doubt; it is found, according to M. Bedel, exclusively on *Betula* (birch), but its habitat in the larval state is unknown.

Owing to the number of species comprised in the genus it is very difficult to form a satisfactory table; at the same time the differences, although in many cases comparative, are, as a rule, easily appreciable, so that the genus is not in reality as hard as many others that contain fewer species; in constructing a dichotomous table, however, to comprise many species, the difficulty lies in finding leading characters on which to divide off groups or series that run more or less into one another; as has been before remarked, the older writers on *Apions*, such as Kirby, Walton and others, divided the genus into larger or smaller groups on the distance of the insertion of the antennæ from the base of the rostrum; this character, although most useful in some cases, is very confusing in others, and appears to be abandoned by the latest writers; I have, to a considerable extent, although not altogether, followed Bedel's classification (l. c. p. 205), but it must be admitted that some of the characters are not altogether easy of appreciation, and the table given below must be regarded merely as a guide to the detailed descriptions and not as a substitute for them. In his catalogue of the species Bedel (l. c. pp. 360 *et seqq.*) divides them into seventeen groups; some of these are of course very marked, but others appear to be made up of rather discordant elements and might with reason be further subdivided.

I. Rostrum narrowed towards apex, wedge-shaped or subulate; eyes large and very prominent. (*Oxystoma*, Dumeril, *nec* Stephens).

i. Upper surface blue; size larger; sutural stria abridged in front and scarcely passing the apex of scutellum . . . . . A. POMONÆ, *F.*

ii. Upper surface black or slate-coloured; size smaller; sutural stria of elytra not abridged in front and continued to base.

1. Rostrum strongly and angularly gibbose beneath; antennæ entirely red in the male, more or less broadly black towards apex in female . . . . . A. CRACCÆ, *L.*

2. Rostrum slightly or comparatively slightly gibbose beneath; antennæ black in both sexes, with the exception of one or two joints at base.

A. Rostrum abruptly subulate.

a. Forehead with distinct striæ between eyes; base of rostrum almost smooth in centre . . A. CERDO, *Gerst.*
b. Forehead without distinct striæ between eyes; base of rostrum dull and closely punctured throughout . . . . . A. OPETICUM, *Bach.*
B. Rostrum very gradually subulate; forehead with very distinct striæ between eyes . . . . A. SUBULATUM, *Kirby.*

II. Rostrum cylindrical or subcylindrical, not subulate towards apex.
i. Second stria of elytra united at apex to the eighth stria; antennæ inserted at the base of rostrum, which is furnished with a strong tooth on each side at the point of insertion; legs, in part at least, red; upper surface strongly squamose (*Oxystoma*, Steph. *nec* Dum.).
1. Scales of a uniform grey colour . . . . . A. ULICIS, *Forst.*
2. Scales brown, variegated with white.
A. Elytra dilated and rounded, brown with the central interstices white . . . . . A. GENISTÆ, *Kirby.*
B. Elytra subparallel, brown with an oblique dorsal band and the lateral margin white . . A. FUSCIROSTRE, *F.*
ii. Second dorsal stria united at apex to the ninth.
1. Head and thorax black, elytra testaceous, with the base and more or less of the suture and sometimes of the side margins black . . . . . A. MALVÆ, *F.*
2. Upper surface reddish-brown, clothed with whitish pubescence; elytra with two dark denuded dentate bands . . . . . A. URTICARIUM, *Herbst.* (*vernale*, F.)
3. Colour entirely red or yellowish-red (except eyes, which are black).
A. Temples covered with close and strong punctures.
a. Colour bright blood-red; average size larger; eyes smaller and more prominent . . . . A. MINIATUM, *Germ.*
b. Colour pale blood-red; average size smaller; eyes much larger and less prominent . . . A. CRUENTATUM, *Walt.*
B. Temples and throat impunctate, at least behind.
a. Rostrum curved, about as long in the male as in the female.
a*. Elytra evidently dilated behind; head as long as broad . . . . . A. HÆMATODES. *Kirby.* (*frumentarium*, Payk.)
b*. Elytra subparallel; head broader than long . . . . . A. RUBENS, *Steph.*
b. Rostrum nearly straight, considerably longer in female than in male . . . . . A. SANGUINEUM, *De G.*
4. Upper surface dark, black, or of a metallic-blue or greenish-blue colour.
A. Femora entirely or in great part red.
a. Pubescence white or ashy, distinct at all events on under side of male.
a*. Intermediate and posterior pairs of tibiæ red in both sexes.
a†. Interstices of elytra scarcely broader than striæ; rostrum black in both sexes; elytra subparallel; size smaller.

a‡. Tarsi and trochanters black or blackish . . A. PALLIPES, *Kirby.*
b‡. Tarsi and trochanters red . . . . . A. SEMIVITTATUM, *Gyll.* (*Germari*, Walt.)

b†. Interstices of elytra much broader than striæ; rostrum red in front in male; elytra dilated behind middle; size larger . . . . . A. RUFIROSTRE, *Payk.*
b*. Intermediate and posterior pairs of tibiæ black in female, black with apex red in male . . . . A. VICIÆ, *Payk.*
b. Pubescence very slight or absent.
a*. Posterior tibiæ with at least their apical half black.
a†. Anterior coxæ black; male with the second and third joints of the funiculus of the antennæ compressed and much dilated . . . . . A. DIFFORME, *Germ.*
b†. Anterior coxæ red; male with the second and third joints of the funiculus of the antennæ not dilated.
a‡. Posterior tibiæ red at base or ringed with red on their basal half.
* Thorax very closely punctured, rough and dull.
†. Hind portion of elytra obtusely rounded; male with the scape of the antennæ dilated . . . . . A. DISSIMILE, *Germ.*
††. Hind portion of elytra somewhat produced and contracted; male with the scape of the antennæ not dilated . . . A. VARIPES, *Germ.*
**. Thorax diffusely and very finely punctured, smooth and shining . . . . . A. LÆVICOLLE, *Kirby.*
b‡. Posterior tibiæ entirely black.
*. Thorax finely and obsoletely punctured, smooth A. SCHÖNHERRI, *Boh.*
**. Thorax closely and distinctly punctured.
†. Antennæ longer, with the first joint red; trochanters red.
‡. Punctuation of thorax close and regular; forehead not plainly striated between eyes . . . . . A. APRICANS, *Herbst.** (*fagi*, Kirby.)
‡‡. Punctuation of thorax very close, rugose; forehead plainly striated between eyes . . . . . A. BOHEMANI, *Thoms.* (*ononidis*, Gyll.)
††. Antennæ shorter, with the base pitchy; trochanters black . . . . . A. TRIFOLII, *L.*
***. Thorax distinctly but sparingly punctured, with the sides more rounded . . . . . A. RYEI, *Blackburn.*
b*. All the tibiæ red.
a†. Club of antennæ more elongate; rostrum black in both sexes; anterior coxæ of male red, of female black . . . . . A. DICHROUM, *Bedel.* (*flavipes*, F.)
b†. Club of antennæ shorter; rostrum of male yellow-red at apex; anterior coxæ red in both sexes . . . . . A. NIGRITARSE, *Kirby.*

* I have followed Bedel in not regarding Kirby's *A. assimile* as a distinct species.

B. Legs dark, entirely black or more or less metallic.*
a. Forehead with two furrows in the form of a V.
a*. Striæ of elytra rather fine and scarcely punctured; interstices broader . . . . . A. CONFLUENS, *Kirby.*
b*. Striæ of elytra deep and strongly punctured; interstices narrower . . . . . A. STOLIDUM, *Germ.*
b. Forehead without furrows in the form of a V.
a*. Scutellum long and pointed, with two small divergent carinæ at base . . . . . A. RADIOLUS, *Marsh.*
b*. Scutellum even or longitudinally furrowed.
a†. Forehead with a very large and deep longitudinal furrow . . . . . A. ÆNEUM, *F.*
b†. Forehead without a large longitudinal furrow.
a‡. Rostrum with a strong dentiform process on each side at the insertion of the antennæ . . A. CARDUORUM, *Kirby.*
b‡. Rostrum simple, slightly thickened or angled at the insertion of the antennæ.
*. Thorax convex, raised on disc and depressed at base, with the sides strongly rounded.
†. Thorax with a broad and very deep furrow before scutellum; elytra glabrous, black in male and blue in female . . . . . A. SORBI, *F.* (*lævigatum*, Payk.)
††. Thorax without distinct furrow before scutellum; elytra pubescent, black in both sexes A. HOOKERI, *Kirby.*
**. Thorax not, or slightly, convex, with the sides almost straight, or comparatively slightly rounded.†
†. Striæ of elytra very fine, somewhat obsolete; thorax almost smooth . . . . . A. LÆVIGATUM, *Kirby.* (*brunneipes*, Boh.)
††. Striæ of elytra distinct.
‡. First joint of funiculus of antennæ short and thickened suddenly from base, about as broad as the following; thorax very coarsely punctured with a broad and very deep furrow at base . . . . . A. ONOPORDI, *Kirby.*
‡‡. First joint of funiculus of antennæ globose, ovate or gradually claviform, almost always thicker than the following.
aa. Sutural striæ prolonged to the base of elytra.
aa*. Body behind thorax narrower and elongate.
aa†. Rostrum dull, pubescent nearly to apex, straight in the male and slightly curved in the female . . A. FLAVIMANUM, *Gyll.*
bb†. Rostrum shiny, almost glabrous, plainly curved in both sexes; base of anterior tibiæ in male with a testaceous ring . . . . . A. ANNULIPES, *Wenck.*

* Occasionally the apex of femora or base of tibiæ is furnished with a testaceous ring in one sex, as in *A. annulipes* and *A. filirostre*, and in *A. flavimanum* the tibiæ are pitchy brown.

† *A. atomarium* is a somewhat intermediate species, and might almost be classed with the two preceding.

bb*. Body behind thorax broad and comparatively short.
aa†. Shoulders very prominent; size larger . . . . A. VICINUM, *Kirby*.
bb†. Shoulders rounded; size smaller . . . . . A. ATOMARIUM, *Kirby*.
bb. Sutural striæ not prolonged to base of elytra; as a rule not, or scarcely, passing the apex of scutellum.
aa*. Rostrum strongly curved, as a rule long and slender (but rather short in a few species).
aa†. Interstices narrow, carinate, much narrower than the striæ, which are strongly and catenulately punctured (found on *Salix*). . . . . A. MINIMUM, *Herbst*.
bb†. Interstices level or convex, rarely raised, very seldom as narrow as the striæ.
aa‡. Thorax and elytra glabrous.*
aaa. Colour of elytra metallic, blue, green, or greenish-blue.
aaa*. Punctuation of thorax shallow and diffuse.
aaa†. Size smaller; elytra more depressed, greenish-blue; fovea at base of thorax not strong . . . . . A. VIRENS, *Herbst*.
bbb†. Size much larger; elytra convex, deep blue; fovea at base of thorax strong. A. FUNCTIGERUM, *Payk*.
bbb*. Punctuation of thorax deep and more or less close.
aaa†. Eyes prominent.
aaa‡. Head and thorax black, elytra deep purplish-blue . . . . . A. PISI, *F*.
bbb‡. Colour entirely bright golden green or greenish-blue . . . . . A. ASTRAGALI, *Payk*.
bbb†. Eyes not prominent; head and thorax black, elytra deep blue . . . . . A. ÆTHIOPS, *Herbst*. (*subsulcatum*, Marsh.)
bbb. Colour of upper and under surface entirely black.
aaa*. Thorax diffusely and very finely punctured, smooth and shining, much longer than broad; size larger . . . . . A. EBENINUM, *Kirby*.
bbb*. Thorax closely and comparatively strongly punctured, dull, not much longer than broad; size small . . . . . A. FILIROSTRE, *Kirby*.
bb‡. Thorax and elytra more or less distinctly pubescent.
aaa. Thorax with a central dorsal channel extending from base to apex; colour leaden; size rather small . . . . . A. ONONIS, *Kirby*.
bbb. Thorax with a central dorsal channel continued beyond middle, but more or less obsolete towards apex, and sometimes towards base.
aaa*. Elytra blue; forehead with a depression between eyes; antennæ black A. SPENCEI, *Kirby*.
bbb*. Elytra black or leaden-coloured; forehead without depression between eyes.

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* In *A. virens* the pubescence is scarcely visible, and I have therefore placed it in this division.

aaa†. Antennæ entirely reddish-yellow in the male, dark with the base reddish-yellow in the female; elytra not strongly dilated behind . . . . . A. ERVI, *Kirby.*

bbb†. Antennæ black in both sexes; elytra strongly dilated behind, pear-shaped . . . . . A. STRIATUM, *Marsh.*

ccc. Thorax with an impression or channel distinct at base only, and rarely reaching middle.*

aaa*. Tarsi with the first joint much longer than the second, as long as or longer than the other joints taken together; legs very long . . . . . A. VORAX, *Herbst.*

bbb*. Tarsi with the first joint shorter than the rest taken together, but considerably longer than the second.

aaa†. Head longer than broad; eyes oval, less prominent . . . . . A. GYLLENHALI, *Kirby.*

bbb†. Head broader than long; eyes rounded, more prominent . . . . . A. UNICOLOR, *Kirby.* (*afrum*, Gyll.)

ccc*. Tarsi with the first joint about as long as, or slightly longer than, second.

aaa†. Elytra blue or greenish-blue.

aaa‡. Elytra elongate, size larger; thorax closely punctured . . . . . A. MELILOTI, *Kirby.*

bbb‡. Elytra not elongate; size smaller.

aaaa. Punctuation of thorax stronger and less close; pubescence not distinct . . . . . A. LIVESCERUM, *Gyll.* (*reflexum*, Gyll.)

bbbb. Punctuation of thorax finer and very close; pubescence very distinct . . . . . A. WALTONI, *Steph.* (*Curtisi*, Boh.)

bbb†. Body black or leaden-black.

aaa‡. Hind body much dilated, pear-shaped . . . . A. IMMUNE, *Kirby.*

bbb‡. Hind body not, or comparatively slightly, dilated or pear-shaped.

aaaa. Orbits of eyes furnished beneath with a border of white hairs; elytra often with a slight bronze reflection . . . . . A. SIMILE, *Kirby.*

bbbb. Orbits of eyes not furnished beneath with a border of white hairs; elytra without bronze reflection.

aaaa*. Scutellum long, rectangular; size large; (insect closely resembling *A. meliloti*, except in colour) . . . . . A. SCUTELLARE, *Kirby.*

bbbb*. Scutellum short, usually rounded or triangular.

aaaa†. Thorax plainly longer than broad.

aaaa‡. Thorax distinctly narrowed in front; elytra somewhat dilated behind; size larger. . . . . A. LOTI, *Kirby.*

bbbb‡. Thorax subcylindrical with the sides subparallel; size small.

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* This character, as a rule, is a very good one, but in one or two species (e.g. *A. Gyllenhali*, and in the preceding group *A. Spencei*) is somewhat unsatisfactory, as the impressions and channels sometimes vary in different specimens of the same insect; I cannot, however, find a more evident or reliable character on which to separate these groups.

aaaa§. Pubescence strong; elytra moderately convex. — A. SENICULUM, *Kirby.*
bbbb§. Pubescence scanty; elytra depressed . . . — A. TENUE, *Kirby.*
bbbb†. Thorax as long as broad or transverse.
aaaa‡. Forehead with a broad impression in front; rostrum of equal length in both sexes . . . . . — A. PUBESCENS, *Kirby.*
bbbb‡. Forehead even; rostrum a little longer in female than in male . . . . . — A. CURTISI, *Walt.* (*curtulum*, Desbr.)
bb*. Rostrum straight or only slightly curved (more robust and broader than in the preceding species).*
aa†. Base of elytra bordered between scutellum and fourth stria; upper surface of a reddish purple metallic colour; size larger . . . . . — A. LIMONII, *Kirby.*
bb†. Base of elytra not bordered; size smaller.
aa‡. Head and thorax black; elytra metallic (blue, greenish-blue or violet).
aaa. Elytra short, strongly dilated and rounded behind, convex.
aaa*. Sides of thorax almost straight; temples and throat almost impunctate . . . . . — A. MARCHICUM, *Herbst.*
bbb*. Sides of thorax somewhat rounded; temples and throat thickly and plainly punctured . — A. AFFINE, *Kirby.*
bbb. Elytra long, feebly dilated behind, depressed in front.
aaa*. Forehead distinctly punctured, rather shiny; rostrum in both sexes evidently longer than the head . . . . . — A. VIOLACEUM, *Kirby.*
bbb*. Forehead almost shagreened, very dull; rostrum shorter than the head in male and about as long as the head in the female . . . . . — A. HYDROLAPATHI, *Marsh.*
bb‡. Head thorax and elytra unicolorous black.
aaa. Scutellum very small, scarcely visible; punctuation of thorax less close with central line impunctate; size smaller . . . . . — A. SEDI, *Germ.*
bbb. Scutellum rather large, oblong; punctuation of thorax very close; size larger . . . . . — A. HUMILE, *Germ.* (*curtirostre*, Germ.)

I have for convenience, sake followed Bedel in indicating the chief groups, although I have not kept to his arrangement; they are, however, to a great extent merely artificial groups and simply adopted with a view to help the student in the identification of the species.

GROUP 1.

Rostrum subulate at apex: colour dark blue or black with legs entirely dark (*on various* Leguminosæ).

A. pomonæ, F. (*cyanescens*, Kirby). Head and thorax black or blue-black, elytra blue or greenish-blue, finely and scantily pubescent above, more closely beneath; head strongly sculptured, rostrum broad behind and much narrowed in front, gibbose beneath before the insertion of the antennæ, with a smooth central line on the upper surface at base which is more apparent in the male; antennæ black with the first joint

* *vide* p. 135, line 6.

usually reddish or ferruginous; thorax longer than broad, narrowed in front, very closely and rather strongly punctured, with a fine central channel before scutellum reaching middle; elytra convex with the shoulders strongly marked and with strong punctured striæ, interstices flat, finely shagreened; legs long, black; size variable; L. $2\frac{3}{4}$–$3\frac{1}{2}$ mm.

Male with the thorax broader than in female, and with the narrowed portion of the rostrum shorter and duller.

On *Vicia sepium*, *Lathyrus pratensis*, and also on *Sarothamnus scoparius*, *Cratægus oxyacanthæ*, &c.; the larva apparently feeds in the pods of *Leguminosæ*; common and generally distributed throughout England from the Midland counties southwards, but rarer further north; Northumberland and Durham district, recorded by Mr. Bold, as common in Mr. Selby's Twizell collection; Scotland, very rare, Forth district, "Dalmeny Park," Murray's Cat. It appears to extend over the greater part of Europe and Algeria; Mr. Walton (Annals and Magazine of Natural History 1844, p. 19) says that he has beaten the species out of juniper bushes at Birch Wood in considerable abundance in the month of May. Curtis (Farm. Insects, p. 487) observes that "as early as May these weevils are found on the hawthorn, and are abundant until the autumn on heather, fir-trees, and oaks," and that he has ascertained that the female deposits her eggs in the pods of vetches, from which he has bred the beetle; the larva is of a pale ochreous colour; the chief vetches attacked are *Vicia sepium* and *V. sativa*; Curtis further remarks that experience shows that *V. sepium* (the bush vetch) is difficult to cultivate on a large scale, owing to the destruction of the seeds by species of *Apion*.

A. opeticum, Bach. (♂ *Marshami*, Boh.). Allied to the preceding species but on the average smaller and distinguished by its invariably black colour, and by having the rostrum more abruptly contracted a little behind the middle and less dilated at the base in both sexes; the club of the antennæ also is evidently less elongate and the sutural stria is continued to base of elytra. L. $2\frac{1}{3}$–3 mm.

On *Orobus vernus* and *Lotus corniculatus*; very rare in Britain; two specimens only have occurred; these were taken by Dr. Power several years ago on *Lotus corniculatus* growing on a railway bank near Bopeep, Hastings; the species is by no means uncommon in northern and central Europe on *Orobus vernus*.

A. craccæ, L. (♂ *ruficorne*, Herbst.). Of the same general shape as *A. pomonæ*, but much smaller, and of a dull black colour and more evidently pubescent; head broad, distinctly striated between eyes; rostrum abruptly narrowed in front, finely and closely punctured, except towards apex, strongly and angularly gibbose beneath; thorax as long as its breadth at base, narrowed in front, rather finely and very closely punctured, with a fine central furrow before scutellum which is variable in length; elytra convex, of shorter and broader form than in *A. pomonæ*, with strong punctured striæ and flat shagreened interstices; legs black with strongly pubescent trochanters. L. 2–$2\frac{1}{3}$ mm.

Male with the rostrum shorter, as long as thorax, and the antennæ entirely testaceous.

Female with the rostrum longer, half as long again as thorax, and the antennæ dark towards apex, or testaceous only at base; the narrowed part of the rostrum is also longer in this sex.

On *Vicia cracca*, *Lathyrus sylvestris*, *Ervum hirsutum*, &c.; local, but not uncommon where it occurs; Darenth Wood, Shirley, Claygate, Caterham, Esher, Dorking, Dagenham; Dover; Hythe; Hastings; Glanvilles Wootton; Isle of Wight; Norfolk; Yorkshire; Northumberland and Durham district. "On *Vicia cracca* in fields above Swatwell, opposite Axwell Park," Hardy; Scotland, Forth district, very rare, "Dalmeny Park," Murray's Cat.; very probably, however, the last two records should be referred to *A. cerdo*; Ireland, near Dublin, and Belfast; the species extends over Europe and Northern Asia; it is one of those that occurs plentifully on certain trees; Mr. Walton took it in great abundance on the oak and ash at Shirley Common, near Croydon, and Dr. Power on lime trees at Rowner, Hants; it has been found in France on *Vicia multiflora* and *V. hirsuta* as well as on *V. cracca*.

A. cerdo, Thoms. Allied to *A. craccæ* from which it may be known by its average larger size and more bulky limbs, and also by having the rostrum less gibbose on its under side, the forehead with only two or three distinct striæ between eyes, the antennæ with only one or two basal joints testaceous in both sexes, and the rostrum longer in front of the insertion of the antennæ and more gradually acuminate; from *A. opeticum* it may be separated by the striæ between the eyes and by having the base of the rostrum almost smooth in centre; it also resembles *A. subulatum*, but may be easily distinguished from that species by its more abruptly subulate rostrum which is evidently, although comparatively slightly, gibbose beneath; in the male the rostrum is shorter and more evidently pubescent than in the female. L. $2\frac{1}{2}$–$3\frac{1}{4}$ mm.

On *Vicia cracca*; almost exclusively a northern species; Bewdley Forest (W. G. Blatch); Northumberland and Durham district, Bothal, Gosforth, Gibside, banks of Irthing, Hetton Hall, near Belford; Scotland, very local, Solway district, Dumfries; one specimen is in Mr Crotch's collection from Killarney, Ireland; it is found in northern and central Europe.

A. subulatum, Kirby (♂ *Marshami*, Steph.). This species may easily be distinguished from the preceding by its much more gradually subulate rostrum which is scarcely, if at all, gibbose beneath at the insertion of the antennæ; the colour is dull black and the pubescence is fine and scanty: head rather broad, plainly punctured, distinctly striated between eyes, antennæ black, with the first joint usually ferruginous, inserted at about middle of rostrum; thorax slightly narrowed in front, with rather strong close punctuation, and a fine channel before scutellum; elytra dilated behind with the punctures of the striæ placed rather closely together, interstices flat, rather broad, feebly shagreened; legs black. L. $2\frac{1}{2}$–3 mm.

Male smaller with the rostrum shorter and less narrowed towards apex.

On species of *Vicia*, also on *Lathyrus pratensis* and *Lotus corniculatus*; local, but not uncommon where it occurs; Chatham, Caterham, Dorking, Tonbridge; Bletchingley, Birdbrook, Rusper, near Maidstone (bred from pods of *Lathyrus pratensis* (Gorham);) Herne Bay; Dover; Hastings; Rowner, Hants; Isle of Wight; Glanvilles Wootton; Seaton, Devon; Norfolk; Suffolk; Lickey Hills; Trench

Woods ; Barton Moss, Cheshire ; Yorkshire ; Northumberland and Durham district ; Scotland, rare, Solway, Tweed and Forth districts ; Ireland, Dublin, Waterford and Armagh ; the species extends over Europe and the Mediterranean district, and northern and central Asia.

GROUP 2.

Upper surface strongly squamose ; antennæ inserted at the base of the rostrum which is furnished with a strong tooth on each side at the point of their insertion ; elytra with the second stria united behind to the eighth (*Oxystoma*, Steph.); (on furze, broom and *Genista*).

A. ulicis, Forst. Oblong, rather convex, black, covered with thick white scaly pubescence, so that the insect appears to be of a silvery grey colour ; head short, rugosely punctured ; eyes convex ; rostrum varying in the sexes, narrow and almost straight, brownish-black or somewhat ferruginous ; antennæ slender, more or less testaceous, with the club darker ; thorax scarcely longer than broad, convex, with sides narrowed in front, rounded behind middle and contracted at base, finely and closely punctured, with a short stria before scutellum ; scutellum black, glabrous ; elytra convex, broader at base than thorax, not dilated behind, with fine striæ and broad finely rugose interstices ; underside thickly squamose ; legs dark, more or less pitchy, anterior pair often reddish. L. 2–2¾ mm.

Male with the rostrum and antennæ considerably shorter than in the female.

On *Ulex Europæus* (common furze) and *U. nanus;* common and generally distributed throughout the greater part of the kingdom.

A. genistæ, Kirby. Oval, rather robust, thickly covered with silvery white and fawn-coloured elongate scales, the sides of thorax, underside of body and three central interstices of each elytra being light and the remainder brownish ; rostrum moderate, curved, antennæ dark, reddish towards base; head short, eyes prominent ; thorax broader at base than long, slightly narrowed in front, closely and rather strongly punctured ; elytra ovate, rather broad, with sides strongly rounded, striæ fine ; legs red, tarsi black. L. ¾–2⅓ mm.

On *Genista tinctoria* and *G. anglica;* very local, but not uncommon where it occurs ; Wanstead, Wimbledon, Esher, Horsell, Woking, Reigate, Weybridge, Bearsted, near Maidstone ; Suffolk ; New Forest ; Glanvilles Wootton ; Scotland, rare, Moray district.

A. fuscirostre, F. More elongate and parallel-sided than the preceding, black, clothed rather sparingly with whitish and cinnamon-coloured elongate scales ; the general colour is brown with the sides of the elytra and an oblique band on each reaching from shoulders to suture, white: the scales, however, are very often abraded ; head short, coarsely punctured, rostrum moderately long, more strongly toothed at the insertion of the antennæ than in the preceding species ; thorax

convex, a little longer than broad, with sides scarcely narrowed in front and broadest behind middle, where they are rounded, closely punctured, with a small stria before scutellum, which is glabrous; elytra long, subparallel, not much broader than thorax, finely striated; legs robust, red, with the base of femora and the tarsi usually black. L. $2\frac{1}{3}$–3 mm.

In the male the rostrum is shorter, and the thorax and general form longer and more parallel.

On *Genista tinctoria*, *G. anglica* and *Sarothamnus scoparius*; very local and, as a rule, not common; Chatham, Whitstable, Weybridge, Chattenden, Plumstead, Birch Wood, Charlton, Croydon; Suffolk; Colchester; Redgrave Fen; Bewdley; Scotland, Forth district, very rare, "Juniper Green, near Edinburgh. Mr. R. N. Greville," Murray's Cat. This latter record may be in error, the Scotch catalogue of the species being in a somewhat unsatisfactory condition. Dr. Sharp (Scottish Nat. xxxviii. p. 287), says that he has himself given very little attention to the Apious of Scotland, and that a considerable proportion of the species given in his catalogue are included only on the authority of Murray's Catalogue, and some of them are probably not really found in Scotland.

Group 3.

Upper surface more or less testaceous or reddish brown; antennæ not inserted at base of rostrum (on *Malva* and *Urtica*).

A. malvæ, F. Oval, rather depressed, clothed with whitish gray pubescence which is more evident on the underside, black, with the elytra testaceous, except a patch at scutellum, often covering base, and more or less of the suture and sometimes of side margins: head rather short and broad, eyes prominent, surrounded with white cilia, rostrum broad, often testaceous at apex, pubescent, more shining in front, antennæ testaceous; thorax about as long as broad, narrowed in front, feebly rounded at sides, finely punctured; scutellum very small, glabrous; elytra rather flat on disc, considerably broader at base than thorax, slightly widened behind middle, with finely punctured striæ; legs testaceous, claws and sometimes the base of the femora infuscate. L 2–$2\frac{1}{2}$ mm.

In the male the rostrum is shorter and duller than in the female.

On species of *Malva*; the larva has been found in the seed vessels of *M. sylvestris* and *M. rotundifolia*; locally common; generally distributed in the London and South Eastern districts of England; Essex; Devon, general but not common; Swansea; Hartlebury, near Worcester; Cambridge; Hunstanton, Norfolk, abundant; it is, apparently, not common in the Midlands, and I know of no record further north than Repton, Burton-on-Trent: the species, according to Bedel, occurs over the whole of Europe and the Mediterranean region, but it is not mentioned by Thomson as occurring in Scandinavia, and the British distribution points to the fact that it does not occur in the northern districts.

A. urticarium, Herbst. (*vernale*, F., *cœcinnum*, Marsh). One of our smallest and prettiest species; elongate and narrow, of a lighter or darker reddish-brown colour, clothed with distinct whitish pubescence which is thicker at the sides of thorax and on the elytra; on the

latter there are two smooth and glabrous dentate bands which appear dark against the white pubescence; head broad, vertex slightly depressed, rostrum rather long, dilated at base, antennæ reddish with club darker; thorax subquadrate, scarcely narrowed in front, not very closely punctured, with a variable impression or stria before scutellum; elytra convex, broader at base than thorax, with the shoulders well marked, and with distinct punctured striæ, interstices rather convex; underside clothed with rather thick white pubescence; legs red, tarsi and base of femora more or less infuscate. L. 2–2¼ mm.

Male smaller, with the rostrum shorter, thicker and evidently more pubescent than in female.

On *Urtica dioica* (the common stinging nettle); also on *U. urens*; the larvæ live in the stems of the nettles; very local, but sometimes common where it occurs; Darenth, Gravesend, Caterham, Ripley, Dartford, Sheerness, Belvedere, Southend, Woking, Sittingbourne; Deal; Hastings; Isle of Wight; Swanage; Glanvilles Wootton; Swansea; I know of no localities further north.

Group 4.

Colour entirely blood-red or yellowish scarlet (chiefly on *Rumex*).

A. miniatum, Germ. (*frumentarium*, Herbst. *nec* Payk.). One of the largest and most conspicuous species of the genus; colour blood-red, pubescence very scanty; head long, coarsely punctured on both its upper and under side, eyes black, very prominent; rostrum comparatively short, curved, very stout, punctured at base, rather shining and more finely punctured towards apex, apex dark; thorax subcylindrical, dilated and rounded about middle, rather strongly constricted in front, slightly narrowed at base, thickly and coarsely punctured, with a stria before scutellum, which is small and furrowed; elytra obovate, convex, with deep strongly punctured striæ, interstices convex scarcely as broad as the striæ; legs rather stout, apex of tibiæ and claws and sometimes femora towards base pitchy. L. 3½–4½ mm.

Male with the head broader and the rostrum shorter and more plainly punctured.

On species of *Rumex*, especially *R. obtusifolius* and *R. nemorosus*; the larva has been observed in the stalks of *R. hydrolapathum*; according to Perris, however, it forms a gall on the leaves of the two first mentioned species in which it undergoes its metamorphoses *; generally distributed and common from the Midlands southwards, but rarer further north; according to Murray it is occasional throughout Scotland; it is apparently rare in the Northumberland and Durham districts. Ireland, near Dublin and Waterford.

A. cruentatum, Walton. This species may easily be distinguished from the preceding by its smaller size, less deep red colour, and the shape of the eyes which are much larger and less prominent; the thorax

* Bedel (l. c., p. 383) is of opinion that the species referred to by Perris may be either *A. cruentatum* or *A. hæmatodes* and not *A. miniatum*.

also is more cylindrical and less strongly punctured : in general appearance it more closely resembles *A. hæmatodes*, but may be known by the punctured temples, the shape of the eyes and the stouter rostrum. L. 3–3$\frac{1}{3}$ mm.

On *Rumex ;* also, according to Mr. Champion, on sallows, and by sweeping in grassy fields, on the borders of woods, &c.; not common; Sydenham, Hampstead, Chatham, Claygate, Walton-on-Thames, Dulwich, Cowley, Birch Wood, Farnham, Sandhurst; Deal; Hastings; Arundel; Plymouth; Northumberland and Durham district; Scotland; Solway, Tweed and Tay districts; Ireland, near Waterford.

A. hæmatodes, Kirby (*frumentarium*, Payk., L. ?). Of a pale sanguineous colour, which is, however, darker in some specimens than in others, slightly pubescent, dull ; head about as long as broad, finely and closely punctured, temples and throat impunctate behind, rostrum rather short, curved, shining, dark at apex ; thorax almost cylindrical, rather finely and very closely punctured ; elytra oval, dilated, rather long, with punctured striæ and subconvex interstices ; claws and apex of tibiæ often black : it is a smaller species than either of the two preceding. L. 2$\frac{1}{3}$–2$\frac{1}{2}$ mm.

Male with the rostrum shorter and more pubescent.

Sandy places ; on *Rumex acetosella ;* the larva, which is of an orange colour, lives in a gall on the central ridge or petiole of the leaf ; also on *Teucrium scorodonia ;* somewhat local, but not uncommon, and generally distributed throughout the kingdom as far north as the Orkney Islands.

A. rubens, Steph. This species is easily distinguished from all the other red species by its smaller size, narrow and subparallel form and short broad head, as well as by its more evident pubescence ; the rostrum is comparatively slender, strongly curved, finely punctured and rather shining, dark at apex ; thorax subtransverse, scarcely rounded at sides, finely and closely punctured, with an obsolete furrow before scutellum ; elytra with well marked shoulders, sub-parallel, with strong punctured striæ, interstices convex; legs rather short, claws black. L. 2 mm.

Male with the rostrum shorter and thicker than in the female.

Sandy places, on *Rumex acetosella*, *Teucrium scorodonia*, &c.; local, but not uncommon in some districts; Esher, Shirley, Weybridge, Wimbledon, Coombe Wood, West Wickham ; Essex ; St. Leonard's; New Forest; Bournemouth ; Shirley Warren, Southampton ; Glanvilles Wootton (abundant) ; Blackdown, Devon (rare) ; Swansea ; Barmouth ; Knowle, near Birmingham ; Ashwicken ; Chat Moss ; Sherwood Forest ; Liverpool district (rare) ; Scotland, Balmuto, Fifeshire (Power).

A. sanguineum, De G. Oblong-obovate, of the form of *A. violaceum*, finely pubescent, colour dull sanguineous ; head about as long as broad, more coarsely punctured than thorax, vertex not punctured at sides ; rostrum in the male shorter and thicker than in the female, rather dull, distinctly punctured to apex, almost straight ; in the female long, cylindrical, glabrous and shining, with scattered minute punctures, tip pitchy ; thorax longer than broad, feebly rounded at sides, more narrowed

in front than behind, very finely and closely punctured; elytra not very convex, crenate-striate, with narrow, somewhat raised, interstices; legs robust; the species may be known by its shape and by having the rostrum nearly straight and much longer in the female than in the male. L. $2\frac{1}{2}$–$3\frac{1}{3}$ mm.

On *Rumex acetosella;* according to M. C. Brisout the larva forms a gall at the roots of the plant; also on *Teucrium scorodonia:* in sandy places; rare; Reigate (Champion); Esher (in some numbers (Champion)); Weybridge on *Agrimonia eupatoria* (Power); Horsell (Power); Barmouth (Blatch); London and Yorkshire (Stephens).

Group 5.

Upper surface black; legs wholly or in part red; pubescence distinct at all events on under-side in male.

A. pallipes, Kirby (*geniculatum,* Germ.). Oblong, sub-parallel, dull black, clothed with distinct and very evident whitish pubescence, which is, however, easily abraded; head short and broad, rather strongly punctured, with one stria between the eyes, which is, however, often obsolete, eyes prominent; rostrum scarcely as long as head and thorax, curved, a little thickened at base, finely punctured; antennæ inserted near base, reddish-testaceous, with the club usually darker; thorax scarcely longer than broad, slightly constricted in front, with the sides sub-parallel, finely and closely punctured; scutellum rather large, sub-cordiform; elytra oblong-oval, with large punctured striæ, interstices scarcely broader than the striæ, base of the third a little dilated and thickly pubescent; legs testaceous with the tarsi and trochanters, and usually the apex of tibiæ, and the knees, dark. L. 2–$2\frac{1}{2}$ mm.

Male with the rostrum stouter and duller, pubescent, and more evidently punctured; in the female the rostrum is longer and smoother and more plainly curved.

On *Mercurialis perennis* and *Allium,* especially in chalky districts; very local, but not uncommon where it occurs; London district, not uncommon, Caterham, Mickleham, Birch Wood, Sevenoaks, St. Mary Cray, Dorking, Shirley, Birdbrook (Essex); Ditchingham, Suffolk; Birchington; St. Leonards Forest; Arundel; Bath; Robins Wood, Repton; Yorkshire; Bowden, near Manchester; Northumberland and Durham district, rare; Scotland, very local, on *Allium,* Forth district; abundant at Eskbank, May 18, 1865 (Sharp).

A. semivittatum, Gyll. (*Germari,* Walt.). Closely allied to the preceding, but more convex, with thicker and whiter pubescence, and usually with a distinct bronze reflection; the rostrum is shorter and the thorax is more rounded at the sides; the elytra are proportionally broader, with the shoulders more marked, and there is often a denuded fascia on their disc; the club of the antennæ is rarely infuscate, and the insect may easily be distinguished by having the tarsi and trochanters red. L. $1\frac{3}{4}$–$2\frac{1}{4}$ mm.

On *Mercurialis annua* in September and October; the larva lives in the knots of

the stem; extremely local; it has only been found in this country by Mr. Walton, who many years ago took it in abundance near the Tivoli Gardens, Margate; the species occurs rather rarely in central and southern Europe and Algeria.

A. rufirostre, F. (*malvarum,* Kirby). Black, elytra with a more or less distinct greenish-æneous reflection, upper surface very scantily pubescent; head rather broad, striated between eyes, rostrum varying in the sexes; thorax a little longer than broad, narrowed in front, regularly, rather closely and distinctly punctured, with a fovea before scutellum; elytra widened, with fine striæ which are almost impunctate, and very broad interstices which are rather shining; antennæ reddish testaceous, darker in female, legs red, with apex of tarsi dark. L. 3 mm.

Male with the rostrum reddish-yellow for its apical half, punctured, much shorter than in female; under-side clothed with thick white squamose pubescence, apex of abdomen red.

Female with the rostrum entirely black, longer and smoother, the sides of the breast clothed with thick whitish pubescence, and the apex of abdomen and anterior coxæ black.

On mallows; the larva has been observed in the seed vessels of *Malva sylvestris* and *M. rotundifolia*; common and generally distributed from Yorkshire southwards, but rarer further north; Northumberland and Durham districts, very rare; not recorded from Scotland; Ireland, near Dublin.

A. viciæ, Payk. A rather short and broad species which bears a considerable resemblance to *A. ervi* in shape and in the fact that the antennæ are entirely yellow in the male and partially black in the female; upper surface rather dull, clothed with fine whitish pubescence; head rather broad, striated between eyes; thorax subtransverse constricted in front, coarsely and regularly punctured, with a channel before scutellum reaching middle; elytra globose-obovate, with punctured striæ and flat interstices; legs rather long. L. 2 mm.

Male with the rostrum punctured and pubescent, the antennæ entirely yellow, and the under side of the eye and the under surface of the body clothed with white squamose pubescence; the intermediate and posterior tibiæ are black with the basal third red.*

Female with the rostrum more slender and more curved, smooth and shining, dull at base, the antennæ fuscous towards apex, and the intermediate and posterior tibiæ black with base at most pitchy.

On *Vicia cracca*; locally common; Wimbledon, Caterham, Birch Wood, Chatham, Rusper, near Maidstone; Eastbourne; Thorness Bay, Isle of Wight; Exeter; Bideford; Wicken Fen; Midland districts, generally distributed; Repton, Burton-on-Trent; Yorkshire (very common, Walton); Barton Moss, Cheshire; Liverpool district; Northumberland and Durham district; Scotland, Solway, Tweed, Forth and Tay districts; Ireland, Waterford and near Belfast.

Group 6.

Upper surface black; legs wholly or in part red; pubescence very slight or absent (chiefly on species of Trifolium).

* On page 133, line 7, "base" should be read for "apex." See Vol. I. Introduction, page xxx.

A. difforme, Germ. (*tibiale*, Desbr.). Black, shining, glabrous; antennæ varying very much in the sexes, red, more or less broadly fuscous towards apex; head striated between eyes; thorax conical, closely and rather coarsely punctured, with a distinct furrow before scutellum; elytra oval, with shoulders rather strongly marked, and with punctured striæ, interstices rather broad. L. 3 mm.

Male with the scape of the antennæ clavate, much dilated at apex, funiculus with the first joint small, and the second and third very broad and dilated; femora, except extreme apex, the trochanters, and more or less of tibiæ, red, anterior tibiæ curved and slightly dilated, posterior tibiæ dilated at apex.

Female with the antennæ and tibiæ simple, and the rostrum more slender than in male; femora, except apex, red, tibiæ and anterior coxæ and trochanters black.

Marshy places; on *Polygonum hydropiper*, &c.; local; London district, rather common and generally distributed; Birchington; Deal; Dover; Hastings; Arundel; Brighton; Portsmouth; Devonshire; Littlington, Cambridge; Huntingdonshire; Knowle, near Birmingham; I know of no record further north than Hunstanton, Norfolk, where I have taken it sparingly on the side of a brook towards Heacham.

A. dissimile, Germ. Smaller than the preceding, black, almost glabrous; head rather broad, somewhat obsoletely punctured in front; thorax subcylindrical, with the sides rounded in middle, closely and rather strongly punctured, with an indistinct channel before base; elytra comparatively short, with rather fine punctured striæ, shoulders strongly prominent; femora and basal half of tibiæ red, anterior tibiæ often almost entirely red. L. $2\frac{1}{2}$ mm.

Male with the scape of the antennæ much dilated and reddish yellow, the remaining joints being black; the first two joints of the tarsi are dilated and furnished with thick white silky pubescence beneath, and the posterior tibiæ are slightly curved.

Female with the antennæ simple, entirely black, and the tibiæ and tarsi simple.

Sandy places; on *Trifolium arvense* in September and October; local, but occasionally plentiful where it occurs; Weybridge, Sevenoaks, Birch Wood; Deal (on flowers of the Haresfoot Trefoil, &c.); Sandwich; Arundel, Sussex; St. Osyth; Barmouth.

A. varipes, Germ. Black, shining, with the antennæ black, pitchy testaceous towards base; forehead closely sculptured; rostrum long and shining, sparingly punctured; thorax oblong, closely and subrugosely punctured, with a fine central channel reaching from base to middle; elytra long, oblong oval, with punctured striæ; femora, except extreme apex, and anterior coxæ, red; anterior tibiæ mostly red, intermediate and posterior pairs with a broader or narrower red ring before base; the species is allied to *A. apricans*, from which it may be known by having the rostrum longer and much more curved, especially in the female, the

stouter legs, and the distinct red rings before the base of the intermediate and posterior tibiæ, which is always black. L. $2\frac{1}{4}$–$2\frac{1}{2}$ mm.

Male with the anterior tibiæ slightly curved, and the antennæ lighter at base than in female.

On the red clover; very local; London district, not uncommon, Mickleham, Caterham, Croydon, Birch Wood, Dartford, Maidstone, Cowley, Warlingham, Southend, &c.; Birchington; Pegwell Bay; Dover; Hastings; Eastbourne; Arundel; Isle of Wight; Glanvilles Wootton; Devonshire, Seaton Beach and Exeter; Wicken Fen; Repton; York; Northumberland and Durham district, very rare; Scotland, very rare, Forth district, "Dalmeny Park, Mr. R. N. Greville, Murray's Cat."

A. lævicolle, Kirby. From all the allied species except *A. Schönherri* this very distinct insect may at once be known by its finely punctured smooth and shining thorax, from which it derives its name; it is considerably larger and more robust than *A. Schönherri* and may be known from that species by having the base of the posterior tibiæ furnished with a broad testaceous ring; the whole body is black, smooth and shining; head rather broad, striated; rostrum stout, a little longer in female than in male; thorax oblong, very slightly narrowed in front, with sides subparallel, and a very distinct central furrow behind; elytra oblong oval, with punctured striæ which are not so strong in some specimens as in others; legs red, with trochanters, knees, apex of tibiæ, and tarsi, black. L. $2\frac{1}{2}$ mm.

Sandy and chalky places; by sweeping herbage; occasionally found in moss beneath furze, and in haystack refuse; its exact food plant appears to be unknown, but Bedel (l. c. p. 366) says that Bargagli (Rincop. Europ. p. 158) supposes that the species develops itself in a gall (?) on *Trifolium repens;* very local, but occasionally not uncommon where it occurs; Darenth; Dulwich; Gravesend, Sheerness, Dartford, Southend; Windsor; Deal; Dover; Hastings; Eastbourne; Arundel; Hurstpierpoint; Littlehampton; Brighton; Isle of Wight, Ryde, Freshwater, Totlands Bay, &c.; it appears to be almost confined to the south-eastern districts of England, and is chiefly found near the coast.

A. Schonherri, Boh. Black, shining, glabrous; head short and broad, striated between eyes, rostrum rather short and stout, narrowed in front and much thickened behind, somewhat curved; antennæ about as long as rostrum, black, except first joint, which is more or less red; thorax narrow, oblong and subcylindrical, very finely and minutely punctured, smooth and rather shining, the punctures being more or less distinct in different specimens, base with a minute fovea; elytra convex, rather short, with deep finely punctured striæ, interstices rather broad and flat; legs black with the anterior coxæ and trochanters reddish or pitchy, anterior tibiæ variable, intermediate and posterior tibiæ black, all the femora red. L. 2 mm.

In the female the rostrum is more slender than in the male, and the antennæ, as in several of the allied species, are inserted a little behind middle.

By sweeping herbage, on or near the coast: it probably occurs on *Trifolium*, as it has been found in some numbers at the bottom of a clover stack in winter at Sheerness by Mr. J. J. Walker; very local and rare: Southend (Rye and Gorham); Sheerness (Walker and Champion); Weybridge and Seaford, Devon (Power); Eastbourne (Waterhouse); Portsmouth, 1873 (Walker); Heath at Warning Camp near Arundel (Walton and S. Stevens); Brading, Isle of Wight (S. Stevens); Scarborough, August, 1837 (Walton); the specimens in our collection are chiefly due to the liberality of Mr. J. J. Walker, who has found so many rare British species in numbers, and is a true type of an unselfish entomologist, as he collects vigorously for his friends and keeps no collection himself.

A. apricans, Herbst. (*fagi*, Kirby, *flavifemoratum*, Kirby, *assimile*, Kirby (?), *flavipes*, Müll. *nec* F.). Black, glabrous, rather shining; forehead rugosely punctured, rostrum long and slender, slightly curved, antennæ black with base reddish; forehead rugosely punctured; thorax oblong, oval-cylindrical, rather closely and distinctly and regularly punctured, with a central channel behind; elytra obovate with strong punctured striæ, interstices rather broad; legs black, with all the femora and the anterior tibiæ reddish-testaceous. L. 2–2½ mm.

Female with the rostrum longer than in male, and the elytra deflexed and callose behind.

On red clover (*Trifolium pratense*), &c.; also occasionally on trees; generally distributed and common throughout the greater part of the kingdom; the species is spread over Europe and Northern Asia, and sometimes does considerable damage in clover fields.

A. assimile, Kirby. I have followed Bedel in not regarding this as a separate species; as he remarks (l. c. p. 209), authors are not agreed as to the distinctive characters they assign to it, and it might be added that the characters themselves are comparative and slight, and in as far as they rest on the punctuation of the thorax and colour of legs they are not reliable, as in these points different specimens of the same species are somewhat variable. I have never been able satisfactorily to distinguish the two species and am very glad that *A. assimile* appears now to be sunk, as it considerably simplifies the red-legged group; it may, however, be as well to point out the usually received differences as given by Walton (Ann. and Mag. Nat. Hist. 1844, p. 37), where he says, "*A. assimile* may be known from *A. fagi* by having the rostrum in both sexes distinctly more curved, and in the male attenuated in front, whereas the latter species has the rostrum of both sexes filiform, nearly straight, and evidently longest in the female. *A. assimile* has the basal joints of the antennæ dull piceous and the thorax closely punctuated, with the punctures confluent. *A. fagi* has the basal joints of the antennæ testaceous and the thorax above more convex, with shallow subremote punctures on the disc; and it is a larger insect than *A. assimile*." *A. assimile* is recorded as found in company with *A. fagi* and as being just as common.

A. Bohemani, Thoms. (*ononidis*, Gyll., *ononicola*, Bach., *assimile*, Kirby *forte*, *apricans* var. *Seidl.*). Closely allied to *A. apricans* but

larger, with the forehead strongly striated between the eyes and the thorax closely, strongly and rugosely punctured; on the rostrum there is a distinct central carina prolonged almost to the insertion of the antennæ, and the thorax is impressed behind on each side at base; the male may be distinguished from the same sex in *A. apricans* by its short, almost subulate, rostrum and longer antennæ, and the female may be known by its more strongly arched rostrum; all the femora are red (the anterior coxæ and trochanters being also of that colour); the anterior tibiæ are very dusky testaceous and the other tibiæ are black. L. $2\frac{3}{4}$–3 mm.

On *Ononis spinosa* and other species of *Ononis;* chiefly on the coast in Britain, but it is found throughout the greater part of Europe; locally abundant; Herne Bay; Whitstable; Dover; Hastings; Shipley, near Horsham; Isle of Wight; Wallasey, Cheshire; Dr. Sharp has taken it in profusion on the South coast on *Ononis spinosa* and *O. arvensis;* the larva lives in the pods of the plants.

A. trifolii, L. (*æstivum,* Germ., *flavipes,* Laich, ? F.). This species is very closely allied to *A. apricans,* but may be distinguished by having the anterior trochanters pitchy and the four posterior trochanters black, whereas in the latter species they are all rufous; the antennæ are relatively shorter and are entirely black; the rostrum is very little curved in either sex, and the general form is shorter; the average size, moreover, is considerably smaller. L. $1\frac{1}{2}$–2 mm.

On the red clover; not so abundant as the preceding, but generally distributed and more or less common from the midland counties southwards; rarer further north. Northumberland and Durham district, rare; Scotland, Solway district, "Raehills, Rev. W. Little, Murray's Cat."; it probably occurs commonly in Ireland.

A. Ryei, Blackburn. This species may be an extreme form of one of the closely allied species, and requires further confirmation; according to the description given in the Entomologist's Monthly Magazine (xi. 128), it may be separated from all the rest in the group with the femora and anterior tibiæ alone reddish-yellow, by its short, broad, sparingly punctured thorax, which is scarcely, if at all, longer than broad, and has its sides very evidently rounded; it is most nearly allied to *A. apricans* (*fagi*), from which it differs in its shorter and more strongly bent rostrum, and in its antennæ, which have a darker base. L. $2\frac{1}{2}$ mm.

Taken sparingly by Mr. C. Lilley and the Rev. T. Blackburn in the Shetland Islands, in July, 1874.

A. dichroum, Bedel (*flavipes,* Brit. Cat., ? F.). This and the succeeding species are easily distinguished from all the others in the group by having all the tibiæ entirely red or reddish-yellow; from *A. nigritarse* the present species may be known by its larger size, and also by having the rostrum black in both sexes, and the anterior coxæ yellow-red in the male and black in the female; the forehead is plainly striated between the eyes, and the thorax is subcylindrical, very closely and

sometimes rather rugosely punctured, with a distinct channel at base; the elytra are elongate ovate, with moderately strong punctured striæ. L. $1\frac{1}{2}$–2 mm.

On white clover (*Trifolium repens*), *Spiræa*, &c.: common and generally distributed throughout the kingdom; it extends over Europe and Northern Asia.

I have adopted Bedel's name for this species, as the common name *A. flavipes* has been applied to several insects by different authors, and it does not seem at all clear to what species the original type must be assigned; it is better therefore to adopt an entirely new name.

A. nigritarse, Kirby. Smaller than the preceding from which it may at once be known by the more finely punctured and smoother thorax, and by the fact that the male has the anterior half of the rostrum yellow-red; the anterior coxæ are red in both sexes, and the antennæ are reddish-yellow except the club, whereas in *A. dichroum* the anterior coxæ are black in the female, and the apical half of the funiculus of the antennæ is black in both sexes. L. $1\frac{1}{2}$ mm.

On various species of *Trifolium*, and also on other low plants; common and generally distributed throughout England from the Manchester and Liverpool district southwards; recorded by Bold as not common in the Northumberland and Durham district, and by Dr. Sharp as occurring only in the Solway district of Scotland; Ireland, Dublin, &c.; the larvæ of the clover-feeding species appear to be almost always found in the flower-heads.

The *A. Waterhousei* of Boheman is, according to Walton, a variety of the female of this species with the tibiæ obscurely testaceous.

Group 7—22.

The whole of the species in the remaining groups have the body black or metallic with the legs entirely dark (except A. annulipes, *which has a testaceous ring at the base of the tibiæ in male,* A. flavimanum *which has the base of the tibiæ yellow-brown in both sexes, the colour being often obscure, and* A. filirostre *which sometimes has a testaceous ring at the apex of the anterior femora); the chief distinguishing characters will be found in the table of species* (pp. 134 et seqq.).

Group 7.

Rather small narrow species, with the forehead marked with two distinct furrows in the form of a V (*on* Corymbiferæ).

A. confluens, Kirby. Rather narrow, black, somewhat shining, clothed with distinct but fine and sparse pubescence; head almost as broad as the anterior margin of thorax, finely shagreened, rostrum slightly curved, about as long as head and thorax, antennæ rather stout, inserted near base of rostrum; thorax almost cylindrical, a little longer than broad, sparingly and finely punctured with a small fovea at base;

elytra leaden, not very convex, with fine and not deep punctured striæ, and broad flat interstices; legs rather stout. L. $1\frac{3}{4}$–2 mm.

Male with the rostrum shorter and the head broader, and the first joint of the posterior tarsi armed with a small spine beneath.

Chiefly on *Matricaria chamomilla*, but occasionally on *Chrysanthemum leucanthemum*; locally common; Mickleham, Egham and Gomshall, Surrey; Lee, Esher, Birch Wood, Chatham, Sheerness, Erith, Belvedere, Dartford, &c.; Deal; Arundel; Brighton; Portsmouth; Isle of Wight; Devon; St. Faith's, Norwich; Lowestoft; Heysham, near Lancaster; Ireland, Armagh (Johnson).

A. stolidum, Germ. This species is very closely allied to the preceding, and has by many authors been considered merely a variety; it may, however, be known by the stronger striæ of the elytra and consequently narrower interstices; the rostrum is a little longer and more curved, the frontal impression is stronger, and the thorax is broader; the general form is said to be shorter, but intermediate specimens occur; the pubescence also is less evident. L. $1\frac{1}{2}$–$1\frac{3}{4}$ mm.

On *Chrysanthemum leucanthemum* (Ox-eye Daisy) and not on *Matricaria*; not common, or rather very local; Mickleham, Hammersmith, Birch Wood, Caterham, Sheerness, Weybridge, Horsell, Barking; Bushey, Herts; Birchington; Sussex; Isle of Wight; Blackpool (Chappell); Scotland, rare, Solway district only.

Group 8.

Species with the thorax subglobose, convex on disc and strongly rounded at sides (chiefly on Corymbiferæ).

A. sorbi, F. (*lævigatum*, Payk., Bedel, &c, *nec* Kirby, *viridescens*, Marsh, ♂ *carbonarium*, Germ., ♂ *Sahlbergi*, Gyll.). Short and broad, glabrous; male entirely black, female with the elytra blue; head short, enlarged behind, forehead rugose or striate, eyes not prominent; rostrum varying in the sexes; antennæ moderately long with the scape as long as the two following joints, and the club oval; thorax convex, about as long as broad, with the sides strongly rounded, rather coarsely punctured, the punctures being more or less diffuse on disc and closer at sides, basal fovea deep; elytra very broad, with punctured striæ, and wide flat interstices; legs black, rather long. L. 3–4 mm.

Male considerably smaller than female, entirely black, with the rostrum much shorter, dull and punctured, and the elytra almost spherical.

Female larger with the elytra blue, and the rostrum as long as the body, smooth and shining.

On *Matricaria chamomilla*, *M. inodora*, *Anthemis arvensis*, &c.; also on the wild cherry; rare, male extremely rare; Tonbridge Wells (male), Wood Ditton (1835), and Cambridge (Power); Cambridge, in moss and dead leaves (Wollaston); Hastings (Butler); London district, Suffolk and Yorkshire (Stephens); Shoreham, Sussex (Rev. A. Matthews); Isle of Wight (Gorham); Bury Hill, near Arundel, August, and recently at Totlands Bay, Isle of Wight (S. Stevens); Knaresborough, Yorkshire, on the blackthorn (*Prunus spinosa*), both sexes (Walton). In August,

1877, the year after I began collecting Coleoptera, I beat a considerable number of specimens out of a hedge near Brockenhurst, New Forest, but as I did not know the species I paid no attention to it and only kept three or four examples; I have only seen one male of the species, which is in Dr. Power's collection.

A. Hookeri, Kirby. Short and broad, black, rather dull, sometimes with a slight greenish reflection, scantily pubescent; head short and broad, eyes rather prominent; rostrum about as long as head and thorax, dilated and dull at base, narrowed and rather shining in front; thorax subglobose, convex, more narrowed in front than behind, with fine and very close punctuation and an obsolete fovea or channel at base; elytra oblong-oval, with well-marked shoulders, and deep punctured striæ, interstices flat, very finely and transversely shagreened; legs moderately long and stout. L $2–2\frac{1}{2}$ mm.

Male smaller, with the rostrum shorter, and the elytra usually black, rarely greenish.

Female larger, with the rostrum longer, and the elytra usually greenish; the antennæ also are somewhat longer and more slender than in the male.

On *Matricaria chamomilla, Hieracium umbellatum, Trifolium pratense,* &c.; local; London district, not uncommon, Claygate, Esher, Caterham, Shirley, Woking, Bexley, Chatham, Sheerness, Gravesend, Dartford, Whitstable; Shipley, near Horsham; Hastings; Bognor; Worthing; Portsmouth; Southampton; New Forest; Bournemouth; Isle of Wight, Ventnor, Sandown, &c.; Devon (larvæ feeding on the heads of flowers of *Matricaria inodora, V. maritima*); Corwen; Lowestoft; Wicken Fen; Erdington; Knowle, near Birmingham; Harrogate.

Group 9.

Rather long and large, more or less metallic, species with the intermediate coxæ broadly distant (on mallows and thistles).

A. æneum, F. A large convex species, black, with the elytra metallic, blue, greenish, or occasionally coppery; pubescence very fine and scanty; forehead with a strong and deep longitudinal furrow, a point that will easily distinguish the species; rostrum thick, cylindrical, slightly dilated at sides, plainly punctured; antennæ rather short and thick; thorax longer than broad, somewhat constricted in front, coarsely punctured, with a deep furrow or fovea before scutellum which is elongate; elytra convex, shining, with the shoulders well marked, comparatively finely striated, the striæ being apparently almost impunctate, and with the interstices broad and flat and marked with traces of fine diffuse punctuation; legs rather stout, black. L. $3–3\frac{1}{2}$ mm.

Male with the rostrum thicker and shorter, and the anterior tibiæ slightly curved.

On various species of mallows; the larva has been found in the stems of *M. sylvestris* and *rotundifolia*, and the perfect insect has also occurred on other species; generally distributed and common throughout the greater part of England and probably Scotland and Ireland.

A. radiolus, Kirby (*aterrimum*, Marsh, *oxurum*, Kirby). This species is found in company with the preceding which it much resembles in shape, but may be easily distinguished by its more slaty-leaden colour and much more evident pubescence, as well as by the absence of a frontal fovea; the head and thorax are more finely punctured, and the antennæ are longer; the scutellum has two small divergent carinæ at base; the elytra are more strongly striated and the striæ are evidently punctured; the legs are moderately long and finely pubescent. L. $2\frac{1}{2}$–3 mm.

Male with the rostrum thicker and shorter and the anterior tibiæ slightly curved.

On various species of mallows; usually found in company with the preceding and similarly distributed; it has occurred on *Tanacetum vulgare* and has also been found on the holly.

A. onopordi, Kirby (*penetrans*, Steph.). Black, with the elytra blue-black, blue or greenish, more shining than the rest of the body; pubescence almost absent; head small, coarsely punctured, striated between eyes; rostrum thick, gently curved, slightly dilated near the insertion of the antennæ; antennæ stout, black; thorax longer than broad, with the sides almost parallel, very strongly and coarsely punctured, the punctuation being more or less confluent, and with a deep furrow before scutellum which is very small; elytra oval, moderately convex, widened at sides, with strong punctured striæ; legs stout, moderately long. L. $2\frac{1}{2}$–3 mm.

Male with the head broader than in the female, and with the rostrum shorter and thicker and the eyes more prominent.

On *Onopordon acanthium* and other species of thistles; also on certain species of *Cnicus* and *Rumex*; the larva is said to undergo its transformations in the stems of *Centaurea nigra*; common and generally distributed in England and Scotland, and probably in Ireland.

Group 10.

Rostrum very strongly dilated on each side at the insertion of the antennæ (on thistles).

A. carduorum, Kirby (*cyaneum*, De G., *gibbirostre*, Gyll.). Elongate, black, elytra slightly bluish or greenish, pubescence more or less evident; head finely striated between eyes, which are slightly prominent; rostrum longer than head and thorax, strongly curved, with a large tooth on each side at the insertion of the antennæ, finely punctured and more shining at apex; antennæ stout; thorax convex, subparallel, slightly rounded at sides, moderately strongly punctured, with a furrow before scutellum, which is small; elytra with strongly marked shoulders, scarcely rounded at sides which are not widened in middle, with punctured striæ and flat finely shagreened interstices; legs black, robust, more or less pubescent; size extremely variable. L. $1\frac{4}{5}$–$3\frac{1}{4}$ mm.

Male usually smaller than female, with the anterior tibiæ curved at apex and armed with a small tooth, and with the first joint of the posterior tarsi furnished with a small hook on its internal apical border.

On thistles; generally distributed and common throughout the kingdom; the larva has been observed in the central stalk of the leaf of the artichoke (*Cynara scolymus*), in the stems of *Cirsium arvense*, and in the axils of the stems of species of *Carduus*.

GROUP 11.

Striæ of elytra very fine, more or less obsolete, thorax almost smooth (on Gnaphalium (Filago) gallicum, *the narrow cudweed, very rare).*

A. lævigatum, Kirby, *nec* Payk. (*brunneipes*, Boh.). Black, rather shining, glabrous, with the elytra black, bluish, or slightly violet; head quadrate, forehead with a semicircular finely striated depression; rostrum as long as head and thorax, curved and cylindrical, finely and diffusely punctured; thorax cylindrical, about as long as broad, very finely punctured, almost smooth, and with the fovea before scutellum scarcely apparent; scutellum very small; elytra convex, broadest a little behind middle with very fine and more or less obsolete striæ and broad and flat interstices, which are shining; legs black or obscure pitchy-brown. L. 2–2$\frac{1}{3}$ mm.

Male with the rostrum shorter than in the female; according to Walton the male is entirely black, whereas the female has the elytra of a rich violet colour.

By sweeping low plants, August and September, extremely rare; it occurs on *Gnaphalium* (*Filago*) *gallicum*, on which plant the larva lives in a gall on the terminal bud; taken many years ago in a corner of a field at Birch Wood, Kent, by Mr. Walton, Mr. Waterhouse, and Mr. S. Stevens; the latter gentleman informs me that the locality is destroyed; it has also been taken at Birch Wood by Mr. F. Smith and in the same locality on *Gnaphalium gallicum* by Dr. Power.

GROUP 12.

Small or very small species, with the sutural striæ prolonged to the base of elytra (chiefly on species of Thymus *and* Mentha).

A. flavimanum, Gyll. (*picicorne*, Steph.). A small and rather elongate species, black, pubescent; head broad and short, with close rugose punctuation; rostrum dull, pubescent almost to apex, as long as head and thorax; antennæ slender, with the base pitchy-testaceous; thorax almost as broad as long, strongly constricted in front, rounded at the sides, with the anterior margin raised, finely and closely punctured; scutellum small; elytra a little broader at base than thorax, with the sides subparallel, striæ rather strong and strongly punctured, interstices narrow; legs black, rather stout, tibiæ more or less pitchy, or pitchy-testaceous. L. 2–2$\frac{1}{4}$ mm.

Male with the rostrum shorter than in female, the head broader, and the eyes larger, and the antennæ more plainly testaceous at base; the

legs also appear to be somewhat lighter in this sex, all the tibiæ and the anterior femora being more or less pitchy-brown or pitchy-testaceous.

Chalky districts; on *Teucrium scorodonia*, and species of *Mentha*; the larva has been found in the centre of the stem or at the roots of *Mentha rotundifolia*; very local, but not uncommon in some places where it has occurred; Mickleham, Caterham, Reigate, Bearsted, near Maidstone, Faversham, Chatham, Gravesend, Chattenden; Mickleham and Riddlesdown on *Origanum vulgare* (Power); Arundel; Crohamhurst.

A. annulipes, Wenck. (*millum*, Bach.). In general appearance this species resembles the preceding, but differs in its shorter thorax, the colour of the legs and the very robust femora; head short and broad, vertex depressed, forehead rugosely punctured, eyes slightly prominent; rostrum about as long as head and thorax, finely punctured, shining; antennæ inserted towards the base of rostrum; thorax transverse, somewhat narrowed in front, less closely punctured than in *A. flavimanum*; scutellum small, foveolate; elytra somewhat depressed with the shoulders obliquely rounded but with the humeral callosity well marked, sides subparallel and very obtusely produced at apex; interstices less dull than in the preceding species; legs robust. L. $1\frac{4}{5}$–2 mm.

Male with the antennæ entirely testaceous, except the club, and with all the tibiæ marked with testaceous before the base and on the inner side, and the femora (especially the anterior pair) very robust.

Female with the antennæ reddish at base and with the legs entirely black.

Chalky hill sides and in woods; by sweeping herbage; the food plant is unknown, but according to Bedel is probably one of the *Labiatæ*; very rare; Chatham, Mickleham and Caterham (Champion); Chattenden; Mickleham, and Parkhurst Forest, Isle of Wight (Power); Mickleham (S. Stevens); the only male taken in Britain has been captured by Dr. J. W. Ellis near Liverpool, probably at Wallasey.

A. vicinum, Kirby (*incrassatum*, Germ., *loti*, Gyll., *nec* Kirby). Rather short and broad, convex, dull black, with rather close grey pubescence which in fresh specimens gives the insect a grey appearance, but is very easily rubbed; head broad and short; rostrum slender, curved, a little thicker at the insertion of the antennæ; antennæ inserted towards base, rather slender, black with the base obscurely lighter; thorax transverse rather strongly narrowed in front, gently rounded at the sides, strongly and closely punctured, with a short stria before scutellum; elytra short, oval, convex, much broader at base than thorax, slightly dilated behind middle, with the shoulders plainly marked, and with broad strongly punctured striæ which are of about the same width as the interstices: these latter are finely shagreened; legs black, moderately stout. L. $2\frac{1}{2}$ mm.

Male with the rostrum shorter than in the female and pubescent.

On *Thymus serpyllum*, *Mentha aquatica*, &c.: rare; Claygate Lane, near Esher (Power); Windsor; Wicken Fen; Pegwell Bay (T. Wood); Southampton (Blatch); Heysham, near Lancaster (Reston); London district, Suffolk and Yorkshire

(Stephens); the male is rarer than the female. Walton says of the species, "very rare in the south of England, but I found it in Yorkshire in profusion on the blackthorn (*Prunus spinosa*), growing on a hedge bank by the side of a ditch full of rushes in a marshy situation."

A. atomarium, Kirby (*pusillum*, Germ.). The smallest British species; oval, short, dull black, clothed with very distinct greyish pubescence; head short, finely striated between eyes which are large; rostrum cylindrical, curved, with fine diffuse punctuation; antennæ inserted towards base, black with the scape often more or less testaceous; thorax transverse, convex, rounded at sides and narrowed in front, thickly and rather strongly punctured, with a fine short stria before scutellum; scutellum very small, convex and glabrous; elytra short-oval and convex, rounded behind, with the shoulders not strongly marked; striæ strong and plainly punctured, interstices rather narrow, shagreened; legs black, short. L. $1\frac{1}{3}$–$1\frac{3}{4}$ mm.

Male usually smaller with the rostrum shorter and more strongly pubescent.

Chalky places; on *Thymus serpyllum*; very local, but not uncommon where it occurs; Chatham, Birch Wood, Mickleham, Reigate, Caterham, Kenley (Surrey); Dover; Arundel; Whitsand Bay, near Plymouth; Holyhead; Ashwicken, near Cambridge.

GROUP 13.

Very small species with the sulci of the elytra as broad as the interstices (*on* Salix).

A. minimum, Herbst. (*velox*, Kirby, *foraminosum*, Gyll). Oval, moderately elongate, dull-black, with fine and very scanty pubescence; head broad and very short, forehead strongly punctured, eyes large and slightly prominent; rostrum stout, rather smooth and shining, scarcely as long as head and thorax, finely punctured; antennæ black, sometimes obscurely reddish at base, inserted a little before middle of rostrum; thorax scarcely as long as broad, strongly and deeply punctured, with a small fovea at base; scutellum triangular, not furrowed; elytra oval, moderately convex, subparallel, but slightly enlarged behind middle, with the shoulders rounded and not marked, and with very broad and strongly and catenulately punctured striæ; the interstices are narrower than the striæ and somewhat raised, and are transversely shagreened; legs rather long, black, anterior femora stout, tarsal claws with a small tooth at base; size variable. L. $1\frac{1}{2}$–2 mm.

Male with the rostrum longer than in female.

On various species of *Salix*, in May and June; very local and, as a rule, rare, but occasionally found in numbers; Hampstead, Wimbledon, Coombe Wood, Woking, Dorking, Maidstone, Esher, Horsell (Walton, Stevens, Power, Champion and others); Dover (E. G. Hall); Bretby Wood, near Repton (Garneys); Scotland, very rare Solway district, "Raehills, Rev. W. Little," Murray's Cat.; according to Wencker the larva feeds in a gall produced by a *Nematus* on the leaves of *Salix*

vitellina, and Kaltenbach has observed it in a gall on leaves of *S. cinerea*; M. Bedel says that the perfect insect is common "dans les dunes de la Somme" on *S. repens*, *var. argentea*.

GROUP 14.

Species with at least the elytra strongly metallic, blue or greenish-blue, glabrous, with the sutural stria of elytra not reaching the base of elytra (*on* Leguminosæ, *chiefly* Vicia).

A. virens, Herbst. (*æneocephalum*, Gyll.). Black with the elytra greenish-blue, head usually more or less æneous, and thorax, as a rule, metallic, æneous or greenish, pubescence extremely scanty, almost absent, so that the upper surface appears glabrous or almost glabrous; head rather large, eyes prominent; rostrum curved, moderately stout, slightly dilated at the insertion of the antennæ; thorax cylindrical, subconical, finely and sparingly punctured, with a small fovea at base; elytra depressed on disc, considerably widened behind middle, produced at apex, with the shoulders well marked, and with strong punctured striæ, interstices narrow, somewhat raised; legs moderately long. L. 2–2½ mm.

Male with the rostrum shorter than in female; female with the forehead furrowed between eyes.

On species of *Trifolium*; the larva has been observed in the stems of *T. pratense*; often taken by sweeping among grass; common and generally distributed throughout the greater part of the kingdom.

A. astragali, Payk. In general form resembling the preceding species; upper surface entirely of a brilliant shining golden bluish-green, or greenish colour, sometimes more or less coppery; head striated between eyes; rostrum moderately long, shining, finely punctured; thorax subcylindrical, about as long as broad at base, coarsely and not closely punctured, with a distinct central furrow, which in some specimens extends for the whole length, and is deepened behind; scutellum rather convex; elytra convex but depressed towards base, with broad punctured striæ and flat, plainly shagreened, interstices; legs moderate, more or less metallic. L. 2¼–2¾ mm.

On the edges of woods on *Astragalus*, especially *Astragalus glyciphyllus* (the Sweet Astragal or Milkvetch); very rare, although it occurs in moderate numbers occasionally where found; Cherry Hinton, near Cambridge (Crotch); Guestling, near Hastings; neighbourhood of Northampton (Greville); Skellingthorpe Wood, Lincoln (Rev. H. R. Matthews); Barham, Suffolk, and near Leeds (Stephens); Scotland, extremely rare, Forth district, "Queensferry, Dr. Greville," Murray's Cat.

A. punctigerum, Payk. (*sulcifrons*, Kirby). Rather a large species, which resembles the two following, but may be easily known by its more parallel-sided and much more finely and shallowly punctured thorax; the general colour is black with the elytra dark blue, and the thorax sometimes slightly metallic; head striated between eyes which are prominent; rostrum rather stout, shining in front, slightly thickened at the

insertion of the antennæ; antennæ rather stout, inserted a little before middle of rostrum; thorax rather longer than broad, subparallel, with the sides a little rounded, slightly constricted in front, finely and not closely punctured, more sparingly on disc, central furrow fine usually reaching beyond middle; elytra convex with punctured striæ, and broad flat interstices, which are wider than the striæ; legs rather long and robust. L. 3–3½ mm.

On *Vicia sepium* and *V. cracca*; local, but not uncommon in some districts; London district, generally distributed; Dover; Hastings; Devon; Llangollen; Cambridge; apparently rare in the Midland districts (Repton and Matlock being the only localities I know of); Isle of Man; Northumberland and Durham district; Scotland, very rare, Forth district, "Dalmeny Park, Mr. R. N. Greville," Murray's Cat.

A. pisi, F. (*punctifrons*, Kirby, *æratum*, Steph.). A short broad species, black with the elytra deep blue; head short and broad with the eyes prominent, rostrum rather long, curved, antennæ black, often obscurely lighter at base; thorax about as long as the breadth at base, strongly punctured, the punctuation being diffuse on disc, furrow before scutellum deep; elytra dilated, subglobose, with punctured striæ which are about as broad as the interstices; interstices somewhat raised; legs moderately long, black. L. 2½–2¾ mm.

Male with the rostrum shorter and less curved than in female.

On *Vicia sepium*, *Lathyrus pratensis*, *Onobrychis sativa*, *Trifolium recumbens*, &c.; the larva, according to Perris, is to be looked for in the pods of *Lathyrus pratensis*; very common and generally distributed throughout the kingdom; it is one of our most abundant species.

A. æthiops, Herbst. (*subsulcatum*, Marsh, *marchicum*, Gyll., *nec* Herbst., *subcæruleum*, Steph.). This species may easily be distinguished from *A. pisi*, which it somewhat resembles, by its longer and more elegant form, longer rostrum, striate forehead, and much less prominent eyes; the elytra are more ovate and more produced behind and less short and are of a brighter blue colour; the interstices also are flatter and broader; the coarser sculpture of the thorax and its more conical shape will distinguish it from *A. punctigerum*, which is altogether a stouter and more robust insect; in the female the rostrum is more than double as long as the thorax. L. 2½–3 mm.

On *Vicia sepium* and *V. sativa*; less common than the preceding, but apparently generally distributed throughout England and Wales; Scotland, Solway, Tweed, Forth, Tay and probably other districts; Ireland, Waterford and probably general.

Group 15.

Species rather large, jet black, without pubescence, with long diffusely punctured thorax and very strongly sulcate elytral striæ (*on* Vicia).

A. eboninum, Kirby (*Kunzei*, Schön.). A rather large and somewhat conspicuous species, jet black, sometimes with a slight æneous reflection, glabrous, shining; head broad, forehead more or less plainly

striated between eyes, the sculpture being, however, variable, eyes rather prominent; rostrum subcylindrical, rather stout, evidently punctured, but somewhat shining in front; antennæ inserted just before middle of rostrum; thorax distinctly longer than broad, parallel-sided and cylindrical, diffusely finely and minutely punctured, with a dorsal furrow before scutellum, which is variable in length and breadth; elytra obovate, with strong catenulately punctured sulcate striæ, interstices convex; legs black, robust. L. $2\frac{1}{2}$–$3\frac{1}{4}$ mm.

Male with the rostrum slightly curved, one and a half times as long as the thorax; female with the rostrum twice as long as thorax.

On *Lotus major*, *L. corniculatus* and *Orobus*; often found in moss in winter; local, but not uncommon where it occurs; Shirley, Caterham, Mickleham, Coombe Wood, Chatham, Whitstable, Dartford, Sheerness, Maidstone, Horsell, Claygate, Dorking, Gravesend, &c.; Littlington, near Cambridge; Ashwicken; Hertford; Isle of Wight; Exeter; Gloucester; Hopwas Wood, Tamworth; Trench Woods; Yorkshire; Wallasey, Cheshire; Walton says that he has taken it plentifully on *Lotus major* in June and July in several places in the north and south of England.

Group 16.

Species small, black, without pubescence, rostrum long and slender, femora pitchy at apex (probably on a leguminous plant).

A. filirostre, Kirby (*morio*, Germ.). A small, rather shining, black, glabrous species; head finely striate between eyes, which are not prominent; rostrum long, filiform, slightly curved, somewhat dilated at the insertion of the antennæ, finely punctured; antennæ inserted near middle, slender; thorax a little longer than broad, distinctly but rather finely and not very deeply punctured, with a short and fine fovea or stria before scutellum which is punctiform; elytra rather convex but depressed towards base, rounded at sides and widened in middle, with broad and rather deep punctured striæ, and slightly convex shagreened interstices; legs rather long and slender, female sometimes with a broad testaceous ring at the apex of the anterior femora. L. $1\frac{3}{4}$–$2\frac{1}{2}$ mm.

Male with the rostrum longer than in female

Chalky and sandy places; by sweeping low plants; occasionally found in moss; it probably lives on a leguminous plant; local and not common; Mickleham, Caterham, Warlingham, Reigate, Dorking, Birch Wood, Charlton, Dartford, Chatham, Riddlesdown, near Croydon, Bushey, Rusper, near Maidstone, &c.; Arundel; Brighton; Exeter; Suffolk; Trench Woods, Bromsgrove.

Group 17.

Black, pubescent, species, very strongly dilated behind, pear-shaped (on furze and broom).

A. striatum, Kirby (*atratulum*, Germ.). Short and broad, much dilated behind, black, dull, clothed with fine greyish pubescence; head rather broad, rugosely punctate between eyes, vertex with a smooth

shining band adjoining the thorax; rostrum curved, longer than head and thorax, dull and punctured behind, smooth and shining in front; antennæ inserted near middle of rostrum, rather long; thorax about as long as broad, a little narrower in front than behind, with coarse and often more or less confluent punctuation, and a distinct central channel, which is sometimes entire, and sometimes abbreviated towards apex and base; scutellum small; elytra pyriform, a little broader at base than base of thorax and gradually and strongly dilated behind, the greatest breadth being almost at apex, shoulders not marked; striæ broad and deep and strongly punctured, interstices somewhat convex, about as broad as the striæ, shagreened; legs black, rather long and stout. L. $2\frac{1}{2}$–$3\frac{1}{2}$ mm.

Male with the rostrum slightly thicker and shorter than in female.

On *Ulex Europæus*, *Sarothamnus scoparius*, &c.; common and generally distributed throughout the kingdom.

A. immune, Kirby (*betulæ*, Gyll.). This species very closely resembles the preceding, with which it is often confused, but it is, on the average, smaller, and may be known by having the head distinctly striated between the eyes, and the vertex very coarsely punctured where it is adjacent to thorax, the corresponding space in *A. striatum* being, as Walton points out, smooth and shining; the thorax is rather longer and has no central furrow in middle, but a small stria or fovea before scutellum, which is sometimes obsolete or wanting; the striæ of the elytra are deep with the punctures somewhat stronger than in *A. striatum*, and placed more widely apart, but this latter character is not a very dependable one. L. 2–$2\frac{3}{4}$ mm.

On *Sarothamnus scoparius*; local, but not uncommon where found; Barnes, Charlton, Chatham, Birch Wood, Shirley, Chobham, Bearsted, Weybridge, Mickleham; Essex; Dover; Hastings; Shirley Warren, Southampton; New Forest; Isle of Wight; Kirby and Bidston, near Liverpool; Northumberland and Durham district; Scotland, Solway, Tweed and Forth districts.

Group 18.

Black or metallic, pubescent, species, with the rostrum curved and usually long and slender (*on low* Leguminosæ, *chiefly* Lathyrus, Vicia, *&c., with the exception of* A. Scutellare *which occurs on* Ulex).

A. ononis, Kirby. (*ononidis*, Bedel, &c., *nec* Gyll.). Dull black, thickly clothed with grey pubescence; head long, somewhat enlarged behind, coarsely and rugosely punctured, and striated between the eyes, which are large and slightly projecting; rostrum rather stout, curved, strongly and closely punctured, underside furnished along its whole length with small hairs visible if viewed sideways (a distinctive character pointed out by M. Bedel); antennæ black, rather long and slender, inserted near middle; thorax about as long as broad, slightly narrowed in front, closely and coarsely punctured, with a fine

central furrow extending for its whole length; scutellum small; elytra oval and convex, broadest about or a little behind middle, with strong punctured striæ and shagreened flat interstices which are about the breadth of the striæ; legs black, long and slender. L. 2–2½ mm.

Male with the rostrum longer, stouter and more strongly pubescent than in female.

On *Ononis spinosa* and *var. campestris;* the larva lives in the pods; locally abundant and generally distributed, but apparently more common in the south and near the coast than in inland and midland districts; Scotland common, Solway, Tweed, Forth and other districts; in Ireland it is most likely general.

A. Spencei, Kirby (*intrusum*, Gyll.). Oval, rather short, convex, black with the elytra blue or greenish-blue, finely pubescent, sometimes almost glabrous, rather dull; head broader in male than in female, vertex punctured and striated and with a strong fovea between eyes which are convex and prominent; rostrum stout, curved, dull and punctured at base and more shining in front; antennæ filiform, black with the base often ferruginous, inserted at about the middle of rostrum; thorax slightly transverse, narrowed in front, coarsely but not deeply punctured, with a central furrow reaching beyond middle and deepened behind; scutellum large, furrowed; elytra rather short, widened behind middle, with the shoulders well marked and with broad punctured striæ, interstices flat, about as broad as the striæ, finely shagreened; legs black, rather long and slender. L. 2¼–2½ mm.

Male with the rostrum shorter than in the female, the vertex of head more plainly impressed, and the body more pubescent.

On *Vicia cracca;* local; London district, not common, Coombe Wood, Horsell, Shirley, Kingsbury (Middlesex), Hampstead, &c.; Henley; Suffolk; Margate; Hastings; Hampshire; Thorness Bay, Isle of Wight; Glanvilles Wootton; Devon; Chat Moss; Repton, not uncommon; Harrogate, Scarborough, and other places in Yorkshire; Bidston and Wallasey, near Liverpool, common; Northumberland and Durham district; Scotland, Solway, Tweed, Forth and Tay districts.

A. ervi, Kirby (♂ *lathyri*, Kirby). Oval, short, dull-black, very finely pubescent; head broad, striated between eyes which are large and projecting and bordered with white hairs; rostrum curved, thicker at base than in front, base shagreened and dull, front part shining; antennæ slender, inserted about the middle of rostrum; thorax a little longer than broad, plainly narrowed in front, with strong close punctuation and an abbreviated central furrow; elytra oval, enlarged behind, with plainly punctured striæ and flat interstices, which are scarcely broader than the striæ; legs black, elongate. L. 2–2½ mm.

Male with the rostrum duller, straighter, shorter and stouter than in female, and with the antennæ entirely yellowish-red; in the female the antennæ are dark towards apex and have the basal joints yellowish-red.

On *Lathyrus pratensis* and species of *Vicia;* common and generally distributed throughout the kingdom.

A. vorax, Herbst. (♂ *fuscicorne*, Marsh, ♂ *pallicorne*, Gyll.). This species may easily be known by its long form, rather large size, and very long legs; colour dull black, with the elytra bluish, pubescence grey, rather thick and distinct; head depressed and striated between eyes which are prominent; rostrum not strongly curved, thickened at base, with the punctuation rather diffuse in front and dense behind; antennæ inserted near middle, long and slender, dark with the base testaceous; thorax about as long as or longer than broad, plainly narrowed in front, closely and finely punctured, with a fine central furrow which is often obsolete; scutellum oval, pubescent; elytra long, subparallel, slightly rounded and dilated at sides, with punctured striæ, interstices rather narrow; legs very long. L. $2\frac{1}{2}$–3 mm.

Male with the antennæ inserted a little before the middle of the rostrum which is shorter than in the female and more punctured and pubescent; antennæ with the base more broadly reddish-yellow; anterior tibiæ sinuate and twisted.

Female with the antennæ inserted just behind middle, more smooth and shining, and with only the two or three basal joints reddish-yellow.

On *Vicia cracca* and other *Leguminosæ*; also on hazel, ash, &c.; somewhat local, but rather common and widely distributed throughout England and Ireland; Scotland, Forth district, but it is probably general throughout at least the southern counties.

A. Gyllenhali, Kirby (*unicolor*, Kirby, *pars*, *æthiops*, Gyll., *nec* Herbst.). Black, rather dull, elytra often with a slight iron-blue or iron-grey reflection, finely pubescent; head very narrow, coarsely punctured, and striate between the eyes which are flat and not prominent; rostrum long and rather stout, punctured; antennæ inserted near middle, black or pitchy with the base lighter; thorax about as long as its breadth at base, coarsely punctured, with a fine stria before scutellum; scutellum very small; elytra obovate, moderately long, more or less enlarged behind middle, with well marked shoulders, and with plainly punctured striæ, interstices flat, shagreened; legs black, long and slender. L. $2\frac{1}{2}$–3 mm.

Male with the rostrum shorter than in female and slightly gibbose beneath before the insertion of the antennæ.

On *Vicia cracca*; also on trees; local and, as a rule, not common in England; London district, rare; Whitstable; Suffolk; Glanvilles Wootton; Barmouth; Yorkshire; Blackpool; Northumberland and Durham district very rare (Bold); Scotland, very local, Solway, Forth, Clyde and Dee districts; it has been reared by Professor Trail from swellings on the stems of *Vicia cracca*; Aberlady on *Geranium sanguineum* (Power); Ireland, found most abundantly near Waterford and at Killarney and Avoca on everything, on trees more particularly (Power); Armagh not common (Johnson).

A. unicolor, Kirby (*platalea*, Germ., ♂ *afrum*, Gyll., *afer*, *auct.*). Very closely allied to the preceding, from which it may be easily dis-

tinguished by its much shorter and broader head and much more prominent eyes; the rostrum is shorter and stouter and the thorax less narrowed in front and more coarsely punctured; the elytra also are shorter and the size appears, on the average, to be smaller; the male has the rostrum a little dilated in the middle, and slightly gibbose beneath at the insertion of the antennæ. L. $2\frac{1}{2}$–$2\frac{3}{4}$ mm.

On *Vicia cracca* and other *Leguminosæ*; local; London district, not common, Chatham, Mickleham, Woking, Caterham, Ashtead, Horsell, Colney Hatch, Claygate, Reigate, Birdbrook, Kingsbury Reservoir; not recorded from the southern counties; Midland counties, general (W. G. Blatch); Repton (Garneys); Bollin Valley, Cheshire; Spital, near Liverpool; Northumberland and Durham district, Wallington, &c.; Scotland, Forth district, "near Edinburgh, A. Murray," Murray's Cat.

A. meliloti, Kirby (*bifoveolatum*, Steph.). A rather large and very elongate species, with the elytra rather depressed; black with the elytra bluish or greenish-blue, pubescence very fine and scanty; head rather narrow, strongly punctured, striated and somewhat depressed between eyes, which are slightly prominent, hinder part near thorax smooth and shining; rostrum rather shining, slightly curved, moderately long, plainly punctured, marked usually with striæ between the antennæ, which are inserted about the middle; thorax as long as broad, with sides subparallel, very slightly rounded, coarsely punctured, posterior angles sharp, stria before scutellum fine; scutellum oval, furrowed; elytra elongate, with sides widened a little behind, and with punctured striæ, and plainly shagreened interstices which are broader than the striæ; legs black, not long; size very variable. L. 2–$3\frac{1}{2}$ mm.

Male with the rostrum shorter stouter and duller than in female.

On *Melilotus officinalis* and *M. arvensis*; also on *Trifolium officinale*; the larva mines the stems; local, but common where it occurs; Hammersmith, Charlton, Shirley, Bearsted, near Maidstone; Windsor; Arundel; Cowes, Ryde, and Thorness Bay, Isle of Wight; Ditchingham, Norfolk; Knowle, near Birmingham; Hopwas Wood, Tamworth; Trench Woods, Bromsgrove; Repton; recorded by Stephens from Yorkshire, but I know of no locality further north.

A. scutellare, Kirby (*Kirbyi*, Germ., *angustatum*, Gyll.). This species bear a strong superficial resemblance to the preceding, but may at once be known by its colour, which is slaty black, and its more coarse and strongly marked pubescence: the club of the antennæ is more elongate, and the striæ between the eyes are finer and more numerous; the elytra have the shoulders more strongly marked, and the legs are more strongly pubescent; as in the preceding species the rostrum is shorter and stouter in the male. L. $2\frac{3}{4}$–$3\frac{1}{2}$ mm.

On furze, *Ulex Europæus* and *U. nanus*; local, but not uncommon in some districts; London district, not uncommon, Esher, Woking, Weybridge, Charlton, Shirley, Leith Hill, Cobham, Coombe Wood; Wimbledon and Horsell (Power), on *Potentilla tormentilla*; Guestling; Bournemouth; Lyndhurst; Shirley Warren, Southampton; Devonshire, Newton and Exeter; Yardley, Sutton, and Knowle, near Birmingham; Barmouth; Derbyshire, Repton, &c.; Yorkshire; Bidston, near Liverpool; not

recorded from the north of England or from Scotland; Ireland, Phœnix Park, near Dublin.

The larva of this species has been observed in galls on the young shoots of *U. nanus*; it is 5 mm. in length when full grown, of a yellowish colour with the head reddish-brown; the galls resemble threaded beads and do not injure the vegetation (v. Wencker, Apionides, L'Abeille, p. 117).

A. livescerum, Gyll. (*reflexum*, Gyll., *hedysari*, Walt.). Black, with a more or less bronze reflexion on thorax, and with the elytra blue or greenish-blue, sometimes black-blue; pubescence very fine, scarcely evident; head rather broad, punctured and very finely, often obsoletely, striated between eyes which are a little prominent; rostrum cylindrical, slightly curved, rather strongly and very closely punctured, about as long as head and thorax; antennæ rather long, inserted at about the middle of rostrum; thorax about as long as broad, scarcely narrowed in front, strongly punctured, the punctuation being sometimes closer and sometimes more diffuse, with a small stria or fovea before scutellum; scutellum oval, furrowed; elytra rather short, convex, dilated behind middle, with deep and rather broad punctured striæ, interstices somewhat convex, finely and plainly shagreened; legs black, moderately long. L. $2\frac{1}{2}$–$2\frac{3}{4}$ mm.

Male with the rostrum shorter and thicker and more closely punctured behind than in female, and the anterior margin of thorax more raised.

On *Onobrychis sativa*; in chalky districts; local; Darenth, Purley Downs, Chatham, Caterham, Mickleham, Dartford, Whitstable, Southend; Swanscombe; Birchington; Brighton; Littlington, Cambridge; Knowle, near Birmingham; Bidston Hill, Liverpool, on heather, July (Ellis).

A. Waltoni, Steph. (*Curtisi*, Boh., *nec* Walt.). Allied to *A. livescerum*, but smaller, more evidently pubescent, and with the punctuation of the thorax much finer; head and thorax bluish or slate-coloured, more or less metallic, elytra bluish or slaty-blue; vertex closely punctured, finely striated between eyes which are slightly convex; rostrum a little longer than head and thorax, punctured; antennæ inserted about middle, rather long and slender; thorax about as long as broad, with the sides subparallel and scarcely rounded, closely punctured, furrow before scutellum fine or obsolete; scutellum small; elytra convex, rather short and broad, dilated behind middle, with the shoulders rounded, and the punctured striæ not deep, interstices flat, broader than the striæ, very finely shagreened; legs black, not elongate. L. 2 mm.

Chalky places; on *Thymus serpyllum* and other low plants; often found in moss in winter; very local, but not uncommon in the London district; Reigate, Caterham, Mickleham (abundant, Power), Sevenoaks, Dartford, Chatham, Purley, Riddlesdown, near Croydon, Faversham; Brighton; Whitsand Bay, near Plymouth (Walker); Heysham (Power).

A. loti, Kirby (*angustatum*, Kirby, *modestum*, Germ., *glabratum*, Germ.). Black, clothed with evident, but not very close, ashy pubescence; head narrower than the anterior margin of the thorax, closely

punctured and finely wrinkled between the eyes; rostrum cylindrical, rather long, curved, shining, finely and diffusely punctured, often with a small stria or fovea between the antennæ, which are rather stout and are inserted at about the middle; thorax conical, longer than broad, with close and rather strong punctuation, which is sometimes more or less confluent, and a small stria or fovea before scutellum which is often obsolete; elytra rather broad, wider behind middle, with rather strong punctured striæ, which are about as broad as the interstices, the latter being flat and shagreened; legs moderately long and stout. L. 2–2½ mm.

Male with the rostrum shorter and more plainly punctured than in female, and with the anterior femora stouter.

On *Lotus corniculatus*; the larva feeds in the pods of the plant; locally abundant and widely distributed throughout the greater part of the kingdom: it appears, however, to be commoner in the South of England, and to be somewhat rare in the midland and northern counties; Scotland, Solway, Tweed and Forth districts; Ireland, Waterford, &c.

This species somewhat resembles *A. ononis*, but is larger and more robust, with the pubescence less evident, and with a wider head and more conical thorax, which has the furrow before scutellum small and obsolete, and not continued for the whole length as in the latter species.

A. seniculum, Kirby (*tenue*, Gyll.. *nec* Kirby, *pusillum*, Steph.). One of our smallest species; narrow, dull black, clothed with rather thick greyish pubescence; head long, eyes slightly prominent; rostrum moderately long, curved; thorax about as long as broad, feebly punctured, with a fovea at base; elytra rather long, leaden black, with sides a little dilated, and with punctured striæ which are distinct but not very deep, interstices about as broad as the striæ, plainly shagreened; legs moderately long and stout. L. 1½–1¾ mm.

Male with the rostrum shorter and more thickly pubescent than in emale.

On *Trifolium pratense* and other species of *Trifolium*; the larva has been observed in the stems; common and generally distributed from Yorkshire southwards; less common further north; Scotland, rare, Solway and Forth districts; Ireland, Waterford and Armagh, and probably common.

A. tenue, Kirby, *nec* Gyll. Very like the preceding in size and general appearance, but more slender and much more glabrous and shining, the pubescence being very scanty, and with the elytra evidently depressed on disc; the vertex of the head is more plainly punctured, and the thorax is longer and more cylindrical with more sparing punctuation; the elytra, moreover, are less acuminate at apex and the striæ are stronger. L. 1½–1¾ mm.

On *Melilotus officinalis* and *Medicago sativa*; the larva lives in the stems; not so common as the preceding but very widely distributed, especially in the London district and the South of England; Bristol; South Wales; Knowle, near Birmingham; Trench Woods; Filey, Yorks; Manchester, general but rare; not recorded

from the Northumberland and Durham district; Scotland, Solway and Forth districts; Ireland, Armagh (Johnson).

GROUP 19.

Small strongly pubescent black species with the rostrum strongly curved, but short, at all events in male (on birch, willows, &c.).

A. simile, Kirby (*superciliosum*, Gyll., *triste*, Germ.). Black with the elytra somewhat shining and presenting a slight æneous reflection, clothed with sparing but distinct and rather strong whitish pubescence, and with the orbit of the eyes beneath and the sides of the breast furnished with white hairs; head rather broad, eyes somewhat prominent; rostrum very variable in length in the sexes; antennæ inserted behind middle; thorax about as long as broad or slightly transverse, scarcely narrowed in front, coarsely punctured, with a small fovea before scutellum, which is rather large; elytra moderately long, a little dilated behind middle, produced at apex in female, with the shoulders well marked, and with broad strongly punctured striæ, interstices narrow, subcarinate; legs black, moderately long. L. 2 mm.

Male with the rostrum scarcely longer than the thorax, pubescent; antennæ inserted a little behind middle of rostrum; posterior tibiæ terminating in a distinct hook.

Female with the rostrum nearly twice as long as thorax, slender and plainly curved, more shining; antennæ inserted at some distance behind middle of rostrum; posterior tibiæ simple.

On birch (*Betula alba*); local, but not uncommon where it occurs; Esher, Dulwich, Chobham, Coombe Wood, Shirley, Ripley, Dorking, Birch Wood, Mickleham, Gravesend, Whitstable; Hertford; Hunstanton, Norfolk; Ashwicken, Cambridge; Redgrave Fen; Bretby Wood, Repton; Yorkshire.

A. pubescens, Kirby (*civicum*, Germ., *salicis*, Gyll.). Black, rather dull, clothed with fine but very distinct greyish pubescence; head rather broad, forehead rugose, with a broad impression in front, eyes convex; rostrum of nearly equal length in both sexes; antennæ inserted about middle; thorax transverse, scarcely narrowed in front and with the sides subparallel, moderately strongly punctured, with a small short fovea before scutellum, which is small; elytra oblong, slightly depressed towards base, with well marked shoulders, and with much finer striæ and broader interstices than in the preceding species, the latter being wide, flat and very plainly shagreened, whereas in *A. simile* they are scarcely as broad as the striæ and are convex: legs black, moderately long. L. 2 mm.

The rostrum is duller in the male but scarcely differs in length in the sexes, as it is said to do by some authors.

On willows, and amongst grass; occasionally found in haystack refuse; very local, but not uncommon where it occurs; Caterham, Shirley, Birch Wood, Esher, Weybridge, Rusper, Sheerness, Chatham; Kingsgate; Deal; Hastings; Arundel; Suffolk; Ashwicken; Knowle, near Birmingham; Barmouth; Heysham; Yorkshire; Scotland, Forth district, "Kinross-shire, A. Murray," Murray's Cat.

A. Curtisi, Walt. (*curtulum*, Desbr., *teste* Bedel). Very closely allied to *A. pubescens*, but, on an average, of smaller size, and also evidently narrower and more parallel; the forehead has no impression, or a very obsolete one, at the base of rostrum; the rostrum is shorter and more shining and evidently longer in the female than in the male, and the eyes are less prominent; the thorax is longer, being about as long as broad, and is more finely punctured, with the fovea before scutellum less marked and often obsolete, and the elytra are more narrow, convex and parallel with the striæ finer and more superficial. L. $1\frac{3}{4}$–2 mm.

Sandy places on the coast, by sweeping grass, &c.; the actual food plant does not appear to be known; local, but sometimes abundant where it occurs; Dulwich; Shipley, near Horsham; Deal; Hastings and St. Leonards; Littlehampton; Arundel; Brighton; Devon; Norfolk; Heysham and Lancaster.

GROUP 20.

Large purple-red metallic species with short stout and straight rostrum. (*On* Statice.)

A. limonii, Kirby. One of the largest and most conspicuous species of the genus; oval, convex, coppery-red or reddish-purple sometimes with a greenish tinge, with the elytra often darker than thorax, covered with short scanty pubescence; head broad, rugose between eyes, which are large and scarcely prominent; rostrum very short and stout, often of a purple colour, coarsely punctured, the punctuation being closer at the base and sides; antennæ short, inserted about middle; thorax longer than broad, with the sides subparallel and scarcely narrowed in front, usually coppery or brassy, sometimes greenish, finely and diffusely punctured, with a deep and more or less elongate fovea before scutellum; elytra oval, strongly rounded and widened at sides, broadest about middle, produced obtusely behind, with the shoulders rounded, and with punctured striæ, which are fine in some specimens and rather strong in others, interstices rather broad, shagreened; underside punctured, coppery; legs dark, more or less metallic, stout and rather short. L. 3–4 mm.

Male with the rostrum shorter than in female, and the antennæ a little shorter and stouter.

Salt marshes, on the decaying leaves and old roots of *Statice limonium* (the Sea Lavender) in July and August; very local, but common where it occurs; Gravesend, Sheerness, Whitstable; Walton-on-Naze; Dover; Folkestone; Hythe; Southampton; Burnham Market; first taken by Mr. Kirby at Holme-next-the-Sea, Norfolk, and subsequently in profusion by Mr. Walton in August, 1841, in the same locality.

GROUP 21.

Very small black species with straight stout rostrum and quadrate thorax, with sides rather strongly rounded. (*On* Sedum.)

A. sedi, Germ. (*tumidicolle*, Bach.). A small, somewhat elongate,

species, black, rather dull, sometimes with a very slight bronze reflection; pubescence fine and very easily rubbed off, so that the upper surface, except in fresh specimens, appears almost glabrous; head longer than broad, with the eyes not prominent, distinctly punctured, and with the space between the eyes a little depressed and finely but distinctly striated; rostrum short, scarcely longer than thorax, rather stout and straight or almost straight, dull and closely punctured to the insertion of the antennæ, from thence more diffusely punctured, shining at apex; antennæ short and stout inserted near middle of rostrum; thorax about as long as broad with the sides rather strongly rounded, widest about middle, not very closely but regularly and rather deeply punctured on disc, more thickly at sides where the punctuation is often confluent, with a small but distinct furrow before scutellum; elytra oval, rather long, with the shoulders scarcely marked, rounded at sides, broadest a little behind middle; striæ punctured, distinct, but comparatively fine, interstices rather broad, very flat, shagreened; legs black, moderately long and stout. L. $1\frac{1}{2}$–$1\frac{3}{4}$ mm.

Sandy places; on species of *Sedum*, especially *Sedum album* and *S. acre;* very local, and, as a rule, rare; it has, however, been found not uncommonly at Deal by Mr. S. Stevens, Mr. Champion, Dr. Power and others; Wimbledon (Power); Southend; Harwich, one specimen (J. J. Walker); Bath; Stretford, near Manchester (Reston); Scotland, Forth district; the species probably occurs in many other localities; it somewhat resembles small specimens of the common *A. humile*, from which it may be known by its narrower head, less prominent eyes, more rounded sides of thorax, and finer elytral striæ.

Group 22.

Moderate-sized or rather small species, metallic or black, with short and stout straight rostrum (*on* Rumex, Teucrium *and* Sarothamnus, *&c.*).

A. marchicum, Herbst. (*Spartii*, Kirby, *aterrimum*, L., *violaceum*, Gyll. *nec* Kirby). Black, slightly shining, head and thorax with a slight bronze reflection, elytra dark blue or violet, sometimes greenish; head short and broad, closely punctured, and finely striate between eyes which are slightly prominent, temples and throat almost impunctate; rostrum short and stout, closely punctured and dull behind, shining in front; antennæ inserted about middle; thorax as long as, or a little longer than, broad, with the sides almost straight, with very distinct but rather fine punctuation, which is, as a rule, not very close, fovea before scutellum often indistinct, but sometimes well marked; elytra oval, short and broad, convex, with strong punctured striæ and slightly convex interstices; legs black, moderately long; the colour and the striation of elytra is somewhat variable. L. $1\frac{1}{2}$–2 mm.

Sandy places; on *Rumex acetosella*, *Teucrium scorodonia* and *Sarothamnus scoparius*, &c.; local, but not uncommon where it occurs; Hampstead, Esher, Caterham, Shirley, Mickleham, Bromley, Horsell; Hastings; Dover; Yardley, Sutton and Knowle, near Birmingham; Lickey Hills; Yorkshire; Manchester district,

general; Liverpool district, frequent; Lancaster and Heysham; Northumberland and Durham district, apparently rare; Scotland, Solway, Tweed and Forth districts; Dr. Power has taken it commonly at Balmuto on *Leguminosæ*: it seems to vary as to its food plant: Walton says that he took it first on *Teucrium* in Yorkshire and afterwards on *Rumex acetosella* on Hampstead Heath, but that he has never found it in the south on *Teucrium*.

A. affine, Kirby. Very closely allied to the preceding, and not considered distinct by some of the early authors: it is, however, a larger species on the average and may be known by having the temples and throat plainly punctured, and the sides of the thorax evidently more rounded and dilated; the thorax moreover has the punctuation coarser and deeper and occasionally more or less confluent; the elytra are somewhat wider and more convex; the colour and the striation of the elytra is variable as in the preceding species. L. 2–2½ mm.

Damp places; beneath *Sarothamnus scoparius* and amongst grass and herbage; the actual food plant, however, is not, apparently, known with any certainty; local, and, as a rule, not common; Lee, Caterham, Horsell (in some numbers, October (Power), Ashtead, Southend, Weybridge, Bearsted near Maidstone; Suffolk; Cambridgeshire; Yorkshire; Manchester, general (Chappell); Lancaster and Heysham; Northumberland and Durham district; Scotland, Solway and Forth districts; the species does not appear to be found in company with *A. marchicum*.

A. violaceum, Kirby (*cyaneum*, Ol.). An elongate species, with the elytra rather depressed on disc, very finely pubescent, somewhat shining; head and thorax black, often with a slight æneous reflection, elytra blue or greenish blue; head a little narrower than thorax, with the vertex punctured, and finely striate between eyes, which are convex and slightly prominent; rostrum short and stout, scarcely longer than thorax, dull and punctured behind and shining before the insertion of the antennæ; antennæ inserted a little behind middle; thorax a little longer than, or about as long as, broad, with the sides very slightly rounded, strongly, deeply and closely punctured, with a fovea or short broad stria before scutellum; scutellum rather large, black or bronze, furrowed; elytra long, with sides widened behind, shoulders rounded but marked, punctured striæ not deep, interstices flat but somewhat variable, plainly shagreened; legs dark, more or less metallic, short and stout, tarsi, especially the anterior pair, rather broad. L. 2½–3½ mm.

Male with the rostrum shorter than in female, and also more strongly punctured and more shining at apex; the pygidium also in this sex is often uncovered.

On species of *Rumex*, especially *obtusifolius*, *conglomeratus*, *crispus* and *acetosa*: the larva lives in the stalk; common and generally distributed throughout the kingdom as far north as the Orkney Islands.

A. hydrolapathi, Kirby (*cæruleipenne*, Steph.). Closely allied to the preceding with which it is often confounded; the general form, however, is broader and shorter; the head is considerably broader and more closely punctured; the rostrum is shorter and thicker at the base; the thorax is more finely and thickly punctured, and instead of a fovea or

short broad stria, has a fine stria or furrow before scutellum, which is usually continued beyond middle; the punctures of the interstices of the elytra are also placed more closely together. L. $2\frac{1}{2}$–$3\frac{1}{2}$ mm.

On *Rumex hydrolapathum* (the great water dock) and also on *R. obtusifolius* (the broad dock); widely distributed throughout the greater part of England and Wales and not uncommon in many localities, but much less common than *A. violaceum;* it is widely spread throughout the midland counties, and general in the Manchester district; it has not, however, been recorded from the Northumberland and Durham district; Scotland, Solway and Forth districts; Ireland, Dublin, Belfast, &c, and probably general; it has been taken at Swansea on lucerne.

A. humile, Germ. (*curtirostre*, Germ., *brevirostre*, Gyll., *plebeium*, Steph.). Black, rather dull, clothed with fine and distinct greyish pubescence; head broad, almost quadrate, very closely punctured and very finely rugose between eyes, which are slightly prominent; rostrum short and stout, dull and thickly punctured at base, more shining towards apex; antennæ rather stout, inserted about middle of rostrum; thorax subcylindrical, about as long as, or a little longer than, broad, with close and deep punctuation and a small fovea at base; scutellum rather long; elytra sometimes with an extremely slight metallic reflection, widened behind, broadest behind middle, with the shoulders obliquely rounded and not strongly marked, and with plainly punctured striæ, interstices about as broad as the striæ, shagreened; legs black, rather slender and not elongate. L. $1\frac{3}{4}$–$2\frac{1}{4}$ mm.

Male with the rostrum thicker than in female, and the thorax shorter.

On *Rumex acetosa* (the sorrel dock) and amongst grass and herbage; the larva lives in the stems of the food plant; common and generally distributed throughout England and probably Scotland and Ireland.

Sub-fam. **Brachyrrhininæ.**

(*Otiorrhynchidæ* and *Brachyderidæ.*)

This sub-family contains several important tribes, which are largely represented in the European fauna; they comprise all those genera in which the mandibles are provided externally at apex with a corneous appendage, or with the cicatrix of such appendage; these appendages are always present in the pupa state, but are deciduous and are almost always shed as soon as the perfect state is attained; they may, however, be occasionally observed, and I have a fully developed specimen of the rare *Cœnopsis fissirostris* in my collection in which they are very perfect and are about as long as the rostrum: in one or two specimens also of *Otiorrhynchus tenebricosus* in my possession, one appendage remains, but in this species these false mandibles appear to be much shorter proportionally and less falcate than in *Cœnopsis;* Leconte and Horn (Classification of the Coleoptera of North America, p. 434) notice this variation and state that the deciduous pieces are of varying form, usually elongate and slender, sometimes falcate and acute, or short and conical; as they

were the authors who called more particular attention to the importance of the character presented by these false mandibles (although it had of course been noticed long before by various writers), their remarks on the subject may with advantage be quoted:—

"In the early life of the imago these pieces are lost, and the place of their attachment is indicated by a scar, which is usually on the face of the mandible, but frequently borne at the tip of a process of varying length. The form of the mandible itself, without reference to the scar, indicates the occurrence of the deciduous piece. When the mandibles are acute at tip and one overlaps the other by an edge more or less acute, no deciduous piece will be found. Its occurrence may generally be expected in those in which the mandibles meet with a broad surface and whose function is rather that of crushing than cutting."

The larvæ do not call for any particular remark, but in some cases are more elongate than is usually the rule with the Rhynchophora, and are furnished with outstanding hairs; they undergo their transformations underground, and the use of the false mandibles is obviously to allow them to work their way through their surroundings on their emergence from the pupa state: when once they have emerged they shed them as they have no further use for them, their habits being, as stated above, to crush rather than cut the leaves, etc., that form their food.

The sub-family has been very differently constituted by various authors, and the student who wishes to examine further into the subject is referred to the works of Thomson (especially Skandinaviens Coleoptera, vol. x. pp. 161, et seqq.), Leconte and Horn, &c., as well as to the older works of Schönherr and others: M. Bedel divides them into eight tribes which are here adopted; the old names are, however, in two or three cases retained in preference to those he has made use of; there seems, for example, no reason in forming a new name "*Synirmini*" to include *Tropiphorus* Schönherr, because a genus of Saurians whose name requires priority is called *Tropidophorus*; it is, however, best to adopt a new name for the sub-family as it includes in great measure both the Brachyderidæ and the Otiorrhynchidæ of older authors.

I. Side pieces of the mesosternum very unequal, the episterna directly attaining and for some distance extending along the margin of elytra, the epimera small or very small.
  i. Scrobes short, superior, rarely lateral, and then directed towards the eyes; club of antennæ with the second joint shorter than the first . . . . . OTIORRHYNCHINA.
  ii. Scrobes lateral and directed inferiorly; club of antennæ with the second joint about equal to the first . . . . . BRACHYDERINA.

II. Side pieces of the mesosternum divided diagonally and nearly equal, the episterna not reaching the elytra, except in a point at extreme base where they join the epimera.
  i. Tarsal claws connate.
    1. Prosternum slightly emarginate at apex and furnished with short hairs at the sides of the emargination; central dorsal line of thorax finely keeled from base to apex; eyes very flat, almond shaped . . . . . TROPIPHORINA.
    2. Prosternum not emarginate at apex; eyes convex.
      A. Elytra more or less elongate with the shoulders

usually prominent; metasternum long or comparatively long . . . . . PHYLLOBIINA.
B. Elytra short and broad with the shoulders rounded; metasternum very short . . . . . PHILOPEDINA.
ii. Tarsal claws free.
1. Thorax furnished with long hairs at the sides behind eyes, which are prominent . . . . . TANYMECINA.
2. Thorax without long hairs at the sides behind eyes, which are not prominent.
A. Tips of hind tibiæ enclosed externally by a plate fringed with spinules; episterna of metasternum indistinct. . . . . BARYNOTINA.
B. Tips of hind tibiæ without plate; episterna of metasternum well marked . . . . . ALOPHINA.

OTIORRHYNCHINA.

This tribe contains a large number of species, the majority of which belong to the very extensive and important genus *Otiorrhynchus*, which is very largely represented in Europe, and contains some of the most conspicuous of our British Rhynchophora: they are most closely allied to the Brachyderina, from which they chiefly differ in the formation of the scrobes and the club of the antennæ; the following genera occur in Britain:—

I. Throat without special striation.
i. Scrobes superior, entirely visible from above; antennæ long.
1. Femora claviform, often dentate beneath; tarsal claws free, equal . . . . . OTIORRHYNCHUS, *Germ.*
2. Femora not claviform, always simple beneath; tarsal claws variable, connate in our species . . PERITELUS, *Germ.*
ii. Scrobes entirely or partially lateral, deep and directed towards the eyes; form short, stout and robust; antennæ short and thick.
1. Scape of antennæ gradually thickened from base to apex; ventral segments of abdomen clothed with dull scales . . . . . TRACHYPHLŒUS, *Germ.*
2. Scape of antennæ strongly thickened and produced into a prominence externally at base; ventral segments of abdomen without scales . . . . . CATHORMIOCERUS, *Schönh.*
II. Throat with close strong and deep longitudinal striæ . . . . . CÆNOPSIS, *Bach.*

OTIORRHYNCHUS, Germar (*Brachyrrhinus*, Latreille).

This is one of the most important genera of the Rhynchophora; it contains, at present, about four hundred species, of which the great majority are found in Europe and the adjacent countries, the largest number being attached to mountainous districts; a certain amount are found in Northern Asia and North America, but the North American species (*O. sulcatus*, *ligneus*, *rugifrons*, *maurus* and *monticola*) have all

been introduced from Europe; *O. maurus* and *O. monticola* also occur in Greenland; one or two species are recorded in the Munich catalogue from Chili, in which country, as before observed, a great number of the European forms appear to repeat themselves.

The members of the genus are very variable both in size, colour and covering, and are in many cases very difficult to determine; the following are their chief characters: scrobes, which are rather short and not well marked behind, entirely visible from above and the rostrum more or less dilated at apex on each side of them; antennæ with the scape elongate, funiculus variable; head not constricted at base, eyes not touching margin of thorax; thorax truncate at base and apex very variable in sculpture; elytra ovate with the shoulders rounded off; femora clavate, sometimes toothed; tarsal claws free and equal; the males are usually narrower than the females, and present modifications of the anal segment of the abdomen and the tibiæ.

The species feed on various plants, shrubs and small trees; as a rule they are nocturnal in their habits, and during the day secrete themselves at the roots of their food plants, in moss, &c.; many, however, may be beaten from bushes, &c., in full daylight; those that live on bushes are, when quite fresh, often furnished with very scanty dusty patches on their upper surface, which very soon disappear.

Certain of the *Otiorrhynchi* are very destructive to vines and wall-fruit and also to raspberries, &c.; for a fuller account of their ravages and the remedies proposed, the student is referred to Curtis, Farm Insects, p. 384, and to Miss Ormerod's Manual of Injurious Insects, p. 305; the chief offenders are *O. sulcatus*, *O. picipes* (the most abundant member of the genus) and *O. tenebricosus*.

O. sulcatus is often a great pest to vines, especially in hot-houses; at night they attack the new wood, in April, and afterwards feed upon the young shoots which turn black; as they never feed in the day gardeners often do not know what it is that has caused the damage; if, however, they go into the greenhouse at night with a lantern they may find them feeding, and by holding a sheet underneath and tapping the branches they may often capture a considerable number, and by repeating the process may materially lessen the damage; as the beetles hide in any crannies in the walls, &c., against which the vines are trained, it is of especial importance that these should be kept as smooth, clean and well whitewashed as possible; they also hide in the earth near the wall, and a line of ashes sprinkled with diluted paraffin or with weak diluted carbolic acid run along the junction of the wall and the ground will prove serviceable.

The larvæ of *O. sulcatus* are rather large whitish, legless, somewhat hairy grubs, and are to be found from August to spring at the roots of the food plants; the pupæ are yellowish white, and may be met with in April about three or four inches below the surface of the ground; the best remedy for an infected vine-border is to clear out the soil to a depth of some inches and fill up with fresh; some authorities recommend

the application of soot and lime to the roots, and watering with ammoniacal liquor and common agricultural salt.

O. picipes chiefly attacks raspberries and sometimes does a great deal of damage; beating the trees after dark with trays smeared with tar has been found of great service in checking their ravages.

O. tenebricosus does not apparently do much damage in Britain, but has been recorded as attacking the buds, shoots, young leaves, &c., of apricots, nectarines, peaches, plums, &c., and the roots of raspberries, currants, gooseberries and strawberries; the latter plant is also sometimes injured by *O. sulcatus*. Seventeen species have been usually regarded as British, but *O. ambiguus* is scarcely distinct from *O. rugifrons*, and *O. ebeninus* is somewhat doubtful.

I. Anterior femora without a trace of a tooth on their under side.
  i. Elytra without raised setæ.
    1. Elytra with pubescence absent or very slight, at most arranged in very small tufts, and not obscuring the general ground colour.
      A. Anterior tibiæ much compressed, with a distinct keel on their outer side; elytra more or less dilated at sides and somewhat abruptly acuminate towards apex . . . . . O. ATROAPTERUS, *De G.*
      B. Anterior tibiæ not compressed, or at all events only slightly compressed towards apex, and without distinct keel on their outer side.
        a. Thorax very coarsely granulated throughout . . . . . O. MAURUS, *Gyll.*
        b. Thorax punctured on disc, or finely granulate or shagreened.
          a*. Size much smaller (6–7 mm.); forehead broader and more arched . . . O. BLANDUS, *Gyll.* (*monticola*, Walt.)
          b*. Size much larger (10-13 mm.); forehead narrower and less arched.
            a†. Legs ferruginous; femora normally dilated; male with the anal ventral segment longitudinally striate.
              a‡. Antennæ with joints of funiculus longer; female longer, with elytra less acuminate at apex and more obsoletely punctured . . . . . O. TENEBRICOSUS, *Herbst.*
              b‡. Antennæ with joints of funiculus shorter; female shorter, with elytra more acuminate at apex and more plainly punctured . . . . . O. FUSCIPES, *Walt.* (*hæmatopus*, Schön.(?))
            b†. Legs black; femora much dilated on their under side; male with the anal ventral segment punctured or at most scratched . . . . . O. MORIO, *F.* (*v. ebeninus*, Schön.).
    2. Elytra very closely covered with filiform greyish scales, which completely cover the upper surface . . . . . O. RAUCUS, *F.*

ii. Elytra with distinct raised setæ.
1. Elytra with the alternate interstices strongly raised, thickly covered with round greyish yellow and brown scales . . . . . O. SEPTENTRIONIS, *Herbst.* (*scaber*, L.)

2. Elytra with the alternate interstices not rai ed.
A. Rostrum with a deep furrow; length 6½–7½ mm. . . . . O. SCABROSUS, *Marsh.*
B. Rostrum even, scarcely, if at all, furrowed; length 4½–5½ mm. . . . . O. LIGNEUS, *Ol.*

II. Anterior femora more or less plainly toothed beneath.
i. Apical external angle of anterior tibiæ much dilated; size large (exceeding 10 mm.); general colour greyish . . . . . O. LIGUSTICI, *L.*
ii. Apical external angle of anterior tibiæ not or scarcely dilated; size moderate or small (not exceeding 10 mm.).
1. Elytra thickly covered with small round scales, which are present also on the punctures of the elytra; teeth of anterior femora very indistinct; length 6½–8 mm . . . . . O. PICIPES, *F.* (*singularis*, L.)

2. Elytra without scales, but with small very scattered tufts of fine subsquamose yellowish hairs; length 9–10 mm. . . . . O. SULCATUS, *F.*
3. Elytra with scanty greyish pubescence; length 4½–6½ mm.
A. Thorax granulate without longitudinal furrows in middle . . . . . O. RUGIFRONS, *Gyll.*
B. Thorax granulate with strong longitudinal furrows in middle.
a. Body black, broader, less thickly pubescent; disc of thorax very strongly furrowed . . O. OVATUS, *L.*
b. Body pitchy red, narrower, more thickly pubescent; disc of thorax feebly furrowed . O. MUSCORUM, *Bris.*

O. tenebricosus, Herbst. A large and conspicuous species, black, moderately shining; head and thorax finely coriaceous, the latter narrow, rounded and slightly dilated at sides; rostrum with a carina in middle; antennæ very long, slender, black or pitchy; elytra oblong ovate more or less acuminate at apex, with small fascicles of ashy pubescence, which are very fugitive and only visible in fresh specimens, and with punctured striæ, which differ in the sexes, interstices shagreened; legs red or pitchy red, elongate, femora clavate not toothed on under side. L. 10–13 mm.

Male narrower with the anal segment of the abdomen strongly striated, and the elytra more distinctly punctured.

Female broader with the anal segment of the abdomen punctured, and the elytra obsoletely punctured.

In moss, at roots of grass, under stones, &c.; also on various fruit trees, and often taken by beating whitethorn hedges; rather common, especially in chalky districts, but local. London and South-eastern and Southern districts of England, generally distributed; Bath; Swansea; Salford Priors, Warwickshire; Scotland very rare, Solway and Forth districts (this record may be in error, as it rests on the authority

of Murray's Catalogue only, the species having never been met with by Dr. Sharp); Ireland, Baldoyle.

O. fuscipes, Walton, Ol.? (*hæmatopus*, Schön.?). There is some doubt regarding this insect, which is exceedingly closely allied to the preceding, and by some authors is united with it; it differs chiefly in having the antennæ, in both sexes, with the joints of the funiculus shorter and stouter; it is, moreover, a shorter insect, and very generally smaller and less pubescent; the elytra of the female, moreover, are evidently shorter in proportion to their breadth, more acuminate at apex, and more distinctly punctured. L. $9\frac{1}{2}$–$11\frac{1}{2}$ mm.

Of similar habits to the preceding species, and occasionally found in company with it; local, but not uncommon where it occurs; Mickleham, Box Hill, Caterham, Chatham, Sheerness; Folkestone; Isle of Wight; Portland Island; it has also been recorded from Strensall, York.

O. morio, F., *v. ebeninus*, Schön. Elongate-ovate, black, shining, with the thorax closely alutaceous or shagreened at sides and diffusely punctured on disc; the elytra are oblong ovate, with distinct punctured striæ, lateral interstices tuberculate or granulate, inner ones only rugose; apical ventral segment of male punctured or at most scratched, not striate longitudinally as in the two preceding species; the type form, which according to Schönherr is a separate species, has the elytra more ovate, more obsoletely punctate-striate, and the interstices closely and more evidently rugosely granulate. L. 10–11 mm.

The variety alone has occurred in Britain and is extremely rare, a few specimens having been taken in the West of Scotland by Mr. R. K. Greville (Murray's Cat.); Mr. Hardy refers to it in the proceedings of the Berwickshire Nat. Club, vol. ii. No. vi. p. 281, but I have not had the opportunity of seeing the reference. I have never seen a specimen in any collection.

O. atroapterus, De G. (*ater*, Steph.). Much smaller than either of the preceding species; black, rather shining; rostrum rugose with a distinct central keel; antennæ pitchy; head finely shagreened, thorax as long as broad, dilated at sides, disc punctured, sides shagreened; elytra dilated, acuminate towards apex, finely shagreened or granulate, striæ very obsolete; legs pitchy red or brownish, tibiæ compressed and carinate. L. 7–$8\frac{1}{2}$ mm.

Male with the base of the abdomen broadly and not deeply impressed, the anal segment with an abbreviated impressed line at apex, and the apical margin subtruncate and densely villose.

Sandy places on the coast; at roots of grass, in moss, &c.; locally common; Deal; Dover; Isle of Wight; Weymouth; Portland; Exmouth, Devon (on brambles); Swansea; Barmouth; Rhyl; Blackpool; Southport; Heysham, near Lancaster; Northumberland and Durham district, Hartlepool, &c.; Scotland, local, Tweed, Forth, Dee, Moray and Shetland districts; Ireland, Portmarnock, Malahide, near Dublin, Armagh, and Furnish Island, co. Galway.

O. blandus, Gyll (*monticola*, Walt.; *lævigatus*, Steph.). Somewhat resembling the preceding but smaller and narrower; black, shining, glabrous; antennæ pitchy; rostrum rugose with a broad smooth central raised line; head broad, finely punctured; thorax longer than broad, diffusely and not strongly punctured on disc, closely punctured or shagreened at sides; elytra ovate with fine punctured striæ, interstices punctured and more or less distinctly shagreened, especially at sides; legs pitchy, tibiæ not compressed and carinate. L. 6–7 mm.

Male with the abdomen impressed at base and the tibiæ armed with a small hook.

Sub-alpine; Scotland, common, Tweed, Forth, Tay, Dee, Moray, Sutherland and Shetland districts, and probably general; Ireland, Kilkeel (Champion); it has not hitherto occurred in England.

O. maurus, Gyll. Black, rather shining, sparingly clothed with ashy pubescence, which is arranged in more or less distinct small patches upon the elytra; antennæ pitchy or pitchy red; rostrum rugose with a distinct central raised line; forehead broad, rather arched; thorax scarcely as long as broad, closely and coarsely granulated, the granulations on disc being large and round; elytra ovate, with plainly punctured striæ, interstices obsoletely rugose; legs pitchy red. L. $6\frac{1}{2}$–$7\frac{1}{2}$ mm.

A northern species, as a rule, which extends to Greenland and Iceland; local and not common; Cheshire; Manchester district; Scarborough; Skiddaw; Cheviots; Scotland, scarce, Solway, Clyde, Tay, Dee, Moray and Shetland districts; Ireland, Newcastle (Champion); Stephens recorded it from South Wales, but this is most probably an error.

O. raucus, F. Black, with the antennæ and legs pitchy ferruginous, head and thorax not thickly covered with thin hair like scales, which are of a brownish grey or greyish yellow colour, elytra very thickly covered with the same, which completely hide the integument and are broader on the striæ; rostrum rugosely punctured; thorax about as long as broad with the sides rounded and dilated, not strongly, but distinctly, granulated, the granulations being moderately large, central line finely raised; elytra with rather distinct punctured striæ, the punctures in the striæ being less evident at apex. L. 6–7 mm.

Chalky and sandy places; by sweeping herbage, also at the foot of trees, under plants, &c.; according to Rouzet it does damage to pear trees; rare; Darenth, Hammersmith, Hampstead, Chatham, Greenhithe, Southend, Claygate, Reigate, Bearsted, near Maidstone; Glanvilles Wootton; Swansea; Bottisham, near Cambridge; Cromer; Northumberland and Durham district "Twizell," P. T. Selby, Esq. (*Bold*).

O. scabrosus, Marsh. Oblong ovate, rough, black or pitchy, with the elytra ferruginous brown or pitchy brown; upper surface with greyish pubescence, which is setose and distinctly raised if viewed sideways; rostrum rugose with a deep central channel; head short; thorax at least as long as broad with the sides slightly rounded, coarsely and

closely granulated, and with a more or less distinct central furrow; elytra rough and scabrous, with punctured striæ; antennæ and legs dull ferruginous. L. $6\frac{1}{2}$–$7\frac{1}{2}$ mm.

Chalky and sandy places; under stones, in moss, at roots of low plants, &c.; often by beating hedges; locally common; London district, generally distributed; Dover; Hastings; Portsmouth district; Isle of Wight, Ryde, Sandown, Ventnor, &c.; Exeter; Swansea; Hunstanton; Wallasey, Cheshire, and Aigburth, Liverpool district; Lincoln; not recorded from the Northumberland and Durham district; recorded in Murray's Catalogue from "Dollar, Berwickshire, East Lothian, &c.," but Dr. Sharp says he has never seen a specimen found in Scotland, and concludes the record must be erroneous; Ireland, near Dundrum, Waterford, &c.

O. ligneus, Ol. (*scabridus*, Steph.). One of the smaller species which is sometimes confused with *O. ovatus* and *O. muscorum*, from which it may be known by the absence of teeth on the anterior femora; pitchy black or ferruginous, elytra ferruginous or pitchy-red, with light outstanding pubescence; antennæ pitchy or reddish; rostrum rugose; thorax rounded at sides, thickly and coarsely granulated; elytra ovate, rough, with punctured striæ, interstices transversely rugose; legs ferruginous. L $4\frac{1}{2}$–$6\frac{1}{2}$ mm.

In moss, at the roots of plants, under stones, &c.; local and widely distributed, but never very common; London district, found in many localities; Dover; Folkestone; Hastings; Sandown, Isle of Wight; Portsmouth district; Devon; Bristol; Llangollen; Bridgenorth; Repton; Sherwood Forest; Liverpool district; Lancaster; Cleethorpes, Lincolnshire; Northumberland and Durham district; Scotland, not common, in sandy places, Solway and Clyde districts; Ireland, Rathkurby, near Waterford, Cramond, &c.

O. septentrionis, Herbst. (*scaber*, L.). Ovate, brown red, closely covered with round brownish grey or yellowish grey scales, which on the elytra are variegated with irregular patches of reddish-brown scales, which produce a tessellated appearance; rostrum thickly scaled, not or scarcely ridged, eyes flat; antennæ red; thorax about as long as, or a little longer than, broad, with the sides rounded, granulate; elytra with the alternate interstices strongly raised, and with rows of deep punctures, each of which bears a round scale, each interstice with strong erect or semi-erect scale-like somewhat clavate, setæ; legs red. L. 5–$5\frac{1}{2}$ mm.

Only found in the highland districts of Scotland, where it is very local, but not uncommon where it occurs; Tay, Dee and Moray districts (Braemar, Aviemore, Rannoch, &c.).

O. picipes, F. (*singularis*, L., *squamiger*, Steph.). Oblong, ovate, pitchy, clothed with fuscous-ashy pubescence, which is not much raised, and closely covered with brownish and lighter yellowish brown scales, which cause the elytra to appear more or less tessellated; head with a very fine central ridge; thorax almost longer than broad, granulated, the granulations being very coarse on the centre of disc; elytra not very convex, with the interstices very slightly raised, and

with punctured striæ, the punctures being furnished with scales on each, which causes them to appear ocellate ; legs red or pitchy-red, teeth of femora often very indistinct. L. $6\frac{1}{2}$–8 mm.

By beating young trees, hedges, &c. ; especially hurtful to raspberries ; only too common throughout the kingdom ; Dr. Sharp records it as "very abundant" in Scotland.

O. sulcatus, F. Black, rather shining ; rostrum with a deep broad furrow, head finely punctured, antennæ ferruginous ; thorax at least as long as broad, with the sides slightly rounded, strongly granulate, with a more or less obsolete central channel, which, together with the head, is furnished with scanty greyish-yellow hairs ; elytra with deep furrows, interstices as well as furrows with coarse granulations or tubercles ; upper surface with scanty, but very distinct, patches and fasciæ of yellowish subsquamose hairs ; legs pitchy ; teeth of anterior femora distinct. L. 9–10 mm.

At roots of plants, in moss, &c. ; often injurious to vines, strawberries, &c. ; somewhat local, but only too common where it occurs ; apparently generally distributed in the London, southern, and midland districts, and, in fact, as far north as the Northumberland and Durham district, but recorded by Dr. Sharp as rare in Scotland, Forth and Tay districts ; Ireland, Dublin, Waterford, Armagh, Newcastle, and apparently generally distributed ; the species is spread all over Europe, and Leconte and Horn record it from Massachusetts, Canada, Newfoundland and Nova Scotia.

O. ligustici, L. Black, clothed with grey scales and scattered ashy hairs, so that the whole insect presents a dirty dull grey appearance, which together with its large size will at once distinguish it from all our other species ; head rugosely punctured, rostrum distinctly carinate, antennæ black or pitchy black ; thorax slightly transverse, rather strongly narrowed and slightly constricted at apex, with the sides strongly rounded, strongly granulate, the granulations on disc not being very close together ; scutellum invisible ; elytra large and ample, much broader than thorax, finely scabrous and granulate, with fine and not distinct punctured striæ towards sides and at apex ; legs robust, black, pubescent, teeth of anterior tibiæ distinct. L. 11–13 mm.

Heathy places, very rare ; at roots of *Anthyllis vulneraria* at the sides of chalky cliffs ; very rare in England, but according to Bedel it often occurs in France in great abundance, and does injury to vines, clovers and garden herbs on light lands : Godstone (Surrey), Hartfield, Barham (Suffolk) and Southend (Stephens) ; Isle of Wight, Ventnor (S. Stevens), Sandown (Blatch and myself) ; Hawley Flat, near Blackwater, Hampshire (Smith) ; Kimpton, near Andover (Rudd) ; Matlock (Chappell) ; Isle of Man (Blatch) ; Scotland, Edinburgh (Stephens ; not, however, alluded to by Sharp).

O. rugifrons, Gyll. (*ambiguus*, Brit. Cat.). Black, dull, with slight ashy pubescence ; rostrum punctured and longitudinally rugose, with a more or less distinct central carina, eyes depressed ; antennæ rather long, stout, pitchy black ; thorax a little broader than long, or about as broad as long, closely and rather strongly granulate without

sulci in middle; elytra ovate, rather depressed in front, with moderately strong punctured striæ, interstices convex, granulate; legs pitchy black; teeth of anterior femora small. L. $4\frac{1}{2}$–$6\frac{1}{2}$ mm.

Chalky and sandy places, on the coast or not very far inland; at roots of grass, under decaying seaweed, stones, &c.; local, but common where it occurs; Dover; Sussex; Portsmouth district; Sandown, Isle of Wight; Chesil Beach; Portland, small variety (Gorham); Weymouth; Falmouth; Scilly Islands; Whitsand Bay, Plymouth; Exmouth; Woollacombe sands (Devon); Bath; Llandudno; Lancaster; Cleethorpes, Lincolnshire; Northumberland and Durham district, Hartlepool, &c.; Scotland, not common, Solway and Tay districts.

In the Entomologist's Monthly Magazine, vol. ii., p. 152, Mr. Rye stated that he had taken specimens at Rannoch, which he considered to be the *O. ambiguus* of Schönherr (recorded as British by De Marseul, Cat. Col. d'Europe, 1863, and Stierlin), in company with *O. rugifrons*, to which it appeared to be very closely allied, if indeed the two insects were not specifically identical. Mr. Rye thus describes his insect (Ent. Ann. 1867, p. 87):—"It appears to be somewhat narrower than *O. rugifrons*, and clothed more thickly with hairs; the thorax is somewhat more finely granulated, and the elytra are more finely punctate-striate, with the granulations of the interstices not arranged in such distinct rows. The rostrum and vertex are more rugosely punctate, the punctures running into longitudinal rugulæ; the former also is distinctly keeled in the middle, with an obsolete longitudinal furrow on each side. The second joint of the funiculus should be almost shorter than the first, instead of somewhat longer as in *O. rugifrons*:" it will be noticed that the differences are very slight and comparative, and with respect to the central carina of the rostrum, which is supposed to be simply rugose longitudinally in *O. rugifrons*, it appears certainly to be present to a greater or a less degree in the last-named insect; whether *O. ambiguus* is really a separate species or not remains to be proved, but our British specimens are certainly very doubtfully distinct from *O. rugifrons*, even as a variety. The presence of a small tooth on the anterior femora and the colour as well as the greater distance of the eyes from one another on the forehead will separate this species from *O. ligneus*; from *O. ovatus* it may be easily known by its average larger size, duller appearance, much smaller tooth on the anterior femora, and the absence of longitudinal sulci on the thorax, which is much more finely granulated.

O. ovatus, L. Black, rather shining, clothed with thin griseous pubescence; head and rostrum even or almost even with an impression between eyes (which are comparatively prominent), finely and rugosely punctured; antennæ red; thorax very convex, subglobose, very coarsely granulate, the granulations on disc coalescing and forming longitudinal ridges and deep sulci; elytra convex, somewhat acuminate at apex, with coarse punctured striæ, interstices finely shagreened on disc, more rugose at sides; legs red, anterior femora with a strong tooth; reddish varieties

occur (apparently the *v. pabulinus*, Panz.), which are often confused with the succeeding species. L. 4–5 mm.

In moss, and at the roots of various plants; it appears to feed on various kinds of vegetation; occasionally it is found by beating hedges; common and very widely distributed, but in Britain it appears to be almost confined to the coast counties; Dr. Sharp records it as common in Scotland in the Solway, Clyde, Forth and Tay districts; Ireland, near Dublin, and probably widely spread; according to Bedel it is distributed over all Europe, western Siberia, and the north-eastern part of the United States.

O. muscorum, Bris. Very closely allied to the reddish variety of the preceding species, but as a rule distinguished from it by its more or less ferruginous colour; it is also smaller, with evidently shorter and less robust antennæ and legs (the posterior femora being very feebly toothed beneath); the general form is narrower, the pubescence more distinct, and the thorax is less strongly tuberculate, and the central sulci are far less strongly marked (a point that will easily separate it); it also has a narrower rostrum, which is distinctly depressed in the middle. L. 4 mm.

In moss; occasionally found in sandpits and by sweeping herbage; not uncommon; Dartford, St. Mary Cray, Shirley, Mickleham, Leith Hill, West Wickham; Malvern; Knowle, near Birmingham; Banks of Dove, Burton-on-Trent; Church Stretton; Llangollen; Manchester district, abundant and general in sandy places, especially on the coast (Chappell); Northumberland and Durham district, on Melilot trefoil at South Shields and Hartley (Bold); Scotland, not rare, Solway, Forth, Dee and probably other districts; Ireland, Armagh (Johnson).

PERITELUS, Germar.

This genus contains nearly fifty species, of which the majority occur in Europe, and the remainder have been described from North and South Africa; they are, for the most part, extremely local; only one species is found in Britain, and this very rarely; they are closely allied to *Otiorrhynchus*, from which they differ in having the femora not clavate and always simple beneath, and the tarsal claws (in our species) connate; the antennæ are stout and rather long, the scutellum indistinct, and the body closely covered with scales, without short recumbent hairs.

P. griseus, Ol. (*sphæroides*, Germ.). Oblong-ovate; black, clothed thickly with greyish and brownish scales, which are light at sides of head, thorax and elytra, and in fresh specimens have a slight pinkish reflection; antennæ reddish-pitch brown, scape longer than the funiculus; forehead with a small depression between eyes, rostrum with a fine central furrow; thorax with the sides gradually and slightly rounded, deeply and diffusely punctured; elytra ovate, with fine and not very closely punctured striæ, interstices broad; legs pitchy red or brownish. L. 6–8 mm.

On bushes, &c.; sometimes injurious to vines; extremely rare in Britain; Ventnor and Sandown, Isle of Wight (Wainwright and Sidebotham).

TRACHYPHLŒUS, Germar.

This is a very obscure and difficult genus, containing about fifty species, which are chiefly found in Europe and Northern and Southern Africa; the genus is also represented in North America; its members are short and stout, brown, grey or sandy-coloured insects, which live on and at the roots of low plants; they are often coated with a crusted covering, which in colour just resembles the ground they are found on, so that they easily escape observation; they are chiefly found in sandy places near the coast: the following are their most important distinguishing characters:—form short, obovate, antennæ short and thick with a stout scape, inserted near apex of rostrum, scrobes rarely visible from above; thorax strongly transverse, constricted in front; elytra oval or subglobose, usually with erect scale-like setæ; legs short and robust, femora simple, tarsi short.

About one-third of the European species occur in Britain: it is very hard to tabulate them satisfactorily as some of the characters are not very evident, and it really requires a comparison with authentic specimens to name them with any accuracy; their differences are very easily seen if the insects are placed side by side.

I. Anterior tibiæ without special spines and not digitate or produced at apex.
  i. Second ventral segment of abdomen longer than the next two united; elytra with well marked impunctate or almost impunctate striæ . . . . T. MYRMECOPHILUS, *Seidl.*
  ii. Second ventral segment of abdomen shorter than or equal to the next two united; elytra with the striæ more or less distinctly punctured.
    1. Sides of thorax obtusely angled; raised scale-like hairs of elytra very coarse; second ventral segment shorter than the next two united . . T. ARISTATUS, *Gyll.*
    2. Sides of thorax rounded; raised scale-like hairs of elytra comparatively fine; second ventral segment equal to the next two united . . . . T. SQUAMULATUS, *Ol.*

II. Anterior tibiæ with spines at or near apex or produced and digitate at apex.
  i. Size larger; scrobes plainly visible from above . T. SCABER, *L.*
  ii. Size smaller; scrobes scarcely, if at all, visible from above.
    1. Striæ of elytra distinct.
      A. Rostrum furrowed; thorax with a more or less distinct central furrow, sometimes obsolete . . . . . T. SCABRICULUS, *L.*
      B. Rostrum and thorax even . . . . . T. LATICOLLIS, *Boh.*
    2. Striæ of elytra very faint; upper surface with a close crusted covering.
      A. Elytra with a scanty series of small clubbed scale-like setæ on each interstice; anterior tibiæ with three pointed teeth, the central one forked at apex. . . . . T. SPINIMANUS, *Germ.*
      B. Elytra with a series of clubbed scale-like setæ

on the alternate interstices which are somewhat convex; anterior tibiæ with three teeth at apex . . . . . T. ALTERNANS, *Gyll.*

T. myrmecophilus, Seidl. Pitchy black or brownish, with the antennæ and legs pitchy or pitchy ferruginous, very dull; head with a central furrow, antennæ very stout; thorax with sides rounded and narrowed in front, very closely sculptured, and with an exceedingly obsolete central furrow; elytra with well marked striæ which are almost, if not quite, impunctate; apex of anterior tibiæ almost simple. L. $2\frac{1}{2}$–$3\frac{1}{4}$ mm.

Extremely local; found by Mr. Moncreaff near Southsea, and recorded by him as at one time common at Lumps Pond, Southsea beach, at roots of grass and in sand holes, but the locality has been destroyed; Hastings district (Bennett and Ford); Mr. Gorham records it doubtfully from Freshwater, Isle of Wight; according to Bedel it occurs under stones in May, and its name would seem to imply that it has been found in company with ants; it has been found in France and at the Escurial in Spain.

The species is intermediate between *T. aristatus* and *T. squamulatus*, resembling more particularly the latter, from which it may be known by its stouter and more evident elytral setæ, its larger eyes, laterally more rounded and bristly thorax, rather longer second abdominal segment, and less horizontal scrobes, which are directed at first rather upwards and then down towards the eye, and have their upper margin not so sharply defined.

T. aristatus, Gyll. Pitchy-rufous, with the head and thorax often darker and the elytra lighter, the latter with comparatively close and very distinct erect white scale-like setæ; scape of antennæ stout; head furrowed; thorax with the sides dilated and obtusely angled in middle, very closely, but distinctly, sculptured, and with a very distinct central furrow; elytra subglobose, or globose-ovate, slightly rostrate and inflexed at apex, with strong deeply and coarsely punctured striæ, interstices finely rugose; anterior tibiæ almost simple at apex. L. $2\frac{1}{2}$–3 mm.

Sandy and chalky places; in moss and at the roots of *Lotus corniculatus;* not common; Hampstead, Mickleham, Shirley, Faversham, Coombe and Birch Woods, Merstham (Surrey); New Forest; Portsdown, near Southsea, on chalk; Scotland, very local, Solway district.

The castaneous or rather bright rufo-piceous elytra, strongly punctured striæ, and very stout white erect setæ, together with the shape and sculpture of the thorax, will easily distinguish this species.

T. squamulatus, Ol. This species is allied to the two preceding; from the former it differs as above described, and from the latter it may be known by having the sides of the thorax rounded and not obtusely angled, the erect setæ of the elytra relatively finer and the second ventral segment equal to, and not less than, the third and fourth united; the

elytra, as a rule, appear to be darker and much less distinctly punctured; the anterior tibiæ are unarmed in front in both sexes. L. $2\frac{1}{2}$–3 mm.

Sandy and chalky places, in moss and at roots of *Lotus corniculatus;* very local and, as a rule, not common; Shirley, Mickleham, Caterham, Box Hill, Crohamhurst, Chatham, Faversham; Southsea; Portsmouth, common at roots of grass in spring; Sandown, Isle of Wight; Scarborough; Ireland, Waterford (Power); Walton records it as "rather rare, occasionally found on sandy banks on Windmill Hill, Gravesend; also near Birch Wood, and Bishops Wood, Hampstead, in June;" he appears, however, to have mixed this species and *T. aristatus.*

T. scaber, L. (*bifoveolatus,* Beck., *squamosus,* Gyll.). The largest of our species, obovate, dull-brown, sometimes entirely covered with a greyish or whitish crusted covering, antennæ and legs pitchy or rufescent; scrobes plainly visible from above; thorax very transverse, not constricted at base, but broader at base than at apex; elytra with rather variable striæ, interstices usually tessellated with fuscous and cinereous scales, furnished behind with small outstanding scale-like setæ; the thorax is, as a rule, compressed at each side with a fovea, but is variable both as to impressions and sculpture and the distinctness of the central channel, which is usually present; according to Walton it may be distinguished from every other species "by having the head invariably with a transverse striga or constricted at the base, and by the anterior tibiæ being armed in both sexes at their apices, externally and in front, with six minute spines." L. $3\frac{1}{2}$–$4\frac{1}{2}$ mm.

In moss, &c.; occasionally found in sand pits and by sweeping herbage; also at the roots of low plants in sandy places; local; London district, and south-eastern and southern counties, common and generally distributed; Somerset; Bristol; Barmouth; Malvern; St. Faith's, Norwich; Scarborough; Northumberland and Durham district, rare, Hartlepool, South Shields, Hetton Hall, near Belford, and Tunstall Hill; Scotland, rare, Tweed, Forth and Moray districts; Ireland, near Waterford (Power).

T. scabriculus, L. (*scaber,* Schönh., *nec* L.). Much smaller than the preceding, obovate, fuscous black or brownish, thickly clothed with greyish scales, head depressed, thickly and rugosely punctured; rostrum rather broad with a deep central channel; thorax very transverse, with an oblong fovea towards each side, finely and rugosely punctured, central channel obsolete, disc and sides with a few whitish scattered setæ; elytra with punctured striæ, thickly clothed with narrow erect scale-like setæ; in grey specimens the elytra are somewhat tessellated, and there is a rather conspicuous white spot of scales on each elytron before middle near suture; apex of anterior tibiæ with a strong tooth on outer-side and another (bifid at apex) in front; teeth small in female. L. $2\frac{1}{2}$–3 mm.

In sandy and chalky places, in moss, at roots of grass and low plants; common and generally distributed in the London and southern districts, but does not apparently occur in the midland counties or in Yorkshire, Lancashire, &c.; Northumberland and Durham district, very rare, "Marsden" Mr. J. Hardy; Scotland, rare, Solway and Tweed districts; Ireland, near Dublin; according to Walton it is "certainly the most abundant insect of the genus."

T. laticollis, Boh. (*spinimanus,* Thoms., *nec* Germ.). Ovate, black, antennæ and legs brown-red, closely covered with grey scales; rostrum and thorax even; thorax very broad, with sides strongly rounded and a broad deep curved transverse impression near apex; elytra with distinct punctured striæ, interstices level, each with a row of erect white setæ; anterior tibiæ with two not very strong teeth at apex; the species superficially resembles *T. spinimanus,* from which the much shorter armature of its anterior tibiæ at once separates it, but it is more closely allied to *T. alternans,* from which it may be known by having the elytra distinctly striated, with level interstices, all moderately thickly set with fine scale-like setæ, whereas in the latter species the striæ are indistinct and the alternate interstices only are setose, and somewhat elevated. L. $2\frac{1}{2}$–3 mm.

Extremely rare; Weston-super-Mare (five examples, Crotch); Scotland, extremely rare, Solway district (Sharp).

T. spinimanus, Germ. (*nec* Thoms. *et* Gyll.). Black, antennæ and legs red-brown; upper surface covered with a thick white or lighter or darker brown crusted covering, which almost completely hides the obsolete interstices; rostrum flat; thorax very transverse with sides rounded, constricted in front, without central furrow; elytra with the alternate interstices sometimes very slightly raised, and with a series of small clavate scale-like setæ on each interstice; anterior tibiæ with a long spine near the apex externally, and with two diverging spines in front. L. $2\frac{1}{2}$–3 mm.

Chalky hill sides; at the roots of *Helianthemum vulgare;* very local, but common where it occurs; Chatham (taken by Mr. Champion and Mr. Walker in great profusion in various parts of the district); Hampstead; Mickleham; Southend; Sheppy; Dover; Arundel; Southsea beach, near Cumberland Fort; chalk hill, near Portsmouth; Walton records it somewhat doubtfully from Cromer, Norfolk.

T. alternans, Gyll. Closely allied to the preceding, but with the striæ (if the crusted covering be removed) more distinct, the alternate interstices only furnished with erect scale-like setæ, and somewhat elevated, and the spinose appendages at the apex of the anterior tibiæ smaller: the rostrum is almost as broad and rather longer than the head, and finely channelled in the middle; the thorax is short, transverse, narrowed and transversely impressed in front, much dilated and rounded at sides, without central furrow; elytra ovate; legs pitchy or dark testaceous. L. $2\frac{1}{2}$–$2\frac{3}{4}$ mm.

Chalky hill sides; in moss, and at roots of *Helianthemum vulgare;* occasionally by sweeping herbage; very local and, as a rule, not common; Box Hill, Mickleham, Ashford, Eastry, Southend, Chatham; Margate; Dover (common, J. J. Walker); Folkestone; Arundel; Southsea beach, near Cumberland Fort; Sandown and Ventnor, Isle of Wight; Portland; Weymouth.

CATHORMIOCERUS, Schönherr.

This genus contains rather more than twenty species, of which all but three or four are found in Europe, the others occurring in Algeria

and Madeira; it is extremely closely allied to *Trachyphlœus*, but its members may be distinguished from the latter genus by having the ventral segments without scales and somewhat shining and the base of the scape dilated and produced into a prominence externally.* M. Bedel considers the latter to be merely a specific character and unites the two genera as one; the two British species are extremely local.

I. Antennæ more slender; eyes less prominent; punctuation feebler; colour lighter . . . . . C. SOCIUS, *Boh.*

II. Antennæ stouter; eyes more prominent; punctuation stronger; colour darker . . . . . C. MARITIMUS, *Rye.*

C. socius, Boh. Oblong-ovate, pitch black, with the antennæ and legs lighter; upper surface with greyish scales, which are more close at sides and are scanty in middle, as well as on under-side; rostrum furrowed; scape of antennæ long and stout, abruptly dilated externally almost immediately as it leaves the scrobe, scrobes broadly open in front if viewed from above; thorax not much broader than long, with the sides rounded, very closely sculptured; elytra with regular distinct punctured striæ, interstices with erect whitish scale-like setæ, which are more evident behind; tibiæ without distinct spines at apex. L. $2\frac{1}{2}$–3 mm.

Sandy places; extremely local; introduced as British by Mr. Walton and reintroduced by Mr. Rye on the authority of a single specimen taken by Mr. H. Montague in the early part of the summer of 1867 at Freshwater, Isle of Wight; I took a single specimen in the spring of 1882 at the foot of the cliffs at Sandown in the Island; during the summers of 1887 and 1888 Mr. Champion has, however, taken a considerable number of specimens in the Sandown locality; its distribution is very strange, as it has been taken by Dr. Sharp at a great elevation, in the Sierra Nevada, at the margins of snow-fields; M. Bedel records a single specimen from the neighbourhood of nests of *Aphænogaster* (a l'entour des fourmilières d'*Aphænogaster*), but I do not know whether his insect has been compared with our specimens; he further says that *C. maritimus* is probably nothing but a variety of *C. socius*, which it certainly is not if our specimens are rightly named.

C. maritimus, Rye. Allied to the preceding but flatter, darker, more strongly punctured, and with the antennæ more robust; the head is wider and the eyes more prominent; the rostrum has the central longitudinal furrow not so evident; the scape is not dilated until at some little distance from the scrobe, a rather conspicuous slender space intervening; the funiculus and the club are (comparing the same sexes) very distinctly broader and stouter; the thorax is longer and more coarsely punctured; the elytra are flatter, less ovate, with the sides a little straighter, and with the striæ much more coarsely punctured, and the setæ on the interstices are black, and not so stout or quite so long; the legs are darker, and the apex of the tibiæ is scarcely so enlarged. L. $2\frac{1}{2}$–3 mm.

Portsmouth district, discovered by Mr. Moncreaff in the salterns near Southsea; extremely local, at roots of grass, plantain, &c., and confined to a few square yards; it is a very difficult species to capture, as it tucks in its antennæ and legs and feigns death at times for half an hour, and it is the exact colour of the soil.

* This applies to our species, but Mr. Rye (Ent. Monthly Mag. vii. 151), considers that the extreme development of the antennæ in some *Cathormioceri*, being mostly sexual and not found in all the species, is not of much generic value. Bedel unites the genus with *Trachyphlœus*.

CÆNOPSIS, Bach.

This genus is a very small one, containing only three species, which are found in Europe, Northern Africa and Madeira; they are allied to *Otiorrhynchus* and *Trachyphlœus*, but may be easily known by the close strong and deep longitudinal striæ on the throat; in *C. fissirostris* the deciduous mandibles are long and hooked; the two British species differ considerably in size and general appearance.

I. Thorax as long as broad; elytra oblong-oval; size larger . . . . . C. FISSIROSTRIS, *Walt.*
II. Thorax evidently transverse; elytra sub-globose; size smaller . . . . . C. WALTONI, *Boh.*

C. fissirostris, Walt. Oblong-ovate, brown, closely covered with dark brown and greyish yellow scales; rostrum short with a broad deep furrow; eyes rather prominent; antennæ ferruginous; thorax as long as broad, with the sides rather dilated and furnished with light scales and squamose setæ, closely sculptured, with a narrow raised central line; elytra with plainly punctured striæ, second interstice broader than the first, apical portion with distinct erect scale-like setæ; legs ferruginous, posterior femora usually with a white ring. L. 5 mm.

Sandy places, in thick wet moss; rare; Chislehurst (Marsh); Plumstead (Smith); Shirley (Champion); Shirley Pit, on three or four occasions (Power); Hastings district, Peppering, Guestling, and St. Leonards; Shirley Warren, Southampton (Gorham); New Forest; Plymouth; Cannock Chase, Hednesford (Blatch).

C. Waltoni, Schön. (*ventricosus*, Steph.; *Trachyphlœus Waltoni*, Walton). Very like a *Trachyphlœus* in general appearance and quite different, at first sight, from the preceding; ovate, black, thickly clothed with griseous and cinereous recumbent scales, and with white erect scale-like setæ; head short, depressed, deeply striated and ridged above; eyes small, round and prominent; rostrum rather narrower and scarcely longer than the head, deeply excavated above; antennæ rufo-ferruginous; thorax broader in the middle than long, considerably narrowed in front, greatly dilated and rounded at the sides towards base, finely carinated, thickly punctured, the punctures confluent; elytra ample, globose or globose-ovate, with regular deeply and strongly punctured striæ; interstices narrow, convex, and coriaceous, each with erect setæ behind; legs rather short, robust, fusco-cinereous, squamose; anterior tibiæ unarmed. L. 3–3½ mm.

Sandy and chalky places; in moss, gravel pits, under stones, &c.; very local; London district, not uncommon, Hampstead, Shirley, Esher, Horsell, Coombe Wood, Chatham, Dartford, Plumstead (abundant in the latter locality, July 30, 1864 (Power)); Hastings district; Portsmouth district; New Forest; Whitsand Bay, Plymouth; Bristol; Stourport; Cannock Chase; Bridgenorth, Shropshire; South of Ireland (T. V. Wollaston).

BRACHYDERINA.

This tribe is very differently constituted by various authors; in the

European catalogue of Heyden Reitter and Weise, for instance, it includes *Polydrusus*, *Sitones*, *Trachyphlœus* and other genera which are now separated from it; as here constituted it contains a few genera whose members are for the most part small or moderately sized thick-set insects, which differ from the preceding tribe by having the scrobes lateral and directed inferiorly and the second joint of the club of the antennæ about equal to the first, and from all that follow by the formation of the side pieces of the mesosternum; the latter character will be found to separate *Barypeithes sulcifrons*, Boh. (which is regarded by Duval as the type species of the genus) from our other two species *B. araneiformis* (*brunnipes*) and *B. pellucidus*; a new generic name is therefore required for the latter species, which must accordingly be retained among the Brachyderina under the genus *Exomias*, Bedel, the genus *Barypeithes* proper being referred to the Phyllobiina.

I. Eyes small and very prominent; vertex of head constricted; scape of antennæ not reaching beyond the level of the eyes . . . . . STROPHOSOMUS, *Steph.*

II. Eyes moderate, not or only slightly prominent; vertex of head not constricted; scape of antennæ reaching beyond the posterior margin of the eyes.

i. Femora simple; third joint of the funiculus of the antennæ globose or transverse.

1. Elytra glabrous or covered with long fine outstanding hairs.

A. Scrobes deflexed on lower part . . . . . EXOMIAS, *Bedel.*

B. Scrobes not deflexed . . . . . OMIAS, *Schön.*

2. Elytra with coarse and stout outstanding scale-like setæ . . . . . BRACHYSOMUS, *Steph.*

ii. Femora toothed beneath; third joint of funiculus of antennæ oblong or elongate.

1. Anterior coxæ placed much nearer to the anterior margin of the thorax than to the posterior; elytra without raised setæ . . . . . EUSOMUS, *Germ.*

2. Anterior coxæ placed at about equal distances from the anterior and posterior margins of thorax; elytra with raised scale-like setæ on the interstices . . . SCIAPHILUS, *Steph.*

STROPHOSOMUS, Schönherr.

This genus, according to the Munich catalogue, contains fifty-two species, the majority of which are recorded as from Europe, representatives also being mentioned from Morocco, South Africa, Ceylon and Peru; in the European catalogue of Heyden Reitter and Weise, thirty-three species are recorded from Europe alone, of which fourteen belong to the sub-genus *Neliocarus*, Thoms.; Bedel, however, although he also includes the latter sub-genus, reckons only about thirty species altogether, all of which are confined to the west of Europe and the Morocco district, except one (*S. albolineatus*, Seidl.), which occurs in Russia and Austria, and may be generically distinct; they are short, dull-looking, brownish or greyish insects, with the elytra subglobose and with the eyes ex-

tremely prominent, appearing, in some species, as if almost detached from the head ; this character, together with the large broadly triangular head, will easily distinguish them from their allies ; the vertex is constricted behind the eyes; the scrobes are deep, sometimes slightly deflexed, sometimes almost straight; the thorax is transverse or subtransverse, as a rule, not much longer than the head; in size they vary from $3\frac{1}{2}$ to $6\frac{1}{2}$ mm.; in the males the tibiæ are terminated by a small hook and the last abdominal segment is sometimes modified; five species are usually regarded as British, of which three belong to the sub-genus *Neliocarus*, Thomson, above referred to; as, however, Walton's species *S. fulvicornis* is recognized by Dr. Sharp and apparently on the continent, as it appears in the catalogue of Heyden Reitter and Weise as from Britain and Germany, I have thought it best to include it, although, if my specimens are correctly named, they appear to come extremely close to *S. capitatus*, De G. (*obesus*, Marsh.) ; although the genus is a small one, two or three of the species are often hard to distinguish, as they are somewhat variable in size, colour, &c.

I. Elytra not fitting tightly into the base of thorax; scrobes slightly but plainly deflexed (*Strophosomus* i. sp.).
  i. Elytra with the suture denuded at base, forming a black longitudinal patch at scutellum . . . . . S. CORYLI, *F.*
  ii. Elytra with the suture not denuded at base.
    1. Erect hairs on elytra very distinct, if viewed sideways; thorax rugosely punctured. . . . . S. CAPITATUS, *De G.* (*obesus*, Marsh.)
    2. Erect hairs on elytra much less distinct, and often more or less obsolete, even if viewed sideways; thorax somewhat remotely punctured . . . . . S. FULVICORNIS, *Walt.*

II. Elytra fitting tightly into base of thorax; elytra and thorax slightly constricted at base (*Neliocarus*, Thoms.)
  i. Base of thorax slightly but plainly emarginate just before scutellum; upper surface entirely clothed with long outstanding hairs . . . . . S. FABER, *Herbst.*
  ii. Base of thorax not emarginate before scutellum; upper surface without or with very short outstanding hairs.
    1. Upper surface entirely covered with scales . . . S. RETUSUS, *Marsh.*
    2. Upper surface mostly denuded, except at sides, black and shining . . . . . S. LATERALIS, *Payk.* (*limbatus*, F.)

S. coryli, F. (*obesus*, Thoms. *nec* Marsh). Black, with the antennæ and legs ferruginous, thickly clothed with brownish or fuscous-ashy scales, with a denuded black longitudinal patch at base of elytra near scutellum; rostrum bisulcate in front; head longitudinally rugose; thorax granulate-rugose with three more or less distinct, often obsolete, fuscous dorsal lines; elytra with moderate punctured striæ, interstices convex, with short setæ, legs robust, squamose and pubescent. L. $4\frac{1}{2}$–6 mm.

On various trees, hazel, oak, fir, &c.; common and generally distributed throughout the kingdom; in quite fresh specimens the scales, as in many other allied species, have a distinct coppery reflection.

S. capitatus, De G. (*obesus*, Marsh, *asperifoliarum*, Steph.). Closely allied to the preceding but distinguished by not having the abraded longitudinal black patch at base of suture of elytra; the size is more variable and on the average smaller; the thorax is rugulose-punctate and has no trace of a dorsal channel which is often evident in *S. coryli*; the elytra are more oval with the shoulders much less marked; the striæ on the elytra, moreover, are narrower and more shallow, with the interstices flatter; the latter differences, however, are scarcely evident except in denuded specimens; the colour is extremely variable, but appears to be, as a rule, more often grey or dark grey than in *S. coryli*. L. $3\frac{1}{2}$–$5\frac{1}{2}$ mm.

On young hazel, oak, broom, &c.; in woods and hedges; generally distributed and common from the midland districts southwards; less common further north, although generally distributed; Scotland, local, Solway and Forth districts; Ireland, probably occurring in many localities.

S. fulvicornis, Walton. Very closely allied to both the two preceding, but differing in general form and in the fact that the antennæ and legs are entirely fulvous; the absence of the black patch at base of suture will separate it from *S. coryli*, and the longitudinally rugulose head from both this species and *S. obesus*; from the latter species it may further be known by having the thorax subremotely punctured, as well as by having the erect setæ on the elytra much shorter and more or less obsolete; the depressed scales of the elytra, moreover, appear when magnified to be of a subelliptical form, whereas in its congeners they are subrotundate. L. 4–$5\frac{1}{2}$ mm.

"Taken by Mr. Curtis on heath in a fir plantation on Parley Heath in October, and likewise I believe by Mr. Dale" (Walton); I have specimens which appear to belong to the species which I took in the New Forest at the end of July, 1877.

S. retusus, Marsh (*squamulatus*, Steph. Manual, *alternans*, Schönh.). Short and broad, thickly covered with greyish and fuscous scales, which in fresh specimens are arranged in more or less distinct longitudinal lines, and have a more or less distinct coppery reflection; head flat, eyes extremely prominent; antennæ reddish, darker towards apex; thorax very transverse, short, rugosely punctured; elytra fitting tightly to base of thorax, not bordered at base, with fine and distinctly punctured striæ which meet more or less in front; legs variable, rufous, pitchy or pitchy ferruginous. L. 3–$4\frac{1}{2}$ mm.

Male with the anal segment furnished with two very fine parallel longitudinal carinæ.

On *Erica*; also on *Ulex nanus*; according to Mr. Champion on young oaks, &c., in woods; local, but very widely distributed from the New Forest to the Moray district of Scotland; it is, however, rather rare in the midlands; Ireland, Waterford (Power).

S. faber, Herbst. (*pilosellus*, Gyll., *chætophorus*, Steph., *septentrionis*, Steph.). The largest of our species; black, clothed with ashy or ashy-brown scales and thick erect greyish hairs; head depressed, with

the forehead channelled; antennæ fuscous, reddish at base; thorax rather short, feebly bisinuate at base, coarsely punctured; elytra obovate, with rather deeply and coarsely punctured striæ, raised at base, long in proportion as compared with all the preceding species; legs robust, black or ferruginous. L. 6–6½ mm.

Male with the posterior femora strongly excised before apex, and the fifth ventral segment of the abdomen slightly impressed and glabrous at apex; in the female the posterior tibiæ are slightly sinuate before apex.

At roots of grass and low plants, in moss, &c.; the larva has been found in turning over sods; occurs in dry sandy and chalky places and in marshes; local; London district, Kent and Surrey, generally distributed and common (Champion); Rudham, Norfolk; Deal; Dover; Hastings; Southampton; Dorsetshire; Falmouth; Whitsand Bay, Plymouth; Bath; Bristol; Malvern Hills; Findern near Repton; Dunham Park, Manchester; Northumberland and Durham district; Scotland, doubtful; Murray records it as "not uncommon," but Dr. Sharp has never taken it in Scotland, nor is he aware of any recorded locality.

S. lateralis, Payk (*limbatus,* F.). A very distinct species; shining black, upper surface almost glabrous; head coarsely punctured, antennæ pitchy; thorax short, coarsely punctured, with a distinct central furrow, with more or less evident scanty silvery scales at sides, base quite truncate; elytra obovate, raised at base, with coarsely and deeply punctured striæ, and more or less scanty fine erect setæ, and with a broad margin of silvery scales at sides, which are also present at the base of the suture; legs pitchy. L. 4½–6 mm.

On *Erica* and *Calluna* (heath and ling); very common and generally distributed in all heathy districts from the New Forest to the north of Scotland and probably in Ireland.

EXOMIAS, Bedel.

The insects contained in this genus were formerly comprised under *Barypeithes* Duval, but as Bedel has placed Duval's type, *B. sulcifrons*, under the Phyllobiina, a new name becomes necessary; they are small black, brownish or reddish yellow insects, in outline somewhat resembling *Otiorrhynchus ovatus*, but very much smaller and more elongate; the antennæ are long and slender, the punctuation coarse, and the femora more or less clavate. All the known species are found in Europe and occur in moss and at the roots of low plants; two inhabit Britain.

I. Elytra almost glabrous; thorax more diffusely punctured	E. ARANEIFORMIS, *Schrank.* (*brunnipes,* Ol.).
II. Elytra thickly set with long outstanding greyish hairs; thorax more thickly punctured	E. PELLUCIDUS, *Boh.*

E. araneiformis, Schrank. (*brunnipes,* Ol.). Oblong-ovate, elongate, black, pitchy or pitchy brown, shining, almost glabrous, with very short and scanty greyish pubescence; rostrum broad, rugose, with a central furrow; antennæ long and slender, red; thorax at least as long as

broad, with the sides moderately rounded and dilated, diffusely and coarsely punctured; elytra elongate ovate with very coarsely punctured striæ; legs rather long, red, femora ferruginous. In the male the anterior tibiæ are somewhat curved at apex. L. 3–3½ mm.

In moss, in woods; occasionally it does damage by burrowing into strawberries; locally abundant; London district, Kent and Surrey, common everywhere; it appears to be more or less general as far north as the Lancaster district and Cheshire, but it ceases entirely in the north and is not recorded from the Northumberland and Durham district, nor has Dr. Sharp ever come across a Scotch example, although it must be admitted that Murray records it as "occasional" in Scotland. Ireland, Malahide, near Dublin (Power), Armagh, &c.

E. pellucidus, Boh. Very like the preceding in general shape and appearance, but easily distinguished by having the upper surface thickly set with long outstanding greyish hairs; the general colour is, on the average, more pitchy; the thorax is more dilated at the sides and more thickly punctured, the punctures being evidently less coarse, and the elytra have the striæ deeper and the punctures set much more closely together; antennæ and legs red. L. 3–3½ mm.

Sandy places; in moss, &c.; very local, and, as a rule, rare, but occasionally in profusion; Hackney; Eastry, Kent in profusion, (Gorham); Kingsgate (600 specimens on the shore in 1886, T. Wood); Sandwich; Knowle, near Birmingham (Blatch).

OMIAS, Schönherr.

This genus contains about twenty species which are found in Europe, the Canaries, Cyprus, the Caucasus district and Central Asia; they very strongly resemble *Brachysomus,* from which they differ in the finer outstanding hairs and the rather more prominent eyes, and in having the first joint of the funiculus shorter than second, whereas in *Brachysomus* it is longer; the more transverse thorax and the fact that the scrobes are not deflexed will separate it from *Exomias;* Thomson (Skand. Col. vii. 14?, 143) includes *Brachysomus hirsutulus* and *Omias Bohemani* under one genus.

O. mollinus, Boh. (*Bohemani,* Zett.).* Pitchy-black or pitchy-brown, shining, sparingly clothed with fine outstanding greyish pubescence; antennæ and legs red; head indistinctly punctured, vertex almost smooth, rostrum broad; thorax a little broader than long, with the sides rounded, rather closely punctured; elytra ovate, convex with the shoulders rounded, and with deep, coarsely punctured, striæ, interstices convex; legs moderately long, femora simple, tarsi short. L. 3–3½ mm.

By sweeping low plants; local and, as a rule, not common; Southend (Gorham); Portsmouth district (Moncreaff); Bewdley (Blatch); Repton, Burton-on-Trent (where I have taken it in numbers by sweeping near an osier-bed); Heysham, near Lancaster; Northumberland and Durham district, "near Swalwell," J. Hardy; Scotland, rare, Tweed and Tay districts.

* M. Bedel writes to me as follows regarding this species, of which I sent him a specimen: "*L'Omias mollinus* que je connaissais pas appartient bien au groupe des Brachyderini."

BRACHYSOMUS, Steph. (*Platytarsus*, Schönherr, *pars*).

About a dozen species are contained in this genus which chiefly inhabit Europe; one or two occur also in Algeria; they are small, subglobose, insects, with stout outstanding scale-like setæ, the thorax transverse, the scrobes not deflexed, and the third joint of the funiculus of the antennæ short; they are found in moss, and at roots of low plants; one of our British species is not uncommon, but the other is very rare.

I. Eyes flat, contiguous to margin of thorax (*Brachysomus*, Steph.); second joint of funiculus of antennæ considerably shorter than first; form broader and more convex . . . . . B. ECHINATUS, *Bonsd.* (*hirsutulus*, F.)

II. Eyes convex, distant from the margin of thorax (*Platytarsus*, Schön.); second joint of funiculus of antennæ not much shorter than first; form narrower and less convex . . . . . B. HIRTUS, *Boh.* (*setulosus*, Boh.)

B. echinatus, Bonsd. (*hirsutulus*, F.). Fuscous-black or brown, with the antennæ and legs red, scantily clothed with ashy scales; head flat, rostrum without central channel; thorax strongly transverse, covered with erect scale-like setæ, scarcely rounded at sides, not channelled, punctured; elytra subglobose, with ashy scales on the interstices, and erect coarse scale-like setæ throughout; underside clothed with ashy scales; legs moderately stout, tarsi short. L. 2–2¾ mm.

By beating and sweeping herbage, in early summer; also under dead leaves in winter; locally common; London district, common, Shirley, Mickleham, Caterham, Darenth Wood, Chatham, Birch Wood, West Wickham, Reigate; Bottisham, Cambridge; Norfolk; Swansea; Hereford; Llangollen; Llandudno; Knowle; Bewdley; Repton; Liverpool; Northumberland and Durham district; Scotland, rare, Tweed and Forth districts (Sharp); Balmuto, Fifeshire (Power).

B. hirtus, Boh. (*setulosus*, Boh.). Allied to the preceding but distinguished by having the eyes convex and distant from the anterior margin of the thorax, and the second joint of the funiculus of the antennæ not much shorter than first; the form is narrower and less convex, and the thorax is longer and more rounded at the sides; the margins of the thorax are furnished with a row of round whitish scales, and the elytra are scantily clothed with narrow scales, and numerous raised scale-like setæ, which are not at all claviform; the general colour is darker. L. 2½–3 mm.

Chalky hill sides, in moss, &c., in early spring; very rare; Caterham, one example in moss in April (Champion); Chatham (Walker); Tunbridge (Wollaston); Arundel, in moss, February, 1842 (S. Stevens); Southampton (Walton); Henley-on-Thames (Power); Mr. Douglas has found it in a primrose root from the London district which he bought in one of the London markets.

EUSOMUS, Germar.

This genus contains about twenty species from Europe, Northern

Africa, and Northern and Central Asia; one only occurs in Britain and it requires further confirmation before it can be regarded as really indigenous; the members of the genus have somewhat the facies of *Polydrusus*, from which they may be known by the very convex ovate elytra, short scrobes and emarginate rostrum.

E. ovulum, Ill. About the size of *Polydrusus sericeus*, slender, black, clothed with yellowish-green, slightly metallic, round scales, which are sometimes more yellow on the alternate interstices of the elytra; antennæ with the scape and base of the first joint of the funiculus ferruginous; rostrum narrower than the head; eyes convex; scutellum wanting; elytra oval with close-lying pubescence; anal segment of abdomen pubescent; femora with a spiniform tooth, that on the posterior pair being very feeble, tarsi with the first joint elongate. L. 6–7½ mm.

On *Achillea millefolium*, among grass, &c.; extremely rare; "Taken by Mr. Edleston, at Grange" (Ent. Monthly Mag. viii. 83). The species has been recorded from Guestling, near Hastings, but Mr. Bennett, who recorded it, tells me that his specimen was wrongly named, and must be referred to another species; *E. ovulum*, therefore, appears to require further confirmation as British.

SCIAPHILUS, Steph.

In this genus the head is narrower than the thorax, the eyes scarcely prominent, the antennæ long and slender, and the scrobes strongly deflexed; the thorax is transverse and the elytra are oval; the whole upper surface is thickly covered with grey scales and strong outstanding scale-like setæ, which are more evident on the elytra; the limits of the genus are not as yet properly defined; about thirty species are enumerated in the Munich catalogue and about twenty in the European catalogue of Heyden, Reitter and Weise, but some of these most probably will have to be placed near *Polydrusus*; only one species occurs in Britain.

S. muricatus, F. (*asperatus*, Bonsd.). Black or fuscous-black, thickly covered with scales, which vary in colour from a dirty grey to yellowish-grey and sometimes show a slight metallic reflection; antennæ red with the first and second joints of funiculus elongate; rostrum glabrous at apex, with a V-shaped impression; scutellum very small, but distinct; thorax short, subcylindrical; elytra oval, with the alternate interstices slightly raised and a row of setæ on each interstice, and with rather fine but distinct punctured striæ, apex deflexed and acuminate; all the femora with a small sharp tooth. L. 4–6 mm.

Male with the tibiæ armed with a rather distinct hook.

In woods and hedges; by beating and sweeping; often in moss; somewhat local, but more or less common and generally distributed from the Midland districts southwards; rarer further north; Manchester district, general but rare; Liverpool; Northumberland and Durham district; Scotland, occasional in moss and herbage, Solway, Tweed and Forth districts; Ireland, Dublin, Waterford, Galway, Armagh, and probably general.

TROPIPHORINA (Synirmina).

This tribe contains one European genus *Tropiphorus* Schön. (*Synirmus* Bedel), which is allied to the Phyllobiina and Cneorrhinina, but differs in having the prosternum slightly emarginate at apex and furnished with short hairs at the sides of the emargination, and also in the fact that the thorax is finely, but very distinctly, keeled on its central line, and that the eyes are flat and almond-shaped. Thomson includes the tribe under the Otiorrhynchina.

TROPIPHORUS Schönherr (*Synirmus* Bedel, *Tropidophorus*, Gemm.).

About a dozen species are comprised in this genus which appear to be all found in Europe; two have generally been regarded as British, but a third has lately been added by Dr. Sharp; they are rather large, ovate, insects, with the rostrum broad but rather long, the scrobes short and not deflexed, and the scape of the antennæ not passing the eyes, which are depressed; the elytra are convex, especially behind, and very strongly deflexed and acuminate at apex.

I. Elytra with the third, fifth and seventh interstices costate, the raised lines on the last two meeting at apex — T. CARINATUS, *Müll.*

II. Elytra with the interstices not costate.

i. Elytra at sides of base plainly projecting beyond the base of thorax, with the external basal angle projecting in front, regularly and feebly widened from this angle to the middle . . . . . — T. TOMENTOSUS, *Marsh.* (*mercurialis*, Brit. Cat.)

ii. Elytra with the basal external angle obtuse and truncate, coinciding with the posterior angle of the thorax, rather abruptly enlarged from that angle for one-fifth of their length and then forming a slight angled curve . . . . . — T. OBTUSUS, *Bonsd.*

T. carinatus, Müll. Oblong-ovate, black, thickly clothed with dark brown coppery scales; antennæ ferruginous, club darker; rostrum stout and moderately long, head with a longitudinal fovea between eyes which are flat, very closely sculptured; thorax slightly transverse, with sides subparallel, rounded and narrowed in front, very closely sculptured, with a distinct central raised line; elytra convex, with their basal external angles reaching beyond the basal angles of thorax, with the third, fifth, seventh and also the eighth, ninth and tenth interstices raised and costate, and the striæ fine, regularly and not closely punctured; suture much raised behind; legs pitchy. L. $6\frac{1}{2}$–7 mm.

In moss, under stones, &c.; rarely by sweeping herbage; very local and not common; Shirley, Highgate in some numbers (Power), Faversham, Chatham, Bishops Wood, Hythe; Folkestone; Hastings district; Winchester; Glanvilles Wootton; Henley-on-Thames; Manchester district, general in moss.

T. tomentosus, Marsh (*mercurialis*, Brit. Cat.). Black, clothed

with greyish-coppery or dull golden scales; very like the preceding in general appearance, but easily distinguished by not having the interstices costate, as well as by its lighter colour; the elytra at the sides of base plainly project beyond the basal angles of the thorax, and their basal external angles are prominent in front; from these angles to the middle the elytra are gradually and feebly widened; the striæ are somewhat coarsely punctured, but are much hidden by the scales in fresh specimens; suture somewhat elevated behind; femora black with metallic hairs; tibiæ and tarsi ferruginous or pitchy. L. $6\frac{1}{2}$ mm.

On *Mercurialis perennis*, especially in chalky districts; local, but not uncommon where it occurs; Mickleham; Hastings; Devon; Swansea; Herefordshire; Knowle; Bewdley; Repton and neighbourhood; Manchester district, general but not common; Liverpool district; York; Scarborough; Teesdale; Northumberland and Durham district; Scotland, common in flood refuse, Solway, Forth, Tay, Dee, Moray and probably other districts; Ireland, near Dublin, frequent, near Belfast, &c.

T. obtusus, Bonsd. Very like the preceding: in fact Thomson (Skandinaviens Coleoptera vii. p. 145) has described it as the female of that species; it may, however, be known by having the basal external angle of the elytra truncate and obtuse, and coinciding with the external angle of the thorax, rather abruptly enlarged from that angle to the first fifth of their length and thence very slightly deflexed; the suture of the elytra is less raised at apex and the central carina of the thorax is not so strongly marked, and the interstices, moreover, of the elytra are flatter. L. $6\frac{1}{2}$ mm.

Very rare; taken by Dr. Sharp on the banks of the water of Cairn between Irongray and Dunscore, Dumfriesshire. I have a specimen among some duplicates given me by Dr. Sharp which must, I think, be referred to this species; the central line of the thorax, however, is strongly marked.

PHYLLOBIINA.

This tribe, as here constituted, contains the following British genera, *Phyllobius*, *Polydrusus*, *Liophlœus* and *Barypeithes* (the latter genus only containing *B. sulcifrons*), and also *Scythropus*, Schön., *Ptochus* Schön. and *Argoptochus* Weise; its members are distinguished by having the tarsal claws connate, and also by the more or less elongated elytra, of which the shoulders (except in *Barypeithes*) are well marked and prominent, and the long or comparatively long metasternum; many of the species are covered with exceedingly brilliant golden green scales and are very beautiful and conspicuous insects; the introduction of the genus *Barypeithes* by Bedel causes a certain amount of confusion, and it is probable that it may have to be differently located; the arrangement here adopted is of great advantage as bringing *Phyllobius* and *Polydrusus* into close connection; these two genera are extremely closely allied both in general appearance and habit, but have usually been placed in different tribes.

I. Scrobes curved, deflexed and more or less prolonged towards under surface.
  i. Upper surface, without scales; size small . . . . BARYPEITHES, *Duv.*
  ii. Upper surface with a more or less thick covering of scales; size moderate.
    1. Apex of the tibiæ with the outer margin not reflexed at the insertion of the tarsi.
      A. Scrobes meeting beneath rostrum; antennæ with joints 3–7 of the funiculus globose and subtransverse . . . . . METALLITES, *Germ.*
      B. Scrobes not meeting beneath rostrum; antennæ with joints 3–7 of the funiculus not globose . . POLYDRUSUS, *Germ.*
    2. Apex of the tibiæ with the outer margin reflexed forming a cavity for the insertion of the tarsi; size large . . . . . LIOPHLŒUS, *Germ.*
II. Scrobes not curved or deflexed; upper surface usually thickly covered with scales but occasionally simply pubescent . . . . . PHYLLOBIUS, *Germ.*

BARYPEITHES, Duval.

This genus as here constituted contains the single species *B. sulcifrons*, the two other British species usually included under it (*B. araneiformis* and *B. pellucidus*) being now referred to a new genus, *Exomias*, which is placed under the *Brachyderina* through the formation of the side pieces of the metasternum; it is a small black shining insect with a very short rostrum.

B. sulcifrons, Boh. Oblong, glabrous, black or pitchy black, shining; head broad, closely and distinctly, but comparatively finely punctured, rostrum very short and broad, with a strong central furrow; antennæ long, red, with club darker; thorax often reddish, with the sides dilated, coarsely and not very closely punctured; elytra elongate oval, with the shoulders rounded, and with regular rows of rather strong punctures, interstices finely punctured; legs moderately long and stout, red, femora simple. L. 3 mm.

In moss, &c.; very local; Mount Edgecumbe; Devonshire, Killerton (Rev. H. S. Gorham); Douglas, Isle of Man; Scarborough; taken in the north of Northumberland by Mr. J. Hardy; Scotland, very local, Tweed and Forth districts.

LIOPHLŒUS, Germar.

In the Munich catalogue published in 1871, seventeen species are enumerated as belonging to this genus, but in the European catalogue of Heyden, Reitter and Weise no less than twenty-eight species are mentioned from Europe alone, fourteen new ones having been described by M. Tournier; according to Bedel the species belonging to the genus vary extremely and several forms have been divided off as separate which have no real appreciable characters; they inhabit Europe and the Caucasus and one or two have been described from Persia; our single

species is a large insect, with the scrobes curved and deflexed and the apex of the tibiæ with the outer margin reflexed and forming a cavity for the insertion of the tarsi.

L. nubilus, F. (*tessellatus*, Bonsd.). Black, dull, densely clothed with ashy-brown scales, which occasionally, in freshly emerged specimens, are coppery; these scales are thicker at the sides of the thorax, and the elytra have the alternate interstices tessellated with small fuscous spots; head with a longitudinal impression between eyes; thorax with the sides slightly rounded, very closely sculptured, with a more or less obsolete raised central line; elytra large and ample, much broader than thorax, with punctured striæ and broad flat interstices; legs black, pubescent; the colour of the scales is variable; in the male, which is smaller, they are lighter and the dark tessellated patches are more evident. L. 8–11 mm.

On hedges, young trees, nettles, &c., also by beating ivy, which seems to be the especial food plant of the insect; generally distributed and common throughout the greater part of England and Wales; not so common further north; Northumberland and Durham district, local; a large number of specimens were taken at Benton feeding on the ivy; Scotland, scarce, Solway, Dee and probably other districts; Ireland, Belfast, Galway, Waterford, Dublin, and most likely general. According to Bedel the females have a transverse yellowish, almost membranous band, at the posterior margin of the second, third, and fourth segments of the abdomen; this band, in the males, is rudimentary or absent.

METALLITES, Germar.

This genus, which contains about twenty species, mostly occurring in Europe, is united by M. Bedel with *Polydrusus;* it differs, however, in having the third to the seventh joints of the funiculus of the antennæ globose and subtransverse; the antennæ themselves are shorter and stouter and the scutellum is strongly transverse and quadrangular; the scrobes meet below rostrum; the legs are rather stout and the elytra somewhat acuminate; one species only occurs in Britain.

M. marginatus, Steph. Oblong-ovate, dark, slightly rufous, clothed with hair-like cinereous scales, which are sometimes slightly coppery, and are thicker at suture and sides of elytra, and also on the forehead and at sides of thorax; antennæ ferruginous, comparatively short and stout, with the last joints of the funiculus very short; thorax rather longer than broad, with the sides rounded, very closely sculptured; elytra with rather deep punctured striæ, and with lighter and darker scales arranged in more or less distinct lines, the suture and sides being lighter than disc, although sometimes obscurely so; legs reddish testaceous, femora clavate and all plainly, as a rule, though not strongly, dentate. L. 3-4½ mm.

On broom and juniper; very local, but not uncommon where it occurs; Birch Wood, St. Mary Cray, Chatham, Bearsted, Black Park; Henley; New Forest; Glanvilles Wootton (common); the species has recently been found in France on the birch.

POLYDRUSUS, Germar.

The members of this genus may be known by having the scrobes deep and well marked in front and angularly deflexed behind; the rostrum is short and emarginate at apex; the vertex of the head is large and the eyes are round and usually prominent; as a rule the femora are without teeth, but this is not always the case; the species, in many cases, resemble very closely certain of the *Phyllobii*, from which the formation of the scrobes will at once separate them; the last ventral segment is rather short and variously modified in the males; in the females it is usually triangular and simple; the genus comprises upwards of a hundred species which are mostly found in the Palearctic region and also in North America; one or two species appear to have been described from South America (Columbia and Brazil); about sixty species are found in Europe, of which only nine occur in Britain; in both the genera *Polydrusus* and *Phyllobius* many of the species are covered with very brilliant golden green scales and their elytra form most beautiful objects for the microscope.

I. External margin of all the tibiæ flattened, and furnished with two raised keels enclosing a channel between them; scales long and narrow. Length 6½–8½ mm. (*Eudipnus*, Thoms.) . . . . . P. MICANS, *F.*

II. External margin of tibiæ without double raised keel.

i. Scape of antennæ shorter, not reaching beyond the posterior margin of the eyes; upper surface thickly clothed with round green scales; mentum concealing the maxillæ (*Chrysoyphis*, De G.); length 5–6½ mm. . . . . P. SERICEUS, *Schall.*

ii. Scape of antennæ longer, evidently reaching beyond the posterior margin of eyes; length 4–6 mm.

1. Femora simple.

A. Last two or three joints of funiculus of antennæ nearly as broad as long; scrobes more prolonged behind; colour greyish-brown, unicolorous or with grey fasciæ . P. TERETICOLLIS, *De G.* (*undatus*, F.)

B. Last joints of funiculus of antennæ oblong, obconical; scrobes less prolonged behind; colour brighter or duller golden green.

a. Temples raised into a prominence behind each eye; abdomen chiefly pilose; scrobes reaching anterior margin of eyes; scales shining . . . . . P. PTERYGOMALIS, *Boh.*

b. Temples without prominences behind eyes; abdomen squamose; scrobes not reaching anterior margin of eyes; scales dull . . P. FLAVIPES, *De G.*

2. Femora with a larger or smaller tooth on their inferior margin.

A. Thorax and elytra of a uniform colour, closely covered with small round bright green scales; legs dark with green scales P. PLANIFRONS, *Gyll.*

B. Thorax not closely covered with scales, and also furnished with very short hairs; colour very variable.
a. Elytra oval with the humeral prominences scarcely marked; legs red; (species maritime) . . . . . P. CHRYSOMELA, *Ol.*
b. Elytra with the humeral prominences well marked.
a* Elytra scarcely broader at shoulders than thorax; femora dark, tibiæ red P. CONFLUENS, *Steph.*
b* Elytra much broader at shoulders than thorax; femora and tibiæ, unicolorous, dark . . . . . P. CERVINUS, *L.*

P. micans, F. (*mollis*, Ström., *sec* Bedel). A rather large and conspicuous species, black, clothed with narrow, hair-like, brilliant coppery golden scales, antennæ and legs red, club of the former somewhat darker; head and thorax coarsely punctured, the latter rather small, with the sides very slightly rounded; elytra large and ample, somewhat gibbose behind, with comparatively strong, although very narrow, punctured striæ, colour of scales usually fiery-copper, but sometimes greenish; legs moderately long. L. $6\frac{1}{2}$–$8\frac{1}{2}$ mm.

Woods and hedges; on young birches, oaks, hazels, sallows, &c; very local, but not uncommon where it occurs; Mickleham, Darenth, Shooters Hill, Westerham, Bearsted, Chatham, Swanscombe Wood, near Gravesend; Burnham Beeches; Glanvilles Wootton; Swansea; Bewdley; Bretby Wood, Repton; Carlisle; Northumberland and Durham district; Scotland, Tweed, Clyde and Forth districts (Murray's Cat.); Dr. Sharp, however, says that the species is unknown to him as Scottish, and that he is inclined to suspect an error in the determination (Scottish Nat., July, 1879).

P. sericeus, Schall. Oblong, subcylindrical, black, clothed throughout very thickly with rather dull round green scales, antennæ pale testaceous, club usually dusky; head with an impression between eyes, thorax subtransverse, very slightly narrowed at apex, with an obsolete central dorsal furrow; elytra large, with finely punctured striæ; legs pale testaceous, with the femora somewhat thickened, usually rather dusky, and more or less clothed with green scales, armed beneath with an obsolete tooth. L. 5–$6\frac{1}{2}$ mm.

Male narrower, with the posterior tibiæ furnished with long pubescence within towards apex, and the anterior armed with a small hook; fifth ventral segment slightly impressed transversely before the apical margin which is rounded.

Female with the anterior tibiæ nearly simple and the posterior tibiæ sparingly pilose, fifth ventral segment conical triangular.

On shrubs and trees (oak, hazel, willow, &c.); very rare; Kimpton, Hants (Rev. G. T. Rudd); Kimpton, received from Mr. Reeks, taken June, 1875 (S. Stevens); Thruxton (Reeks), also from Saunders (Champion); Stephens records that he has found it near London, but that most of his specimens were received from the vicinity of Bristol; in woods near Swansea (Dillwyn).

P. tereticollis, De G. (*undatus*, F.). Elongate, black, rather densely clothed with ashy scales, which are somewhat silvery at the sides and apex of elytra, which have the surface furnished with three waved fasciæ, which are sometimes deep brown, sometimes lighter, and sometimes obsolete or absent, so that the whole upper surface appears unicolorous; rostrum about as long as head; thorax narrow, subcylindrical, with the sides scarcely rounded; elytra much broader than thorax, convex behind, with fine, but distinct punctured striæ; antennæ and legs red. L. 4–5 mm.

Male with the anterior tibiæ strongly curved internally and the fifth ventral segment slightly impressed before posterior margin.

On young oaks and other trees and bushes; generally distributed and, as a rule, common throughout England and Scotland; I know of no record from Ireland, but it probably occurs.

P. pterygomalis, Boh. (*pterygomaticus*, Boh. *sec* Bedel; *flavipes*, Marsh *nec* De G.). Oblong, subcylindrical, black, thickly covered with very bright more or less shining golden green scales, and shining pale raised hairs, antennæ and legs yellow or yellowish red; head rather large, scarcely narrower than thorax, with eyes prominent, and with the temples plainly raised just behind eyes into a prominence; thorax transverse, with the sides rounded, slightly constricted at base and apex; elytra with fine punctured striæ; femora without teeth; in the male the scales are more shining than in the female. L. 4–5 mm.

On young oak, hazel, beech, &c., in woods; generally distributed and not uncommon throughout England and the greater part of Scotland; Ireland, Dublin, Waterford, Belfast, and probably common.

P. flavipes, De G. (*nec* Marsh). Extremely like the preceding species, but easily distinguished by the absence of prominences behind eyes, the duller scales of the upper surface, and the fact that the raised hairs intermixed with the scales are fuscous and not pale; the abdomen is much more thickly squamose; the thorax is, moreover, less rounded at the sides, and less distinctly transverse; the scrobes do not attain the anterior margin of the eyes, whereas in *P. pterygomalis* they just reach beyond it, although not so prolonged as in *P. tereticollis;* this at least is my experience, although it must be allowed that Bedel states that in both *P. flavipes* and *P. pterygomalis* the scrobes are obliterated at the apex of the eyes. L. 4–5 mm.

On young trees in woods, &c.; also by sweeping; rare; Hammersmith (formerly), Lee, Loughton, Bearsted, near Maidstone, Windsor Forest; Hainault Forest; Hythe; Holm Bush, Brighton; New Forest; Buddon Wood, Leicestershire; Langworth Wood, Lincoln (where I have found it sparingly and might probably have taken a number of specimens, but I passed it over as the preceding species); it has been recorded by Mc Nab from Glasnevin Gardens, Dublin.

P. planifrons, Gyll. (*argentatus*, Ol.). Oblong, black, densely clothed throughout (except the tarsi and antennæ), with rich green

scales, the upper surface without hairs ; head rather large, subquadrate, closely punctured, forehead with a fovea in middle ; rostrum a little shorter and narrower than the head, the apex triangularly emarginate ; antennæ slender, the joints rufous or testaceous, with their apices pitchy and the club fuscous ; thorax short, transverse, a little narrowed and slightly constricted anteriorly, with the sides moderately rounded and dilated ; elytra subconvex, with the shoulders marked, and with punctured striæ, interstices broad and flat ; legs rather stout, femora and tibiæ black, the former toothed, tarsi rufous. L. 5–6 mm.

On young oaks ; very rare ; Llandudno, May, 1865 (Sidebotham) ; Silverdale, May, 1866 (Power) ; Lydiate, near Liverpool, August, 1887 (Ellis) ; a specimen in Dr. Power's collection standing under this name proved to be *Phyllobius maculicornis* : Walton records one specimen as in the British Museum, but without locality.

P. cervinus, L. Black, clothed throughout with golden or silvery green, sometimes ashy scales, the colour being very variable ; elytra nearly unicolorous or with more or less distinct denuded spots ; head with a small fovea, antennæ long and slender, red, fuscous towards apex ; thorax nearly as long as broad, with the sides very slightly rounded ; elytra with the shoulders prominent and square, with comparatively deep punctured striæ ; legs black, with ashy pubescence, tarsi fuscous, all the femora with a small acute tooth ; the species is often very much abraded ; the specimens with green scales are sometimes confused with allied insects ; the shape of the scrobes will separate it from any of the Phyllobii, and the toothed femora and dark legs from *P. pterygomalis* and *P. flavipes* ; size very variable. L. $4\frac{1}{2}$–$6\frac{1}{2}$ mm.

On young trees, in woods, hedges, &c. (especially on oak, birch and fir) ; generally distributed and more or less common throughout England and Scotland, and probably Ireland. Dr. Sharp records it as common in Scotland on Scotch fir.

P. chrysomela, Ol. (*sericeus*, Steph. *nec* Schall. ; *pulchellus*, Steph.). A beautiful and conspicuous species, which is, however, very often more or less abraded, black, with shining green, golden-yellow, coppery red or silvery grey scales, which are scanty on the head and thorax, and on the elytra are arranged very thickly at the sides and on two lines on the elytra, which in consequence present a longitudinally banded appearance ; rostrum short, head broad ; thorax with the sides strongly rounded and dilated, with short hairs mixed with the scales ; elytra oval with the humeral prominences slightly marked, only a little broader at base than thorax ; antennæ and legs reddish testaceous, club of former often dusky, femora sometimes pitchy in old abraded specimens, anterior pair evidently dentate. L. 5-$5\frac{1}{2}$ mm.

On *Artemisia maritima* ; according to Bedel on maritime *Chenopodiaceæ* ; apparently a littoral or submaritime insect ; Walton records having taken it "on grassy banks just above high-water mark on the shores of the Thames, below Gravesend, and at Burnham, on the coast of the Bristol Channel at the beginning of June" ; Strood ; Pegwell Bay ; Portsmouth ; Bournemouth ; Lymington ; Weymouth ; Glanvilles Wootton ; Swansea ; Preston ; Scotland, very rare, Solway district ; with

respect to its capture near Portsmouth, Mr. Moncreaff writes, "abundant on wormwood at the north-western side of our island in May."

P. confluens, Steph. Black, more or less sparingly clothed with ashy-silvery scales which are arranged in denser lines on centre and sides of thorax, and on sides and at each side of suture of elytra, and are often more or less abraded; rostrum short; antennæ slender, red, fuscous towards apex; thorax with the sides rounded and somewhat dilated, contracted in front, closely sculptured; elytra oval, widened behind, scarcely narrower at base than elytra, with the humeral prominences not strongly marked, and with moderate punctured striæ; femora dark, tibiæ red or reddish, anterior femora plainly dentate. L. 5–5½ mm.

On the broom (*Sarothamnus scoparius*) and the furze (*Ulex Europæus*); very local, but not uncommon where it occurs; Plumstead, Charlton, Gravesend, Weybridge, Bearsted, Coombe Wood; Brandon, Suffolk; Hastings; Brighton; Shirley Warren, Southampton; New Forest, Lyndhurst, &c.; Bournemouth; Glanvilles Wootton; South Wales; Scarborough; Liverpool district. The species has very much the general appearance of *Sitones regensteinensis*.

PHYLLOBIUS, Schönherr.

This genus contains more than a hundred species, of which more than half occur in Europe, and the remainder are chiefly found in Northern Asia; a few also have been described from India, Ceylon, Abyssinia, Chili, &c., but they form an exceedingly small proportion; *P. calcaratus* has occurred in Canada; they are very closely allied to *Polydrusus* in general appearance and habits, but may be distinguished by not having the scrobes curved and deflexed, very short and nariform; the antennæ are long or rather long, with the last joints of the funiculus usually round; the thorax is transverse, or about as long as broad; the femora are usually, but not always, strongly toothed, and the tarsi have the first joint for the most part elongate; in the males of many species, according to M. Bedel, the second ventral segment of the abdomen is raised in a transverse fold, which is contiguous to the posterior margin, and the female has sometimes a fovea on the last segment.

The British species may be distinguished as follows:—

1. Femora strongly toothed.
   i. Elytra without scales, but with distinct long pubescence; colour of body black with brown elytra (*Nemoicus*, Steph.). . . . . P. OBLONGUS, *L.*
   ii. Elytra with scales.
      1. Elytra with narrow scales and no apparent additional raised pubescence.
         A. Posterior tibiæ not compressed and carinate on their external border; eyes moderately prominent.
            a. Legs reddish or reddish-testaceous; scales of elytra yellowish green, longer and thinner; last joints of funiculus of antennæ considerably longer than broad . . P. CALCARATUS, *F.*
            b. Legs dark, more or less clothed with greenish scales; scales of elytra bright green

or golden green, shorter and thicker; last joints of funiculus of antennæ only slightly longer than broad . . . . . P. URTICÆ, *De G.* (*alneti*, F.)

B. All the tibiæ compressed and carinate on their outer edge; scales of elytra coppery . . P. PYRI, *L.*

2. Elytra with round scales and distinct additional raised pubescence.

A. Elytra with long erect hairs; antennæ entirely yellowish-red . . . . . P. ARGENTATUS, *L.*

B. Elytra with very short erect hairs; antennæ with apex of scape and at least base of club dark . . . . . P. MACULICORNIS, *Germ.*

II. Femora not or very indistinctly toothed.

i. Upper surface thickly covered with scales.

1. Abdomen thickly covered with scales; average size larger . . . . . P. POMONÆ, *Ol.*

2. Abdomen with fine pubescence but without, or almost without, scales, shining black; average size smaller . . . . . P. VIRIDIÆRIS, *Laich.* (*uniformis*, Marsh.)

ii. Elytra without scales, shining black; thorax with the sides clothed with green scales . . . . . P. VIRIDICOLLIS, *F.*

P. oblongus, L. Oblong, black, with the elytra castaneous brown, clothed with long greyish pubescence; antennæ and legs red, club of the former darker; head distinctly punctured, rostrum with the apex rufous; thorax with the sides slightly rounded, coarsely punctured, with an obsolete smooth raised line in middle; elytra with strong and regular punctured striæ, lighter or darker castaneous brown, sometimes with the lateral margin black or dusky, legs rather long. L. $4\frac{1}{2}$–5 mm.

Male with the anterior tibiæ armed with rather a strong hook, and the first and second ventral segments of the abdomen slightly impressed.

On elms and apple trees, &c.; also on low shrubs, in hedges, &c.; generally distributed and common throughout the greater part of England and Wales; Scotland, local, on bushes, Solway, Moray and probably other districts; Ireland, Dublin, Belfast, Armagh and probably common.

P. calcaratus, F. (*glaucus*, Scop.; *cæsius*, Steph.; *pyri*, Steph. *nec* L.). A large and conspicuous species, oblong, elongate, subparallel, black, clothed with long and narrow, filiform, yellowish-green or golden scales; head rather long, with an obsolete impression between the antennæ; antennæ red, fuscous towards apex; thorax about as long as broad with the sides rounded and widened in middle; elytra long, much broader at base than thorax, with fine punctured striæ, interstices broad, apex with short outstanding hairs; legs red, with the tarsi, and sometimes femora, pitchy; apical external angle of posterior tibiæ cut off obliquely; abdomen with long thin pubescence. L. 7–10 mm.

Male with the apex of the anal segment of the abdomen subtruncate.

On alders; also on various bushes, in hedges, &c.; locally common; it appears to be generally distributed throughout England; Scotland, common, Solway, Tay, Dee, and probably other districts; Ireland, near Dublin, and most likely widely distributed.

P. urticæ, De G. (*alneti,* F.). Oblong with the elytra on an average broader, more convex, and less parallel than in the preceding species, thickly clothed with silky golden green or bright green scales which are denser on the elytra; eyes prominent; thorax with sides rounded; elytra with faint punctured striæ; antennæ dark, ferruginous at base; legs entirely black, with greenish scales; apical external margin of posterior tibiæ curved; abdomen with short close pubescence. L. $7\frac{1}{2}$–9 mm.

Male with the fifth ventral segment of the abdomen broadly and very slightly impressed in middle, with the posterior margin very slightly emarginate.

On nettles; common and generally distributed throughout the kingdom.

P. pyri, L. (*vespertinus,* F., *mutus,* Gyll.). Oblong, black, clothed with scattered narrow golden coppery, coppery, or greenish coppery scales; head thickly and rugosely punctured, antennæ red, with the club usually darker; thorax with the sides strongly rounded, depressed in front and behind; scutellum with white scales; elytra much broader than thorax, subparallel, acuminate at apex, with delicate punctured striæ; legs red, tarsi more or less pitchy, femora clavate, sometimes pitchy at apex; the colour of the upper surface is very variable, and, except in quite fresh specimens, has a very abraded appearance. L. 5–7 mm.

Male with the first ventral segment of abdomen impressed, and the second with a transverse fold behind.

On whitethorn, young trees in woods, nettles, &c.; generally distributed and common throughout the greater part of England and Scotland, and probably Ireland.

P. argentatus, L. Oblong, subparallel, very thickly clothed with shining golden green round scales, intermingled with erect pale hairs; scrobes converging behind on rostrum; head oblong; antennæ slender, with the second joint of the funiculus longer than the first, and the club elongate, entirely reddish testaceous; eyes large, moderately prominent; thorax with the sides rounded, impressed in front and behind; elytra with fine punctured striæ, interstices broad and flat; femora clavate, dark, with green scales, tibiæ and tarsi reddish testaceous. L. 4–$5\frac{1}{2}$ mm.

Male with the thorax more dilated at sides, and the anterior tibiæ armed with a rather strong hook.

Female with the thorax scarcely dilated at sides, and the rostrum channelled before antennæ.

On young birches, oaks, &c., in woods, also in whitethorn hedges; common and generally distributed throughout the kingdom.

P. maculicornis, Germ. Very like the preceding, but easily distinguished by having the scales smaller and duller, and the antennæ with the apex of scape and at least the base of the club dark; the eyes are a little more prominent, the antennæ shorter, and the scrobes are less

convergent on the rostrum ; the elytra have the erect hairs very short, and the legs are black with greenish scales. L. 4–5½ mm.

Male with the fifth ventral segment of the abdomen subtruncate at apex; anterior tibiæ furnished with a rather large hook.

On young oak, hazel, &c., in hedges ; by sweeping herbage on the borders of woods, &c. ; not uncommon and generally distributed throughout England and Scotland, and probably Ireland ; it is, however, far less common than the preceding species, and is rather local.

A variety occurs in which the scales are entirely of a deep grey colour, so that the insect appears to be of a drab colour with no admixture of green whatever ; I have met with it in Bretby Wood, near Repton ; it appears to answer to the *var. cinereipennis* of the following species, and may be called *var. cinereus.*

P. pomonæ, Ol. Black, with both the upper and under surface thickly clothed with green or yellowish-green scales ; head oblong, antennæ rather long, red ; thorax with the sides very slightly rounded ; elytra with the apex acuminate, with fine punctured striæ ; legs red or ferruginous, sometimes with the femora darker. L. 3–4½ mm.

Male with the anterior tibiæ armed with a small hook.

Female with the fifth ventral segment rather deeply and broadly impressed.

On young trees, in woods and hedges ; often by sweeping herbage ; somewhat local, but common where it occurs, and widely distributed throughout England and Scotland, and probably Ireland.

V. cinereipennis, Gyll. In this variety the scales are dull grey ; it is rather rare, but Dr. Sharp has taken it commonly at Aberlady.

P. viridiæris, Laich. (*uniformis,* Marsh). Allied to the preceding, but on an average smaller and easily distinguished by having the abdomen shining black, pubescent, but without, or almost without scales ; the thorax has the sides more strongly rounded, and the elytra are less acuminate at apex ; the female has no fovea on the anal segment of the abdomen ; legs moderate ; femora pitchy black, with green scales, tibiæ and tarsi testaceous. L. 2½–3½ mm.

Male with the second ventral segment furnished with a transverse raised fold behind ; in the preceding species it is simple.

On nettles ; in woods, hedges, &c. (on hawthorns, sloe bushes, &c.) ; common and generally distributed throughout the country.

A variety occurs with the scales greyish ; it has been taken in Scotland ; it may be called *v. griseus ;* varieties also rarely occur with the scales blue-green.

P. viridicollis, F. Black, shining ; head rather large, thickly and rugosely punctured, sparingly clothed with greenish hair-like scales ; antennæ rather short and stout, ferruginous; thorax with the sides rounded, strongly and rugosely punctured, sides rather thickly clothed

with greenish hair-like scales with which also the under side and femora are covered; elytra smooth and shining with coarsely and deeply punctured striæ, acuminate at apex; abdomen with the scales more sparing than on breast; femora black, tibiæ and tarsi ferruginous. L. 3–4½ mm.

Male with the anterior tibiæ armed with a distinct hook.

On flowers of *Hieracium*, *Alchemilla*, *Artemisia maritima*, and by general sweeping; local; not recorded from the London district; Yarmbuth; Devil's Ditch, Cambridgeshire; Matlock; Dove Dale; Cleethorpes; York; Clitheroe; Hartlepool; Northumberland and Durham district; Scotland, local, on *Alchemilla*, Solway, Forth, Tay and Dee districts. With regard to the genus the Rev. W. C. Hey writes to me as follows: "My father and I took the whole genus (nine species) one spring in the field below our house at Clifton, York; Crotch named them; he was with us at the time."

TANYMECINA.

This tribe is represented in Europe by five or six genera and about eighty species; only one genus, however, comprising one species, is found in Britain; the tribe may be known by the free tarsal claws taken in conjunction with the fact that the thorax is furnished with long hairs at the sides behind the eyes.

TANYMECUS, Schönherr.

A rather large number of species are comprised in this genus, which is widely distributed over the greater part of the world; twenty-one species occur in Europe, of which one only is widely distributed; it is the sole representative found in Norway and Sweden, France and Britain; it is a rather large, elongate, somewhat depressed, insect, with the rostrum short and broad, the antennæ long, and the eyes depressed; the scrobes are obsolete behind; the thorax is longer than broad, subcylindrical; the elytra are somewhat acuminate at apex, and the tibiæ are setulose at apex; it is found on various members of the thistle tribe.

T. palliatus, F. Elongate, not very convex, black, clothed with fuscous pilose hairs and scales, and with light greyish-white scales on rostrum, at sides of thorax and elytra and on the under side; rostrum flat and broad; thorax oblong, closely sculptured; elytra at base much broader than thorax, with the shoulders strongly marked, and with fine, but rather deep and plainly punctured, striæ; legs moderate, black, with grey pubescence, fringe at apical external angle of intermediate and posterior tibiæ rather long and divided. L. 8–11 mm.

Male with the middle of the abdomen very slightly impressed, the anterior tibiæ sinuate on their inner side at apex and armed with a small hook.

Female with the abdomen convex and even, and the anterior tibiæ scarcely sinuate.

On burdocks, thistles, nettles, &c.; local; London district, rather common; Darenth Wood, Forest Hill, Chatham, Sheerness, Birch Wood, Epping, Walthamstow, Claygate, Horsell, Bushey, Tottenham, Reigate, &c.; Bottisham, Cambridge; Cromer; Pegwell Bay (common but extremely local, under stones on the shore); Hastings; Shipley; Winchester; Portsmouth district; Hayling; Isle of Wight; New Forest; Glanvilles Wootton; Bristol; Swansea; Banks of Wye; I know of no record from the Midland counties, but it probably occurs; York; Scarborough; Lancaster; Northumberland and Durham district; Scotland, rare, Solway district only.

PHILOPEDINA (*Cneorrhinina*, pars.).

This tribe contains six European genera, the nomenclature of which is somewhat confused, as the majority of the species have been referred to the genus *Cneorrhinus*; this latter genus, however, contains only two species, *C. barcelonicus* and *C. Heydeni*, and the two British species must be referred respectively to *Philopedon* and *Atactogenus*; the tribe has by some authors been included under the Otiorrhynchina, from which it differs by the formation of the side pieces of the mesosternum; from the Phyllobiina it may be known by the short oval convex elytra, which are almost subglobose, and the short metasternum.

I. Apical external angle of anterior tibiæ strongly produced . . . . . PHILOPEDON, *Steph.*
II. Apical external angle of anterior tibiæ not produced . ATACTOGENUS, *Tourn.*

PHILOPEDON, Stephens (*Dactylorrhinus*, Tournier; *Cneorrhinus*, pars. auct.).

The genus *Cneorrhinus*, to which the species contained under this and the preceding tribe have been referred by many authors, contains about thirty species which are widely distributed, representatives occurring in Europe, South Africa, Northern China, Japan, &c.; these have, however, been divided into several fresh genera, and in the last European catalogue *Cneorrhinus* contains only the two species, *C. barcelonicus* and *C. Heydeni*, whereas our common species, *C. geminatus*, F., is referred to the *Dactylorrhinus* of Tournier. Bedel, however, rightly revives the name *Philopedon* of Stephens; the genus is characterized, as Stephens says (Ill. iv. 124), by the remarkable rotundity of its elytra, as compared with its short transverse thorax; the rostrum is broad, short, channelled, and divided from the head, as it were, by a transverse suture; the eyes are very prominent, and the posterior pairs of tibiæ have a distinct tuft at their heel; the antennæ are rather short and the scrobes angularly deflexed; in *Philopedon* proper the external angle of the anterior tibiæ is strongly produced.

P. geminatus, F. Black, thickly clothed with fuscous-grey scales, which are lighter on head, at base and sides of thorax and on alternate lines on the elytra; upper surface with short erect ashy hairs; head broad, eyes prominent, forehead somewhat depressed; antennæ ferru-

ginous or pitchy red; thorax transverse, short, finely and rugosely punctate, with the sides moderately rounded; elytra subglobose, with fine punctured striæ, interstices very closely sculptured; legs pitchy, clothed with grey scales; size and arrangement of the lighter scales very variable. L. 4–7½ mm.

Sandy places on the coast; very common near the sea, but, as a rule, not an inland species; generally distributed throughout the kingdom and, as a rule, common; Dr. Sharp records it as common in Scotland as far north as the Shetland Islands; it is not altogether confined to the sea-coast, as Mr. Blatch has taken it at Kidderminster and Bewdley, but it appears to be very rare at any distance from the maritime counties.

ATACTOGENUS, Tournier.

This genus comprises eighteen European species; the single British representative is very like *Philopedon geminatus*, from which it may be known by not having the apical external angle of the anterior tibiæ produced; it is also somewhat more elongate, with the sculpture of the thorax and the striæ of the elytra evidently stronger.

A. exaratus, Marsh (*plumbeus*, Marsh). Oblong, pitch-brown or fuscous-black, clothed with round scales which vary very much in colour from greyish to brownish, and are sometimes uniform and sometimes furnished with lighter bands; head broad, eyes very prominent, antennæ pitchy, with the second joint of the funiculus as long as the third and fourth united; thorax short, narrowed in front, closely sculptured; elytra oval, with distinct punctured striæ; legs fuscous; size very variable; in the female the elytra are more ample and the anal segment of the abdomen is subtriangular. L. 5–9 mm.

On young trees in woods, hedges, &c.; occasionally by sweeping herbage; local; Darenth Wood, Chislehurst, Woking, Shirley, Claygate, Caterham, Coombe Wood, Birch Wood, Barnes, Hampstead, Horsell, Esher, Lee, Weybridge, Westerham, West Wickham; Bottisham, Cambridge; Hythe; Hastings; Devon; Swansea; Bewdley; Bridgnorth; Burton-on-Trent; Sherwood Forest; Lancaster; Cumberland; Northumberland and Durham district; not recorded from Scotland; Ireland, Armagh (Johnson).

BARYNOTINA.

This tribe, containing the genus *Barynotus*, has been included by different authors with the Otiorrhynchina and the Philopedina, from the former of which it differs by the formation of the side pieces of the mesosternum, while from the latter it may be known by the free tarsal claws and general shape; it appears to be most closely related to the Alophina, but differs in the formation of the apex of the hind tibiæ, and the longer scape of the antennæ; the cicatrix, moreover, at the apex of the rostrum is large and very distinct.

BARYNOTUS, Germar (*Merionus*, Stephens).

This genus contains only about a dozen species, which, with one or two exceptions, are all found in Europe; *B. Schönherri* has been taken in Newfoundland, and Say has described another North American species, *B. granulatus;* the latter, however, is not noticed by Leconte and Horn in their classification, and *B. Schönherri* may have been an importation, so that Bedel is most likely right in regarding the genus as confined to Europe; the species are attached chiefly to cold and mountainous districts; they are rather large insects, with the upper surface more or less thickly clothed with scales, which are usually grey or brownish, but sometimes more or less metallic; the rostrum is broad, dilated at apex, with a strong central furrow and well-marked very obtusely deflexed scrobes; eyes depressed; thorax about as long as broad, with a more or less distinct central furrow; elytra variable, with punctured striæ, strongly deflexed and more or less acuminate at apex; femora not toothed.

The three British species may be distinguished as follows:—

I. Rostrum with one furrow; head and thorax more shining and much less thickly squamose than the elytra, which are subparallel.	
i. Scales of elytra denser, not or scarcely metallic, grey and brown, obscurely variegated	B. OBSCURUS, *F.*
ii. Scales of elytra less dense, distinctly metallic, scarcely variegated	B. SCHÖNHERRI, *Zett.*
II. Rostrum with five furrows; head, thorax and elytra uniformly and thickly covered with dull grey scales, the latter dilated behind	B. ELEVATUS, *Marsh.* (*mærens*, auct. *nec* F.)

B. obscurus, F. (*murinus*, Müll.). Pitchy black, clothed with obscurely variegated scales, which are comparatively scanty on the head and thorax, and very scanty on the rostrum; rostrum with a strong longitudinal groove and oblong rugose punctures; thorax punctured anteriorly, with the sides and hinder portion obsoletely granulated, nearly as long as broad, with the sides rounded, broadest a little before middle; elytra with fine punctured striæ, interstices thickly and finely coriaceous, the alternate ones and the suture behind slightly elevated, with erect cinereous setæ, which are conspicuous towards apex; legs black, with the tibiæ and tarsi sometimes ferruginous. L. $8\frac{1}{2}$–10 mm.

The female appears to be broader than the male, with the sides of the elytra more rounded

Under stones, at roots of grass, in moss, flood refuse, &c.; rather common and generally distributed throughout England and Wales; Scotland, not very common, Solway, Dee and Moray, and probably all the southern districts; Ireland, Newcastle, Waterford, Armagh, and most likely general.

B. Schönherri, Zett. Very like the preceding, but, on an average, a little smaller, with the scales less variegated and plainly metallic,

almost, if not quite, wanting on rostrum, very scanty on thorax; thorax more evidently punctured, with the sides straighter and less rounded; elytra with the shoulders more pronounced. L. 8–9 mm.

Found under the same circumstances as the preceding; local, but common in many northern localities; Manchester district, general (Chappell); Heysham, near Lancaster (Reston); Northumberland and Durham district, of occasional occurrence in meadows, &c. (Bold); Scotland, rather common in flood refuse, Solway, Forth, Tay, Dee and Shetland districts, and probably general; Ireland, Newcastle (Champion) and Armagh (Johnson).

B. elevatus, Marsh (*mœrens*, auct. *nec* F.). Fuscous-pitchy, thickly clothed with dull unicolorous grey scales; rostrum squamose, with a deep central furrow and two oblique shorter ones on each side; thorax slightly transverse, with the sides moderately rounded; elytra dilated behind, with rather strongly punctured striæ, alternate interstices and apex of suture elevated, fifth and sixth striæ united near shoulders, raised setæ rather fine; legs black, tibiæ and tarsi pitchy; the antennæ are, as a rule, pitchy, but are sometimes ferruginous and the legs rufo-piceous. L. $7\frac{1}{2}$–9 mm.

Under stones, in moss, flood refuse, &c.; also by sweeping among bracken; local, and as a rule not common; London district, not common, St. Mary Cray, Chislehurst; Aylsham, Norfolk; Suffolk; Littlington, Cambridge; Folkestone; Devon; Bath; Bristol; Gloucester; Knowle, near Birmingham; Swansea; Llandudno; Amlwch, Anglesea; Bretby Wood, Repton (common by sweeping among bracken in early summer); Leyburn, Yorks; Manchester district, general; Heysham; Northumberland and Durham district; Scotland, rather common in flood refuse, Solway, Tweed and Forth districts; Ireland, near Dublin, frequent, Armagh, &c.

ALOPHINA.

The two genera included by Bedel under this tribe, *Alophus* and *Rhytidoderes*, are placed by Heyden Reitter and Weise under the section Rhynchænitæ in the Hyperina and Cleonina respectively; their position therefore appears to be somewhat in dispute; they are, however, closely allied to the *Barynotina*, from which they differ in the characters before referred to; one genus only, represented by one species, occurs in Britain.

ALOPHUS, Schönherr.

This genus contains about twenty species, of which the greater number are found in Northern Asia; five occur in Europe, and one or two have been found in North America and Egypt; our single species, in general appearance, much resembles a large *Hypera*: the rostrum is rather long, with the scrobes much deflexed and almost meeting below; the antennæ are somewhat slender, with the first two joints of the funiculus nearly equal; the thorax is subquadrate or slightly transverse, and the second abdominal segment is at least as long as the next two

together; it may at once be distinguished by the large common V-shaped patch at the apex of the elytra.

A. triguttatus, F. Oblong-ovate, somewhat variable in form, upper surface covered with grey, yellowish-brown or brown scales (which in fresh specimens are often more or less metallic, especially on head and thorax), mixed with fine hairs, usually more or less variegated with small dark patches on the elytra, which are furnished with a lighter spot on each before middle and a broad V-shaped common patch before apex; rostrum with a central furrow; thorax rather longer than broad, with the sides subparallel, in fresh specimens with bands of lighter scales at sides; elytra broadly emarginate at base, with very fine, more or less obsolete, striæ; legs pitchy, tarsi and tibiæ ferruginous, anterior femora not toothed. L. 7–8 mm.

Male with the body behind thorax oblong and the base of the abdomen with a broad impression; female with the body behind thorax subcordiform and the base of abdomen without impression.

Sandy and chalky places; under stones, and in moss, flood refuse, &c.; not uncommon, and generally distributed throughout England; Scotland, on herbage, often abundant in flood refuse, Solway, Moray, and probably many other districts; it is most likely widely distributed in Ireland; in my experience it is never abundant but occurs singly in various localities, under stones, on pavements, &c.

Sub-Fam. **Curculioninæ.**

This sub-family contains by far the great majority of the Rhynchophora and is made up of very divergent and heterogeneous forms, many of which exhibit relationships to other families; they are, however, all connected by the fact that the mandibles have no scar or cicatrix at the anterior external angle of the rostrum, a point which will separate them from all the Brachyrrhininæ; from the Apioninæ, which are by many authors included in the sub-family, they may (with the exception of *Nanophyes*) be distinguished by the formation of the trochanters, and from the Attelabinæ by the geniculated antennæ,* rounded intermediate coxæ, and the fact that the projection of the first ventral segment is, except in *Lixus*, obtuse or truncate, whereas in the last mentioned subfamily it is always acuminate.

The following characters may be noticed besides those just mentioned; mentum varying in size, maxillæ exposed, palpi short, four-jointed, rigid and conical; rostrum variable, but usually long and more or less slender, sometimes of varying length in the sexes, in which case it is longest in the female, scrobes entirely or almost entirely lateral with the apical portion occasionally visible from above (*Hylobius*); eyes variable, as a rule depressed, sometimes very convex (*Anthonomina*), round or almond-shaped; antennæ with the club annulated or articulated; prosternum longer or shorter before anterior coxæ, which are either con-

* In *Cleonus*, *Rhamphus* and *Magdalis* the antennæ are only feebly geniculate, but in the other genera this character is strongly marked.

tiguous or separate and in the latter case often have the interval between them channelled for the reception of the rostrum ; mesosternum variable in width with the epimera and episterna differently divided, but not attaining the coxæ, epimera in some tribes extended into the angle between thorax and elytra and with their extremity visible from above ; anterior coxæ rounded, sometimes contiguous, sometimes distant ; middle coxæ rounded, more or less separated ; posterior coxæ oval, more or less distant, sometimes placed very far apart (*Gronops*), occasionally, but not often, attaining the elytral margin ; legs variable, ambulatorial in most species, sometimes natatorial (*Litodactylus* and *Eubrychius*), sometimes saltatorial (*Orchestes* and certain species of *Rhinonchus*) ; tarsi usually dilated, with the third joint usually dilated and bilobed and spongy beneath, rarely narrow ; claws either connate or free, simple dentate or appendiculate, very rarely single (*Mononychus*).

The larvæ of the Curculioninæ are white or yellowish-white grubs with the head usually darker ; they attack various parts of plants or trees and undergo their transformations underground, or in galls formed on their food plants ; some form simple cocoons on the plants, while a few, e.g. *Hylobius*, bore galleries in rotten wood and in these change to the perfect insect.

The tribe as here constituted corresponds to the *Curculionides phanérognathes* of Lacordaire with the addition of the genus *Sitones*, except that *Alophus* (and *Rhytidoderes* in the continental fauna) is transferred to the Brachyrrhininæ, and that *Apion* is separated and formed into a distinct sub-family. As M. Bedel observes (l.c. p. 64) the large number of insects that are comprised in the sub-family and the difficulties that they present compel the adoption, in the present state of our knowledge, of an exceptional number of tribes, which must be regarded as merely provisional ; M. Bedel has contributed in very great measure to our knowledge of the group, but much yet remains to be accomplished, and the classification will, in the future, be very greatly modified ; in the present work M. Bedel's tribes are adopted with the addition of the *Smicronychina*, which form a transition from the *Lixina* to the *Erirrhinina*.

I. Mandibles inserted side by side on the apex of the rostrum and moving vertically . . . . . BALANININA.

II. Mandibles inserted at each side of the rostrum and moving horizontally.

i. Anterior tibiæ without a regular ridge on the central line of their posterior margin.

1. Tibiæ without a curved hook at their apical external angle ; but either with or without such a hook towards their apical internal margin.

A. Funiculus of antennæ composed of six or seven joints.

a. Posterior coxæ reaching to the base of the second ventral segment and dividing the first, which is very short, into three equal parts ; body globose ; intermediate and posterior coxæ very widely separated . . . . . OROBITINA.

b. Posterior coxæ not reaching apex of first ventral segment, which is not divided into separate parts.

a*. Mandibles thickly punctured and pubescent on their surface, sharp and without a tooth on their internal edge, and curved into a sharp hook at apex . . . . . SITONINA.

b*. Mandibles glabrous, or rarely furnished with a few patches of rough hairs, on their upper surface, bilobed at apex or dentate on their inner side before apex.

a†. Posterior margin of the second segment of the abdomen produced at each side and extending over the third segment to the base of the fourth . . . . . TYCHIINA.

b†. Posterior margin of the second segment of the abdomen distinct in all its extent from the base of the fourth.

a‡. Epimera of mesosternum not extending between the thorax and elytra and with its extremity invisible from above; anterior coxæ usually contiguous.

*. Tarsi without onychium, and terminating at the third joint, which is strongly dilated . . . . . ANOPLINA.

**. Tarsi normal, furnished with onychium.

†. Posterior femora strongly thickened and adapted for leaping; eyes almost meeting on upper surface of head . . . . . ORCHESTINA.

††. Posterior femora not adapted for leaping; eyes widely separated on upper surface of head.

‡. Tarsal claws connate.

aa*. Eyes widely separated beneath by the rostrum which is stout and, as a rule, nearly as wide as head; tibiæ armed with a large hook or tooth at apex; size large . . . . . LIXINA.

bb*. Eyes almost meeting beneath rostrum, which is slender, or comparatively slender, and much narrower than head; tibiæ armed with a small tooth; size small or very small . . . . . SMICRONYCHINA.

‡‡. Tarsal claws free.

aa*. Eyes extremely prominent; tarsal claws almost always appendiculate . . . . . ANTHONOMINA.

bb*. Eyes not or scarcely prominent; tarsal claws not appendiculate.

aa†. Surface of thorax uneven and in places excavate; eyes vertical; upper surface scaly . . GRONOPINA.

bb†. Surface of thorax smooth or slightly uneven in front, but not excavate.

aa‡. Tarsal claws strongly toothed at base on their under side . . . . . ELLESCHINA.

bb‡. Tarsal claws simple.

aaa*. Elytra broadly and separately rounded at apex; anterior coxæ narrowly separate. ACALYPTINA.

bbb*. Elytra jointly rounded or separately acuminate at apex; anterior coxæ contiguous.

aaa†. Third joint of tarsi very short behind base of onychium, strongly bilobed.

aaa‡. Posterior tibiæ without or with a very obsolete hook at apex; rostrum not carinate; trochanters without a long projecting seta . HYPERINA.

bbb‡. Posterior tibiæ with a more or less strong hook or spur at apex;

rostrum usually carinate; trochanters nearly always furnished with a long projecting seta.
aaaa*. Onychium not extending beyond the lobes of the third tarsal joint; species very small, sub-aquatic . . . . . TANYSPHYRINA.
bbbb*. Onychium extending considerably beyond the lobes of the third tarsal joint; insects of moderate or large size.
aaaa†. Opening of scrobes visible in front if viewed from above; rostrum stout . . . . . CURCULIONINA.
bbbb†. Opening of scrobes not visible from above; rostrum long and slender . . . . . ERIRRHININA.
bbb†. Third joint of tarsi long behind base of onychium truncate or emarginate at apex, rarely slightly bilobed; * insects aquatic or sub-aquatic, usually furnished with a hydrofuge tegument . . . . . BAGOINA.
b‡. Epimera of mesosternum extending between thorax and elytra, and with its extremity visible from above; anterior coxæ usually separated (p. 214, line 12).
*. Tibiæ without a curved hook at their apical internal angle; tarsal claws often appendiculate; body behind thorax usually short and broad and often subglobose; upper surface, as a rule, strongly squamose . . . . . CEUTHORRHYNCHINA.
**. Tibiæ with a strong curved hook at their apical internal angle; tarsal claws simple; body oblong, and as a rule glabrous . . . . . BARINA.
B. Funiculus of antennæ composed of five joints.
a. Abdomen with segments 2–4 produced into a point on each side at apex . . . . . CIONINA.
b. Abdomen with segments 2–4 straight or regularly curved at apex . . . . . GYMNETRINA.
2. Tibiæ with a curved hook at their apical external angle; abdomen with segments 2–4 straight on their apical margin.
A. Antennæ abruptly geniculate; anterior coxæ more or less separated.
a. Prosternum deeply channelled between the anterior coxæ for the reception of the rostrum . . . . . CRYPTORRHYNCHINA.
b. Prosternum not channelled.
a*. Femora strongly toothed; upper surface furnished with broad raised claviform scale-like hairs . . . TRACHODINA.
b*. Femora not toothed.
a†. Under surface of body uniformly clothed with scales; third tarsal joint very strongly bilobed; pygidium of male divided . . . . . PISSODINA.
b†. Under surface of body glabrous or almost glabrous; third joint of tarsi smaller and less strongly bilobed; pygidium of both sexes undivided . . . . . COSSONINA.
B. Antennæ feebly geniculate; anterior coxæ contiguous . . . . . MAGDALINA.

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* The third joint of the tarsi is rather short and slightly bilobed in *Bagous lutosus*, Gyll., and *B. glabrirostris*, Herbst., which must therefore be regarded as to a certain extent exceptions.

ii. Anterior tibiæ with a regular ridge running along the entire central line of their posterior margin; club of antennæ smooth at base; thorax very long; apex of elytra with a membranous border . . . . . CALANDRINA.

SITONINA.

This tribe has usually been regarded as belonging to the Otiorrhynchinæ, and has been classed with the Brachyderina or Phyllobiina: it must, however, be regarded as belonging to the sub-family Curculioninæ, although it is in some respects transitionary; it contains only one genus, *Sitones*, which differs from all the other tribes by the structure of the mandibles, which are thickly punctured and pubescent on their surface, sharp and without a tooth on their internal edge and curved into a sharp hook at apex; the rostrum is short and broad; certain of the species are exceedingly destructive to various leguminous crops.

SITONES, Schönherr.

This genus, according to the Munich catalogue, contains about eighty species, of which the majority occur in Europe, but a considerable number are found in North Africa, Northern Asia, North America, Mexico, &c.: according to Bedel, however, several of the North American species are re-described European species, which have been perhaps imported, and he reckons the number of known species at about sixty; fifty-two species, however, are recorded as European in the catalogue of Heyden Reitter and Weise; nineteen have been regarded as British, but two of these, *S. longicollis*, Fahr., and *S. cinerascens*, Fahr., are only varieties of *S. flavescens*, Marsh, and *S. cambricus*, Steph., respectively; they are small, elongate, insects, clothed with more or less variegated grey, brown, whitish or sometimes slightly metallic scales, and in many instances so closely resemble one another that it is very hard to distinguish them by descriptions; good characters, however, are afforded by the relative prominence of the eyes, the shape of the thorax and elytra and the presence or absence of erect hairs and setæ on the elytra; the colour is sometimes constant but sometimes varies considerably in the same species; the males are usually smaller and narrower than the females and present certain differences in the apical segment of the abdomen.

The species are gregarious and many of them are exceedingly abundant in different localities; they live on various *Papilionaceæ*, and occasionally do considerable damage to clover, peas, beans, &c.; there are apparently two broods in each year, but very little is known of their true life history; the most destructive is *S. lineatus*, which may sometimes be found on peas by countless thousands; a description of its ravages is given by Curtis (Farm Insects, p. 346, Plate L.); *S. crinitus* is occasionally injurious, but is much rarer; the beetles are said by Curtis and others to feed only by day, when the sun is bright,

but the Rev. T. Wood has found them feeding by night in large numbers; the attacked crops may be known by having the leaves eaten and notched at the edge; an account of various remedies suggested will be found in Miss Ormerod's Manual of Injurious Insects, p. 133; the pea-crops suffer most in their early stages; the best method, therefore, to prevent the loss of the crop is to ensure as quick a growth as possible, and this may be done by providing "a good seed bed, friable, sufficiently moist, and rich in available plant-food, which may be obtained to a certain extent by peas following cabbage or root crops in rotation; in garden cultivation, besides the liberal supply of manure needed to run on a healthy growth, it has been found to answer well to put a little broken turf and wood ashes along the drill, sow the peas on this, and cover them with a little more of the same"; a good depth of coal ashes, placed at sowing time along the drills on a clayey loam, has been found to answer well; the attacks are worst in dry weather; it is evident, therefore, that keeping the plants damp is distasteful to the beetles and encourages healthy growth; a dressing of lime or soot given to the wet plants is an easily applied and generally effective remedy.

The British species may to a certain extent be distinguished by the following table, but a careful study of the detailed descriptions, and, if possible, a comparison of authentic types, is necessary, if they are to be determined with any accuracy.

I. Scutellum very conspicuous, with two white tufts of hair which diverge in front and cause it to appear emarginate; scrobes feebly curved; elytra long, with the alternate interstices subconvex; length 6–9 mm. . . . . S. GRISEUS, *F.*

II. Scutellum not conspicuous and not appearing emarginate in front; scrobes more strongly curved.

i. Elytra, if viewed sideways, with very distinct raised setæ.

1. Thorax very closely punctured, convex and arched, forming a distinct angle with the elytra if viewed sideways, sides strongly rounded; eyes prominent; outstanding setæ very long . S. REGENSTEINENSIS, *Herbst.*

2. Thorax not convex and arched, almost on the same level with the elytra.

A. Eyes flat; thorax with large diffuse punctures and with the sides moderately strongly rounded . . . . . S. HISPIDULUS, *F.*

B. Eyes very prominent; thorax coarsely punctured, with the sides slightly rounded.

a. Apex of scrobes plainly visible if viewed from above; punctuation of thorax coarser; scales of elytra very narrow; eyes extremely prominent. . . . . S. WATERHOUSEI, *Walt.*

b. Apex of scrobes not or scarcely visible if viewed from above; punctuation of thorax closer and a little finer; scales of elytra round; eyes very prominent, but less so than in the preceding species. . . . . S. CRINITUS, *Herbst.*

ii. Elytra, if viewed sideways, with fine raised setæ or hairs, which are more or less depressed towards apex, but are distinct from the general pubescence.

1. Sides of elytra narrowed from middle to base; prevailing colour of scales brownish . . . . S. LINEELLUS, *Gyll.*

2. Sides of elytra parallel; prevailing colour of scales grey or silver grey.

A. Thorax as long as broad; eyes more prominent . . . . . S. TIBIALIS, *Herbst.*

B. Thorax broader than long; eyes less prominent . . . . . S. BREVICOLLIS, *Schönh.*

iii. Elytra without raised setæ or hairs distinct from the general pubescence.

1. Eyes very prominent; thorax with the sides strongly rounded and dilated, and with the sculpture consisting of large coarse punctures, and very closely punctured interspaces S. CAMBRICUS, *Steph.*
♂ *V. cinerascens*, Fahr.

2. Eyes not or not strongly prominent; thorax with the sides nearly straight or at most moderately rounded.

A. Forehead deeply excavate from eye to eye.

a. Breast pubescent; side pieces of meso- and metasternum squamose; size smaller; scales somewhat coppery . . . . . S. SULCIFRONS, *Thunb.*

b. Breast and side pieces of meso- and metasternum with the same clothing; size larger; scales dull brown and greyish, with a light patch at shoulders of elytra . . . . . S. HUMERALIS, *Steph.*

B. Forehead not, or only slightly, excavated.

a. Thorax with the anterior margin distinctly raised.

a*. Thorax with the sides moderately rounded and the eyes rather prominent . . . . . S. LINEATUS, *L.*

b*. Thorax with the sides nearly straight, and the eyes flat.

a†. Upper surface with the scales more or less distinctly coppery, elytra with a light band along suture . . . . S. SUTURALIS, *Steph.*

b†. Upper surface with dull scales, elytra without light band along suture . . . . . S. ONONIDIS, *Sharp.*

b. Thorax with the anterior margin not, or scarcely, raised.

a*. Rostral furrow ceasing just before or between eyes, sometimes absent and replaced by a puncture or stria; length 6 mm. . . . . S. PUNCTICOLLIS, *Steph.*

b*. Rostral furrow continued nearly to anterior margin of thorax.

a†. Size large; length 5–5½ mm.; upper surface very thickly clothed with brownish scales, which are scarcely at all variegated . . . . S. FLAVESCENS, *Marsh.*
V. longicollis, Fahr.

b†. Size smaller; length 4–4½ mm.; upper surface comparatively scantily clothed with ashy-brown scales, which are more or less variegated . . . . S. MELILOTI, *Walt.*

S. griseus, F. (*palliatus*, Ol.). Elongate, black, clothed with fuscous or brownish scales, with three longitudinal bands of lighter scales on thorax, and a broad common lighter band running down the suture of elytra, which are more or less distinctly variegated on each side with small dark patches; the general colour varies from dark brown to silvery grey; head long, eyes somewhat prominent, antennæ pitchy with base reddish; thorax about as long as broad, with sides slightly rounded, sparingly and moderately strongly punctured; elytra long, rather strongly contracted at apex and bluntly acuminate, with strong punctured striæ, and somewhat convex interstices; underside with thick whitish scales; legs rather long, femora banded with white and fuscous scales. L. 6–9 mm.

Sandy places; at roots of *Genistæ*, grass, &c.; locally common in many districts on the coast, but less common inland, and not recorded from the Midland counties or any place far distant from the sea; it appears to be generally distributed along the coasts of England and Wales, but to become scarcer in the north; Scotland, very rare, Tay and Moray districts; Dr. Sharp remarks (Scot. Nat. 1879, p. 140), that the occurrence of this species in Scotland requires confirmation; Ireland, Baldoyle; it has occurred inland at Esher, Ripley (Surrey), Wimbledon and Maidstone.

S. cambricus, Steph. Black or brown, upper surface clothed with scanty ashy brown scales, and with very short depressed golden brown pubescence, which, on the elytra, is sometimes variegated with small patches of dark brown or black, but is often unicolorous; head rugose, eyes very prominent, antennæ pitchy, with at most the base reddish; thorax with the sides strongly rounded and dilated with large scattered punctures and the interspaces very closely sculptured; elytra with rather strong punctured striæ, interstices very finely coriaceous; underside thickly clothed with ashy scales; legs black. L. 5–6 mm.

Marshy places; at roots of grass and in moss, and occasionally by sweeping herbage; local and, as a rule, not common; Lee, Charlton, Ripley, Woking, Barnes, Shirley, Esher, Plumstead, Hampstead, Horsell, Cowley; Hertford; Hythe; Hastings; Lyme Regis; Isle of Wight; Lyndhurst; Plymouth; Exeter; South Wales; Barmouth; Knowle; Repton, Bretby Wood; Church Stretton and Bollin, near Bowdon, Cheshire; Pendleton and Bramhall, near Manchester; Yorkshire; Scotland, rare, Solway district; Mr. S. Stevens records it as rare but widely distributed.

V. cinerascens, Fahr. ♂. This variety has been by some authors regarded as a separate species; it cannot, however, be separated from the type; it is smaller, less robust, and narrower, with the punctuation of the upper surface less coarse, the head less furrowed, and the pubescence closer and longer; the rostrum is more broadly sulcate, and the scales of the underside are whiter; in the specimens I have seen the antennæ are red with the club fuscous. L. $4\frac{3}{4}$–$5\frac{1}{2}$ mm.

Taken by Dr. Power at Rathkurby, near Waterford, Ireland, and recorded by Dr. Sharp as very rare in Scotland in the Clyde district.

S. regensteinensis, Herbst. A very distinct species, which is extremely variable in size; black, variegated with coppery or greenish or greenish-grey scales, which are more thick on head and on sides and central line of thorax, and are more or less dense on elytra, on which two spaces at base opposite the two dark lines on thorax are usually more or less denuded; antennæ pitchy, with scape red; rostrum and forehead distinctly sulcate; thorax convex, about as long as broad, with sides rounded, closely and deeply punctured, anterior margin raised; elytra oval, with rather fine but distinct punctured striæ; interstices flat, with long raised setæ; legs squamose, femora dark, tibiæ and tarsi red; underside thickly squamose. L. 3–6 mm.

On broom and furze in spring and autumn; generally distributed and common throughout the kingdom.

S. Waterhousei, Walt. Black, sparingly clothed with ashy and silvery grey scales; head very broad, coarsely punctured, front with a broad fovea and a broad and deep furrow, eyes very large, semiglobose and extremely prominent; antennæ testaceous or pitchy towards apex; thorax oblong, subcylindrical, slightly dilated at the sides, flat above, very coarsely and deeply punctured, somewhat rugose, clothed at the sides and on central line more or less thickly with scales; elytra with the shoulders elevated and callose, sides straight, apex obtusely rounded, with deep punctured striæ; interstices very narrow, convex and rugulose, the second and fourth from the suture distinctly elevated, and clothed more or less with cinereous and silvery white scales, raised setæ very distinct behind; legs ferruginous or pitchy testaceous. L. $4\frac{1}{2}$–5 mm.

At the roots of *Lotus corniculatus*; very local; Claygate (Power); Fairlight, Hastings (Power); Amberley, near Arundel; Isle of Wight (Blatch); New Forest; "at one time abundant at Southsea under birds-foot trefoil; also plentiful at Gosport (Mouncreaff); Chesil Bank, common (J. J. Walker); Seaton, Devon, Jan. 3–10, 1865 (Power); Whitsand Bay, near Plymouth (J. J. Walker); Heysham and Lancaster (Reston); Ireland, near Waterford (Power); Walton records it doubtfully from Cambridge.

S. crinitus, Herbst. (*macularius*, Marsh). Brownish or reddish brown, clothed with greyish brown scales which, in fresh specimens, have a slight coppery reflection; head broad, rostrum very short, antennæ reddish with club pitchy; head and thorax deeply and distinctly and moderately closely punctured, the latter transverse, with three lighter longitudinal lines; elytra with fine punctured striæ, variegated with small black patches, and with very distinct outstanding setæ: femora dark, tibiæ and tarsi red. L. 3–4 mm.

On broom, clover, peas, &c.; also on tares; local, but generally distributed and more or less common in the London district and on the south coast; Littlington, Cambridge; Wicken Fen; Ashwicken; Llangollen; rare in the Midlands, Hopwas Wood, Tamworth (Blatch), being the only locality I know of; Yorkshire, plentiful

(Walton); not recorded from the extreme northern counties of England; Scotland, rare, Solway and Forth districts; Ireland, Baldoyle, and near Belfast.

Mr. Rye (Ent. Monthly Mag. I., p. 232), makes the following remarks regarding this species: "Somewhat resembles *S. tibialis*, but is lighter in colour, testaceous, and with longer elytra, which are distinctly clothed with slight erect hairs. The darkest specimens are ochreous grey, with four broad fuscous lines on the thorax, in a manner continued on the elytra; the two middle lines forming a broad mark near the scutellum, and then becoming narrower along the suture; these bands are slightly mottled with darker colours. The lightest examples are pale ochreous grey, exhibiting scarcely a trace of the above markings; and with the legs entirely testaceous, although the femora and apex of the tarsi are usually fuscous. Intermediate conditions are of course to be found, some of which have an isolated darker mark on the elytra. It is common on tares, especially on the south coast; and may be readily known in the sweeping net by its peculiar chalky look."

S. lineellus, Gyll. Closely allied to *S. crinitus*, but on an average smaller, with the eyes less prominent, the thorax usually more dilated in the middle, with the punctuation (though strong) finer and closer, and the elytra punctured at apex and with small and short outstanding hairs, instead of distinct setæ; the elytra are slightly contracted towards the base, thence a little broader to middle, more distinctly and strongly punctured, with the striæ more deeply impressed, the interstices being a little convex. The upper surface is brown (except the scutellum, which is white), with a white spot, more or less prolonged, at the origin of the 5th, 6th, and 7th interstices; the two or three last interstices, and the underside, are also white. L. 3–3¼ mm.

A northern species; Heysham and Lancaster (Reston); Northumberland and Durham district, rare, "sea-banks north of Whitley, and Hetton Hall, near Belford, W. B. Boyd, Esq." (Bold); Hartlepool (Blatch); Scotland, rare, Solway and Forth districts, Aberlady, &c. (Sharp and Hislop).

This species differs from *S. tibialis* in having the legs more uniformly rufous, the eyes less prominent, the antennæ with a shorter club, the elytra with less strong punctured striæ, the thorax longer, and the elytra less lineated, but more spotted; the hairs at the hinder part of the elytra are, also, somewhat longer.

S. tibialis, Herbst. This species may, as a rule, be easily known by the distinct lines of silvery grey scales which are present on both thorax and elytra, and the prominent eyes; the form is oblong and convex; head and thorax very closely and rather deeply punctured, the latter about as long as broad with the sides slightly rounded: elytra with rather fine punctured striæ; legs variable, but usually with the femora, except base, dark, and the tibiæ and tarsi red; occasionally the

legs are black; the scales are variable in colour and are sometimes greenish or slightly coppery. L. 3–4 mm.

Male with the anterior tibiæ rather strongly curved and armed with a moderately strong hook at apex; fifth segment of the abdomen subtruncate at apex.

Female with the anterior tibiæ slightly curved and armed with a small hook; fifth segment of abdomen slightly impressed before apex.

On broom, furze, clover, heath, &c.; common and generally distributed throughout the kingdom.

S. brevicollis, Schönh. Allied to the preceding, of which it has by some authors been regarded as a variety; it may, however, be distinguished by its shorter thorax and, on the average, smaller size; the rostrum is slightly narrowed at apex, with the central furrow more distinct in front; the antennæ are black, with the scape paler at base, but this does not appear to be always a reliable character; the thorax has the sides slightly rounded, as in *S. tibialis*, but is evidently shorter; the elytra are more convex on the back behind, and wider, sparingly clothed with smaller shining scales (the margins, suture, and two dorsal lines being more closely covered with paler scales), with the punctuation of the striæ more evident, and the short setæ brown (not alternately light), and more dense, especially behind. L. 3–3½ mm.

Apparently rare, but perhaps overlooked; recorded by Dr. Sharp as not uncommon in the South (see Ent. Annual, p. 81, from which the above description of the differences pointed out by Thomson is taken); Birch Wood (Rye and Power); Matlock (J. T. Harris); Scotland, local, Solway district (Sharp).

S. hispidulus, F. Black, clothed with fuscous-brown scales; head short, deeply punctured, with a distinct central channel; antennæ red with the club fuscous; eyes quite flat; thorax with the sides slightly rounded, deeply and diffusely punctured, interspaces very finely sculptured, with three lighter lines, of which the central one is often more or less obsolete; elytra with rather deep punctured striæ, with fuscous-brown scales variegated with small black patches, and stiff outstanding setæ; femora dark, tibiæ and tarsi testaceous; the elliptic form, flattened eyes, strong and remote punctuation of thorax, and short stiff grey bristles, will easily separate it from all our other species. L. 3–4 mm.

Male with the anterior tibiæ curved at apex and armed with rather a strong hook, and the fifth segment of the abdomen almost truncate at apex; in the female the same segment is rounded.

On clover; by sweeping, especially in sandy places; the larva lives at the roots of the plants; common and generally distributed throughout the greater part of the kingdom, but not so plentiful in Scotland, where it appears to be somewhat local; in some districts it is as abundant as *S. lineatus*.

S. humeralis, Steph. In size and general appearance this species somewhat resembles, at first sight, the preceding insect, but may easily

be known by the absence of erect setæ, and by the colour of the elytra, which are clothed with dark brown scales on disc, and light scales towards sides, which form a conspicuous patch at each shoulder, and cause them to appear more or less lineated towards sides, the disc being always dark; there are also three lighter lines, often more or less obsolete, on the thorax; the colour, however, is variable and the insect is sometimes greyish; the shoulders are strongly marked; the thorax is finely punctured, and the punctured striæ on the elytra are fine but distinct; legs and antennæ red or ferruginous, club of the latter and the femora more or less dusky. L. 3–4 mm.

On clover, trefoil, vetch, &c.; common in the London district and the south of England; less common further north, and rather rare, as far as my experience goes, in the Midlands, Knowle, near Birmingham, Repton, &c.; Filey, Yorkshire (common); Northumberland and Durham district, rather uncommon but widely distributed; Scotland, rare, Solway and Tweed districts; it has not apparently occurred in Ireland.

S. meliloti, Walt. Most nearly allied to the preceding species, the head, thorax, and depressed eyes being very similar, but with the front much less deeply excavated, the thorax closely and minutely punctured, the elytra elongate, with the shoulders subrectangular and rounded, and without the conspicuous light patch; the colour is black, clothed more or less thickly with cinereous and silver-grey, or coppery and fuscous scales: head narrow, closely punctured, front flat, with a deeply impressed longitudinal line; eyes depressed and comparatively small; thorax as broad as long, with the sides moderately dilated and rounded; elytra elongate, with the sides nearly straight, and with rather deep punctured striæ, maculated at shoulders and scutellum, interstices indistinctly variegated with fuscous and ashy scales; abraded specimens often occur with scanty silvery-grey scales; underside thickly scaled; legs black, with the base and apex of the femora and the tibiæ and tarsi testaceous. L. 4–4½ mm.

On the melilot trefoil (*Melilotus officinalis*); very local, but occasionally found in numbers; Chatham; Reigate; Plumstead; formerly at Hammersmith; Ryde, Isle of Wight; Yorkshire; Northumberland and Durham district, rare, South Shields and near Hartley.

S. flavescens, Marsh. Black, thickly clothed with brownish or yellowish-brown scales, which are very little variegated, the elytra at most being furnished with a few very small and obscure grey and black dots; head with a central furrow; antennæ red with the club pitchy, or with the base only red; thorax about as long as broad, very finely punctured, with the sides almost straight, and with three obscure lighter longitudinal bands; elytra with the shoulders well marked, not setose, with fine punctured striæ; tibiæ red. L. 5–5½ mm.

Male with the fifth ventral segment of abdomen subtruncate at apex.

By sweeping clover, &c.; not so abundant as some of the other species, but common and generally distributed throughout the kingdom.

V. longicollis, Fahr. Very closely allied to the type, from which it may be known by its average smaller size, more deeply furrowed head, somewhat more prominent eyes, more elongate and distinctly punctured thorax, unspotted head and thorax and more strongly punctate-striate elytra; it can hardly be regarded as a separate species, as the differences are entirely comparative and not very marked. L. $4\frac{1}{2}$–5 mm.

Mr. Walton (Ann. and Mag. Nat. Hist. 1844, p. 69), says that *S. flavescens* unquestionably approaches extremely close to *S. puncticollis*, and that he had formerly a doubt as to their distinctness; the differences are somewhat hard to express in words, but no person could confuse the species, if he saw fresh specimens side by side; *S. flavescens* is a smaller insect and of a different form, with the head narrower, and the elytra shorter and less regularly rounded at the extremity, being more contracted in their lower third; the long frontal furrow reaching almost to the anterior margin of thorax will also serve to distinguish it; according to Walton one of the distinctive characters, as compared with *S. puncticollis*, is that in fresh specimens the alternate interstices are more or less distinctly variegated, but, as far as my experience goes, it is the latter in which the variegation is much more evident; in this respect, however, the individuals of many species vary *inter se* to an indefinite extent.

S. puncticollis, Steph. Larger and more robust than the preceding species, with the head broader and the forehead sometimes with an impressed puncture, sometimes with a central furrow, which, however, never extends beyond eyes; vertex convex usually with two pale spots; thorax about as long as broad, with the sides very slightly rounded, very closely punctured, with three light lines; elytra with the shoulders well marked, more or less obscurely lineated, with interrupted fuscous or black streaks on disc of each; legs comparatively long and robust, dark, tibiæ and tarsi more or less ferruginous; the general colour is fuscous-brown, but is somewhat variable, as is usually the case in the genus. L. 6 mm.

On clover, trefoil, vetch, &c.; common and generally distributed throughout England and Wales in the counties bordering on or not far from the sea, but, as far as my experience goes, it is not common in the Midlands; Scotland, common, Solway, Forth and probably other districts; Ireland, near Waterford, Armagh, &c.; Bedel mentions it as inhabiting all the basin of the Seine and all Europe, so that it can by no means be considered in any sense a maritime insect.

S. suturalis, Steph. Black, not very thickly covered (except in quite freshly emerged specimens) with greyish scales, which are more or less metallic, and are often coppery red or more or less distinctly metallic green; the thorax has three longitudinal lighter bands of scales; and the elytra also is banded, the line running down suture being especially

conspicuous; eyes flat; rostrum with a plain central furrow; thorax about as long as broad, very closely punctured, with the sides almost straight and the anterior margin raised; elytra with fine, but distinct, punctured striæ, gradually narrowed for posterior third; antennæ and legs red, club of the former, and the femora pitchy or black. L. 4–4¼ mm.

By sweeping vetches and other plants; occasionally in moss in winter; not uncommon and generally distributed in the London and southern districts; common in the Midlands and as far north as Yorkshire; less common further north; Scotland, not common, Solway, Tweed and Forth districts; it is probably widely distributed in Ireland.

As Mr. Rye observes (Ent. Monthly Mag. I. p. 230), the smaller size, more depressed eyes, and longitudinal bands of colour, distinguish this species from *S. flavescens*, with which it agrees in many points of structure. Its depressed eyes, metallic hue, and shorter, more robust, and less parallel elytra separate it from *S. lineatus;* and the very prominent eyes of *S. tibialis* at once distinguish the latter insect, which resembles in markings the greenish-grey specimens of *S. suturalis: S. suturalis*, when quite fresh, is sometimes a very brilliant insect, of a coppery red colour, and is the prettiest of all our species, but it is very easily abraded and not often seen in its best condition.

S. ononidis, Sharp (*guttulatus*, Chevr.). Closely allied to the preceding species, but differing in being rather larger, less cylindrical, not so convex, and clothed with scarcely metallic scales; its eyes, moreover, are a little less prominent, not so circular in outline, but more elliptical; the elytra are not so strongly punctate-striate and the interstices are quite flat, instead of being slightly convex; underside clothed with greyish scales. L. 4–4½ mm.

On *Ononis spinosa;* very local; first recorded by Dr. Power from Herne Bay in September, 1865, and subsequently by Dr. Power and Mr Champion; Whitstable (Champion); St. Lawrence, Isle of Wight (one specimen taken by myself in the early spring of 1882); Heysham and Lancashire (Reston); Dr. Power had apparently taken the species at Herne Bay in 1854, and it was most probably mixed with his *suturalis*.

S. lineatus, L. Black, upperside clothed with fuscous scales, which are lighter on three lines on thorax, and on the elytra are more or less lineated, but the latter are very variable, and sometimes quite unicolorous; head with a central furrow, eyes moderately prominent, antennæ rather long and slender, red or ferruginous; thorax transverse, with the sides moderately but evidently rounded, anterior margin somewhat raised, finely and very closely, but rather distinctly punctured; elytra long and parallel, with rather fine, but distinct, punctured striæ; legs moderately long, femora dark, tibiæ and tarsi red or ferruginous; underside thickly clothed with ashy or greyish scales. L. 4–5 mm.

Male with the anterior tibiæ curved, and armed with a small hook,

and with the fifth ventral segment of the abdomen roundly truncate at apex: in the female the same segment is quite rounded.

On various *Papilionaceæ*, clover, vetches, peas, &c.; only too common and generally distributed throughout the kingdom; it is hard to find a place, as Mr. Rye observes, where this pest does not occur from earliest spring down to the foggiest and dampest autumn evenings: the colour varies somewhat, being ordinarily brown, but sometimes ochreous or even greenish grey: the shape of the thorax, however, long parallel elytra, and slender antennæ will serve to distinguish it.

S. sulcifrons, Thunb. (*subaurata*, Steph., *pleuriticus*, Steph., *chloropus*, Marsh). One of the smallest, if not the smallest of our species; black; clothed with sparing metallic scales, which are always more or less abraded, and as in *S. suturalis* are more or less reddish-coppery or greenish; head with a broad excavation from eye to eye, eyes somewhat prominent, often yellowish, antennæ ferruginous; thorax as long as, or longer than, broad, with the sides slightly rounded, very closely but distinctly and moderately strongly, although shallowly, punctured; elytra short, with distinct punctured striæ, which are obsolete at apex; femora dark, tibiæ and tarsi red; breast pubescent with the side pieces of meso- and metasternum plainly clothed with whitish or greyish scales; occasionally the legs are entirely ferruginous; the species, perhaps, most closely resembles *S. suturalis*, but the small size, frontal excavation, more prominent eyes, and scantier scales will serve to separate it. L. $2\frac{1}{2}$–3 mm.

By sweeping clover, lucerne, vetch, &c.; especially in damp places; not so abundant as some species, but generally distributed throughout the kingdom, and, as a rule, common; it is often plentiful on the south coast, and Dr. Sharp records it as common in Scotland.

Thomson (Skand. Col. vii. 96) says that the female has the forehead level between the eyes, but in this he seems to have made some mistake.

GRONOPINA.

This tribe is represented in Europe by the genera *Gronops* and *Rhytidorrhinus;* these are usually placed under the Byrsopina, which latter tribe, as remarked by Bedel (l.c. p. 74) is very distinct from the fact of having the intermediate coxæ contiguous; its members, moreover, are confined to Southern Africa; one species, only, belonging to the genus *Gronops* is found in Britain; Thomson includes it under the Bagoina, to which it is in some points related.

GRONOPS, Schönherr.

This genus contains only about a dozen species which are, however, very widely distributed from Siberia to the Cape of Good Hope; the single British species is a small dull rugose insect, which is found at the

roots of plants in sandy places and is extremely like the ground on which it is found, so that it may often be passed over.

G. lunatus, L. Oblong, clothed with broad scales, part of which are light and part dark, the former forming on the elytra two common crescent-shaped bands with their convex centres opposed to one another; the colour, however, is very variable, and some specimens appear quite light, and others pitchy and dark with the light bands very much reduced; rostrum short, thickly squamose, antennæ short, red, with the club darker, inserted a little behind the apex of the rostrum; eyes vertically oblong; thorax square, marked with eight oblong impressions, arranged in two rows; elytra oblong, much broader at shoulders than thorax, shoulders well marked and prominent, punctured striæ distinct, alternate interstices raised and costiform; legs dark, more or less ringed with light and dark scales or pubescence, first joint of tarsi elongate, second and third joints short. L. 3–4 mm.

Male with the abdomen impressed at base.

Sandy places; local, but often not uncommon where it occurs; it is found under stones and at the roots of low plants, and is particularly attached to salterns and low-lying ground not far from the sea, although it also occurs inland; Shirley, Wimbledon, Wisley (Surrey), Blackheath, Hampstead Heath (formerly common, S. Stevens); Norfolk; Suffolk; Deal; Dover; Hastings (not common); Portsmouth district; Shirley Warren, Southampton (common, Gorham); Lymington Salterns (not uncommon at the end of April); Seaford, Devon (Power); Westward Ho! N. Devon (taken commonly by myself on the flat ground behind the pebble ridge on Northam Burrows at the end of August); Bristol; Crymlyn Burrows, Swansea: I know of no record from further north, but it appears to be general all round the southern coasts from Norfolk to Wales.

HYPERINA (Phytonomina).

This tribe has been variously constituted by different authors, who have in some instances included under it *Alophus*, *Procas*, and one or two other European genera: from the characters above given in the table of the tribes it will be seen that the tribe is closely allied to those most nearly related to it, but, if we regard it as containing simply the genera *Hypera* and *Limobius* it forms a very natural division characterized by the history of the early stages of its members, which can only be compared with that of the Cionina; the larvæ live in the open air on various plants, on the leaves of which they feed; the body is capable of extension and contraction like that of caterpillars, and is covered with a viscous substance which is secreted by a nipple-like prominence on the upper surface of the last segment; locomotion is effected by means of bilobed prominences on the ventral surface; when the larva has attained its full growth it attaches itself to the underside of a leaf or to its stalk and forms a gauzy cocoon from threads of the viscous substance; this cocoon, which shelters the insect from external

enemies, takes about twenty-four hours in construction, and the perfect insect emerges a few days after it has been completed.

The genus *Limobius* chiefly differs from *Hypera* in the fact of having six joints to the funiculus of the antennæ, whereas in the latter genus there are seven; the genera, therefore, bear the same relation to one another that *Ceuthorrhynchidius* bears to *Ceuthorrhynchus*.

I. Funiculus of antennæ with six joints . . . . . LIMOBIUS, *Schönh.*
II. Funiculus of antennæ with seven joints . . . . . HYPERA, *Germ.*

LIMOBIUS, Schönherr.

This genus contains three species which are all found in Europe; two occur in Britain; they may easily be distinguished from *Hypera* by the number of joints in the funiculus of the antennæ; the first joint of the funiculus also is rather larger in proportion to the second; the scrobes are produced as far as the eyes; the body behind the thorax is short and broad and the elytra are furnished with erect scattered setæ.

I. Elytra without a common dark band behind middle . . L. DISSIMILIS, *Herbst.*
II. Elytra with a common dark velvety band behind middle, extending across the second and third interstices . . L. MIXTUS, *Boh.*

L. dissimilis, *Herbst.* (*borealis*, Payk). Rather short, black, closely covered with variegated brown and whitish scales, which usually have, in part at least, a slight metallic reflection; eyes depressed; antennæ ferruginous, with club darker; thorax transverse, with the sides moderately strongly rounded, and with three more or less plain light longitudinal lines; elytra variegated, with the suture white behind, and with chequered black patches on some of the interstices; punctured striæ rather fine; erect setæ distinct; legs red; the colour of the scales is somewhat variable. L. $2\frac{1}{2}$–3 mm.

On *Geranium pratense;* also at the roots of *Geranium sanguineum;* rare; Chatham (Champion), Guildford (Power), Sandwich sandhills (Gorham); Llandudno; Selby, Yorkshire (W. C. Hey); Northumberland and Durham district, not common, Hartlepool, &c.; Scotland, very rare, Forth district, "Queensferry sea-shore, among *Ononis arvensis*, Dr. Greville," Murray's Cat.

L. mixtus, Boh. Allied to the preceding in form and general appearance, but larger, and easily distinguished by having a velvety black, almost crescent-shaped, common spot on the elytra behind middle, which extends across the second and third interstices; the thorax has two pale longitudinal bands, one on each side; the scales and setæ of the elytra are rather coarse and the interstices are slightly raised, and besides the black patch behind middle, there are two small black spots at base, one on each side of the scutellum. L. $3\frac{1}{2}$–4 mm.

Sandy places; on species of *Erodium*, especially *E. cicutarium;* very local, but sometimes not uncommon where it occurs; Deal sandhills, locally common; Dover (Hall); Weymouth; Exeter, very rare (Parfitt's Catalogue).

HYPERA, Germar (*Phytonomus*, Schönherr).

This species is a very extensive one, containing upwards of two hundred species which are almost entirely confined to the Palearctic region; a few, however, have been described from North Africa, Madeira, the Canaries, and South America (Chili, Cayenne, &c.); they are moderate-sized or small insects, often prettily variegated and mottled, with the elytra ovate or oblong ovate and the thorax, as a rule, much narrower than the elytra, which have the shoulders well marked; the rostrum is rather stout and not carinate; the posterior tibiæ have no hook, or a very obsolete one, at apex, and the tarsi have the last joint long with the claws long and free; the femora are simple and not longer than the tibiæ; the scutellum is small but distinct, and the elytra are not produced at apex and are furnished with regular punctured striæ; nearly a hundred species are found in Europe, of which sixteen are contained in the British catalogue; two or three, however, are extremely rare, and are only represented by single specimens in our old collections; they have for the most part a strong family likeness; one or two of them are very common and occasionally are injurious to certain crops, but I have never heard of their doing any material damage.

The sexual differences are sometimes very marked, and consist chiefly of variations in general shape, length of rostrum, point of insertion of the antennæ, &c.

The species are, for the most part, very easy to distinguish if compared side by side, but the differences are often hard to express in words; several authors make considerable use of the characters drawn from the relative length of the first two or three joints of the funiculus of the antennæ, but I have not, in some instances, found them satisfactory, and have preferred, in several instances, to roughly divide them on the clothing of the elytra, which, after all, is the character by which they are, as a rule, superficially distinguished; the shape of the scales is also very important.

I. Rostrum broader, about twice as long as broad; size larger . . . . . H. PUNCTATA, *F.*

II. Rostrum narrower, about three times as long as broad; size smaller.

i. Clothing of elytra formed of coarser scales which are rounded or truncate behind.

1. Alternate interstices somewhat raised; elytra variegated, with an immaculate lighter spot in middle of margin and another at shoulder; scales overlapping one another and broadly concave; length 6 mm. . . . . H. FASCICULATA, *Herbst.*

2. Alternate interstices not raised; elytra variable; scales not overlapping but placed side by side and furrowed in middle.

A. Shoulders scarcely broader than base of thorax; elytra with greyish-yellow or reddish-brown scales, without distinct spots or patches H. ARUNDINIS, *Pays.*

B. Shoulders much broader than base of thorax.
a. Vertex of head distinctly clothed with scales — H. RUMICIS, *L.*
b. Vertex of head with fine pubescence.
a*. Elytra with a distinct series of small square black patches on the first and third, and more or less on the other interstices . — H. POLLUX, *F.*
b*. Elytra with alternate longitudinal bands of grey and white, but without distinct patches . . . . . — H. ALTERANS, *Steph.*

ii. Clothing of elytra consisting of finer scales which are bifurcate behind or of hair-like scales or simple hairs.
1. Anterior tibiæ with a tooth or raised angle towards the middle of the inner margin; elytra with the alternate interstices raised, with longer and shorter dark and light longitudinal bands, but without small patches or irregular variegation . . . . . — H. POLYGONI, *L.*
2. Anterior tibiæ without tooth or prominence on their inner margin.
A. Upper surface with very long raised setæ which are also present on the tibiæ; thorax dilated in front and strongly contracted before base; elytra regularly chequered with small square black patches . . . . . — H. TIGRINA, *Boh.*
B. Upper surface without or with comparatively short, but often distinct, raised setæ, which are not present on the tibiæ.
a. Eyes subconvex, short oval; fourth joint of funiculus of antennæ longer than those on each side of it . . . . . — H. ELONGATA, *Payk.*
b. Eyes very flat, irregularly oblong; fourth joint of funiculus of antennæ equal to the third.
a*. Elytra broader and more ample; size larger; setæ on elytra recumbent behind and scarcely visible if viewed sideways . — H. SUSPICIOSA, *Herbst.*
b*. Elytra narrower and less ample; size smaller; setæ on elytra always distinctly raised and plainly visible if viewed sideways
a†. Elytra with a common dark spot at base of suture, more or less triangular, and extending beyond middle, but without distinct dark patch at sides.
a‡. Size smaller; form less robust; thorax narrower, with the sides less strongly rounded . . . . . — H. VARIABILIS, *Herbst.*
b‡. Size larger; form more robust; thorax broader, with the sides more strongly rounded . . . . . — H. MURINA, *F.*
b†. Elytra without or with a more or less pronounced abraded dark spot at base of suture, never (except in very rubbed specimens) reaching to middle; sides with a more or less distinct dark patch.
a‡. Size larger; thorax with sides di-

lated in front and strongly contracted behind	H. PLANTAGINIS, *De G.*
b‡. Size smaller; thorax with the sides very slightly rounded and scarcely contracted behind	H. TRILINEATA, *Marsh.*
c†. Elytra without any marked variegation; antennæ entirely red; thorax transverse oval; rostrum with a distinct channel opposite the upper border of the scrobes	H. MELES, *F.*
d†. Elytra closely covered with uniform green, sometimes brown, scales; size small	H. NIGRIROSTRIS, *F.*

H. punctata, F. The largest of our species; broad and robust, dull-black, clothed with greyish brown or grey scales, which are broadly lighter on the sides of thorax and elytra; rostrum short and broad; thorax slightly widened in front, but with the sides nearly straight, thickly punctured, with a more or less obscure central line of lighter scales; elytra ovate, much broader at shoulders than thorax, interstices alternately obscurely lighter and darker, sometimes with fascicles of darker scales, every other one slightly raised, punctured striæ rather deep, erect setæ distinct; antennæ red, legs dark with tibiæ obscurely red. L. 7–10 mm.

Male with the anterior tibiæ rather strongly and the intermediate tibiæ slightly curved and armed at apex with a rather distinct hook; abdomen slightly impressed at base and apex.

Female with the anterior tibiæ scarcely curved and the intermediate straight and armed with an obsolete hook; abdomen even.

On species of *Trifolium;* in moss, at roots of plants, &c.; often found crawling on walls and palings, and occasionally by sweeping herbage; common and generally distributed throughout the kingdom.

H. fasciculata, Herbst. (*fasciculosa,* Steph.). Black, densely clothed with white; fuscous, grey or yellowish-grey, with small black patches and markings, which cause the upper surface to appear strongly variegated; head short, covered with white scales, antennæ ferruginous; thorax with the sides rather strongly rounded in front and contracted behind, with three lines of light scales, disc thickly punctured; elytra with rather deep, but obsoletely punctured, striæ, and convex interstices, furnished especially towards apex with rows of setæ, very prettily variegated, with an immaculate more or less distinct semicircular spot (sometimes reduced) in middle of sides, and another at shoulders (often obscure), lighter; the suture is light, chequered with black fascicles, of which there is a longer one at apex, and these fascicles are present on other interstices; legs long, more or less ferruginous, femora squamose and variegated. L. 6 mm.

Sandy places near the sea; under *Erodium cicutarium;* according to Schiödte on *Geranium molle;* extremely local, but not uncommon where it occurs; the chief

locality is Deal sandhills where large numbers have been taken; Sandwich; Portsmouth district; Swansea; Devon; "Isle of Thanet and in Norfolk; more common in Scotland" (Stephens); Scotland, maritime, extremely local, Forth and Clyde districts.

H. arundinis, Payk. Black, densely clothed with compact greyish-yellow or reddish-brown scales, which are rather brighter at sides of elytra and cover both the upper and the underside; thorax with three lighter lines; head convex, with a longitudinal impression between the eyes; rostrum rather long, pubescent, with the apex glabrous; antennæ black with the base pitchy; thorax subcylindrical; elytra scarcely broader than thorax, with faint punctured striæ; legs black, sparingly pubescent. L. 7–7½ mm.

On *Sium latifolium;* the larva has been observed on this plant and on *Sium angustifolium* in France; very rare; "taken in marshy places near Exeter, and I believe in Norfolk," Stephens; Dover (Hall); Titchfield River, Portsmouth (Moncreaff); Dr. Power has a single specimen in his collection labelled "Lewis, 1861."

H. rumicis, L. Black, variegated with rather shining ashy-white and yellowish-brown scales; head thickly punctured, vertex squamose; rostrum almost straight; antennæ dull ferruginous, with the club darker; thorax subcylindrical, with two fuscous longitudinal bands; elytra with fine punctured striæ, thickly clothed with ashy-white and brownish scales, with a subquadrate spot at scutellum, and some minute scattered dots, fuscous or black, a patch on each elytron behind middle near suture being immaculate ashy-white or at all events lighter than the rest of the elytra; legs pitchy. L. 4½–5½ mm.

Male with the anterior tibiæ curved, the abdomen impressed at base, and the club of the antennæ elongate.

Female with the anterior tibiæ almost straight, the abdomen convex at base, and the club of the antennæ less elongate.

On species of *Rumex* (dock), also on *Polygonum aviculare;* generally distributed and common throughout the greater part of the kingdom; in some districts, however, it appears to be local; Mr. Bold records it as rare in Northumberland and Durham, but it appears to be not uncommon in Scotland as far north as the Moray district.

H. pollux, F. (*adspersa,* F.). Black, variegated with ashy-white or yellowish-brown scales; head finely punctured, pubescent; rostrum glabrous at apex, scarcely curved; antennæ red or ferruginous, with the club darker; thorax with the sides slightly rounded, subcylindrical, closely and rather strongly punctured, with two fuscous lines; elytra with fine punctured striæ, interstices irregularly tessellated with small subquadrate blackish spots, the third towards apex and one or two at margin being more or less white; legs black with the apex of the tibiæ and the tarsi somewhat ferruginous; the colour is somewhat variable, the prevailing tint being sometimes grey and sometimes a warm yellowish-brown; this is also the case with other allied species. L. 5–6½ mm.

Male with the antennæ inserted a little behind the middle of rostrum, the anterior tibiæ rather strongly curved and the abdomen impressed at base; in the female the rostrum is longer and the antennæ are inserted at about middle; the anterior tibiæ are only slightly curved.

On various *Umbelliferæ;* the larva has been observed in France on *Helosciadium nodiflorum* and *Crithmum maritimum;* the species is often found at the roots and by sweeping in marshy places; local, but not uncommon where it occurs; Barnes, Shirley, Forest Hill, Northfleet, Higham, Dulwich, Notting Hill, Hammersmith Marshes, Esher, Cowley, Merton, &c.; formerly common in Battersea Fields, near Battersea Park (S. Stevens); Aylsham, Norfolk; Pegwell Bay; Dover; Sandwich; Portsmouth district; Glanvilles Wootton; Exeter; Lee Valley, N. Devon (Power); Swansea; Scarborough; Heysham, near Lancaster; not recorded from Scotland; Ireland, near Belfast and Armagh.

H. alternans, Steph. (*Julini*, Sahlb.). Very like the preceding in appearance and general structure, but on the average rather longer and easily distinguished by the absence of tessellated small black patches on the elytra, which are banded with alternate uninterrupted lines of brown and light scales; the thorax has three lighter bands, the central one being often more or less obsolete, and is closely and rather coarsely punctured; the striæ of the elytra are rather fine; the head has a deeply impressed stria on the vertex; the antennæ are red or pitchy-red with the club darker, and the legs are pitchy-red or blackish, with the tarsi often lighter; the colour of the scales is somewhat variable. L. 6–7 mm.

Marshy places; at roots of plants, &c.; often in company with the preceding species, of which it has by some authors been regarded as a variety; very local, but sometimes not uncommon where found; Battersea; Notting Hill; Barnes; Lee; Hammersmith Marshes; Eastry; Rudham, Norfolk; Pegwell Bay; Sandwich; it appears to be almost confined to the south-eastern counties of England.

H. polygoni, L. (*arator*, L.). Of shorter and broader form than the preceding species, which it somewhat resembles in coloration; black, thickly clothed with greyish, brown and black scales, which are arranged in lines; head with whitish scales, antennæ ferruginous with club fuscous; thorax subtransverse, with the sides slightly rounded, and with three very distinct testaceous or whitish lines; elytra with distinct punctured striæ, with the suture in front white, posteriorly chequered with black and white, disc with three abbreviated dark brown or black lines, alternating with elongated white ones, one dark brown or black line on each side of scutellum at base, and two on each side meeting or approaching one another near apex, being most conspicuous; legs reddish or pitchy red, anterior tibiæ with a tooth or raised prominence towards the middle of the inner margin. L. 5–6 mm.

On *Leguminosæ;* also on *Polygonum, Lychnis vespertina, Silene inflata,* &c.; common and generally distributed from the Midlands southwards; Manchester district, general on the coast, the larvæ feeding on *Lychnis* and capsules of *Silene* (Chappell); rarer further north; Northumberland and Durham district rare; Scotland, occasional, Solway, Clyde, Forth, Tay, Moray, and probably other districts; Ireland, Armagh, Belfast, Killybegs, &c.

H. tigrina, Boh. (*H. pastinaceæ,* Rossi, v. *tigrina,* Boh.). A very distinct and conspicuous species, which may at once be known by the very long outstanding setæ on the elytra, and also by the colour of the elytra; these are closely covered with lighter and darker scales in alternate lines, which are chequered with small square black patches like a chess-board; the antennæ are red with a dark club, and the legs are more or less ferruginous; the thorax is transverse and has the sides strongly rounded and dilated in front and much contracted behind, and the elytra are oblong oval, with very fine striæ. L. $4\frac{1}{2}$–5 mm.

On the heads of *Daucus carota* (the wild carrot); extremely local and not common where it occurs; Dover (where most of the specimens have been taken); Folkestone (S. Stevens); Glanvilles Wootton (Dale).

H. elongata, Payk. Black, clothed with ashy or bright brown pubescence; head short, slightly pubescent, flat between the eyes; rostrum rather short, a little thickened and curved; antennæ red with dark club; thorax convex, closely punctured, with sides rounded, and three rather obsolete lighter lines; elytra somewhat elongate, nearly twice as long as together broad, with moderate punctured striæ, interstices slightly convex, the lateral ones obsoletely marked with fuscous and ashy patches; legs elongate and stout, pubescent. L. 6–7 mm.

Very rare, and perhaps doubtfully indigenous; in Dr. Power's collection there is a doubtful specimen from Birch Wood and another from Mr. Brewer; Stephens (Illust. iv. 102) says, "My specimens were from the Marshamian collection, and I have seen several that were captured near Edinburgh." "Raehills, rare," Rev. W. Little. Dr. Sharp, however, does not recognize the species as from Scotland.

H. suspiciosa, Herbst. (*pedestris,* Payk., *miles,* Payk.). A broad and robust species with ample convex elytra; black, densely clothed with ashy pubescence and scales; head thickly punctured, with a channel between eyes; thorax nearly as long as broad, with the sides slightly rounded, with two light lines towards sides and another, often more or less obsolete, in centre; elytra much broader than thorax, with the suture often lighter at apex, and with obscure blackish patches on the alternate interstices, scutellary region more or less dark, striæ fine and plainly and closely punctured; antennæ ferruginous, with the club dusky black; legs rather long, pitchy. L. 6–7 mm.

Male with the antennæ inserted almost in the middle of the rostrum, the anterior tibiæ rather strongly curved, and the abdomen impressed at base; in the female the antennæ are inserted a little behind the apex of rostrum.

On various *Leguminosæ;* the larva has been observed on *Lotus* and *Lathyrus pratensis;* local, but not uncommon where it occurs; Dulwich, Coombe Wood, Chatham, Whitstable; Margate; Deal; Hythe; Folkestone; Portsmouth district; Whitsand Bay, Plymouth; Somersetshire; Swansea; Bewdley; Coleshill, near Birmingham; Wicken Fen; Sherwood Forest; Filey, Yorkshire, not uncommon near the coast; banks and meadows near the Bollin, Cheshire; New Brighton; Northum-

berland and Durham district; Scotland, rare, Forth district; it has not been recorded from Ireland, but probably occurs in that country.

H. variabilis, Herbst. (*postica*, Gyll.). Much smaller and narrower than the preceding species; black, clothed with brown or ashy scales; head with a faint depression between eyes; antennæ red with darker club; thorax with the sides evenly rounded, and with three longitudinal lighter bands, of which the central one is sometimes more or less obsolete; on the two side ones there is a small dark patch just in front of middle; elytra with a large denuded dark patch reaching from the base at scutellum to beyond middle, remainder of suture tessellated, sides with obscure small black patches and lighter lines, neither being strongly marked; femora pitchy black, tibiæ and tarsi ferruginous. L. 4–5 mm.

Male with the antennæ inserted almost in the middle of the rostrum and the abdomen slightly impressed at base; in the female the antennæ are inserted a little behind the apex of the rostrum.

On various *Leguminosæ*, *Trifolium*, *Medicago*, &c.; often in moss, and haystack and vegetable refuse; generally distributed and common in the London district and the southern counties; somewhat local in the Midlands; Liverpool district, general; Northumberland and Durham district; Scotland, rare, Solway, Forth and probably other districts; Ireland, Waterford and Armagh. In this species, as in several of its allies, the scales, in fresh specimens, have sometimes a coppery reflection, especially on thorax; the elytra occasionally have a fuscous band near sides.

H. murina, F. Extremely like the preceding in general appearance, but considerably larger and of more robust form; the rostrum and funiculus are longer; the thorax is broader with the sides more rounded, and the elytra have the interstices more raised and the dark patch at base of elytra less distinct; in the female the fifth ventral segment is rounded at the extreme apex only, instead of being broadly rounded. As M. Bedel remarks (l. c. p. 79), all authors admit the distinctness of this species from *H. variabilis*, without, however, being able to define the distinctive characters. L. 6–7 mm.

Sandy places; by sweeping *Leguminosæ*; often in sand-pits; according to Heeger it lives on *Medicago sativa*; very local, but not uncommon in some districts; Battersea Fields (formerly) Shirley, Mickleham, Sydenham, Reigate, Dartford, Gravesend, Maidstone, Chatham, Whitstable; Deal; Dover; Arundel; Glanvilles Wootton; Exeter district; Cleethorpes, Lincolnshire; Crosby, Liverpool (rare); Scotland, very rare, Solway and Forth districts; Ireland, Portmarnock.

H. plantaginis, De G. Black, clothed with ashy-brown scales, head convex, finely punctured, with an impression between the eyes; antennæ ferruginous or red with club dark; eyes distant on forehead; thorax transverse with the sides strongly rounded and dilated in front and much narrowed to base, with three light bands, the central one narrow; elytra with a plain denuded dark lateral patch on each side towards margins and a short denuded line on each side of suture at base;

there is also a spot at shoulders and, as a rule, at apex of suture; legs stout, rufo-ferruginous. L. 4–5 mm.

Male with the anterior tibiæ curved and the base of abdomen and last segment impressed, the latter sinuate on each side.

Female with the anterior tibiæ scarcely curved and the fifth ventral segment with a small fovea before apex which is broadly rounded.

Chalky and sandy places; on *Plantago*; also in moss and by general sweeping; not uncommon and generally distributed throughout England and Wales; Dr. Sharp, however, records it as rare in Scotland, Solway and Forth districts; Ireland, near Dublin and Belfast and probably widely distributed.

H. meles, F. Pitch-black, closely covered with greyish or yellowish-brown hair-like scales; head small; rostrum rather long and nearly straight with the central line and apex glabrous; antennæ entirely red, second joint of funiculus not much longer than third joint; thorax transverse oval, strongly rounded and dilated at sides, nearly twice as broad as long with a light narrow central line, and a somewhat curved broader one on each side; elytra with a row of whitish hairs on interstices, without marked variegation, but with obscure small light and dark patches and fascicles, and with the apex of suture spotted more or less obscurely with white and brown; femora dark, tibiæ, and usually tarsi, ferruginous. L. 4–5 mm.

Male with the anterior tibiæ rather strongly curved, and the base of abdomen and the last segment broadly impressed.

On *Trifolium pratense* and Lucerne; apparently very rare; Mickleham (Power); received from Ross years ago (S. Stevens); Selby, near York, by sweeping a river bank in September (W. C. Hey). In Waterhouse's catalogue it is given as synonymous with *H. Trifolii*, Herbst. (Steph. Ill. iv. 99), which Stephens records as "not infrequent within the metropolitan district; also found in Norfolk and Suffolk." The species appears to be very imperfectly known. Thomson says that it may be distinguished by its longer rostrum, which is channelled in front between the antennæ and has the lateral line more strongly impressed and the central longitudinal line glabrous, and further by the very transverse thorax which has the sides much dilated; in the latter character it resembles *H. plantaginis*, but may be separated from that species by the longer and more shining rostrum, the nearer approximation of the eyes on the forehead, and the absence of a denuded patch at sides of elytra.

H. trilineata, Marsh. A small species; black, thickly clothed with brownish-ashy or ashy scales, which are sometimes slightly metallic, and occasionally in part slightly greenish; antennæ red with club dark; thorax almost as long as broad with three lighter lines, sides only slightly rounded, and only a little contracted behind; elytra with the suture mottled with dark spots, and with two dark lines near scutellum, and a dark patch on each side of disc towards apex, punctured striæ fine; the variegation, however, differs very much in more or less abraded specimens; legs ferruginous, femora usually dark. L. $3\frac{1}{2}$–4 mm.

Male with the anterior tibiæ rather strongly curved, the abdomen broadly impressed at base, and the fifth ventral segment of the abdo-

men impressed with a small round fovea and broadly sinuate on each side at apex.

On various *Leguminosæ*, especially *Lotus*: the larva has been observed on *Anthyllis vulneraria*; somewhat local and not abundant, but very widely distributed from the Midland counties southwards: Wallasey, Cheshire (rare); it appears to become rarer further north, although Mr. Bold records it as not infrequent in the Northumberland and Durham district; Scotland, very rare, Solway district only; Ireland, Armagh (Johnson).

H. nigrirostris, F. (*viridis*, Prov.). A small and very well-known and easily distinguished species; pitchy-black, clothed with uniform green (sometimes light brown) hair-like scales, with the head and three more or less obsolete lines on thorax lighter; head finely punctured; thorax with the sides rather strongly rounded; elytra with fine punctured striæ, uniformly clothed with rich green scales, which are sometimes spotted with fuscous and sometimes entirely brown, raised setæ on interstices white and distinct; antennæ red with club dark, legs red with dark femora. L. $3\frac{1}{2}$–4 mm.

Male with the anterior tibiæ rather strongly curved, the abdomen broadly impressed at base, and the last ventral segment broadly sinuate at each side and broadly impressed in middle; the point of insertion of the antennæ is also a little different in the sexes.

On various species of clover; often in moss and haystack refuse; the larva has also been observed on *Ononis spinosa*; abundant and generally distributed throughout the kingdom; it is one of the commonest of the British Curculionidæ.

The *V. ononinis* (Stevens) is a rather large form of the brown variety of this common insect; Mr. Stevens tells me that he took all the specimens (which agree among themselves) "on *Ononis* and not on clover which *nigirostris* frequents"; at first sight it looks very different to ordinary specimens of the type form.

LIXINA.

This tribe contains about a dozen European genera of which four are represented in Britain; they are, for the most part, oblong or elongate-oblong insects (except in the case of *Larinus*), with the rostrum broad and stout and, as a rule, nearly as broad as the head; many of the species are large and conspicuous and very prettily marked insects; some of them (as for instance *Lixus bicolor*) have the power of secreting a dusty pollen-like matter, of a whitish, yellowish or reddish colour, which occasionally hides completely the sculpture and pubescence; according to Bedel the insect has the power of renewing this secretion, if accidentally rubbed.

Our four genera may be distinguished as follows, but the characters are not altogether satisfactory in one or two cases.

I. Rostrum very short and stout, about as long as head; tibiæ with long raised hairs on their exterior margin . RHINOCYLLUS, *Germ.*

II. Rostrum always longer than head; tibiæ without long raised hairs on their exterior margin.
  i. Scrobes produced nearly to apex of rostrum; rostrum uneven, thick and moderately long . . . . . CLEONUS, *Schön.*
  ii. Scrobes ceasing at a distance from apex of rostrum; rostrum rarely uneven, thick and sometimes long.
    1. Thorax oblong, evidently longer than broad; body behind thorax cylindrical or fusiform . . . . . LIXUS, *F.*
    2. Thorax short, about as long as broad; body behind thorax oval or oblong-oval, not cylindrical . LARINUS, *Germ.*

The larvæ of *Rhinocyllus* and *Larinus* live in the heads of Compositæ; the larvæ of *Cleonus* are found at the roots of various plants, while those of *Lixus* inhabit stems.

RHINOCYLLUS, Germar.

This genus comprises about half-a-dozen species which are all inhabitants of the Palearctic region; our single species is found on various members of the thistle tribe; the larva undergoes its transformations in the heads of the plants in which it feeds; it is a robust greyish insect, with the rostrum very short, about as long as broad, and the tibiæ with long raised hairs on their exterior margin.

R. latirostris, Latr. (*conicus*, Fröh.; *thaumaturgus*, Steph.; *antiodontalgicus*, Gerbi.). An oblong, rather robust, species, black, clouded with ashy, more or less plainly tessellated, pubescence; rostrum very short and stout, about as long as head; antennæ stout, pitchy; thorax transverse, somewhat narrowed in front, closely and rather coarsely and rugosely punctured, with long ashy pubescence; elytra oblong, broader at base than thorax, with the humeral callus rather well marked, punctured striæ fine but distinct, interstices closely sculptured; legs dark, pubescent. L. 4–6 mm.

On various species of thistles; the larva lives in the heads of *Carduus nutans*, various species of *Cirsium*, and also of *Centaurea nigra*; local and usually rare; Faversham (in abundance, J. J. Walker); Canterbury (Power and Stephens): Shipley, near Horsham (once common, Gorham); coasts of Sussex, Hants and Dorset; Rye, near Hastings; Isle of Wight; Portland and Weymouth, sometimes common (Harris, Blatch, &c.). Walton records it as abundant on the south coast, but it is very local; the species seems to have been regarded as a specific for toothache; hence some of the long names that have been attached to it.

CLEONUS, Schönherr (*Mecaspis*, Schönherr; *Bothynoderes*, Schönherr).

The species belonging to this genus are of large or moderately large size, robust, but elongate, and subparallel form, and very often exceedingly handsomely variegated with shades of white and grey; the rostrum is stout, but always longer than the head, and uneven, with the scrobes produced nearly to apex; the eyes are depressed; the thorax is

oblong or subquadrate and bisinuate at base; the prosternum is deeply emarginate at apex; the elytra are long and somewhat depressed at base; the legs are moderately long and the femora are not armed with teeth.

The genus is a very extensive one and, if we include the subgenera into which it has been divided, contains upwards of three hundred species, which are mostly found in Europe and Northern and Central Asia; a few, however, have been described from Africa (Algeria and Cape of Good Hope), India, &c.; they are found in sandy places at the roots of various plants; the larvæ feed in the roots and undergo their transformations in a sort of cocoon, always beneath the earth.

When we consider that more than a hundred species are found in Europe, it must be admitted that the genus is very poorly represented in Britain by four, one of which is almost doubtfully indigenous, and another extremely rare; they may be distinguished as follows:—

I. Second joint of posterior tarsi short, scarcely longer than broad; third joint of tarsi with spongy pubescence beneath.	
1. First joint of funiculus of antennæ at least as long as second; length 10–15 mm.	C. SULCIROSTRIS, *L.*
2. First joint of funiculus of antennæ very short, much shorter than second	C. ALBIDUS, *F.* (*fasciatus*, Müll.)
II. Second joint of posterior tarsi elongate, plainly longer than broad; tarsi with joints 1–3 furnished with lateral setæ and without pubescence beneath.	
1. Underside of thorax with a tubercular prominence before each coxa; vertex of head distinctly ridged; elytra longer in proportion to thorax . .	C. NEBULOSUS, *L.*
2. Underside of thorax without distinct tubercular prominences before coxæ; vertex of head scarcely ridged; elytra shorter in proportion to thorax . .	C. GLAUCUS, *F.* (*turbatus*, Fahrs.)

C. sulcirostris, L. (*piger*, Scop.; *scutellatus*, Boh.). Black, thickly clothed with greyish pubescence; vertex of head thickly pubescent; rostrum with three deep almost equal, furrows; thorax about as long as broad, with large scattered bare granulations, disc with two broad dark denuded longitudinal bands, separated by a narrow light band, which is usually continued on vertex; elytra with fine punctured striæ, pubescence more or less thick, with two oblique dark denuded fasciæ on each, directed towards apex and meeting or nearly meeting at suture; a callose spot towards apex is also denuded; these markings are very variable and depend in great measure on the freshness of the insect; in newly-emerged specimens the elytra are sometimes almost of a uniform grey colour. L. 10–15 mm.

Male with the base of the abdomen impressed in middle and the last segment very slightly emarginate at apex.

On various species of thistles; local but often common where found; it appears to be

chiefly, but not altogether, confined to districts near the coast; Charlton, Whitstable, Sheerness, Gravesend, Harwich, Great Yarmouth, Hertford; Bottisham, near Cambridge; Dover; Hastings; Eastbourne; Portsmouth; Chesil Beach; Bristol; Swansea; Erdington; Knowle, near Birmingham; Southport and Blackpool, Lancashire; Liverpool, common, sometimes in profusion, on the Crosby and Hightown Sandhills among thistles; Northumberland and Durham district; Scotland, maritime, rare, Forth district; it probably occurs in Ireland.

C. albidus, F. (*fasciatus,* Müll.). Much smaller than the preceding species, with which it agrees in having the second joint of the posterior tarsi short, scarcely, if at all, longer than broad; it may however be known by its colour, which renders it one of the prettiest and most conspicuous of our British Curculionidæ; black, with the thorax clothed at sides and more scantily on disc with yellowish or whitish yellow pubescence, elytra very thickly clothed with snowy pubescence, with a broad space at shoulders, a waved uneven band about middle and a patch before apex denuded; rostrum short, with a central carina, which is bifurcate in front; thorax very uneven and irregularly rugose on disc, about as long as broad, with sides straight and parallel; elytra slightly broader than thorax, with fine punctured striæ which are concealed by the pubescence; legs pitchy, pubescent; the male characters are the same as in the preceding species. L. 7–10 mm.

Sandy places: on *Chenopodiaceæ;* the larva has been found on *Atriplex rosea* (Frosted Orache) and *Chenopodium album* (White Goosefoot), and the perfect insect has occurred in abundance near Venice on *Atriplex patula* (Common Orache); the species is extremely rare in Britain; I have a fine specimen in my collection taken by Mr. W. H. Harwood in the Colchester district in 1883; in Dr. Power's collection there is a specimen, without locality, from the Rev. J. Laundy Browne (probably from the Fen districts), and Mr. Samuel Stevens possesses a single example, received by him from Mr. Salmon, taken at "Thetford, Norfolk;" Stephens (Manual, p. 251) gives as localities Norwich, Ipswich, Cromer and Portobello, near Edinburgh.

C. nebulosus, L. (*Lethierryi,* Chevr.). Of about the size of *C. sulcirostris,* but easily distinguished by the elongate second joint of the posterior tarsi, which is distinctly longer than broad, and its darker appearance, as well as by the reddish tinge which is usually apparent on some portion of its body; black, thickly but irregularly clothed with ashy pubescence; rostrum uniformly pubescent, with a strong and broad basal carina; thorax about as long as broad, with the sides constricted before apex, with a central abbreviated carina in front and the disc strongly rugose, the rugosities and elevations being raised above the pubescence; elytra with rather strong punctured striæ, and the alternate interstices more or less elevated, especially at base, pubescence much variegated with oblique denuded fasciæ and patches; the tubercle towards apex is also always denuded; legs long, pubescent; the pubescence on the head and rostrum, the thorax, legs and more or less of elytra is usually to a greater or less extent of a duller or brighter reddish colour. L. 13–14 mm.

In heathy places; at the roots of *Ericaceæ;* in sand-pits, &c.; rare; Esher,

Shirley, Leith Hill, Weybridge, Wimbledon, Chobham, Sandhurst; Norwich; Suffolk; Cambridge; New Forest.

C. glaucus, F. (*turbatus*, Fahrs.). Very like the preceding, but shorter, with the vertex not distinctly carinate, the posterior tibiæ with a longer spur, the prosternum without distinct tubercular prominences before coxæ, and the elytra shorter in proportion to the thorax, with the alternate interstices less raised; in size, general appearance, and markings, the species appears to closely resemble *C. nebulosus*. L. 12–13 mm.

Heathy places; at the roots of *Ericaceæ*; extremely rare and requires further confirmation as British; Ockham and Ripley, Surrey (Steph. Man. 281); on a common between Chobham and Ripley, seven specimens taken by Mr. Neale in June, 1815 (Steph. Ill. iv. 155); Chobham, taken by Mr. Standish (S. Stevens).

(*C. ophthalmicus*, Rossi (*momus*, Scop.; *quadripunctatus*, Schrank; *distinctus*, Steph. Ill.). This species is now omitted from our lists; it is allied to *C. albidus* and *C. sulcirostris* in having the second joint of the posterior tarsi short, and differs from the former in having the first joint of the funiculus of the antennæ at least as long as the second; from the latter it may be known by having the mesosternal projection broadly truncate between the intermediate coxæ, instead of being terminated in a sharp or obtuse point (on this character Motschulsky has placed it in a separate genus. *Leucosomus*); the colour is black, varied with ashy pubescence; the thorax is white at the sides and the elytra are obscurely striated with several rows of elevated ashy hairs, and each is furnished with two distinct white spots behind the middle, the anterior of which is somewhat divided; towards the base are some rather lighter dashes; on the breast are some fascicles of ashy down, and the margins of the abdominal segments are pale; legs black, pubescent. L. 9–15 mm.

Coombe Wood and Epping Forest (Stephens); Stephens, however (Ill. iv. 153), says he had only seen two specimens, one of which, from Coombe Wood, had been taken about twenty years before.

LIXUS, Fabricius.

This is a very interesting genus which in some respects is closely allied to *Cleonus* but differs in the fact that the scrobes cease at a distance from the apex of rostrum, and also in the usually more elongate form, the absence of the definite variegation of the elytra which is so conspicuous in many species of *Cleonus*, and the fact that many of its members have the power of secreting the dusty pollen-like matter before referred to; the sexual differences are unimportant; the species are very numerous, upwards of three hundred in number, and are very widely distributed throughout the world from Siberia to the Cape of Good Hope and Brazil; in fact it appears to be one of the most universally distributed genera of the Rhynchophora; as in the case of

Cleonus, however, the genus, which comprises about seventy-five European species, is exceedingly poorly represented in Britain, only five being known, these being all extremely local or very rare; the capture, however, of a hundred and fifty specimens of *L. angustatus* by Dr. Power, at Fairlight, near Hastings, between August 21st and September 2nd, 1867, rather serves to show that the members of the genus are perhaps overlooked (as might naturally happen owing to their habits) and that certain of them, and perhaps some new ones, may yet be found in numbers in hitherto unworked localities.

The larvæ of several species are known; they do not call for any particular notice as far as structure is concerned; they live and undergo their transformations in the stems of various plants (*Umbelliferæ, Polygonaceæ, Compositæ*, &c.); the female pierces the stem with her mandibles and deposits an egg in the opening, and the young larva when hatched begins to feed upon the soft internal parts of the stem; in the case of the large species one larva alone appears to be found in each stem, but in the smaller ones several may inhabit one plant; the species may be discovered in localities they inhabit by the unhealthy appearance of the plants. Perris (Larves des Coléoptères, p. 388) gives an account of the habits of the larvæ and of the plants on which they are parasitic; of our species *L. paraplecticus* appears to be chiefly attached to *Phellandrium aquaticum* and *Sium latifolium*; *L. iridis* to Hemlock and Angelica, &c.; *L. filiformis* to *Carduus nutans* and *crispus* and species of *Cirsium*; *L. algirus* to *Cirsium arvense* and *palustre*; and *L. bicolor* to *Erodium cicutarium*.*

I. Scape of antennæ plainly longer than the two first joints of the funiculus taken together.
  i. Elytra with a sharp prolongation at apex which is at least as long (if viewed from below) as the anal segment.
    1. Prolongation at apex of elytra long, nearly as long as thorax; form slender; eyes prominent . . . L. PARAPLECTICUS, *L.*
    2. Prolongation at apex of elytra short; form much more robust and broader; eyes flat . . . . . L. IRIDIS, *Ol.* (*turbatus*, Gyll.)
  ii. Elytra separately rounded or bluntly angled at apex, without prolongation.
    1. Thorax without a definite light band at sides; first joint of funiculus of antennæ relatively

* M. Perris's lament (l.c. p. 389) over the comparatively small knowledge possessed by entomologists concerning such conspicuous species as the Lixi and Larini is perhaps worth quoting, as it does not apply simply to French entomologists:—"Que d'entomologistes, hélas! qui, au lieu de pénétrer dans les secrets de la science, restent à la surface et la font consister à trouver à grand effort, ne fût-ce que sur un seul individu, un caractère qui différencie tel insecte de son voisin, ou à posséder beaucoup d'espèces por les aligner avec art dans des boites! Combien d'autres, ignorants de la botanique, sont incapables de savourer le charme des relations qui lient les insectes aux végétaux! Combien enfin qui, ayant toutes les qualités requises pour servir et même honorer la science, gardent pour eux leurs découvertes, par nonchalance ou comme s'ils en étaient jaloux!"

long, three times as long as broad; length 12–17 mm. . . . . L. ALGIRUS, *L.* (*angustatus*, F.)

2. Thorax with a broad and distinct yellowish or whitish band at sides; first joint of funiculus of antennæ relatively short, one and a half times as long as broad; length 5½–12½ mm. . . . . L. BICOLOR, *Ol.*

II. Scape of antennæ scarcely longer than the two first joints of the funiculus taken together; length 4½-9 mm. . . . . L. FILIFORMIS, *F.* (*elongatus*, Gœze.)

L. paraplecticus, L. (*phellandrii*, De G.; *productus*, Steph.). Elongate, very narrow, black or fuscous black, clothed with grey pubescence, and more or less distinctly sprinkled with a lutescent or greenish powder; margins and underside lighter and more thickly pubescent; head obsoletely punctured, eyes rather prominent, rostrum glabrous at apex; thorax much longer than broad, very slightly narrowed towards front, with two broad longitudinal flavescent streaks, which are usually indistinct; elytra elongate, with plainly punctured striæ, and terminating in two long dehiscent points; antennæ ferruginous with club darker; legs black, pubescent. L. 11–16 mm. (including apical processes, but not rostrum).

Marshy places; on *Sium latifolium*, also on *Phellandrium*; rare; it is one of the fen species that seems to have disappeared before drainage; it has, however, occurred in other localities; "Banks of Thames between Fulham and Barnes (very plentiful at times); Isle of Ely; Holme Fen, Hunts; Halvergate, Norfolk; near Carlisle, &c." (Stephens); Brugh Marsh (Heysham); Horning Fen; formerly at Hammersmith (one specimen only, S. Stevens); the species was at one time very common in the fen districts; Stephens (Illust. iv. 158) says "that the larva, which feeds on plants of *Phellandrium* and *Sium*, is said to be very injurious to cattle, when they happen to swallow it with their food."

(*L. iridis*, Ol. (*turbatus*, Gyll.; *gemellatus*, Gyll.). Much broader than the preceding species, and of about the same size and general appearance as *L. algirus*, from which it is easily distinguished by the short points at the apex of the elytra; the colour is black with grey pubescence, powdered with yellow or greenish yellow, and the head and most of rostrum, margins of thorax and elytra, and part of underside, as well as two more or less distinct streaks on disc of thorax, are lighter; head finely punctured, antennæ ferruginous, rostrum rather long; thorax conical, gradually but sensibly narrowed towards front, longer than broad, closely punctured; elytra with rows of distinct punctures, points at apex, if viewed from below, not longer than the anal segment; legs dark, with thick yellowish pubescence. L. 14–16 mm.

On various *Umbelliferæ*; the larva, according to Bedel, has been observed in France on *Chærophyllum bulbosum*, *Cicuta virosa* and *Angelica sylvestris*; very little indeed seems to be known with regard to this species as British; there is an old specimen, with the apex of the elytra broken, in Dr. Power's collection, labelled 36-2; on reference to his note-book I find that in the year 1836 he only mentions two localities, one "Hornsea Fen," June 6th, and the second "Mildenhall," from which

place this specimen apparently came; there is no reason why it should not be a British species, and it is better, therefore, not to omit it altogether; it occurs locally in Norway and Sweden and France).

L. algirus, L. (*angustatus*, F.). A large and conspicuous, robust, and rather broad species; cylindrical, black, with fine and scanty grey pubescence, which is thicker on the underside and very sparsely powdered with yellow or yellowish grey; head finely punctured, eyes flat; rostrum moderately long and stout, slightly curved, rather coarsely punctured, with a small longitudinal channel between the insertions of the antennæ; thorax rugose, slightly narrowed in front, anterior margin smoother, base with a more or less prolonged longitudinal channel before scutellum; elytra depressed at scutellum, with distinct rows of punctures, without process at apex. L. 12–17 mm.

On thistles; also according to Bedel on various species of low-growing *Malvaceæ:* very local; London district, very rare, Sydenham (Stephens); Shoreham, Hickstead, &c., Sussex (Stephens); Fairlight, Hastings, local (Power, S. Stevens, &c.); Faygate, near Rusper (Gore).

L. bicolor, Ol. (*vilis*, Rossi; *lateralis*, Steph.). Elongate; black, with grey or brown pubescence and thickly powdered with a yellowish or yellowish-chestnut powder which, together with the pubescence, is very easily rubbed off, so that good specimens are difficult to procure; rostrum with a central carina; eyes depressed; antennæ red or pitchy red, club often darker; thorax longer than broad, with sides very slightly rounded and narrowed in front, rugosely punctured, with a broad yellowish white band at margins, which in quite fresh specimens is continued as a light brownish yellow band on the margins of the base of the elytra; elytra with fine punctured striæ; apex of each obtusely rounded; legs black, with thick pubescence; size very variable. L. $5\frac{1}{2}$–$12\frac{1}{2}$ mm.

Sandy places near the coast; beneath and at roots of *Erodium cicutarium;* extremely local; the chief locality is Deal sandhills, on which considerable numbers have been taken; Isle of Thanet, near Sandwich, in June (Stephens); Sandwich, sandhills (Gorham); Portsmouth district (one specimen by sweeping, Moncreaff); there is also a doubtful record from Plymouth.

L. filiformis, F. (*elongatus*, Gœze, *nec* Germ). One of the smaller species; elongate, black, with grey pubescence powdered with yellow; thorax with four yellow lines; rostrum almost as long as thorax, closely punctured, indistinctly channelled at base; antennæ ferruginous, scape scarcely longer than the two first joints of the funiculus taken together; thorax conical, with a deep transverse impression in front, very closely punctured; pubescence of the dorsal bands almost woolly: elytra scarcely impressed at base, separately rounded at apex, with the pubescence uniform (var. *rufitarsis*, Boh.) or condensed in uneven patches; legs dark, with the tarsi ferruginous. L. $4\frac{1}{2}$–9 mm.

On various species of thistles, especially *Carduus nutans* and *crispus:* one example only was found by Mr. Sidebotham, when beating oak or birch, in a plantation on the side of Roundwey Hill, near Devizes, Wiltshire, early in June, 1864.

Mr. Rye (Ent Annual, 1865, p, 80), says: "This was doubtless only a straggler; the insect would most likely be obtained, if the thistle stems found in that neighbourhood were brought home and secured in a breeding-cage. It is somewhat like *L. bicolor*, but smaller and much less robust; the thorax has two dull grey dorsal lines, and the elytra resemble dark specimens of *Erirrhinus maculatus* in colour and marking." It must be admitted that the species requires further confirmation as indigenous.

LARINUS, Germar.

The species of *Larinus* are more than one hundred in number and are chiefly confined to the Mediterranean region; representatives, however, occur at the Cape of Good Hope, in Siberia, Central Asia, &c.; no species, apparently, have been described from the New World; the antennæ are geniculated, 12-jointed, short and moderately stout, situated towards the apex of the rostrum; the two basal joints of the funiculus are longer than the following, which are short; the club is elongate-ovate and subacute; the rostrum is moderately long; the thorax is gradually narrowed from base to apex with the basal margin strongly bisinuate, the centre being produced opposite to the scutellum; the elytra are broader than thorax, oblong-ovate; the legs are rather stout, with the femora thickened and not denticulate; in the males the abdomen is impressed at base, and the anal segment is very short; all the species are found on members of the thistle tribe; of the fifty-six European species only one is found, and that very rarely, in Britain.

L. carlinæ, Ol. (*Rhinobatus planus*, Steph.). Black, with the sides of the thorax and the underside clothed with more or less scanty greyish pubescence, and with fascicles of the same on the elytra; eyes depressed; rostrum furrowed on each side at base; antennæ red with club dark; thorax thickly rugose, with confluent punctures; scutellum rather large; elytra separately and broadly rounded at base, bluntly rounded at apex, with fine punctured striæ, interstices coriaceous; legs black. L. 7–9½ mm.

On various species of thistles; the larva lives in the heads of the plants; rare; Weybridge and Horsell, Surrey (Power); Dover; Sandgate; Brighton; New Forest; Portsmouth district; Glanvilles Wootton, Mulletts Wood, and Wootton Wood from 1825 to 1872, very scarce; Devon; Weston-super-Mare; Barmouth, Wales (Chappell).

CURCULIONINA.

The relation of this tribe to its allies will be seen by reference to the table stating the tribal differences; it is here regarded as including not only *Hylobius* and *Lepyrus* but also *Liosoma*, *Liparus* (*Molytes*) and *Plinthus*, which have, as a rule, with certain other genera, been referred to a separate tribe, called Liparina or Molytina; *Pissodes*, however, and *Trachodes*, which are by some authors referred respectively to the Hylobiina and Liparina, are under the present arrangement placed under quite separate tribes; the members of the present tribe are, in many

instances, very large and conspicuous insects; the species belonging to the genus *Liosoma* are, however, very small, but are worthy of notice as being almost exact reproductions in miniature of the large and conspicuous species of *Liparus*.

I. First joint of the club of the antennæ shorter than the following joints united.
  i. Prosternum not emarginate at apex; surface of mandibles with scattered patches of hairs . . . . . LEPYRUS, *Schön.*
  ii. Prosternum emarginate at apex; surface of mandibles glabrous.
    1. Length 2–4 mm.; tibiæ with moderately strong spurs at apex . . . . . LIOSOMA, *Steph.*
    2. Length 8–16 mm.;* tibiæ with strong curved spurs at apex.
      A. Scutellum small; metasternum very short . . . . LIPARUS, *Ol.*
      B. Scutellum large; metasternum comparatively long . CURCULIO, *L.* (*Hylobius*, Schön.).

II. First joint of the club of the antennæ as long as all the following united; upper surface very dull with large round punctures . . . . . PLINTHUS, *Germ.*

LEPYRUS, Schönherr.

This genus contains about half-a-dozen species which are found in Europe, Northern Asia, and North America; they are moderate-sized insects with the eyes round, the scutellum scarcely visible, and the prosternum not emarginate at apex; the thorax is narrowed towards apex and broadly rounded at base; the elytra are broadly emarginate at base; the femora are armed with a small tooth; the single British species is extremely rare.

L. binotatus, Payk. (*capucinus*, Schall.). Black, clothed with fusco-cinereous or ashy-brown scales and hairs, very minutely variegated with grey, and with a very small but distinct white point of scales behind the middle of each elytron; rostrum longer than thorax, carinate, somewhat dilated at apex; antennæ moderately thin, inserted near apex of rostrum, scape not reaching eyes, funiculus seven-jointed, with the two first joints rather long; eyes rather convex; thorax narrowed towards apex, closely sculptured, with a small central line; elytra long oval, somewhat acuminate at apex, with regular punctured striæ; legs moderately long. L. $7\frac{1}{2}$–10 mm.

Woods and damp meadows; on *Salix;* often found in flood refuse in France; very rare; Norbiton, Surrey (Lewis); Minley, Hampshire, under a stone in a dusty road, the plants near being birch and broom (Serle Hayward, Ent. Ann. 1870, 102); Eastrey, Portsmouth district, 1870 (Moncreaff); one specimen from Rev. W. Hope (S. Stevens).

LIOSOMA, Stephens.

The species belonging to this genus are about twenty in number;

* *Liparus dirus*, Herbst. (*glabratus*, F.) attains a length of 17–20 mm.; it is widely spread over Central and Southern Europe.

they are found in Central and Southern Europe, Algeria, and the Canary Islands, and one species occurs as far north as Siberia; by far the greater majority, however, have been described from Europe; three occur in Britain; they are very small, usually black, shining insects, resembling almost exactly in miniature the large species of *Liparus*; the antennæ are rather long and are inserted nearly at the apex of the rostrum, which is more or less distinctly carinate; the mandibles are short and slender; the sculpture of the thorax and elytra is very coarse; the scutellum is invisible, and the elytra are not much broader at base than thorax; the prosternum is emarginate at apex; the legs are moderately long and robust and the tarsi are spongy pubescent beneath; the males are narrower than the females, with the rostrum a little shorter and thicker and the antennæ inserted almost at the extreme apex; the anterior tibiæ, moreover, are more slender, and the abdomen is broadly impressed at base.

I. Femora toothed	L. OVATULUM, *Clairv.* (*deflexum*, Panz.)
II. Femora not toothed.	
i. Form longer; thorax more shining; striæ of elytra less marked, with the punctures set less closely together .	L. OBLONGULUM, *Boh.*
ii. Form shorter and smaller; thorax duller; striæ of elytra more marked, with the punctures set more closely together	L. TROGLODYTES, *Rye.*

L. ovatulum, Clairv. (*deflexum*, Panz.; *punctatum*, Marsh). Short and broad; deep shining black, glabrous; antennæ red with club darker; rostrum curved; sides of breast with white pubescence; thorax about as long as broad, with sides subparallel and narrowed just before apex, coarsely and deeply punctured, with a more or less distinct smooth central line; elytra with rows of large round punctures, interstices broad and flat, with a row of very fine punctures and of short and exceedingly fine setæ; legs black, tarsi reddish, femora with a small, but distinct, tooth. L. $2\frac{1}{2}$–3 mm.

Damp places; in moss and at roots of grass; occasionally by sweeping herbage; it appears to live on various *Ranunculaceæ*, and has been found on *Anemone nemorosa* and *Ranunculus repens*; rather local in some districts but generally distributed and, as a rule, common throughout England and Wales; Scotland, not common, Solway, Dee, and probably other districts; it appears to be common in Ireland, Waterford, Galway (abundant), Teelin Bay (Donegal), Dinnish Island, Armagh, Belfast, &c.

V. collaris, Rye. This variety is rather smaller than average specimens of the type-form, and may at once be known by having the thorax and often the rostrum more or less brightly red and the legs red with the femora dark at apex; the thorax also is less closely punctured, and the tooth on the femora is feebler. L. $2\frac{1}{2}$ mm.

Occurs with the type-form but much more rarely; Lee, Highgate, Mickleham, Cowley; Nettlecomb, Somerset; Knowle, near Birmingham; Barmouth; Scotland, Balmuto, Fifeshire (Power); Ireland, Woodlands, near Dublin (Power).

L. oblongulum, Boh. Very closely allied to the preceding, which at first sight it closely resembles, but longer and narrower, with the rostrum longer and more coarsely and deeply punctured, and not quite so stout or so much curved downwards, and the antennæ longer, the difference being especially noticeable in the scape; the sides of the thorax are said to be straighter, but this character is not very evident; the punctures of the elytra are a little larger, forming rows, but apparently not placed in impressed lines, and the underside is more strongly and remotely punctured; the metasternal depression of the male is wider and better defined; the chief character, however, lies in the fact that the femora are not furnished with a tooth. L. $2\frac{1}{2}$–3 mm.

Chalky and sandy places; in moss and by sweeping herbage; rare, but perhaps overlooked; Caterham and Haslemere (Champion); Chatham and Faversham (J. J. Walker); Wrabness, Essex (Walker); Guestling, near Hastings; Sharpness, Gloucestershire (T. Wood); Buddon Wood, Leicestershire; Ireland, Galway, one example (Walker).

L. troglodytes, Rye. A small, short species; in shape resembling *L. ovatulum*, but smaller, with the femora untoothed, and with lighter legs, the femora being pitchy, and the tibiæ and tarsi ferruginous; the anterior tibiæ are also straighter, the rostrum less stout and much more strongly punctured, and the thorax more opaque and much more closely punctured, with the interstices alutaceous, and in parts almost converted into wrinkles; the sculpture of the thorax, together with its smaller size and broader build, the more evident humeral angles and more marked striæ of the elytra will distinguish it from *L. oblongulum*; the antennæ, also, are situated further from the apex of the rostrum than in the latter species. L. 2-$2\frac{1}{2}$ mm.

Chalky banks; in damp moss in spring; very rare; Chatham and Faversham (a few examples taken by J. J. Walker); Fareham (Walker); Guestling, near Hastings; Mr. S. Stevens has a specimen taken at Leith Hill in 1850. Mr. Rye first described the species on one of Mr. Walker's examples in 1873.

LIPARUS, Olivier (*Molytes*, Schönherr).

The species belonging to this genus are among the largest of the European Curculionidæ; they are all peculiar to Northern and Central Europe; they are black, more or less glabrous, and in several cases variegated with patches of yellowish pubescence; the rostrum is moderately long and dilated at apex; the antennæ are moderately long, with the scape reaching eyes, which are vertically oval; thorax with a row of hairs at base and closely applied to the base of elytra; scutellum scarcely visible; elytra broader than thorax, dilated behind, more or less confusedly sculptured; prosternum emarginate at apex; metasternum very short; legs moderately long, tibiæ with a strong tuft at apex externally; in the males the anal segment of the abdomen is broadly and very shallowly impressed.

The larva of *L. coronatus* is described by M. Valéry Mayet in Bedel's Rhynchophora (l.c. p. 96):—Length 15–18 mm.; body elongate, footless, white with the exception of the head, with white hairs on each segment; stigmata nine on each side, ferruginous; head ferruginous, elliptical, vertex deeply furrowed; prothorax emarginate for the reception of the head; meso- and metathorax very short with two transverse folds on the dorsal aspect, underside of all three thoracic segments with small warty locomotive triangular nipples; abdomen composed of nine segments, anal segment with four lobes, the lateral pair being much the most developed; these larvæ appear to take two years for the accomplishment of their metamorphoses; they live in the earth and attack the cultivated carrot and probably other Umbelliferæ; they are hatched in the summer or autumn and pass the winter in the root of their food plant; in spring they leave it and appear to exist all the summer, according to M. Fallou, on their "réserves physiologiques," not appearing until the following spring in the perfect state.

I. Elytra almost glabrous, or at most with a few yellowish hairs on each; disc of thorax uniformly punctured; average size smaller . . . . . L. CORONATUS, *Goeze*.

II. Elytra with patches of yellowish-grey pubescence scattered over their whole surface; disc of thorax with larger and smaller punctures intermingled; average size larger . . . . . L. GERMANUS, *L.*

L. coronatus, Goeze (*anglicanus*, Steph.; *germanus*, Gyll. *nec* Goeze). Black, rather shining; head and rostrum distinctly, but not strongly punctured; antennæ pitchy; thorax nearly as long as broad, with sides rounded just before apex, uniformly and distinctly punctured, with a more or less distinct smooth central line, base and apex with flavescent hairs, which are also present on four more or less distinct spots placed transversely, two on each side of disc; elytra coriaceous, without definite rows of punctures, nearly glabrous, but with a few yellowish hairs in fresh specimens; abdomen on both sides with a series of flavescent spots, and the breast with yellowish hairs; legs black, all the femora with an acute tooth. L. 12–15 mm.

Male with the centre of base of abdomen and the last segment impressed.

In moss, under stones, &c.; often found crawling about roads and on grass stems; according to Bedel it is found on *Umbelliferæ*, especially *Chærophyllum* (*Anthriscus*) *sylvestre* (the Wild Chervil); the larva, as stated above, has been found in the roots of *Daucus carota*; very local, but not uncommon in some districts: Chatham, Lee, Birch Wood, Darenth Wood, Dulwich, Forest Hill, Hammersmith, Shirley, Belvedere, Maidstone; Hertford; Ashdown; Dover; Folkestone; Sandgate; Hayling Island; Portsdown Hill, Portsmouth; Brading, Isle of Wight; Bath; Swansea; Ireland, Portmarnock (rare).

L. germanus, L. One of the largest, if not the largest, of all our indigenous Curculionidæ; black, rather shining, with yellow hairs disposed in three irregular patches on each side of thorax and a number of

small patches of the same scattered over the elytra ; vertex of head finely punctured, rostrum more strongly punctured, antennæ black ; thorax with the sides rounded, broadest about middle and narrowed in front, distinctly punctured, the punctuation consisting of larger and smaller punctures intermingled ; elytra large and ample, coriaceous, without definite rows of punctures ; legs black, femora with small teeth. L. 15–16 mm.

Chalky places ; under stones and in moss ; very local and usually rare ; Maidstone; near Staple, Kent (H. S. Gorham) ; Sandgate ; Dover ; Hythe (in numbers in a sandy wood, T. H. Hart, 1878) ; Folkestone ; it appears to be entirely confined to the South Eastern counties.

CURCULIO, Linné (*Hylobius*, Schönherr).

This genus contains about thirty species, of which about ten occur in Europe, and the remainder have a wide range, representatives having been described from Siberia, Persia, North and South America, New Holland, Java, &c. ; our single species lives in the larval state in stumps and fallen trunks of various pine and fir trees ; the larva, however, of *C. transversovittatus*, one of the species found in France (of which a full description will be found in Bedel's Rhynchophora, pp. 93–95) lives in the roots of *Lythrum salicaria ; C. abietis*, unfortunately, does not confine itself to fallen and decaying limbs ; it is occasionally extremely injurious to Scotch fir, spruce, larch, and other *Coniferæ ;* a full account of the habits of the beetle and suggestions as to remedies will be found given by Miss Ormerod (Manual of Injurious Insects, pp. 233, &c.) ; the beetles feed on the tender bark of young shoots ; they mainly attack young trees, especially plantations formed on ground from which a crop of old fir has recently been removed, and eat away the bark of the stems, sometimes completely stripping them upwards. They also eat the bark of the shoots and destroy the bud ; and, in the larch, they gnaw at the base of the leaves so as to render the shoots bare. The females deposit their eggs, which are transparent and whitish, in rifts of the bark, in logs, root stocks, stumps of felled trees, and on exposed parts of roots ; the maggots hatch in two or three weeks, and may be found from June onwards throughout the winter ; they do not call for any particular remark, as they closely resemble the ordinary weevil maggots, except that the thoracic segments are somewhat swollen ; these maggots bore into the soft wood beneath the bark, and when full fed they change to the pupa state in a cocoon-like accumulation of chips at one end of the boring.

The chief method of prevention is to look carefully to the ground on which young trees are planted ; all chips and old wood should be burnt and no logs should be left about, unless used as traps ; fragments of roots left in the ground should be covered by at least six inches of earth ; laying pieces of bark as traps and carefully examining them, especially after dull weather or during soft rain, will often cause numbers to be captured in infested places, and traps formed of logs and twigs, if care-

fully burnt at intervals, and not allowed to lie too long, will cause an appreciable diminution of the mischief; it has been found a good plan, where planting has been done on a large scale, and the beetle is present to any extent, to take out as many of the old roots as possible, burn all the rubbish that is lying about and graze the ground with cattle for three or four years before replanting; direct applications of soft soap and sulphur, or of paraffin, to the stems of the trees is of service as the beetles commence at the ground level and gradually strip the trees upwards of their bark. The species of *Curculio* are large and conspicuous beetles and may be distinguished by having the scutellum large, the metasternum comparatively long, the antennæ with the scape reaching the eyes, which are vertically oval, and the prosternum emarginate at apex, with the ocular lobes distinct and ciliated.

C. abietis, L. Pitchy black, dull, with yellowish scales which are dotted over the surface in more or less distinct small yellowish patches, and on the elytra form two narrow more or less irregular bands, one before and one behind middle; there are also patches on the thorax, at the sides and before scutellum, and at the apex of the elytra; rostrum stout, rugose, with the antennæ inserted at apex; thorax at least as long as broad, constricted before apex, coarsely and rugosely punctured, with or without a smooth central line; elytra with chains of punctures ("cancellatostriatis," Thoms.), interstices broad, strongly rugose; legs black, femora armed with a rather strong tooth. L. 8–14 mm.

Varieties occur in which the colour is pitchy ferruginous and the legs reddish or pitchy red; the male has the base and the last ventral segment of the abdomen always broadly impressed.

On pines and firs; locally abundant and, as a rule, common throughout the whole kingdom; it is often found crawling on pathways, on pavements, &c.; and Dr. Sharp says that it is often met with in houses in Scotland. Mr. Moncreaff says that he has taken it on flowers of thistles in front of Lumps fort, Southsea, *in cop* in June, with no fir or pine trees within two miles.

PLINTHUS, Germar.

This genus contains about five or six species which are found in Western Europe, the Canary Islands and North America; according to Bedel they chiefly inhabit mountainous regions, but this is certainly not the case with our single species; they hide themselves during the day and come out at night or in the twilight; our species is a somewhat elongate, dull insect, which may easily be recognized by its sculpture, and by having the first joint of the club of the antennæ as long as all the following united.

P. caliginosus, F. Elongate, apterous, dull-black, glabrous or with traces of scales and rows of very short setæ, which, however, are only apparent in newly emerged specimens; antennæ reddish brown, with the first two joints of the funiculus elongate and equal; thorax

longer than broad, subovate, with large round variolose punctures which are confluent at sides, smooth central line narrow, but usually distinct; body behind thorax elongate oval, elytra connate, with rows of the same large punctures as on thorax, third, fifth and seventh interstices more or less raised, sometimes costiform; legs brown red, femora with a sharp tooth, tibiæ sinuate internally at base. L. $5\frac{1}{2}$–9 mm.

Male with the anal segment of the abdomen truncate behind, and leaving the apex of the last dorsal segment exposed.

Under stones and in moss, on the chalk, clay and sand; also under faggots, in woods; local, and almost confined to the London and South Eastern districts; never abundant, but not uncommon in these localities; Charlton, Hampstead, Forest Hill, Faversham, Shirley, Dartford, Chatham, Strood, Maidstone, Westerham; Kingsgate; Dover; Folkestone; Sandgate; Hastings, generally distributed but rare; Brighton; Portsmouth district.

PISSODINA.

The members of this tribe bear a strong relation to the Curculionina with which they have been classed by many authors; they chiefly differ in having the curved hook at the apex of the tibiæ situated at the apical external angle, a character which appears to be very artificial but is of great use in distinguishing several of the tribes belonging to the sub-family; the tribe, together with the Trachodina, which can hardly, perhaps, be separated from it, is allied to the Cryptorrhynchina, from which it differs in not having the rostrum received in a groove on the prosternum; the species are roughly sculptured, dull insects, of moderate or rather large size, which, however, varies considerably in members of the same species; the colour is dark and the surface is variegated with bands of greyish or yellowish scales; the larvæ attack pine and fir trees, and in habits closely resemble those of *Hylobius.*

PISSODES, Germar.

The species belonging to this genus are dull insects, in general appearance somewhat resembling *Curculio* but much smaller; they are characterized by having the scutellum conspicuous and rounded at apex, the femora fusiform and without teeth, and the prosternum not emarginate at apex; the rostrum is rather long and the antennæ are inserted at some distance from its apex; the thorax is narrowed in front and is as wide or almost as wide at base as the base of the elytra; the species are exclusively confined to *Coniferæ;* the larvæ, according to Bedel, attack diseased trees; they form burrows in the outer wood, or if they come across small branches they bore right into their centre, like the larvæ of *Magdalinus;* the genus contains about twenty species, which are confined to Europe, Northern Asia and North America.

I. Size larger; thorax shorter in proportion, with the sides more rounded and the posterior angles less prominent; elytra with the punctures of striæ much stronger and more distinct . . . *P. PINI, L.*

II. Size smaller; thorax longer in proportion, with the sides less rounded, and the posterior angles more prominent; elytra with the punctures of striæ much less strong and more or less indistinct . . . . . P. NOTATUS, *F.*

P. pini, L. Oblong, upper surface depressed, pitchy-black or dark pitchy-brown, with very sparing pale scales; rostrum longer than thorax, reddish-brown; antennæ inserted towards middle of rostrum, pitchy-red with club darker; thorax about as long as its breadth at base, narrowed towards front, constricted before apex, closely and somewhat rugosely punctured, with a fine but distinct smooth raised central line, and with very sparing small patches of yellowish scales, of which two spots, one on each side of middle, are often more or less distinct; elytra subparallel, narrowed from posterior third to apex, a little broader than thorax, with strongly and deeply punctured striæ, the punctures being deeper in the middle, and with two more or less distinct and irregular transverse yellowish bands on each, one before and another behind middle; legs moderately long, ferruginous, with the femora simple. L. 8–10 mm.

On fir and pine trees; very local and confined to the North; Northumberland district (Bold); Scotland, local, on Scotch fir, Forth, Tay, Dee and Moray districts (Braemar, Aviemore, &c.); it is by no means uncommon in some places where found.

P. notatus, F. Very like the preceding but smaller and usually of a somewhat lighter colour, with the fasciæ greyer, much less distinct, and often more or less obsolete; the thorax is longer with the sides less rounded, the posterior angles more prominent, and the base more deeply sinuated; the rostrum is shorter and the elytra are much less strongly punctured; the posterior fascia, moreover, is dilated in the middle and attenuated towards suture; according to Thomson the male has the rostrum a little shorter than the female and the fasciæ of the elytra formed of whitish scales, whereas in the latter sex the posterior fascia is yellowish in the centre. L. 6–8 mm.

On firs and pines; very local and not common; Chat Moss (Chappell); "Sunderland, probably introduced in Scotch timber-laden ships" (Bold); Scotland, rare, Highlands, on Scotch fir, Dee and Moray districts. I have a strong idea that it has been taken in some numbers near Bournemouth, but cannot find any record; it is the only species found in France, where it inhabits the whole basin of the Seine, so that there would be nothing against its occurrence in such a pine-clad district as Bournemouth.

A third species, *P. piniphilus*, has occurred at Sunderland, but was certainly imported with timber-laden ships from the north of Europe; it might, however, be found in this country, as it occurs in Sweden, Finland, Germany, and France; it resembles *P. notatus*, but is smaller (4–5 mm.), and may be known from the latter species by having the first fascia of the elytra always obsolete, and the second nearer the middle than in that species; the punctures of the thorax, moreover, are wider apart, and not confluent.

TRACHODINA.

This tribe is extremely closely allied to the Pissodina, from which it differs by the strongly toothed femora, the inconspicuous scutellum, and the clothing of the upper surface; the single genus *Trachodes* is very nearly related to the Cryptorrhynchina through *Acalles*, but differs in not having the prosternum channelled for the reception of the rostrum.

TRACHODES, Germar.

About eight species are contained in this genus which are found in Northern Asia (chiefly in Siberia and Kamtschatka) and Northern and Central Europe; they are small dull insects, with the elytra connate and gibbose, the prosternum emarginate at apex, the tibiæ bisinuate on their internal margin, and the posterior coxæ subglobose; the femoral teeth are very large and strong; they are found in faggots, and very little, apparently, is as yet known about them.

T. hispidus, L. (*squamifer*, Gyll.). Oblong, convex, blackish-brown, clothed with coarse blackish and ashy scales, rostrum, antennæ and legs reddish-brown; rostrum rather long, curved; antennæ inserted behind middle; thorax as long as broad, rounded at sides, with a row of large dark raised scales on each side of centre and a lighter row towards margin; elytra dark with common wavy grey fasciæ towards apex, alternate interstices with rows of large raised scales; femora clavate, with very strong pointed triangular teeth. L. $2\frac{1}{4}$–4 mm.

In woods; by beating old faggots of oak and beech sticks; rare; near Carlisle (Heysham); New Forest (one specimen, May, 1850, Walker); Buddon Wood, Leicestershire (Bates, Plant, &c.); St. Leonard's Forest (Power); it is also marked in Mr. Moncreaff's list as from Grange, near Gosport.

ORCHESTINA.

The members of this tribe are, with very few exceptions, easily known by the development of the posterior femora, which resemble those of the Halticidæ and enable the insects to leap greater or lesser distances according to their size and thickness, which is variable in the different species; the rostrum is inflexed, and the antennæ have rather a short scape; the eyes are free and, as a rule, prominent; the elytra are considerably broader than the thorax, with the shoulders well marked and the tenth stria joined to the ninth behind the metasternum.

The larvæ live on leaves, for the most part of trees; they mine the parenchyma, like the larvæ of many Micro-Lepidoptera, and after attaining their full size they form a cocoon in their mines or galleries, from which the perfect insect in a short time emerges; the galleries may easily be detected by their reddish or brownish appearance and by being slightly raised above the surface of the leaf.

Two genera are represented in Europe, both of which are found in Britain: they may be distinguished as follows:—

I. Antennæ geniculate, inserted at the sides of the rostrum, before the eyes . . . . . ORCHESTES, *Ill.*
II. Antennæ straight, inserted at the base of the rostrum, between the eyes. . . . . RHAMPHUS, *Clairv.*

ORCHESTES, Illiger (*Rhynchænus*, Clairville).

This genus contains about fifty species, of which more than thirty are found in Europe; the remainder occur in Northern and Southern Africa, the Caucasus district, North America, &c.; the precise number of British species is not quite certain as two or three have their claim to be indigenous based on single specimens, and require further confirmation; if, however, we include *O. sparsus*, *O. decoratus* and *O. loniceræ* the number of species hitherto found in this country is fifteen, which is a very good proportion; as a rule they may be known by the thickened posterior femora, but this is hardly noticeable in the very small species *O. saliceti;* the antennæ are geniculate and inserted at the sides of the rostrum before the eyes, and the anterior coxæ are contiguous; the head is small and the upper surface is almost entirely occupied by the eyes which nearly meet, in many cases, on the vertex; the thorax is very small in proportion to the elytra and only about half as broad as the latter; the scutellum is distinct; the elytra are large in proportion to the rest of the body and are often very prettily variegated; the femora, besides being almost invariably thickened, are longer than the tibiæ; in the males the rostrum is duller and proportionately smaller than in the females, but this is not very marked except in *O. loniceræ*, and there are also slight differences in the insertion of the antennæ and the shape of the pygidium and the apex of the last ventral segment of the abdomen, which, however, do not call for any particular notice; they are all small or very small insects, ranging from 2 to $3\frac{1}{2}$ mm. in length.

The larvæ of several species have been observed and noted by various writers; that of *O. fagi* will be found figured by Westwood (Classification I. p. 336, fig. 41, 19); it is rather peculiarly formed, being dilated towards the front and tapering towards apex, but possesses no legs; according to Bouché the larva of *O. scutellaris*, which mines the leaves of birch in May, is furnished, at the extremity of its pointed terminal segment, with a brown point, as well as with six short legs, but there is probably some mistake, as these characters have not been observed in any other allied larvæ; the habits of *A. alni* are well known; they mine the parenchyma of leaves of the elm and towards the end of autumn these may be seen, in certain localities, covered with more or less small raised yellowish or brownish knobs; the larvæ will be found in these, and when full grown they construct a small cocoon inside

them and there undergo their transformations; they easily cut through the enclosing portion of leaf and appear in large numbers in the perfect state on the outer side of the leaves of the trees.

I. Posterior femora more or less dilated, often dentate on their underside; chest and side pieces pubescent; size larger.
  i. Funiculus of antennæ with six joints (*Orchestes*, i. sp.).
    1. Sides of elytra in front with a row of erect setæ, independent of the general pubescence; sides of thorax with outstanding setæ.
      A. Scape of antennæ comparatively long, inserted a little behind middle of rostrum.
        a. Thorax with a more or less distinct longitudinal central furrow; colour red or brownish-red . . . . . O. QUERCUS, *L.*
        b. Thorax without a central furrow.
          a*. Elytra red or yellowish-red with black spots; femora and tibiæ black . . . . O. ALNI, *L.*
          b*. Elytra unicolorous red; femora and tibiæ in part or entirely yellowish-red . O. ALNI v. FERRUGINEUS, *Marsh.*
          c*. Elytra dark, closely covered with variegated grey, white, and blackish hair-like scales, and with a whitish patch at scutellum . . . . . O. ILICIS, *F.*
      B. Scape of antennæ shorter, inserted between the base and the posterior third part of the rostrum; thorax black.
        a. Elytra black with a clear white spot at base O. IOTA, *F.*
        b. Elytra with raised black hairs which are visible if viewed sideways, variegated with very obscure bands of grey, and with a yellowish-white spot at scutellum; form longer; antennæ and tarsi red . . . . . O. SPARSUS, *Fahrs.*
        c. Elytra with the pubescence even, strongly variegated with white hair-like scales which cover nearly the whole basal portion; form shorter; antennæ, tibiæ and tarsi reddish-yellow . . . . . O. AVELLANÆ, *Don.*
    2. Sides of elytra without a row of erect setæ in front.
      A. Thorax with outstanding setæ at sides; upper surface red, elytra with a spot at shoulders and a broad band in middle brown or black-brown (O. LONICERÆ, *Herbst.*)
      B. Thorax without outstanding setæ at sides.
        a. Elytra not variegated.
          a*. Scape of antennæ longer, inserted just behind the middle of the rostrum; body black covered with brown pubescence . . O. FAGI, *L.*
          b*. Scape of antennæ shorter, inserted towards base of rostrum.
            a†. Body red or reddish covered with light silky yellowish pubescence; anterior coxæ contiguous (*Threcticus*, Thoms.).

a‡. Head, thorax and legs yellowish-red . . . . . O. SCUTELLARIS, *F.*
b‡. Head, thorax and legs dark . . O. SCUTELLARIS, v. SEMIRUFUS, *Gyll.*

b†. Body black, covered with a uniform grey pubescence, anterior coxæ separate (*Hemirrhamphus*, Bedel) . . . . . O. PRATENSIS, *Germ.*

b. Elytra variegated; scape of antennæ short, inserted towards base of thorax . . . . O. RUSCI, *Herbst.*

ii. Funiculus of antennæ with seven joints (*Tachyerges*, Schönh.).

1. Elytra unicolorous black, without variegation; antennæ entirely black or pitchy black. . . . O. STIGMA, *Germ.*

2. Elytra black with transverse fasciæ of whitish pubescence or hair-like scales; antennæ red with at most the club dark.

A. Tarsi testaceous; transverse fasciæ of elytra not distinct . . . . . O. DECORATUS, *Germ.*

B. Tarsi black or pitchy; transverse fasciæ of elytra very distinct, anterior one dentate, reddish or yellowish in middle . . . . . O. SALICIS, *L.*

II. Posterior femora not appreciably dilated (*Isochnus*, Thoms.); funiculus of antennæ with seven joints; chest and side pieces clothed with white scales; elytra black, unicolorous; size very small . . . O. SALICETI, *Payk.*

The above characters will more or less easily distinguish the species; the setæ at the sides of the thorax, however, are very easily rubbed off, and one or two of the other characters are not always very distinct; it may therefore be useful to add a table of the colour differences, which are very marked, as a rule, in this genus.

Colour (at all events of elytra) uniform, without definite variegation; *O. quercus* (red, brownish-red, or reddish-brown, with the abdomen, except base, unicolorous with body); *O. alni*, var. *ferrugineus* (red, with head and abdomen black), and *O. scutellaris* (red, with abdomen black); *O. scutellaris*, var. *semirufus* (red, with head, thorax, legs and abdomen black); *O. fagi* (brown); *O. pratensis* (grey); *O. stigma* (black, sometimes with an obscure greyish patch at scutellum); *O. saliceti* (black).

Colour red, with dark spots or bands on elytra; *O. alni* (head black); *O. loniceræ* (head red).

Colour black with a clear white spot at scutellum, *O. iota.*

Colour variegated; *O. ilicis*, *sparsus*, and *decoratus* (markings very scattered); *O. avellanæ* (elytra with the base entirely covered with a large common white patch and with a band behind middle); *O. rusci* (scutellum and two simple bands on elytra white); *O. salicis* (scutellum and two bands on elytra white, the one behind the middle simple, and the other before the middle dentate and including scutellary patch, and more or less red or yellowish-red in centre).

O. quercus, L. Rufo-testaceous or reddish-brown, rather depressed, clothed with silky yellowish pubescence which is more or less irregular on elytra; eyes, breast and base of abdomen black, the former almost

connate on vertex; thorax bisinuate at base with a more or less distinct dorsal channel; elytra with rather fine punctured striæ, with a large triangular common patch (often more or less abraded) extending from the shoulders to beyond the middle of the suture, densely clothed with pale pubescence, the rest of the surface being less densely pubescent; anterior and intermediate femora each with a minute spine in the middle, the posterior with a double series of six or seven spines on each. L. $2\frac{1}{2}$–$3\frac{1}{2}$ mm.

On oaks; generally distributed and common throughout the greater part of the kingdom.

O. scutellaris, Gyll. Longer and narrower than the preceding, oblong, rufo-ferruginous above, underside and apex of rostrum black, clothed with ashy pubescence, which is thick and lighter on scutellum; antennæ inserted near base of rostrum, with the scape much shorter in proportion than in the preceding species; thorax rather strongly punctured, obsoletely channelled, with the sides narrowed in front and slightly narrowed behind; elytra with rather deep punctured striæ, interstices somewhat shining and rugose; anterior femora narrowed, posterior with a small tooth in the middle; anterior coxæ contiguous; pubescence of episterna of metasternum very close. L. $2\frac{1}{2}$–3 mm.

On alder and wild cherry; rare; Coombe and Darenth Woods, Carlisle and Sketty, near Swansea (Stephens); Norfolk (F. Smith); Lowestoft; Bearsted (Gorham); Sandown; Deal; Glanvilles Wootton (Dale); Stretford, near Manchester (Reston); Northumberland and Durham district (Bold); Scotland, very rare, Solway and Dee districts (Sharp); Ireland, near Belfast (Haliday); there has been some confusion regarding this insect, and it is possible that mistakes may have arisen with regard to some of these localities.

V. semirufus, Gyll. In this variety the head and thorax and often the legs are dark, whereas in the type form they are red; the legs, however, are very variable in colour; according to Stephens the posterior femora, which in the type have only a single small tooth in the middle, are in the variety armed with several small teeth; it seems possible that it may be a distinct species. L. $2\frac{1}{2}$–3 mm.

On alder and wild cherry; very local; St. George's Hill, Weybridge (Stevens); Woking (where Mr. Champion has taken it not uncommonly unaccompanied by the type form).

O. alni, L. Black, pubescent, with the antennæ, tarsi, thorax, anal segment of the abdomen and elytra rufo-testaceous, the latter with four black spots, which are very variable, the apical ones being often united at suture, often very obscure, and sometimes wanting; antennæ with the scape long, inserted just behind middle of rostrum; thorax closely and rather strongly punctured, sometimes with an abbreviated black patch in the middle of disc; elytra with strong punctured striæ; pos-

terior femora very strongly thickened, with a tooth in the middle and a series of rigid cilia behind it. L. $2\frac{1}{2}$–3 mm.

On elms, &c.; often by beating dead hedges and under loose bark; very abundant from the Midland districts southwards, but much rarer further north, and I know of no locality further north than Cleethorpes, Lincolnshire; it was scarce at Repton, near Burton-on-Trent; Ireland, Dublin and Waterford.

V. ferrugineus, Marsh. (*melanocephalus*, Ol.; *saltator*, Fourc.). In this variety the black spots on the elytra are entirely absent; the black head and more elongate form will easily separate it from *O. quercus*, and the black head and strong setæ at sides of thorax and shoulders of elytra will prevent it being confounded with *O. scutellaris*. L. $2\frac{1}{4}$–3 mm.

Found in company with the type, but not quite so common.

O. ilicis, F. (*pilosus*, F.). Oblong-ovate, black; head pubescent; antennæ red-yellow, with the scape long, inserted a little behind middle of rostrum, which is black and rugosely punctured; thorax rugosely sculptured, with strong setæ at sides, more or less distinctly pubescent; scutellum with dense white pubescence; elytra with punctured striæ, interstices flat and somewhat rugose, variegated with grey, white and blackish, and sometimes ferruginous, hair-like scales, with an oblong white streak at base of suture, the markings, except the latter, being however indefinite; anterior and intermediate femora with a single tooth in the middle, posterior pair with a tooth in the middle and a series of small spines besides; legs black, tarsi testaceous. L. $2\frac{1}{2}$–3 mm.

On oak, birch, holly, &c.; somewhat local, but rather common and widely distributed in the London and Southern districts; especially common in the New Forest; Devon (rare); much less common further north; Windsor; Norfolk; Bristol; Swansea; Knowle, near Birmingham; Dunham Park, Manchester; not recorded from the Northumberland and Durham district; Scotland, rare, Solway and Forth districts; it probably occurs in Ireland.

V. nigripes, Fowler. In this variety the antennæ and legs are entirely black and the general colour of the pubescence is darker; the teeth of the posterior femora appear also to be less strongly pronounced. L. $2\frac{1}{2}$–3 mm.

Taken by Dr. Power at Claygate, Shirley, Purley Downs, Birch Wood, Plumstead and Folkestone.

O. sparsus, Fahrs. Very closely allied to the preceding, but smaller and distinguished by having the scape of the antennæ shorter in proportion and inserted nearer to the base of the rostrum; it is covered with black hairs, which are rather long and erect on the thorax and depressed on the elytra, which are obsoletely variegated with grey, and have a whitish or fulvous spot behind the scutellum; the antennæ and tarsi are reddish-yellow; posterior femora with a row of indistinct teeth beneath. L. $2\frac{1}{2}$ mm.

On birch and oak; very rare; one example in Dr. Power's collection taken in July,

1866, near Surbiton, and confirmed by M. Brisout; the species is found in Algeria, Spain, and the South of France, and is rare near Paris, so that we should hardly expect to find it in England.

O. avellanæ, Don (*signifer*, Creutz). Ovate, rather short, black; head dull, slightly pubescent; antennæ testaceous, with the club sometimes dusky; thorax rather thickly punctured, with more or less distinct whitish pubescence; elytra with distinctly punctured striæ, with a large common white subcordate or double lunulate spot covering base and extending broadly along suture beyond middle, and a white band before apex; femora black, simple, tibiæ and tarsi or tarsi, red, legs sometimes entirely black. L. 2–2½ mm.

On hazels and oaks, &c.; local, but not uncommon; Hammersmith, Chatham, Sydenham, Darenth Wood, Sevenoaks, Wickham, Box Hill, Ashtead, Birch Wood, Coombe Wood; Bearsted; Rusper; Windsor; Hastings; Eastbourne; Arundel; New Forest; Portsmouth district; Glanvilles Wootton; Woodbury Common, Devon; Bristol; Swansea; Ditchingham and Bungay, Suffolk; Knowle, near Birmingham: Sherwood Forest; Scarborough; not recorded from the Northumberland and Durham district; Scotland, Solway district; the variety with black legs has been taken by Dr. Power at Birch Wood and Wickham.

O. loniceræ, Herbst. Oval; reddish yellow, eyes, breast, abdomen and a ring before apex of posterior femora black; thorax truncate, and with the sides rounded, disc obsoletely punctured, dull; elytra broad, with the shoulders somewhat rectangular, with deep punctured striæ, interstices narrow and elevated; there is a small round fuscous black spot at shoulders and an irregular narrow fascia in the middle, both sometimes brownish; in the male the rostrum is evidently shorter and duller than in the female. L. 2½ mm.

Very doubtfully indigenous; Stephens (Il. iv. 63) says, "Specimens of this insect have *long* been in the collection of the British Museum; found on the *Lonicera Xylosteum* (Fly Honeysuckle) at Spitchweek, Devon." There is no reason why it should not be found in Britain; in fact we should expect to find it rather than *O. sparsus*, of which a single specimen has been taken by Dr. Power, as it is a more northern insect, occurring in Russia and Denmark as well as not uncommonly in France, &c.; it is also found on *Lonicera Periclymenum* (the Common Honeysuckle).

O. fagi, L. Oblong, black, clothed with rather thick ashy brown pubescence, which is, however, often abraded in older specimens; rostrum black, rugosely punctured; antennæ testaceous, with the club globose-ovate and the scape long and inserted a little behind middle of rostrum; thorax transverse, with the sides slightly rounded, closely but distinctly punctured; elytra with distinctly punctured striæ, interstices flat, minutely sculptured; legs black, tarsi testaceous, anterior and intermediate femora with an indistinct tooth, posterior pair with a stouter tooth, and ciliated. L. 2–2½ mm.

On the beech; common and generally distributed throughout the kingdom.

O. pratensis, Germ. (*tomentosus*, Gyll. *nec* Ol.). Ovate, or oblong-ovate, black, covered thickly with a uniform grey pubescence, which will

easily distinguish the species; antennæ reddish testaceous, with the club pitchy, scape short, inserted towards base of rostrum; thorax with the sides slightly rounded and narrowed in front; elytra with rather deeply punctured striæ, interstices narrow and somewhat convex; legs black, pubescent, tarsi ferruginous, posterior femora angularly dilated beneath, posterior tibiæ somewhat enlarged on their inner side towards apex. L. 2–2¼ mm.

By sweeping thyme and other low plants; especially on chalky hill sides; according to Heeger the larva has been found in the leaves of a species of *Centaurea*; very local, and as a rule rare, but occasionally found not uncommonly in certain localities; Chatham, Maidstone, Micklehain, Reigate, Caterham, Chattenden, Buckden, Cowfold; Hertford; Folkestone; Battle, near Hastings, rare; Holm Bush, Brighton; Fordlands and Woodbury, Devon.; Knaresborough (Stephens).

O. rusci, Herbst. (*bifasciatus*, Gyll.; *affinis*, Steph.). Ovate, black, clothed with scanty greyish-white pubescence; antennæ red with the scape short and inserted towards base of rostrum; thorax transverse, rather strongly and not very closely punctured; elytra with strongly punctured striæ, interstices rather shining, scarcely punctured, with a longitudinal patch at base of suture before scutellum, and two rather regular bands, one just before and one behind middle, of thick whitish or yellowish-white hair-like scales; legs black, tarsi testaceous. L. 2–2½ mm.

On hazel, birch, oak, &c., in woods; apparently generally distributed throughout the kingdom and common from the midland districts southwards; it is, however, less common further north; Scotland, scarce, Solway, Tweed and Moray districts; Ireland, Armagh and Dublin and probably general.

O. iota, F. Oblong-ovate, black, rather dull, clothed with short black hairs; antennæ reddish testaceous, scape and funiculus sometimes pitchy, the former short, inserted towards base of rostrum; thorax comparatively long, narrowed in front, closely and strongly punctured, with a well marked central channel, setæ at sides very distinct; elytra with broad and deeply punctured striæ, interstices rugose, base of suture with a well marked white longitudinal patch; legs black, tarsi ferruginous. L. 2–2½ mm.

On *Myrica Gale*; in boggy places; it has also been observed on the leaves of birch; rare or rather extremely local; Chobham; New Forest, where I have taken it abundantly about a mile from Brockenhurst at the end of August; it has also been found near Lyndhurst by Mr. Walker; Isle of Wight near Whitchurch, also near Hartley Row, Hants (S. Stevens); on sweet gale, Gosport, not common June and July (Moncreaff).

The following four species belong to the genus *Tachyerges*, *Schönh.*, and are characterized by having the funiculus of the antennæ composed of seven joints.

O. stigma, Germ. Oblong-ovate, moderately convex, black, with very sparing greyish pubescence, which is sometimes thicker and forms a spot at scutellum; antennæ black or pitchy black, with an elongate club, scape long, inserted a little in front of the middle of rostrum in

the male, and at about the middle in the female; thorax comparatively long, conical, obsoletely channelled, with the sides not rounded or dilated; elytra with strong, crenulately punctured striæ, interstices convex, somewhat rugose transversely; legs black, posterior femora comparatively slightly thickened; the rostrum is shining and punctured and has an abbreviated channel in the middle. L. $2\frac{1}{2}$–3 mm.

On sallows, willows, alders, &c.; locally common; London district, common; Norfolk; Hastings; Portsmouth district; New Forest; Glanvilles Wootton; Nettlecomb, Somerset; Midland districts, general; Langworth Wood, Lincoln; Stretford, near Manchester; Liverpool district, local; Northumberland and Durham district; Scotland, scarce, Solway, Tweed, Forth and Clyde districts. Ireland, near Dublin.

O. decoratus (Germ. *nec* Steph.*). Suboval, slightly convex, black, sparingly pubescent, rather dull, with the antennæ and tarsi testaceous; rostrum obsoletely punctured; thorax strongly transverse; scutellum thickly clothed with white scales; elytra with two rather obsolete fasciæ formed of small white lines, with punctured striæ, interstices granulately punctured; the antennæ are inserted a little behind the middle of the rostrum; Thomson compares the species with *O. rusci* and says that it is distinguished by having the rostrum obsoletely punctured, the antennæ eleven-jointed, the club longer, the scutellum (which in *O. rusci* is dark but has a whitish longitudinal patch before it) clothed with white scales, and the interstices dull and granulately punctured. L. $2\frac{1}{2}$ mm.

On the leaves of willows; the larva has been found on *Salix fragilis*; Scotland, very rare, on sallows, Solway district (Sharp, Scot. Nat., Oct. 1879, p. 191); much confusion has arisen with regard to this species, through the error of Stephens; the species was omitted from our lists, but has now been reinstated by Dr. Sharp, who alone has taken the true insect in Britain; he has kindly lent me a specimen and says that it is no doubt still to be found about Cairn Water in Dumfriesshire; it appears to be not uncommon in Central and Southern Europe.

O. salicis, L. (*bifasciatus,* F. *nec* Steph.; *capreæ,* F.). Ovate, deep black; head thickly punctured, rostrum with fine punctures; antennæ testaceous with the club fuscous, the scape being inserted at about middle of rostrum; thorax transverse, closely punctured, with yellowish-white scale-like hairs in middle, and whitish hairs at sides near base, which are often rubbed off; scutellum white; elytra with broad and deep punctured striæ, interstices somewhat convex, transversely rugose, rather shining, with two bands of white scales, the hinder one narrow and almost regular, the one in front, dentate and much widened in middle and joining the longitudinal patch before scutellum; this patch and the space on each side of it is more or less distinctly reddish or reddish-yellow; the markings are very distinct; legs entirely black, a character that will easily separate it from *O. rusci*. L. $2\frac{1}{2}$–$2\frac{3}{4}$ mm.

On willows and sallows; the larva has been observed on *S. fragilis;* not uncommon and very widely distributed throughout England and Wales; Scotland, common, Solway, Tweed, Forth, Dee and probably other districts. Ireland near Dublin and Belfast

* The *O. decoratus* of Stephens, as well as his *O. affinis,* are only *O. rusci.*

and most likely general; it appears to be more widely distributed but less common where it occurs than several of the other species.

O. saliceti, Payk. This very small species differs from all the others found in Britain in not having the posterior femora sensibly dilated; in this respect it resembles *O. populi,* a larger species, which occurs in Northern, Central and Southern Europe, and has been wrongly introduced into our lists by Stephens (and on his authority referred to Britain by M. Brisout), on specimens of *O. stigma,* in which the posterior femora are comparatively slightly dilated; subovate, black, rather shining, slightly pubescent; head opaque, finely punctured; rostrum shining, delicately punctured; antennæ red, with the club dark, inserted a little behind middle of rostrum, funiculus seven-jointed; thorax scarcely transverse, convex, strongly and not closely punctured, with the sides rounded, hardly narrower at apex than base; elytra oval, much broader than thorax, with very strong and deep punctured striæ, interstices almost narrower than the striæ, convex and shining; femora black, tibiæ and tarsi red, the latter sometimes pitchy; the species has more the facies of *Tanysphyrus* than of an *Orchestes* and certainly seems distinct generically at first sight. L. $1\frac{1}{2}$ mm.

On various willows and sallows (*Salix cinerea, alba, caprea,* &c.); local and, as a rule, not common; Putney (Champion); Snodland, Kent; Wimbledon Common (S. Stevens); Hammersmith (Power); Norfolk and Somersetshire (Stephens); Portsmouth district (Moncreaff); Repton, Burton-on-Trent (W. Garneys and myself); Chat Moss (Chappell); Southport (Reston); Northumberland and Durham district (Bold); Scotland, local, on sallows, Solway, Tweed, Dee and probably other districts (Sharp); Ireland, Glasnevin, near Dublin (McNab's list); it appears to be very scarce in the Midland counties, but to become commoner in the North.

RHAMPHUS, Clairville.

The members of this genus are small insects which closely resemble *Orchestes,* but differ in having the antennæ straight and inserted at the base of the rostrum between the eyes, and the upper surface of the body glabrous, and by the very short scape of the antennæ; the anterior coxæ are plainly separated; about four are known, which all inhabit Europe; the larva of the single British species is found on the leaves of various trees, willow, apple, cherry, birch, &c.

R. flavicornis, Clairv. (*pulicarius,* Herbst.). Obovate, rather depressed, black, glabrous, slightly shining; antennæ ferruginous or reddish testaceous, with the club, which is rather elongate, dark; scape very short, shorter than the first joint of the funiculus, which is globose-ovate; thorax transverse, narrowed in front, with distinct punctuation, which is scanty, as a rule, on disc; elytra with strongly punctured striæ, interstices narrow and flat; legs entirely black, posterior femora rather strongly thickened. L. $1-1\frac{1}{2}$ mm.

On willows, cherry, birch, apple, &c.; locally common throughout the greater part of England and Wales; Scotland, local, Solway, Tweed, Forth and Moray districts; Ireland, Dublin, Queenstown, Waterford and probably general; it appears to be found in most localities in the Midland counties of England.

ERIRRHININA.

This is a large and important tribe, which has been very variously constituted; from the curculionina (Hylobiina) it may be distinguished by the long and slender rostrum and by the fact that the opening of the scrobes is not visible from above; from the Bagoina it differs in the formation of the third tarsal joint, and from the Hyperina by the stronger hooks at the apex of the tibiæ, the more or less distinctly carinate rostrum, and the fact that the trochanters are usually furnished with a long outstanding seta; considerable confusion has existed with regard to the division of the old genus *Erirrhinus*, and great confusion has lately arisen as to its nomenclature owing to the fact that *Dorytomus* of Sahlberg (1823) has been discovered by M. Bedel to be identical with *Erirrhinus* of Stephens (1831), and therefore a new name (*Eteophilus*) is proposed by him for the *Dorytomus* of Stephens, and the well-known name of *Erirrhinus* is sunk altogether, the name of the tribe also being changed to Dorytomina: I have, however, preferred to adhere, as far as possible, to the old arrangement, as, according to Bedel's nomenclature, *Dorytomus* means one genus with him, and another with Stephens, Thomson and other authors, and besides this the authorities for the so-called type species are in many cases insufficient and sometimes erroneous.

The British genera may be divided as follows:—

I. Anterior femora simple.
  i. Elytra with rows of thick raised setæ on the alternate interstices; third joint of the tarsi without setose pubescence beneath.
    1. Shoulders not marked, completely rounded off; thorax scarcely narrowed before apex . . . . ORTHOCHÆTES, *Germ.*
    2. Shoulders well marked; thorax rather strongly narrowed before apex . . . . . PSEUDOSTYPHLUS, *Tourn.*
  ii. Elytra without rows of raised setæ on the alternate interstices; third joint of tarsi with setose pubescence on each lobe beneath.
    1. Scape of antennæ inserted nearly at apex of rostrum; scrobes commencing close to mouth . PROCAS, *Steph.*
    2. Scape of antennæ inserted at some distance from apex of rostrum; scrobes not commencing close to mouth.
      A. Elytra with the tenth (or marginal) stria effaced or rudimentary . . . . . PACHYTYCHIUS, *Jekel.*
      B. Elytra with the tenth stria entire.
        a. Anterior tibiæ straight; prosternum broad before the anterior coxæ . . . . . GRYPIDIUS, *Steph.*
        b. Anterior tibiæ more or less curved; prosternum not broad before the anterior coxæ.
          a*. Prosternum emarginate in front without a distinct transverse line; elytra glabrous or pubescent, without short scales; eyes oval, depressed . . . . . ERIRRHINUS, *Schönh.*
          b*. Prosternum truncate in front and bordered by a well-marked transverse line; elytra

with the suture at least clothed with short scales; eyes rounded, subconvex . . . . THRYOGENES, *Bedel.*
II. Anterior femora toothed . . . . . DORYTOMUS, *Steph.*

ORTHOCÆTES, Germar.

This genus comprises four or five species, which are confined to Europe; our single representative is a small dull insect, somewhat elongate, with very strong raised setæ on the alternate interstices of the elytra, and with the shoulders not marked; it is found at the roots of plants and exactly resembles the ground on which it occurs, being in fact often covered with an incrustation of dirt, somewhat after the fashion of *Georyssus*.

O. setiger, Beck. Oblong, pitchy brown, but usually covered with mud and dust so that it appears dull grey; rostrum rather long and stout, carinate; antennæ red-brown; head and thorax covered with rough recumbent grey hairs, the latter subquadrate, rugosely punctured; elytra elongate-oval, with deep punctured striæ, alternate interstices raised, with a row of stout and erect whitish-yellow setæ. L. $2\frac{1}{2}$–$2\frac{3}{4}$ mm.

At roots of low plants, especially *Senecio jacobæa* (Ragwort), *Rumex acetosella*, &c., in sandy and chalky places; also in moss; very local but widely distributed and not uncommon in some districts, especially in the South; Caterham, Croydon, Shirley, Box Hill, Woking, Ripley, Faversham, Mickleham, Cowley, Weybridge, Chatham, Sheerness, Southend, Epping Forest; Birdbrook, Essex; Hertford; Wicken Fen; Littlington, Cambridge (one specimen, Power); Kingsgate; Dover; Deal; Hastings; Lewes; Holm Bush and Kemp Town, Brighton; Hayling Island; Portsmouth district; Isle of Wight, Ventnor, &c.; Chesil Beach; Weymouth; Glanvilles Wootton; Whitsand Bay, Plymouth; Woollacombe Sands, Devon; Scotland, Tweed and Forth districts (recorded on Murray's authority, Dr. Sharp having seen no Scotch specimens); Ireland, Portmarnock. Mr. Moncreaff has taken the species *in cop.* on flowers of ragwort in April, and says that in autumn and winter it is to be met with in dead leaves at the base of this plant.

PSEUDOSTYPHLUS, Tournier.

This genus contains three European species; the type *P. pilumnus* has usually been included under *Erirrhinus*, but it differs considerably from that genus and in size and general appearance more closely resembles *Orthocætes*, from which it may be known by its well marked shoulders; the rows of coarse raised setæ on the elytra will easily distinguish it from other allied species; the antennæ have the second joint of the funiculus much shorter than the first and somewhat rounded, the tarsi are short with the second joint transverse, and the femora are not toothed.

P. pilumnus, Gyll. (*setiger*, Perris.). Oblong-ovate, pitchy or reddish brown, thickly clothed with pale grey depressed scales; head

short, depressed; rostrum as long as head and thorax, curved, stout, more or less distinctly rugose, rufo-testaceous or ferruginous; antennæ red, with the club sometimes darker, pubescent; thorax about as long as broad, more or less constricted in front, sides moderately rounded, closely and deeply punctured; elytra with the sides subparallel, narrowed at apex, with rather fine punctured striæ, alternate interstices slightly elevated and furnished with scattered erect thick white setæ; legs shortish, stout, pale ferruginous and pubescent. L. 3 mm.

On *Matricaria chamomilla;* very local, but not uncommon where it occurs; Caterham, Claygate, Lee, Chatham, Sheerness, Cowley; Stratford; Portsmouth (J. J. Walker); Lumps Pond, Southsea (Moncreaff).

PROCAS, Stephens.

Five species from Europe and Northern Africa are recorded in the Munich Catalogue as belonging to this genus, but they seem to have been confused: according to Bedel one species occurs both in Europe and Africa (*P. armillatus*, F.), one in Asia (*P. biguttatus*, Faust), and a third in North America (*P. Lecontei*, Bedel); the first of these species is very rare, and hardly shows itself except during the cold season; all day it remains buried in the ground without any indication of its whereabouts being left on the surface; the upper surface is almost without scales; antennæ geniculate, 12-jointed, rather long and slender, inserted near apex of rostrum, club oblong-ovate, acuminate; rostrum long, rather slender, and curved; eyes depressed; thorax with the sides rounded, the base bisinuate, and the disc convex; scutellum minute, rounded; elytra oblong-ovate, rather long, much broader at base than base of thorax, with the shoulders well marked; femora subclavate, without a tooth.

P. armillatus, F. (*Steveni*, Gyll.; *picipes*, Marsh; *granulicollis*, Walton). Black, almost without scales or pubescence, at most with slight ashy pubescence on upper side and some ashy scales beneath; rostrum rugosely punctured with a more or less distinct central carina, antennæ red or ferruginous; thorax very closely and rather strongly punctured with a smooth central raised line; scutellum pubescent; elytra with distinct punctured striæ, interstices finely granulate; legs black or pitchy black, pubescent, tarsi reddish, with joints 1–3 furnished beneath with rather long hairs, apex of tibiæ more or less thickly clothed with whitish pubescence. L. 4–7 mm.

Marshy places; usually not far from the sea; under stones, at the roots of trees, in moss, &c., in winter and spring; very rare; Battersea Fields, Bristol and Norfolk (Stephens); received from the late Mr. Hemming who took it near Brighton (S. Stevens).

V. granulicollis, Walton. This variety, which Walton considered a separate species, is smaller than the type, and has the head foveolated,

the rostrum slightly thickened at apex, and the thorax more closely and granulately sculptured; in the only specimen I have seen, the elytra are more pubescent, the pubescence being rather obscure, but plainly chequered. L. 4½–5 mm.

Amongst moss and decaying vegetable matter; Mr. Walton (Annals and Mag. of Natural History, 1844, 111) says that the only specimen he had seen was found amongst moss and decayed vegetable matter from a wood at some distance from Carlisle, in December, by T. C. Heysham, Esq., who presented it to him; this specimen is probably the one in Dr. Power's collection as it has Mr. Heysham's name behind the card on which it is mounted; at first sight it looks distinct from the type form, but the latter is variable in size, pubescence, &c., and Mr. Crotch was evidently right in regarding it as only an extreme form of the type.

PACHYTYCHIUS, Jekel.

This genus contains a considerable number of species which are distributed over a great part of the old world; more than twenty occur in Europe; they have long been regarded as belonging to *Tychius*, but may easily be distinguished by the structure of the ventral segments (of which the second does not at the sides attain the fourth), and the fact that the tarsal claws are not appendiculate; the single British species used to be regarded as one of our rarest insects, but has recently been found in considerable numbers near Gosport by Mr. Moncreaff.

P. hæmatocephalus, Gyll. Rather short and broad, pitchy red or ferruginous, sometimes pitchy black; head, antennæ and rostrum red, the latter moderately long, stout, strongly curved, and finely striated, shining; thorax transverse, broad, with the sides strongly dilated and rounded and narrowed at base and apex, punctuation close and fine but distinct, pubescence scanty except at sides where there is a more or less distinct whitish curved spot; scutelium thickly covered with greyish-white scales; elytra at base not broader than middle of thorax, rather short, subparallel, narrowed at apex, with tessellated greyish scales, which are often dark along suture, underside with whitish or greyish scales; striæ distinct, but not strongly punctured, interstices rugose legs stout, ferruginous, more or less squamose, anterior and intermediate femora simple, posterior femora strongly toothed. L. 3–4 mm.

On *Lotus corniculatus*; extremely local; Portsmouth district (Moncreaff); Mr. Moncreaff says that it is abundant in June at the roots of grass near Gosport, and that it feeds on the seeds of the birdsfoot trefoil; the larvæ, according to Perris, live in the pods of this plant.

GRYPIDIUS, Stephens.

This genus only comprises four species which are peculiar to the colder portions of the Northern Hemisphere; they are moderate-sized insects with the rostrum long and curved, the femora simple and the tibiæ slender; the antennæ are rather long and the eyes moderately

large; the elytra are much broader than thorax with the shoulders well marked, and the second abdominal segment is a little longer than the third and fourth taken together; the tarsi are moderately broad, with the claws rather large; the species are found in and on aquatic plants.

G. equiseti, F. (*Erirrhinus equiseti*, Thoms.). Pitch-black; breast, sides of thorax and elytra, and apex of latter closely covered with white and brownish-grey scales, each elytron with a white spot in the middle and at shoulders, and with the scales at sides extended in a dentate patch towards middle; these markings, however, are only distinct in fresh specimens; antennæ pitchy; thorax about as long as broad with sides contracted before apex, closely and finely sculptured; elytra much broader at base than thorax, dilated at shoulders (which are well marked) and behind middle and very gently sinuate between the dilatations, narrowed from posterior quarter to apex, with fine punctured striæ, and the third, fifth, and seventh interstices more or less elevated; legs dark, more or less ferruginous, femora ringed with grey; mesosternum narrow, but not linear between the intermediate coxæ. L. $4\frac{1}{2}$–$6\frac{1}{2}$ mm.

On *Equisetum arvense;* also, according to Bedel, on *E. palustre;* rarely common, but apparently widely and generally distributed throughout England and Wales; London district, not common, Battersea Fields, Claygate, Coombe Wood, Ripley, Chatham; Hythe; Hastings; Portsmouth district; Isle of Wight, Luccombe, &c.; Glanvilles Wootton; Bath; Bristol; Hertford; Bungay, Suffolk; Aylsham and Rudham, Norfolk; Needwood Forest; Eggington, Burton-on-Trent; Gumley, Market Harborough; Ripon; York; Scarborough; Wallasey sandhills (common in spring); Chat Moss; Manchester district; Northumberland and Durham district; Scotland, local, Solway and Forth districts; Ireland, Bray, Belfast, Armagh, &c.

ERIRRHINUS, Schönherr (*Notaris*, Germ.).

The genus *Erirrhinus*, if regarded as including *Notaris* and *Thryogenes*, contains about forty-five or fifty species which are chiefly confined to the northern parts of the Northern Hemisphere; two or three species have also been described from the Australian region; in its restricted sense, as here used, it comprises about a dozen moderate-sized insects, of a black or pitch-brown colour, with or without pubescence; they are always found in marshy places near water or on the banks of streams; but little appears to be known regarding their life history; the sexual differences are unimportant.

1. Thorax thickly punctured, with a more or less distinct smooth central line; upper surface dull or only slightly shining, with more or less distinct pubescence or long hair-like scales.
   i. Elytra rather thickly and distinctly clothed with scale-like pubescence, or slender scales, with a small light spot behind middle of each, sometimes more or less obsolete; size larger.
      1. Elytra shorter and more oval; light spots on elytra

indistinct; sides of ventral segments with whitish scales . . . . . E. SCIRPI, *F.*

2. Elytra longer and less oval; light spots on elytra distinct: sides of ventral segments without scales; scale-like pubescence of elytra arranged, as a rule, in lines on the alternate interstices . . . . . E. BIMACULATUS, *F.*

ii. Elytra with very scanty scattered hair-like scales, without white spots behind middle; size smaller . . . . E. ACRIDULUS, *L.*

II. Thorax not closely punctured on disc, with the central line very indistinct or absent; surface deep black, glabrous and very shining; legs red . . . . . E. ÆTHIOPS, *F.*

E. scirpi, F. Black, dull, clothed moderately thickly with fine fuscous grey scales, which, however, are much more dense in some specimens than in others; head small, punctured, rostrum rather longer than the head and thorax, moderately curved, black, shining, carinated above, distinctly striated and punctured; antennæ long and slender, pitchy-red; thorax nearly as long as broad, rounded at sides, convex, thickly, coarsely and more or less confluently punctured, with a narrow smooth central line; scutellum thickly covered with ashy scales: elytra oblong-ovate, much broader at base than thorax, with punctured striæ, which are deeper towards suture, interstices convex, transversely rugulose on disc, thickly granulate towards sides; the surface is more or less thickly clothed with scales, but the sculpture is always plainly visible, and a little behind middle towards suture there is a more or less distinct small patch of whitish hairs or scales; sides of metasternum and margins of the abdomen densely clothed with minute tufts of whitish hairs or scales; legs rather long, moderately stout, pitchy-red or reddish-testaceous, thinly pubescent. L. 5–7½ mm.

Marshy places; on *Scirpus;* often found hybernating in stems of *Typha latifolia;* very local; first found by Mr. S. Stevens at Hammersmith Marshes; Notting Hill (formerly); Dulwich; Gravesend; Hastings district (common at Peppering and Guestling); Faygate; Portsmouth district; Glanville's Wootton; Rawdon Woods, Bromsgrove; Lancaster; Mr. Johnson records it from Armagh.

E. bimaculatus, F. More elongate and parallel-sided than the preceding species, to which it is closely allied, and with the elytra longer and less oval; it may also be known by the almost total absence of striation on the rostrum, the much less pronounced striæ on disc of elytra and the fact that the sides of the abdomen are not clothed with scales; the white spots on the elytra are more distinct, and the fuscous-grey pubescence is, as a rule, arranged in lines on the alternate interstices, especially in fresh specimens, which appear very often to be distinctly lineated, whereas in *E. scirpi* the clothing of the elytra is more or less confused; the punctuation also of the thorax is slightly coarser than in the latter species; size very variable. L. 5½–10 mm.

Male with the abdomen longitudinally impressed at base and the antennæ inserted further in front of middle of rostrum, which is shorter than in female.

Marshy places, especially about river banks; on sallows and *Cyperaceæ;* occasionally found in flood refuse; not common; Wimbledon, Gravesend, Strood, Chatham, Barking, Sunbury, Dagenham (Essex); Norfolk; Dover; Hayling Island; Bristol; Crymlyn Bay, Swansea; Bewdley, Brosely, Repton and other midland localities; Lincoln, banks of Witham; Liverpool district, flood refuse from the Alt and Leasowe embankment; Lancaster; Carlisle; Northumberland and Durham district, Twizell, near Gilsland; Scotland, maritime, very local, Solway district.

E. acridulus, L. Black, rather dull, or moderately shining, sparingly clothed with greyish squamose pubescence, which is thicker at sides of thorax and on scattered patches on elytra; head and rostrum punctured; antennæ ferruginous; thorax nearly as long as broad, coarsely and deeply punctured, with a more or less distinct smooth central line; scutellum pitchy; elytra oval, with rather deep crenate striæ, much broader at base than thorax, with shoulders well marked, sides narrowed before apex, interstices rugose; legs red, with the femora usually black; sides of abdomen with greyish scales. L. $3\frac{3}{4}$–$5\frac{1}{2}$ mm.

Marshy places; in moss, at roots of grass, on *Carex,* &c.; common and generally distributed throughout the kingdom as far north as the Shetland Islands.

E. æthiops, F. Somewhat elongate, or elongate-ovate, deep black, shining, glabrous; head and base of rostrum distinctly punctured, the latter smooth, even and shining; antennæ ferruginous; thorax about as long as broad, with the sides slightly rounded, rather strongly but somewhat diffusely punctured on disc, more closely at sides; central line impunctate but not raised; scutellum small, smooth and shining; elytra with deep punctured striæ, interstices finely punctured; legs red or pitchy red; varieties occur in which the whole body, or at all events the elytra, are pitchy red, and in some specimens the legs are black. L. 5–7 mm.

Marshy places; in moss; on *Sparganium ramosum;* by sweeping herbage on the edge of drains, &c.; extremely rare in England; Askham Bryant, Yorkshire (Stephens); Askham Bog, York (Stephens); Scotland, rare, Solway, Tweed and Tay districts; Ireland, apparently locally common; Mr. Johnson tells me that he has in some years taken large numbers in the Mullinures, near Armagh, in autumn on *Sparganium,* and in spring in moss; in 1890 it has, however, been extremely scarce and only one specimen has been found by him, in moss from Lowry's Lough, a locality in which it has not previously occurred.

THRYOGENES, Bedel (*Erirrhinus,* auct. pars.).

This genus has been formed by Bedel to include *T. festucæ, T. Nereïs* and *T. scirrhosus,* which have usually been regarded as belonging to *Erirrhinus Schönh.;* they differ in having the prosternum truncate in front and bordered by a well-marked transverse line, the elytra with the suture at least clothed with short scales, and the eyes rounded and subconvex; the three species known are found in marshy places in Europe and Northern Asia; *T. festucæ* lives in the stems of various *Cyperaceæ* (*Scirpus* and *Carex*); its larva, observed by Boie, bores a gallery in the

medullary canal of *Scirpus lacustris*, above the water level; the other species appear to have much the same habits; the males may be distinguished from the females by having the rostrum duller, the two first ventral segments marked with a strong impression, and the anal segment truncate at apex; the three species are extremely closely allied to one another, and it is very difficult to find satisfactory characters on which to distinguish them; those given by Bedel are perhaps as good as any, but the difference in the clothing of the elytra, and the relative length of the joints of the funiculus of the antennæ is not very evident in, at all events, some specimens; nor again are the characters proposed by Thomson and others, which depend upon the smoothness or striation of the rostrum, the relative length of the joints of the tarsi, etc., or the differences drawn from the presence or absence of a spot behind the middle of elytra, at all reliable.

I. Clothing of elytra consisting entirely of scales; elytra with the striæ on disc less strong.
  i. Rostrum longer, punctured and striate (more strongly in male than in female); second joint of funiculus of antennæ as long as the first, third joint longer than broad; size larger . . . . . T. FESTUCÆ, *Herbst.*
  ii. Rostrum shorter, nearly smooth (at all events in female); second joint of funiculus of antennæ shorter than the first, third and following joints moniliform or transverse; size smaller . . . . . T. NEREÏS, *Payk.*
II. Clothing of elytra chiefly pilose; suture with a band of scales; rostrum very distinctly striated; elytra with the striæ on disc stronger . . . . . T. SCIRRHOSUS, *Gyll.*

T. festucæ, Herbst. Elongate, fuscous, thickly clothed with ashy scales; head minutely punctured; rostrum very long, slender and curved, ferruginous, rather dull, rugosely punctured, finely carinate at base; antennæ ferruginous; thorax dull fuscous-brown, very closely sculptured, with the sides and under surface clothed with minute ashy-white scales, almost as long as broad, with the sides very slightly rounded; scutellum whitish; elytra long, parallel-sided, with deep and rather obsoletely punctured striæ, interstices coriaceous; the suture, a small spot in middle of base and a patch behind centre are more thickly covered with whitish scales; legs ferruginous or rufo-testaceous. L. $4\frac{1}{2}$–$5\frac{1}{2}$ mm.

Marshy places; especially about the banks of rivers; on *Scirpus*, *Carex*, &c.; occasionally in flood refuse; very local, and, as a rule, scarce; London district, Kent and Surrey, not uncommon; Gravesend, Whitstable, Barnes, Walton, Horsell, Colney Hatch (Champion, Power and others); Pangbourne, banks of Thames, once abundantly on Fescue grass (S. Stevens); Hastings; Leamington and Salford Priors (Blatch).

T. Nereis, Payk. (*palustris*, Gyll.). Very closely allied to the preceding, but, on an average, considerably smaller, with the antennæ and rostrum shorter, the latter more shining, almost smooth in the female, and the joints of the former shorter, rather stouter, and somewhat

different in form; the second joint of the funiculus is shorter in proportion to the first, and the third and following ones somewhat moniliform or transverse; the thorax is less finely punctured and almost without scales on disc, and the elytra have a spot before the white patch behind middle more evidently denuded, and the white patch itself, as a rule, more distinct; the second joint of the tarsi, moreover, is shorter and sub-transverse. L. $3\frac{1}{2}$–$4\frac{1}{2}$ mm.

Marshy places; by sweeping reeds, &c.; local, but common where it occurs; Claygate, Norwood, Shirley, Woking, Sheerness, Whitstable, Gravesend, Faversham; Norfolk; Birchington; Shipley, near Horsham, and Rusper; Deal; Sandwich; Hastings; Eastbourne; Southsea and Portsmouth district; Sandown, Isle of Wight; New Forest; Glanvilles Wootton; Bewdley Forest; Portishead; Swansea; Barmouth; Knowle, near Birmingham; Needwood; Willington, near Burton-on-Trent; Horning Fen; Oxford; Yorkshire; Northumberland and Durham district, Twizell (Selby); Ireland, near Belfast; the species has not apparently been found in Scotland; it appears to become very scarce further north than the south-midland counties but to be generally locally common in the south-eastern and southern districts.

T. scirrhosus, Gyll. Very like the two preceding species, from which it may be known by the clothing of the elytra which is chiefly pilose, the suture being furnished with a band of scales, and by the evidently stronger crenate striæ on the disc of the elytra; it is smaller than the ordinary specimens of *E. festucæ*, but in size appears to be somewhat intermediate between the two species; in the striation of the rostrum it resembles the last-mentioned species, but this character is much more strongly marked, and it differs moreover in having the joints of the funiculus of the antennæ and the second joint of the tarsi relatively shorter; from *T. Nereïs* it may be known by the much duller and more strongly sculptured rostrum and the more deeply and closely punctured thorax, as well as by the characters before mentioned. L. $3\frac{3}{4}$–5 mm.

Marshy places, by sweeping aquatic plants; not common; Esher, Horsell, Barnes, Sheerness, Eltham, Merton, Colney Hatch, Kingsbury; Hammersmith Marshes and Notting Hill (formerly); Pegwell Bay; Bopeep, near Hastings; New Forest; Sutton Park, near Birmingham; Church Stretton; Ireland, near Dublin (McNab's List).

DORYTOMUS, Stephens.

The members of this genus are about forty in number and are peculiar to Europe, Northern Asia, and the more northern parts of North America; one or two have been described from Southern Africa; they may be recognized from the two preceding genera by having the anterior legs, which are approximate at base, more or less elongated, the anterior femora toothed and the thorax constricted in front; about thirty species are found in Europe, of which thirteen or fourteen have been recorded as British; they usually frequent willows, sallows, aspens and poplars; the larvæ attack the catkins or terminal shoots; the sexual characters are in many cases

very distinct and consist in differences in the length of the rostrum and anterior legs, the shape of the scrobes, &c.; the species, as a rule, are pitchy and fuscous, with the elytra more or less mottled with ferruginous scales or pilose pubescence; in many cases they very closely resemble one another and require great care in their determination; in fact it will be found in many cases extremely hard to distinguish them without a careful comparison of authentic types.

I have followed M. Bedel in regarding *D. costirostris* and *D. Silbermanni* as synonymous with *D. maculatus*, of which species they are evidently at most varieties.

I. Rostrum long and thin, at least as long as half the body; anterior legs of male slender, as long as the whole body . . . . . D. VORAX, *F.* (*longimanus*, Forst).

II Rostrum shorter and stouter, not as long as half the body; anterior legs of male only slightly elongate.

i. Prosternum bordered with a fringe of yellowish hairs in front.

1. Elytra with depressed pubescence and also with small raised setæ which are plainly visible at sides . . . . . D. HIRTIPENNIS, *Bedel.* (*tæniatus*, Brit. Cat.)

2. Elytra with depressed pubescence and without raised setæ.

A. Rostrum channelled or with longitudinal punctured striæ, longer than the head and thorax united.

a. Elytra with well marked variegated scale-like pubescence (which more or less covers the upper surface), scarcely broader at shoulders than base of thorax; anterior tibiæ distinctly angled in the middle of their inner margin in the male . . . . . D. TREMULÆ, *F.*

b. Elytra almost glabrous, plainly broader at shoulders than base of thorax; anterior tibiæ almost straight on their inner margin in both sexes . . . . . D. TORTRIX, *L.*

B. Rostrum even, thickly punctured, and pubescent, and scarcely as long as head and thorax united . . . . . D. VALIDIROSTRIS, *Gyll.*

ii. Prosternum without a trace of a fringe of hairs extending beyond its anterior border.

1. Anterior margin of prosternum not emarginate in the middle; elytra with a very slight prominence, usually covered with whitish hairs, at the apex of the fifth interstice.

A. Rostrum almost glabrous, longer and thinner; form narrower . . . . . D. MACULATUS, *Marsh.* (*tæniatus*, F. *nec* Brit. Cat.)
V. costirostris, Schönh.
V. Silbermanni, Wenck.

B. Rostrum in part pubescent, shorter and thicker; form broader . . . . . D. AFFINIS, *Payk.*

2. Anterior margin of prosternum deeply emarginate in middle, the emargination being sometimes almost hidden by the pubescence which fills it; elytra without small prominences before apex.

A. Head red; rostrum shiny.

a. Rostrum regularly curved for its whole length, usually red but sometimes brown; elytra red, or dusky in front and along suture . . . . . D. MELANOPHTHALMUS, *Payk.* *V. agnathus*, Boh.

b. Rostrum almost straight to the insertion of the antennæ and then slightly curved; insect entirely red . . . . D. PECTORALIS, *Gyll.* (*rufulus*, Bedel.)

B. Head black; rostrum dull, rather stout, usually black.

a. Thorax plainly longer than broad; body behind thorax slender, scarcely broader than base of thorax . . . . D. SALICINUS, *Gyll.*

b. Thorax slightly transverse or about as long as broad; body behind thorax broader, plainly broader than base of thorax.

a*. Rostrum distinctly channelled; thorax rather longer; colour of elytra lighter . . . . . D. SALICIS, *Walt.*

b*. Rostrum not channelled; thorax slightly shorter; colour of elytra darker . . . . . D. MAJALIS, *Payk.*

D. vorax, F. (*longimanus*, Forst.). Pitchy, with uneven ashy tomentose pubescence, elytra variegated with ferruginous and black, thorax often more or less ferruginous; head small, punctured, rostrum long, strongly curved, shining black, striated; antennæ red with club often darker; thorax transverse, strongly constricted before apex, with the sides rounded, rather thickly pubescent, closely and distinctly punctured; elytra with plain punctured striæ, interstices broad; prosternum broad between the anterior coxæ; abdomen with sides and apex ferruginous; legs ferruginous or more or less pitchy, femora, except apex, and more or less of tibiæ, often darker; size variable. L. $4\frac{1}{2}$–$7\frac{1}{2}$ mm.

Male with the rostrum much longer, and the antennæ inserted further towards its apex, and the anterior legs slender and very elongate.

Female with the rostrum and anterior legs comparatively short.

On poplars and aspens; often found hiding in the chinks of the bark in numbers in late autumn and winter; local, in the London and southern districts, but common where it occurs; Coombe Wood; Tooting; Dover; Glanvilles Wootton (common); Exeter; widely distributed in the Midlands; Lincoln, abundant in cracks of willow bark near a row of aspens to the south of the town; Manchester district, general in decayed poplars; Scarborough; much less common in the north; Northumberland

and Durham district, apparently rare; Scotland, rare, Solway, Tweed, Forth and Clyde districts. I know of no record from Ireland, but it almost certainly occurs in that country.

D. tremulæ, F. Fusco-ferruginous, occasionally light ferruginous, with ashy pubescence, which is much variegated on elytra; head closely, but rather distinctly punctured, rostrum long and slender, shining black, glabrous, curved and striated; antennæ lighter or darker red; thorax transverse, with the sides rounded, broadest a little before middle, rather finely punctured, with a raised central line which is more distinct in front; elytra oblong, scarcely broader at shoulders than thorax; legs stout, lighter or darker red, femora robust and clavate and armed with a strong tooth. L. 4–5 mm.

Male with anterior tibiæ produced into a distinct angle in the middle of their inner side, and the rostrum more distinctly striated; teeth of femora very strong.

Female with the anterior tibiæ almost straight, and the rostrum less distinctly striated; teeth of femora less strong.

On *Populus alba* (White Poplar) and *Populus tremula* (Aspen); rare; Birch Wood, and Swanscombe Wood, near Gravesend, Kent (on young aspens at the end of June); West Wickham (T. Wood); Glanvilles Wootton (Dale); Fordlands, Devon (Parfitt); Bristol; South Wales; Knaresborough, Yorkshire, and near Carlisle (Heysham); the stouter form, broader thorax and more robust legs will separate it from the allied species.

D. tortrix, L. One of the most distinct of all the species; pale testaceous, rather shining, almost glabrous, with thin and scanty uneven pubescence, and not variegated; breast fuscous; head closely punctured, rostrum moderately long, slightly curved, shining, finely striated and punctured; thorax transverse, finely but evidently punctured, with the central line not very distinct; elytra with rather strong punctured striæ, interstices finely punctured; legs pale testaceous yellow with the femora slightly clavate and dentate. L. 5–6 mm.

Male with the antennæ inserted further in front of middle of rostrum, and the teeth of the femora stronger.

On aspens and willows, local but not uncommon where it occurs; Dulwich, Darenth Wood, Caterham, Hampstead, Cowley, The Holt, Farnham, Swanscombe Wood, near Gravesend, &c.; Norfolk; Suffolk; St. Peters, Kent; Glanvilles Wootton; Devon; Bristol; South Wales; Midland districts, widely distributed and found in many localities; Scarborough; Alton, near Manchester; Northumberland and Durham district, Twizell and Durham; Scotland, on aspens and Lombardy poplars, Solway, Forth, Dee, Moray and probably other districts; Ireland, near Dublin and Belfast, and probably widely distributed.

D. hirtipennis, Bedel (*tæniatus*, Brit. Cat., Gyll., Thoms., *nec* F.). Fuscous, or fusco-ferruginous, dull, clothed with rather thick greyish pubescence and with small raised black setæ on the elytra which are plainly visible at the sides; the thorax is either fuscous, or ferruginous, or ferruginous with a fuscous spot in the centre, and the elytra are varie-

gated as in many of the allied species; head thickly punctured, rostrum rather stout and comparatively short, very dull, striated and rugose, and almost straight to the insertion of the antennæ; antennæ red or pitchy red; thorax transverse, closely and rather strongly punctured, slightly narrowed at base; elytra with strongly punctured striæ, interstices very narrow, with the shoulders and a small point before apex with white pubescence; these small spots are however not, or scarcely, distinct from the general variegation; legs red or pitchy red, femora toothed. L. 3–4 mm.

Male with the teeth of the femora stronger and the antennæ inserted a little behind apex of rostrum.

On willows; very local and, as a rule, rare; Birdbrook, Essex, in numbers (ninety specimens were taken by Dr. Power on one occasion, Feb. 16th to 18th, 1868, and I remember his telling me that in collecting them from bark in a marshy place he caught a serious illness, which laid him up for a long time); London district (Stephens); Northampton (Greville and Hamlet Clark); banks of the Bollin, Cheshire, and banks of the Mersey (Chappell); Stretford district, Manchester (Reston); Northumberland and Durham district, Castle Eden Dene (Bold); not recorded from Scotland.

The species may be known from its nearest allies by the rugosely sculptured rostrum, and especially by the black setæ on the elytra, as well as by its smaller size.

D. validirostris, Gyll. Oblong-ovate, black or ferruginous, variegated with greyish spotted pubescence; head finely punctured, rostrum very short, thick, nearly straight, closely and finely punctured, and sparingly pubescent; antennæ ferruginous, with the club fuscous; thorax transverse, abruptly narrowed in front, with the sides dilated and rounded, closely punctured, thickly pubescent at sides; elytra with the shoulders elevated, the sides straight, a little convex above, finely striated, the striæ being closely punctured, in mature specimens pitchy black, but often lighter, with the suture and a band towards the side of the elytra pale red, variegated on disc and more or less at sides with unequal fuscous blotches, interspersed with whitish spots; the outer margins, from the shoulders towards the apex, are, in fresh and mature specimens, often broadly edged with whitish; legs short, robust, ferruginous, sometimes pale rufous; femora clavate, armed with a strong tooth. L. 4–4½ mm.

On *Populus nigra;* very local but not uncommon where it occurs; first taken by Mr. S. Stevens near Hammersmith bridge, and found by him in numbers on the Barnes side, and also taken in profusion by Mr. Walton in the same locality, after a high wind, on the lower branches of poplars, and on the grass and shrubs beneath; Dr. Power once took thirty in Mr. Brewer's garden (I believe, near London); Needwood, Staffordshire (Gorham).

D. maculatus, Marsh (*fumosus,* Steph. Ill.; *tæniatus,* F., *nec* Brit. Cat.). Black or pitchy black, or, as is usually the case in most of the darker species, more or less ferruginous in examples that are not quite

mature; the thorax also is variable in colour, being pitchy black or reddish or reddish with dark markings; upper surface slightly shiny, with ashy pubescence, elytra variegated; rostrum moderately stout, longer than thorax, carinate in middle and striated on each side, but less dull and rugose than in *D. validirostris*; antennæ ferruginous with the club often darker; thorax transverse, rather strongly constricted in front, with the sides dilated and rounded, not very strongly but rather closely and very distinctly punctured, with an indistinct central line, which is more or less plain in front; elytra with rather strong punctured striæ, interstices finely punctured, apex of fifth interstice with a small white patch; legs ferruginous, femora toothed. L. $3\frac{1}{2}$–$4\frac{1}{2}$ mm.

Male with the antennæ inserted nearer the apex of rostrum than in the female.

On willows and sallows; common and generally distributed throughout the kingdom.

V. costirostris, Gyll. (*bituberculatus*, Zett.). This variety has by many authors been considered to be a separate species, but it can hardly be regarded as distinct: it is larger, on an average, than the type form, and has the sides of the thorax gradually dilated from apex to middle and broadest in middle, whereas in the type form it is rather suddenly dilated behind apex and broadest before middle; this character is, however, often hard to perceive; the teeth of the femora are, apparently, a little stronger; Walton, who first introduced *D. costirostris* as British, says that it is very hard to distinguish the species from *D. maculatus*, except by the size and the fact that the latter species appears earlier in the spring and is constantly found on a different food plant, the grey sallow (*Salix cinerea*), whereas *D. costirostris* is found on the aspen (*Populus tremula*); I believe, however, that *D. maculatus* is found at almost any time, and the differences of the food plant certainly cannot be relied upon, and I therefore prefer to follow Bedel in keeping them together. L. 4–5 mm.

On young aspens and sallows; not common; Esher; Darenth and Swanscombe Woods; Kent; Windsor Forest; Rusper; Southsea; Glanvilles Wootton; Coleshill, near Birmingham; Bagley Wood, Oxon; Marple; Agecroft, near Manchester; Northumberland and Durham district, Gosforth Woods, very rare; Walton states that he has "received many specimens of *D. costirostris* from the Rev. W. Little, taken in Scotland, but not accompanied with any of *D. maculatus*; also from Mr. R. N. Greville, who found them rather abundantly on the Lombardy poplar near Edinburgh." Dr. Sharp does not mention *D. costirostris* as Scotch, and it is possible that the records must be referred to the *var. Silbermanni*.

V. Silbermanni, Wenck. This variety differs from the type form in its larger size, less closely punctured thorax, and more strongly toothed femora, and from the *var. costirostris* in its average larger size, wider shape, thicker and shorter rostrum, and the uniform spots on its elytra. L. 5 mm.

On willows and aspens; often under bark in winter; not uncommon; Sheerness, Darenth Wood, Caterham, Dulwich, Forest Hill, &c.; Mr. Crotch remarks that it seems to be abundant with us in early spring, so it is most likely generally distri-

buted, but confused with the ordinary type form; Scotland, common, Solway, Forth, Tay, Dee and probably other districts.

D. affinis, Payk. Black, clothed with thick ashy pubescence, dull, antennæ and legs obscurely ferruginous; rostrum stout, almost straight, scarcely as long as the head and thorax united, rugose and striate, partially pubescent; thorax closely, finely, and somewhat obsoletely punctured, with the sides slightly rounded; elytra variegated with ashy pubescence and ferruginous spots, with a small white callosity before apex; femora with pointed teeth; the species may be distinguished from typical *D. maculatus* by its larger size and much broader form, and from the latter species and its varieties by having the rostrum shorter, thicker, less curved, and evidently pubescent. L. $4\frac{1}{2}$–5 mm.

Male with the antennæ inserted a little behind the apex of the rostrum.

On aspens; very rare; introduced by Walton as British on a single specimen taken by the Rev. H. Clark at the end of May, in an excursion to Gamlinghay, Cambridgeshire; London district and Swansea (Stephens); Glanvilles Wootton, abundant (Dale), but this may be in error, as the species is very closely allied to others; it has a very wide range from Siberia and Northern Europe to Algeria, and there is no reason why it should not occur more commonly in Britain.

D. melanophthalmus, Payk. Oblong, rufo-testaceous, more or less pitchy beneath, clothed with pale ashy pubescence, which is slightly variegated on the elytra; head punctured, pilose; antennæ slender, rufo-testaceous; rostrum longer than the head and thorax together, regularly curved for its whole length, stout, striated and punctured, slightly pubescent, red or brownish; thorax rather broader than long, depressed within apex, much dilated and rounded at sides, thickly punctured; elytra oblong, much broader at shoulders than apex, with distinct punctured striæ, interstices closely punctured; legs moderate, femora clavate, armed with a sharp tooth, which is stronger in the male than in the female; the former sex, also, has the antennæ inserted nearer the front of the rostrum. L. 3–4 mm.

V. agnathus, Boh. (*dorsalis,* Thoms.?). In this variety the elytra are dark at base, the colour extending for a greater or less distance towards apex. L. 3–4 mm.

On sallows (*Salix caprea, cinerea,* &c.); local, but not uncommon where it occurs; Darenth Wood, Weybridge, Woking, Horsell, Sydenham, Tilgate, Esher (in plenty in the latter locality, Sept. 24th, 1870 (Power)); Hastings; Bewdley Forest; Cromer; Northumberland and Durham district, on willows, near Axwell Park; Scotland, local, Solway district.

D. pectoralis, Gyll. (*rufulus,* Bedel). Closely allied to the preceding, from which it differs in being a little shorter and proportionately broader and more convex, and also in having the rostrum almost straight to the insertion of the antennæ and then slightly curved; colour red or yellowish-red; breast brown or blackish; rostrum with the apex fuscous,

plainly pubescent, striate and rugose at base; thorax with the sides moderately rounded, distinctly punctured; elytra elongate-ovate with moderately strong punctured striæ, and with scanty and fine greyish pubescence; legs red, teeth of femora moderate or rather feeble. L. 3–4 mm.

On sallows; local, but rather common where it occurs; Darenth Wood, Whitstable, Sevenoaks, Woking, Coombe, Wimbledon, Sydenham, Esher; Rusper; Dover; New Forest; Glanvilles Wootton; Somersetshire; South Wales; Bewdley, Birmingham district, Mashfield (Leicestershire), Needwood (Staffordshire), and other Midland localities; Langworth Wood, Lincoln; Manchester district; Northumberland and Durham district; Scotland, local, Solway, Clyde, Moray and probably other districts; Ireland, near Dublin.

D. salicinus, Gyll. Elongate, narrow, pitchy black, or more or less ferruginous, variegated, and clothed with whitish pubescence; head small, black, closely punctured; rostrum longer than the head and thorax, rugose-striate, black, with the apex rufous; antennæ ferruginous, with the club black; thorax evidently longer than broad, slightly dilated and evenly rounded at the sides, black, with the anterior and posterior margins rufous, thickly punctured and sparingly pubescent. Elytra long and narrow, scarcely broader at base than thorax, with the shoulders somewhat elevated and the sides straight, punctured striæ distinct, interstices narrow and rugose, pubescence coarse; breast black, thickly pubescent; legs pitchy, or lighter or darker red; colour very variable, presenting all shades from pitchy-brown almost black, to reddish-testaceous; the head, however, is always black. L. 3–3½ mm.

Male with the rostrum shorter and more pubescent than in the female, and with the teeth of the femora stronger.

On willows; rare or rather extremely local; Hoveton, Horning, Norfolk (Power); Horning Marshes, in July or the beginning of August (Curtis); Wicken Fen, Cambridge, in profusion, April 9th, 1863 (Power); Mr. Blatch has also taken it in the latter locality. Scotland, Solway district, common in Dumfriesshire (Sharp).

This and the two following species may be known from the two preceding by their black head, and from *D. hirtipennis* (*tæniatus*), which they resemble in size, by the absence of black raised setæ on the elytra; *D. salicinus* is one of the most distinct of all the species and one of the most easily recognized, by reason of its elongate form, narrow elytra, which are scarcely broader than thorax, and especially by the fact that the thorax is evidently longer than broad, whereas it is plainly transverse or subtransverse in all our other species.

D. salicis, Walt. Oblong-ovate, rufo-ferruginous, with the head, rostrum, and breast black; sparingly clothed with ashy pubescence, and maculated on the elytra; head small, subglobose, thickly punctured, with the forehead channelled, black; rostrum rather thick, as long as the head and thorax, rugosely striate, pubescent, black, with the apex testaceous; antennæ reddish, with the club black; thorax slightly transverse, or almost as long as broad, with the sides dilated and

evenly rounded, closely punctured on the disc, rugosely punctured towards the sides, and with a distinct, smooth, dorsal carina; elytra rather long ovate, with the shoulders a little elevated, the sides dilated and rounded, and with punctured striæ, of which the punctures are close and rather large; legs rather short, entirely rufous or rufo-testaceous; femora armed with a small tooth L. 3–3½ mm.

On sallows; in June; rare; Wimbledon Common on dwarf sallows (S. Stevens); Wimbledon (Power); Coombe (one specimen, June 15, 1862 (Power)); Yorkshire (Walton); Northumberland and Durham district, Hetton Hall, near Belford (W. B. Boyd).

D. majalis, Payk. According to Walton this is the smallest species of the genus, but on the average it does not appear to differ much in size from the two preceding; it is closely allied to *D. salicis*, from which it differs in having the rostrum not channelled, the thorax shorter, and the elytra darker, especially towards base; the colour, however, is very variable and cannot be relied upon, as in *D. salicis* the elytra are sometimes more or less fuscous in front; the rostrum and thorax are also variably coloured, the former being entirely black or partly red, and the latter being dark, or reddish with a black patch, or entirely red; the thorax is slightly transverse, with the sides very little rounded; the rostrum is rather long and stout, rugose, but without channels, and the elytra are variegated as in the allied species; the male has the antennæ inserted further in front of middle of rostrum than in the female, and the teeth of the femora stronger. L. 2–3 mm.

On the catkins of *Salix cinerea, caprea, aurita*, &c., in May and June; rare; a northern species; Northumberland and Durham district, Twizell and Castle Eden Dene (Bold); near Carlisle (Heysham); Scotland, Solway district (Sharp); Walton mentions having received many specimens from the Rev. W. Little, taken by him in Scotland; Stephens (Manual, 235), records it from the London district, but this is evidently in error; he appears to have confused the male of *D. agnathus* with the species (*vide* Waterhouse's Catalogue, p. 75).

In studying this genus it must be remembered that the general colour of the body is extremely variable, the dark species, if immature, being coloured precisely like the lighter ones; this very much increases the difficulty of their determination; in some respects the genus, for its size, is the most difficult of all the British Rhynchophora.

In many of the descriptions and notes on this and other genera I am much indebted to the valuable papers by Mr. Walton, published in the Annals and Magazine of Natural History for 1844.

SMICRONYCHINA.

This tribe, which contains the genus *Smicronyx*, is included by Bedel under the Erirrhinina, but differs in having the tarsal claws connate; in this latter respect it agrees with the Lixina, from which it may be easily separated, apart from the very small size of its members, by

having the eyes almost meeting beneath the rostrum which is slender, or comparatively slender, and much narrower than head; the tibiæ, moreover, are armed with a small tooth at apex, and the tenth stria of the elytra is not continued behind the posterior coxæ.

SMICRONYX, Schönherr.

This genus contains about twenty-five species, which are chiefly found in Europe; others occur in Northern Asia and probably in North America; representatives have also been described from Madeira and the Canaries, South Africa, the Caucasus district, Cuba, &c.; they are among the smallest of the Rhynchophora and may be very easily passed over, so that in all probability the number of species will be found to be much greater than is at present known; they fall, as Bedel observes, into two divisions, which will probably have to be separated as distinct genera: in one of these the striæ of the elytra are obsolete and replaced by almost imperceptible lines of points, and in the other the elytra are plainly striated and more or less thickly clothed with scales which are exceedingly easily abraded; four species have usually been regarded as British, but I do not feel at all sure as to their right determination or their synonymy; they are extremely rare insects, so that it is hard to obtain the material on which to work the genus; through the kindness, however, of Mr. S. Stevens, Mr. Champion and others, I have been enabled to examine some fifty specimens; M. Bedel has also kindly examined several of these for me, and among them he has found two specimens of *S. cœcus*, Reich. (*cuscutæ*, Bris.), which must therefore be added to the British list; at first, after a careful examination with a compound microscope, I came to the conclusion that the specimens standing in our collection as *S. cicur* and *S. pygmæus* were identical; however, after an examination of the specimens named by M. Bedel, I have modified my first impressions and am of opinion that, according to continental ideas, the specimens that we have hitherto regarded as *S. jungermanniæ* should be referred to *S. Reichei*, that *S. jungermanniæ* and *S. cicur* are synonymous, and that the specimens standing under *S. pygmæus* in our collections should be referred partly to *S. Reichei* and partly to *S. jungermanniæ*; in fact, I am not sure whether Curtis' original specimen of *S. pygmæus* is not identical with *S. cœcus*, in which case the latter name must be sunk; the genus is certainly a very puzzling one and the characters of the species ill-defined; the punctuation of the thorax, for instance, is by some authors regarded as a valuable character, but it appears to differ considerably in different specimens of the same species; when quite fresh the insects are covered with large elongate-ovate whitish and brownish scales, which are arranged thickly on the thorax and in double rows on the interstices of the elytra; they are very pretty objects under the microscope and in some lights are plainly iridescent; owing to their size and the

loose way in which they are set on the surface they are exceedingly easily abraded and very soon get rubbed off; specimens from which they have been entirely removed are quite black and more or less shiny, and present a very different appearance to fresh or half-abraded specimens; the species attack various parasitic plants, especially the Greater and Lesser Dodder (*Cuscuta europæa* and *epithymum*); they deposit their eggs in the stem and the larva lives in a sort of gall, from which it emerges and buries itself in the earth before undergoing its transformations.

I. Tarsal claws uneven, the internal claw being very short; thorax finely punctured; elytra oval and shining, usually denuded of scales . . . . . S. CŒCUS, *Reich.*

II. Tarsal claws equal; upper surface usually more or less squamose.

i. Thorax with shallow and rather close punctures, duller, interspaces finely but plainly cross-reticulate; body behind thorax broader. . . . . S. REICHEI, *Gyll.*

ii. Thorax with very shallow and comparatively diffuse punctures, less dull, interspaces more finely and often scarcely evidently cross-reticulate; body behind thorax narrower . . . . . S. JUNGERMANNIÆ, *Reich.* (*cicur*, Gyll.)

S. cœcus, Boh. (*cuscutæ*, Ch. Bris.). Oblong-ovate, black, shining, with scanty narrow scales which are very easily rubbed off; thorax globose, narrowed in front, finely punctured; elytra a little broader at base than thorax, with the shoulders well marked, oval and shining, with fine but distinct striæ and finely sculptured interstices; legs rather stout, claws unequal, the inner one being very short; size variable. L. $1\frac{1}{4}$–2 mm.

On *Cuscuta europæa*; two specimens, both without locality, one in the possession of Mr. Champion from Mr. Scott's collection, and one in my own collection; Bedel gives as localities Northern and Central Europe.

The Greater Dodder (*Cuscuta europæa*), according to Bentham, is parasitic on a variety of plants, more especially on herbaceous stems, in Europe and temperate parts of Asia; it is not very abundant in England, and has not been recorded with certainty either from Ireland or Scotland. The Lesser Dodder (*Cuscuta epithymum*) is parasitic on Thyme, Heath, and other small shrubby plants in Europe and temperate Asia; it is more frequent in England than the Greater Dodder, and extends from the Chesil Beach to the south of Scotland, but is apparently unknown in Ireland; a third species, the Flax Dodder (*Cuscuta epilinum*), has been introduced into Britain with flax, but is not indigenous.

S. Reichei, Gyll. (*pygmæus*, Curt. *pars.*). Oblong-ovate, black, rather shiny, closely covered, in fresh specimens, with whitish and brownish white or brownish scales, which are arranged thickly on the thorax and more or less in patches on the interstices of the elytra;

underside more thickly scaled; rostrum long; antennæ rather stout, pitchy at base; thorax convex, about as long as broad, scarcely constricted in front, with the sides somewhat variably rounded in different specimens, shallowly and rather closely punctured, with the spaces between the punctures cross reticulate or finely rugose; elytra broader at base than thorax, with the shoulders more or less marked, narrowed to apex from posterior third, with plain and rather deep, scarcely visibly punctured striæ, interstices under a high magnifying power finely rugose; legs stout, covered with fine scales, tarsi with the penultimate joint strongly bilobed and the onychium short. L. $1\frac{1}{2}$–2 mm.

On *Cuscuta europæa* (Greater Dodder) and *Cuscuta epithymum* (Lesser Dodder); the larva, according to Bedel, forms galls on the stems of the plant; rare; Birch Wood, Arundel Park, &c. (S. Stevens); Box Hill, near Reigate (Power); Chesil Bank (Gorham); Newton Abbott, Devon (Dale).

V. Championis, Fowler. Rather larger than average specimens of the type, with the rostrum thicker and duller and the thorax more thickly and coarsely punctured; the shoulders also of the elytra are rather more marked and broader. L. 2 mm.

Folkestone (E. A. Waterhouse); between Folkestone and Dover (Champion). This is the insect introduced into our lists by Mr. Champion as the true *S. Reichei*.

S. jungermanniæ, Reich. (*cicur*, Gyll.; *pygmæus*, Curt., *pars.*). Much smaller than the preceding, on an average, but closely resembling it in many respects, so that it is rather hard to separate the largest specimens from the smallest *S. Reichei;* elongate-oval or oblong-oval, narrower or broader (this difference may be sexual), thickly clothed in fresh specimens with large scales as in the preceding species, and on the underside and legs with fine scales; thorax about as long as broad, scarcely constricted before apex, with very shallow and more or less diffuse variolose punctures, interstices very finely cross reticulate or rugose; elytra and legs much as in the preceding species. L. $1\frac{1}{4}$–$1\frac{3}{4}$ mm.

On heath, probably on *Cuscuta epithymum* attacking heath; rare; as some people may not agree with me in my synonymy or in joining the species, I give localities under the separate names—*S. cicur* and *S. pygmæus.*

S. cicur, Gyll. By sweeping heath; local and, as a rule, rare; London district, not uncommon; Weybridge, Shirley, Woking, Esher, and Chobham (Champion); Black Gang Chine, Isle of Wight, Weybridge, &c. (S. Stevens); Boundstone (Surrey), St. Faiths (Norwich), and St. Leonards (Power); Bournemouth; New Forest (Blatch).

S. pygmæus, Curtis. Chalky places; by sweeping herbage; rare; Caterham (Champion); Riddlesdown, near Croydon; Horsell and Weybridge (Power); Chesil Bank; Bournemouth and Surrey (Blatch); it is very probable that some of these localities should be referred to

S. Reichei; all the localities given above for the type form of *S. Reichei* have been primarily assigned by British authors to *S. jungermanniæ*.

TANYSPHYRINA.

This tribe contains the genus *Tanysphyrus*, Schön., of which only one species is at present known; it is very small and lives on aquatic plants, more especially the duckweed (*Lemna*), and is spread over Europe, Northern Asia and North America; it has been by some authors referred to the Erirrhinina, but may easily be distinguished by the very short onychium, which is contained entirely by the lobes of the third tarsal joint.

TANYSPHYRUS, Schönherr.

The single species contained in this genus is a very small insect, which is found on species of *Lemna*; the rostrum is rather long and stout and the antennæ are inserted a little behind its apex; the elytra are rather short and broad and considerably broader than the thorax; the tarsal claws are free and the tibiæ armed with a strong hook at apex; the femora are simple and the prosternum not emarginate.

T. lemnæ, F. Oblong, convex, dull black, underside thickly clothed with whitish scales, rostrum black, shining, antennæ and legs pitchy-red; thorax slightly transverse, with the sides very little rounded, closely and distinctly punctured; elytra oval, with strong punctured striæ, interstices rather convex, upper surface with more or less distinct scattered spots of greyish scales; legs robust and rather long. L. $1\frac{1}{3}$ mm.

In ponds and ditches; on duckweed (*Lemna*); often found in flood refuse, moss, &c.; generally distributed and common from the Midland districts southwards, but rarer further north; Cheshire; Liverpool; Scarborough; not recorded from the Northumberland and Durham district; Scotland, taken probably at Duddingstone Loch, in the Forth district, but recorded with some reserve by Dr. Sharp, who says he does not know what has become of the specimens (Scot. Nat. xxxvi. 189). Ireland, near Dublin.

BAGOINA.

The members of this tribe are very closely allied to the Erirrhinina, and they have, by many authors, been included with them; they differ chiefly in their habits, which are, in all the species, aquatic or subaquatic; they are extremely sluggish and have no power of swimming like the aquatic Ceuthorrhynchina (*Eubrychius* and *Litodactylus*); their only means of locomotion in water, therefore, is to cast themselves free from their plants, like the *Helophori*, and allow the current to carry them; the chief character of the tribe lies in the tarsi, which have the third joint long, or comparatively long, behind the onychium, and

truncate or emarginate at apex, but not (or very rarely, and then not strongly) bilobed; the lobes at the sides of the thorax are distinct and often partially cover the eyes, which are round; the posterior coxæ are very broadly distant; the scutellum is small; the elytra have the shoulders well marked and are usually bluntly produced at apex; the femora are simple; the prosternum is broad before the anterior coxæ and is emarginate at apex; the surface of the body is usually furnished with a hydrofuge tegument, or in simpler language a covering which repels water; three genera have been regarded as British—*Hydronomus*, *Bagous* and *Lyprus*; the latter of these has for some time been united with Bagous, and Bedel appears to be right in also regarding *Hydronomus* as a portion of *Bagous*, as the differences scarcely appear to be generic.

BAGOUS, Schönherr (*Hydronomus*, Schönherr).

About fifty species have been described as belonging to this genus, but as no less than thirty-two have been found in Europe, and it is known that representatives occur throughout Northern Asia and North America, it is probable that the number will be very largely increased; species have also been described from Algeria, South Africa, Cuba, &c.; they are so extremely sluggish and retiring in their habits, which are altogether subaquatic, that they are very seldom met with, so that although no less than fourteen or fifteen species have been recorded as British, they are, with few exceptions, scarcely represented in any collections, and in list after list of localities the genus is returned as almost entirely blank; they are, however, gregarious, and in the localities in which they occur, several of the species have been taken by collectors who have found out their habits, in large numbers; the chief characters of the genus have been mentioned above; in form and general appearance the species greatly resemble one another, and they are in many cases difficult to determine except by comparison with authentic specimens.

The larva of *B.* (*Hydronomus*) *alismatis* has been observed by Kaltenbach; it is found feeding on the leaves of *Alisma plantago* and undergoes its transformations in the part of the plant where the base of the leaf like a sheath enfolds the stem of the plant; the perfect insect appears at the beginning of the summer.

The British species may be roughly distinguished as follows, but the characters, in several cases, are not very satisfactory.

I. Prosternum flat before the anterior coxæ; antennæ with the first joint of the funiculus longer than the second (*Hydronomus*, Schönh.) . . . . . B. ALISMATIS, *Marsh.*

II. Prosternum with an excavation before the anterior coxæ, which is margined on each side; antennæ with the first joint of the funiculus about equal to the second (*Bagous*, i. sp.).

i. Club of antennæ with the first joint glabrous and as long as all the following joints united;

thorax enlarged and rounded behind constriction at apex . . . . . B. PETRO, *Herbst.* (*limosus*, Sharp's Cat.)

ii. Club of antennæ with the first joint pubescent.

1. Third joint of the tarsi not broader than the second and not lobed.

A. Antennæ inserted between the middle and base of rostrum which is longer; form very elongate narrow and parallel; thorax as broad as elytra (*Lyprus*, Schönh.). . . . B. CYLINDRUS, *Payk.*

B. Antennæ inserted between middle and apex of rostrum, which is shorter; form broader; thorax narrower than elytra.

a. Fifth interstice of elytra with a strong pointed prominence towards apex, plainly visible if viewed sideways; length 4½–5 mm.

a*. Third interstice with a warty prominence on its posterior half; first interstice with a small shining callosity at base . . . . . B. BINODULUS, *Herbst.*

b*. Third interstice without distinct prominence on its posterior half; first interstice without callosity at base . . B. NODULOSUS, *Gyll.*

. Fifth interstice simply callose at apex; length 2–4 mm.

a*. Funiculus of antennæ six-jointed (apparently five-jointed); size larger; length 3½–4 mm. . . . . B. ARGILLACEUS, *Gyll.* (*inceratus*, Gyll.)

*. Funiculus of antennæ seven-jointed (apparently six-jointed); size smaller; length 2–3½ mm.

a†. Sides of thorax angularly dilated in front behind constriction at apex, and plainly, although gradually, narrowed towards base; form short and broad . . . . . B. LIMOSUS, *Gyll.* (*petrosus*, W. C.)

b†. Sides of thorax not angularly dilated in front, nearly parallel; form narrower, more oblong.

a‡. Scape of antennæ inserted almost in middle of rostrum; form rather elongate; tarsi long . . . . . B. TEMPESTIVUS, *Herbst.*

b‡. Scape of antennæ inserted considerably in front of middle of rostrum; form less elongate.

*. Anterior tibiæ long, slender and subcylindrical, not distinctly thickened above middle; tarsi rather long . . . . . B. FRIT, *Herbst.*

**. Anterior tibiæ moderately long, rather broad and flat, sinuate on their inner side and thickened above middle; tarsi short.

†. Surface of body distinctly

variegated with light and dark grey; elytra depressed with the alternate interstices raised . . . . . B. LUTULOSUS, *Gyll.*

††. Surface of body not distinctly variegated; alternate interstices of elytra at most somewhat convex.

‡. Form broad and robust; elytra convex; dorsal channel of thorax obsolete . . B. DIGLYPTUS, *Boh.*

‡‡. Form comparatively narrow; elytra scarcely convex; dorsal channel of thorax very distinct . . . . B. BREVIS, *Schönh.*

2. Third joint of tarsi broader than the second, and evidently, although not strongly, bilobed.

A. Body behind thorax narrowed into rather an elongate point at apex; sculpture of elytra finer, third interstice with an ill-defined yellowish patch behind; tarsi red . B. LUTOSUS, *Gyll.*

B. Body behind thorax not strongly narrowed and scarcely inflexed at apex; sculpture of elytra coarser, third interstice with a distinct white patch behind; tarsi red or black. . . . . B. GLABRIROSTRIS, *Herbst.* (*lutulentus*, Gyll.) (*V. nigritarsis*, Thoms.)

B. alismatis, Marsh. Oblong, clothed with ashy-white or greyish yellow scales, which are more even on the under surface; elytra somewhat variegated, with a lighter spot on each behind middle and a somewhat denuded dark patch above and below each of them; rostrum moderately long, almost straight, thickly scaled, glabrous at apex, with a plain central furrow; antennæ ferruginous with the club darker; thorax about as long as broad with the sides subparallel, very slightly rounded, finely granulate, with a fine and distinct central furrow, and lighter spots and often one or two small denuded patches at base; on each side there is a plain transverse impression; elytra rather long, somewhat abruptly narrowed before apex, with fine and distinct punctured striæ and flat interstices; legs long, dark, tibiæ curved and of a red colour; in the male of this and most of the other species the abdomen is impressed at base, whereas in the female it is convex. L. 3–3¾ mm.

In ditches, &c.; on *Alisma plantago* (Water Plantain); rather local, but not uncommon and very widely distributed; Notting Hill, Norwood, Ramsgate, Lee, Wimbledon, Battersea, Forest Hill, Barnes, Rainham; Birdbrook, Essex; Deal; Dover; Hastings; Arundel; Sandown; Portsmouth district; Devon; Bath; Swansea; Bewdley; Repton; Lincoln; Norfolk; Liverpool district; Manchester district (general); Northumberland and Durham district; Scotland, local, Solway, Tweed, Forth and Clyde districts; Ireland near Dublin.

B. petro, Herbst. (*limosus*, Sharp's Cat. *nec* Gyll.). Oblong, black, closely covered with grey scales which are somewhat uneven on the elytra; antennæ with the first joint of the club glabrous, shining, and as long as the following united, funiculus seven-jointed; thorax very short, about half as broad again as long, enlarged in front behind the apical constriction and narrowed behind; ashy grey with the apical border or one or two dark patches on border denuded and dark; elytra dull black, convex, short and thick set, with coarse punctured striæ, fifth interstice without callosity towards apex; femora dark, tibiæ ferruginous or red brown, tarsi pitchy. L. $1\frac{2}{3}$–$2\frac{1}{2}$ mm.

In brackish ditches; on aquatic plants; very local, and, as a rule, rare; Gravesend and Sheerness (Champion); Notting Hill, on several occasions (Power); Hammersmith Marshes (H. S. Gorham); Harwich (J. J. Walker); Southsea, in moss near canal, not uncommon in spring (Moncreaff); Askham Bog, York; Scarborough; it is possible that one or two of these localities ought to be referred to *B. subcarinatus*.

B. cylindrus, Payk. Elongate, very narrow, linear, parallel and subcylindrical, black, thickly clothed with ashy scales; rostrum comparatively long, evidently curved, glabrous in front, funiculus of antennæ reddish; thorax slightly variable, longer than, or about as long as broad, with the sides slightly rounded or almost parallel, very closely granulated; elytra at base about as broad as base of thorax, compressed and somewhat attenuate behind, very finely striated, without callosity before apex; legs long, pitchy, with the tibiæ ferruginous, tarsi nearly as long as the tibiæ, with the third joint equal in length to the preceding; hook at apex of tibiæ long and distinct. L. $2\frac{1}{3}$–3 mm.

In ditches, on aquatic plants; rare, or, rather, extremely local; Notting Hill (one hundred and thirty specimens on October 24 and 31, 1863 (Power)); Hammersmith Marshes (formerly common in a damp bank (S. Stevens)); Gravesend (Power and S. Stevens); London district, on watercresses (Stephens); Lee; Sheppy; Whitstable (Champion); Pett Marshes, near Hastings, 1890 (Ford).

B. binodulus, Herbst. This and the following are the two largest British species belonging to the genus, and may be recognized by their size apart from other differences; oblong, black, closely covered with brownish-grey scales, antennæ, tibiæ and tarsi more or less ferruginous; forehead depressed; rostrum short and thick, moderately curved; thorax about as long as broad, constricted at apex, sides subparallel, with an indistinct central furrow, sculpture very close; elytra subparallel until posterior third, from whence they are rather abruptly narrowed and depressed, with a strong prominent projection on the fifth interstice towards apex, a warty prominence on the third interstice behind middle, and a small shining callosity at the base of the first interstice, near scutellum. L. $4\frac{1}{2}$ mm.

In ditches, &c.; by sweeping aquatic plants and with the water net; very rare; Battersea Fields (Stephens); Sandwich (Sharp and Saunders); Arundel (one specimen, Hamlet Clark); Norwich and Crymlyn Bog, Swansea (Stephens); Fen districts

(Brewer *sec* Crotch); the larva has been found in France living gregariously on the Water Soldier (*Stratiotes aloides*).

B. nodulosus, Gyll. (*binodulus*, Thoms. *nec* Gyll.). Very closely allied to the preceding, which it much resembles in general appearance, but, on an average, rather larger, and distinguished by having a not distinct warty prominence on the third interstice of the elytra behind middle and no small shining callosity at the base of the first interstice near scutellum; the alternate interstices of the elytra are very slightly, and scarcely evidently, raised; the warty prominence on the third interstice, appears, however, to be at all events indicated, and hence probably has arisen the confusion between the two species. L. $4\frac{1}{2}$–5 mm.

In ditches, &c; very rare, but, apparently, less so than the preceding species; Pegwell Bay; Mr. S. Stevens says of the species, "formerly not uncommon in ditches near Arundel, but not taken for years; I used to call it *binodulus*, but am told it is now considered to be *nodulosus*;" Mr. Rye, however (Ent. Monthly Mag. vi 257), says "one of my two exponents of *B. binodulus*, given to me by the late Rev. H. Clark, who took it, I believe, near Arundel, is undoubtedly that species; the other, obtained by Brewer, is as undoubtedly *nodulosus*;" according to these opinions both species occur near Arundel, and it is possible that there is some mistake still to be cleared up; if the species did not approach very nearly to one another, they would not have been for so long kept united in our collections.

B. argillaceus, Gyll. (*inceratus*, Brit. Cat.; *encaustus*, Boh.; *halophilus*, Redt.). Smaller than either of the two preceding species, but larger than any of those that follow; oblong, black, somewhat smooth and shining, densely clothed with olive-grey scales, with more or less indistinct pitchy markings on the elytra, and with a more or less distinct whitish patch between middle and apex; the surface is, however, easily abraded and then appears much darker than in fresh specimens; antennæ reddish with club dark, inserted not far from apex of rostrum which is moderately long; thorax about as long as broad or subtransverse, constricted before apex, with the sides nearly straight, punctuation close and very fine; central furrow obsolete; elytra with rather strong, but indistinctly punctured, striæ; legs comparatively short, more or less ferruginous; the somewhat greasy appearance, broad flattish build and comparatively short legs, as well as its size, will easily distinguish the species from its allies; when quite fresh, the thorax is grey with two large approximated ill-defined spots at base. L. $3\frac{1}{2}$–4 mm.

Brackish ditches; on aquatic plants; often in flood refuse, and (in hot sunny weather) by sweeping herbage on ditch banks; very local and usually rare; Gravesend (Douglas); Southend; Sheerness, occasionally found in profusion (Champion, Power, Walker and others); Lumps Pond, Southsea (Moncreaff).

B. limosus, Gyll. (*subcarinatus*, Sharp's Cat.; *petrosus*, W. C.; *laticollis*, Gyll.). A short and broad species; black, closely covered with grey scales, which are sometimes more or less abraded and leave spots or patches on thorax and elytra; on the latter there is sometimes a very indistinct greyish patch behind middle; antennæ ferruginous with club

darker; thorax broad, angularly dilated in front behind constriction and thence gradually narrowed to base, closely sculptured, with an indistinct central ridge in front; elytra broad, somewhat abruptly narrowed at apex, with coarse punctured striæ; interstices convex; legs dark, rather long, tibiæ and tarsi ferruginous. L. 3–3½ mm.

In ditches, &c.; on aquatic plants; extremely local and, as a rule, rare; Hammersmith Marshes (Gorham); Sheerness (Walker); Notting Hill (Power); Gravesend, in plenty, April 19, 1867 (Power); Woking (Marsh).

B. tempestivus, Herbst. Elongate, rather narrow, black, variegated with ashy and whitish scales; antennæ inserted at about the middle of rostrum, ferruginous with the apex and club pitchy; thorax longer than broad, channelled, not much narrower than elytra, with the scales usually much thicker at sides; elytra elongate, subparallel, narrowed at apex, with the shoulders, a large spot behind middle near suture, a callosity on fifth interstice, and many scattered specks and spots white; punctured striæ fine, alternate interstices very slightly and scarcely visibly elevated; legs dark, tibiæ ferruginous, tarsi elongate, with the second joint plainly longer than broad. L. 2½–3 mm.

In ditches; on aquatic plants; local, but common where it occurs; Tottenham; Barnes; Hammersmith; Notting Hill (abundant 1863 (Power)); Sheerness; Gravesend (in plenty, April 19, 1867 (Power)); Whitstable; Bearsted, near Maidstone; Harwich; Southsea, canal, common in moss in spring (Moncreaff); Robins Wood, Repton.

B. lutulosus, Gyll. Allied to the preceding but evidently broader and stouter, much less, although distinctly, variegated, and with the thorax considerably narrower than the elytra, subtransverse, and plainly rugose; the elytra have the alternate interstices evidently, although not strongly, raised; the tibiæ are shorter and more thickened, and the tarsi are evidently shorter and have the three first joints transverse. L. 2½–3 mm.

Sandy districts; by sweeping herbage in damp places; occasionally in sand pits; rare; Barnes, Ashtead, Shirley, Esher (Champion); Esher, Horsell and Woking (Power); Lumps Pond, Southsea (Moncreaff); Armagh, one specimen in moss from edge of a small lake (Johnson).

B. frit, Herbst. (*subcarinatus*, Gyll., *teste* Bedel). Of the same form as *B. nodulosus*, and, according to Thomson, distinguished from all the other species by having the thorax somewhat broader than long, closely and distinctly and subrugosely punctured, with a channel in the centre, and with a white line on each side; the elytra compressed and acuminate behind and submucronate at apex, with the alternate interstices not raised, and the fifth evidently callose, and with a white spot a little behind middle spreading over the third and fourth interstices; the tibiæ are straight on their outer side and abruptly incurved just at apex; and the tarsi are about half the length of the tibiæ, with the second joint slightly transverse, and not narrower than the third; according to Bedel

the tibiæ are long slender and subcylindrical and the tarsi rather long, and in these lie the chief characters by which it is separated from the following species; there has been some confusion with regard to this insect as the name has been applied to two or three distinct species; it appears to be most closely allied to *B. lutulosus*, from which it differs in its more parallel-sided and proportionately narrower thorax as well as in the shape of the tibiæ. L. $2\frac{1}{2}$–3 mm.

In ditches; on aquatic plants; occasionally in moss on pond sides and by sweeping herbage in damp places; extremely local and usually rare; Sheerness (Walker); Woking (Champion); New Forest; Southsea, common in and near canal (Moncreaff); Isle of Wight (Power); ditches near Sandown, common in April (S. Stevens).

B. diglyptus, Boh. Short and broad, black, thickly clothed with grey scales; head subglobose, with the forehead impressed with a small fovea; rostrum stout and curved; antennæ short, black or pitchy; thorax transverse, obsoletely channelled, with a fovea on each side, constricted at apex, and with the sides straight to base, distinctly and subrugosely punctured; elytra broad, parallel-sided, not strongly compressed and attenuated at apex, with unicolorous pale grey scales, punctured striæ not strong, alternate interstices broader but scarcely evidently raised, fifth interstice obsoletely callose behind; legs short and stout, black with the tibiæ ferruginous, sinuate on their inner side and evidently thickened above middle; tarsi short; the species may easily be known by its short and very broad form, uniform grey colour, rugose thorax, of which the sides are straight behind constriction, sinuate and thickened tibiæ and very short tarsi. L. $2\frac{1}{2}$–3 mm.

In ditches, &c.; very rare; one specimen was taken by Mr. J. T. Harris from accumulated flood refuse in his own garden on the banks of the Trent, near Burton, in April, 1872, and a second was subsequently found by Mrs. Harris crawling on a wall near the same spot; it will probably be found in the neighbouring ditches; the species is very rare on the continent.

B. brevis, Schönh. Much narrower than the preceding species, oblong, black, with the funiculus of the antennæ and the apex of the tibiæ ferruginous; rostrum short and stout; thorax nearly as long as broad, with three foveæ before apex, which are sometimes more or less joined, with a strong central furrow ending in the central fovea, closely sculptured, sides slightly rounded; elytra oblong, narrowed at apex, with rather fine, but distinct striæ, alternate interstices broader, but scarcely visibly raised, fifth evidently callose, third with an oval whitish spot behind middle, which is often more or less obsolete; tibiæ sinuate on their inner side and thickened above middle, tarsi short. L. $2\frac{1}{2}$ mm.

In ditches, on aquatic plants, &c.; rare; it has hitherto only been found in Britain by Dr. Power at Horsell, Surrey; it occurred to him in some numbers in this locality.

B. lutosus, Gyll. Elongate, black, clothed with ashy scales; antennæ, except club, and the legs, red; antennæ inserted considerably

in front of middle of rostrum; thorax not transverse with three light longitudinal lines; elytra strongly contracted and inflexed at apex, with fine punctured striæ and flat even interstices, the fifth evidently callose behind; suture raised behind; tibiæ slender, not thickened on their internal margin above middle, strongly curved at apex; tarsi longer than half the length of the tibiæ, with the third joint evidently broader than the preceding, and plainly, although not strongly, bilobed. L. 3–3½ mm.

In ditches on aquatic plants; very rare; Ripley, Surrey (Stephens); Notting Hill, Oct. 24th and 31st, 1863 (Power)); Southsea, one specimen in canal (Moncreaff); Hertford, Norfolk and Lancashire (Stephens).

B. glabrirostris, Herbst. (*lutulentus*, Gyll.; *collignensis*, W. C.). Oblong, black, with the antennæ, except club, and the legs ferruginous, variegated with grey and whitish scales, each elytron with a very distinct white callosity behind the middle, on the third interstice; rostrum moderately long; thorax scarcely as long as broad, hardly rounded at sides, and not strongly constricted in front; elytra with moderately strong striæ and the alternate interstices evidently broader and more raised, suture not elevated behind; legs long, tibiæ long and curved, tarsi moderately elongate with the third joint broader than second and slightly bilobed. L. 3–3½ mm.

Marshy places; by sweeping aquatic plants; rare, or rather extremely local; Forest Hill and Merton Marsh (Power); London district (Stephens); Southsea, canal, common in moss, spring (Moncreaff); Sandown, Isle of Wight (Champion); Carlisle (Stephens); Scotland, Forth district, "near Edinburgh, Rev. W. Little, Murray's Cat."

V. nigritarsis, Thoms. Thomson considers this variety to be a separate species and describes it as very like the preceding but distinguished by having the thorax a little shorter, slightly dilated at the sides which are narrowed at base, the posterior angles slightly obtuse, the disc more strongly punctured subrugosely, the alternate striæ of the elytra less plainly elevated and the antennæ and tarsi black, the second joint of the latter being also shorter. L. 2½–4 mm.

Two examples have been taken by Mr. Champion at Barnes, which are apparently referable to this variety.

ANOPLINA.

The genus *Anoplus*, which forms this tribe, is very distinct from all the other European Rhynchophora from the fact that the tarsi have no onychium and terminate at the third joint; in other respects the genus is, perhaps, most closely allied to the Elleschina with which it is classed by Thomson.

ANOPLUS, Schönherr.

There are only three species known as belonging to this genus, of which two are found in Britain; one of these, *A. roboris*, so exactly resembles the other, *A. plantaris*, that it has been by several authors

regarded as merely a large female of the latter, and the question still appears to be somewhat doubtful; Dr. Sharp, however, recognizes the species in his second catalogue, and M. Bedel also gives it as distinct, and as recently found in France, in his catalogue; it had apparently not been discovered when he wrote the first part of his work; they are small, deep black, robust, strongly sculptured insects, with stout legs and rostrum, and somewhat resemble in shape small specimens of *Orchestes;* the tibiæ are armed with a strong hook at apex, and the second segment of the abdomen is more than twice as long as third.

I. Size smaller; interstices of elytra rugosely punctured . . A. PLANTARIS, *Naez.*
II. Size larger; interstices of elytra with moderately regular rows of punctures . . . . . A. ROBORIS, *Suffr.*

A. plantaris, Naez. Obovate, convex, black, slightly shining, with the antennæ which are rather short and are inserted in front of middle of rostrum testaceous at base; rostrum rather stout, punctured, eyes scarcely prominent; thorax convex, transverse, with sides narrowed in front, closely and rather strongly punctured; scutellum and sides of breast clothed with white scales; elytra broader than thorax, with shoulders well marked, with strong and crenulately punctured striæ, interstices convex, narrower than the striæ, furnished with very short erect whitish setæ; legs entirely black, femora not thickened. L. 2–2¼ mm.

On young birch, alder, &c., in woods; common and generally distributed throughout England and Scotland; Ireland, Lough Neagh district, &c.

A. roboris, Suffr. Very closely allied to the preceding, but larger, with the thorax more coarsely punctured, the punctures being partly confluent, and the striæ on the elytra less deep, the interstices being in consequence broader and flatter; the interstices, moreover, instead of being rugose, are furnished with tolerably regular rows of punctures, each bearing a short white seta, inclined backwards; the characters, however, seem more distinct in a description than they really are if actually examined. L. 2½ mm.

On alders (*A. glutinosa* and according to Nördlinger *A. incana*); also on oaks; rare; Leith Hill (Champion); Coombe and Swithland Woods (Power); Lords Wood, Southampton (Gorham); Leicestershire (received by Wollaston); Scotland, very rare, on oak (Solway district).

ACALYPTINA.

This tribe is closely allied to the Elleschina but differs in having the tarsal claws simple and the pygidium exposed; both the Acalyptina and the Elleschina are placed by some authors under the Tychiina, from which, however, they differ in the formation of the second segment of the abdomen, which in the last-mentioned tribe has the posterior margin produced at each side and extending over the third segment to the base of the fourth.

ACALYPTUS, Schönherr.

This genus contains only one species which, however, has a very wide range, being found in North America, Northern Asia and Northern and Central Europe; it is very rare in Britain.

A. carpini, F. (v. *rufipennis*, Gyll.). Oval, subdepressed, clothed with shining silvery white pubescence, colour variable, sometimes almost black, but usually dark with the elytra testaceous, at least in part, the portions about scutellum and along suture being more or less fuscous; antennæ and legs always red or testaceous, the former eleven-jointed with a small club which is sometimes darker; thorax scarcely broader than long, much narrowed in front, very little rounded at the sides, closely punctured; elytra much broader at base than the base of thorax, separately rounded at apex and leaving the pygidium exposed, with plainly but shallowly punctured striæ; breast densely pubescent; femora a little thickened in the middle, without teeth; the species closely resembles a small *Gymnetron*. L. $1\frac{5}{4}$–2 mm.

Male with the rostrum shorter and the antennæ inserted before middle; in the female the rostrum is longer and thinner with the antennæ inserted in the middle.

On species of *Salix*; usually found on the catkins in spring; rare; Burwell Fen, Cambridge (Power); Little Brickhill, near Stony Stratford, on sallows, April, 1852 (S. Stevens); near Haileybury (H. Gorham).

ELLESCHINA.

This tribe contains the small genus *Elleschus*, which is closely allied to *Erirrhinus*, but differs in having the tarsal claws armed with a strong hooked tooth at base; the species are small with the antennæ 11-jointed and inserted before the middle of the rostrum which is moderately stout; the eyes are subrotundate and only slightly prominent; the thorax is not constricted at apex; the elytra have the shoulders well marked and completely cover the pygidium, and the legs are rather short and stout with all the tibiæ furnished with a strong spine at apex.

ELLESCHUS, Stephens.

This genus contains three or four species, which live in the larval state in the catkins of willows, sallows and poplars; they are found in Europe and Northern Asia, and one of them extends to the United States; a species has also been described, according to the Munich Catalogue, from New Holland; two occur in Britain, but one of these appears to require further confirmation as indigenous.

I. Rostrum black; elytra black with a denuded dark spot or fascia (sometimes rather indistinct) behind the middle of each, near suture . . . . . E. BIPUNCTATUS, *L.*

II. Rostrum red; elytra red, rather variably denuded in patches or spots . . . . . E. SCANICUS, *Payk.*

E. bipunctatus, L. (*unipunctatus,* Ol.). Oblong-oval, black, very thickly clothed with grey pubescence, with a more or less distinct denuded spot on each elytron behind middle near suture; rostrum black, rather stout, very slightly curved, pubescent at base, antennæ clear red; thorax subtransverse, with the sides somewhat rounded, and narrowed in front, distinctly punctured; scutellum comparatively large; elytra long oval, with distinctly punctured striæ, which are almost as broad as the interstices; legs clear red with the femora black and simple, pubescent, penultimate joint of tarsi broad and strongly bilobed. L. $2\frac{1}{2}$–3 mm.

On sallows and poplars; local, but sometimes common where it occurs; Norwood, Darenth Wood, Shirley, Wimbledon, Forest Hill, Hampstead (common on *Salix cinerea* in Bishops Wood in June); Tilgate; Lords Wood, Southampton; New Forest; Glanvilles Wootton, rare; Knowle, near Birmingham; Bretby Wood, Repton; Burnt Wood, Staffordshire; Langworth Wood, Lincoln; Northumberland and Durham district; Scotland, local, Solway, Tweed and Forth districts; Ireland, near Dublin.

E. scanicus, *Payk.* Oblong, testaceous, unequally clothed with pale cinereous hairs; head round, pitchy-black, thickly punctured; eyes black, depressed; rostrum testaceous, about the same size as in the preceding species, rather smooth, sometimes pitchy at base; antennæ entirely pale testaceous; thorax narrowed in front, a little dilated and rounded at the sides, testaceous, thickly and minutely punctured; elytra scarcely twice as broad as the base of thorax, with the sides subparallel, with deep punctured striæ, and flat, rather smooth, interstices, rufo-testaceous, with a large pitchy-black patch at the base, sometimes, however, extending beyond the middle of the elytra, and sometimes partially broken up by the rufous ground colour, outer margins pitchy; the suture densely, the base and disc sparingly, clothed with pale cinereous hairs; the breast black, densely covered with white hairs; legs rather short, stout, entirely red, pubescent; femora robust, very obsoletely denticulated. L. 3–$3\frac{1}{2}$ mm.

On the female catkins of *Populus tremula* and *alba* and also on *Salix cinerea*; introduced as British by Mr. Walton (whose description of the species is mainly given above) on a single immature specimen taken by Mr. Wollaston in Lincolnshire; it is also recorded in McNab's Dublin list as from Portmarnock; there may, however, be some mistake as to the latter locality.

TYCHIINA.

This tribe is here regarded as containing the three genera *Tychius*, *Miccotrogus* and *Sibinia*, which are very closely allied and are placed together under one genus by Thomson and Bedel and other authors; the species may be recognized by the structure of the second ventral segment which has its apical margin deeply excavate in a broad semicircle, and is produced at each of the margins in a point over the third seg-

ment to the base of the fourth; the antennæ are either 10- or 11-jointed and are inserted in front of the middle of the rostrum; the anterior coxæ are contiguous and the prosternum is not emarginate at apex; the thorax is constricted before apex and rounded and dilated at the sides; the scutellum is distinct; the pygidium is exposed, at all events in the male; the legs are comparatively short and stout; the species are small squamose insects, which are in many cases very prettily variegated; they are found on low plants; the larvæ live in the pods or heads of their food-plant, and in many cases construct galls; they undergo their changes in the earth.

The three genera may be distinguished as follows:

I. Elytra subrectangular at apex of suture, jointly rounded, and usually covering pygidium, at all events in female.	
i. Funiculus of antennæ seven-jointed	TYCHIUS, *Germ.*
ii. Funiculus of antennæ six-jointed	MICCOTROGUS, *Schönh.*
II. Elytra separately rounded at apex, leaving the pygidium, at all events in part, exposed; funiculus of antennæ consisting of six joints	SIBINIA, *Schönh.*

TYCHIUS, Germar.

This is a large and important genus containing nearly a hundred species from Europe alone; it is also widely distributed in various quarters of the world, representatives occurring in Northern and Southern Africa, Northern and Central Asia, North and South America, Cuba, &c.; the species are small and for the most part uniformly coloured grey or yellowish-grey insects; a certain amount, however, are very prettily banded and marked; they are found entirely upon species of *Papilionaceæ*; the larvæ develop themselves in a gall in the pods or capsules of their food plants, but they undergo their transformations underground; the sexual differences are not very striking, but the males may be distinguished from the females by having the abdomen depressed at base, the rostrum proportionately shorter, and their pygidium more projecting; in a few instances there are other slight characters in the male, such as a small tooth on the internal border of the anterior tibiæ, &c.; eleven species are found in Britain; of these the first two are comparatively large and are very pretty and conspicuous insects; the remainder, however, are small and, with one or two exceptions, very much alike and hard to distinguish without careful comparison; the last of them, *T. pygmæus*, Bris., is chiefly known by its minute size; it is, in fact, one of the smallest of all our indigenous Rhynchophora.

I. Posterior femora with a very strong tooth; elytra with the suture white, and with two broad white lateral bands, which are interrupted in the middle and form four patches	T. QUINQUEPUNCTATUS, *L.*
II. Posterior femora with a much smaller tooth or quite simple; elytra without or with uninterrupted bands at sides.	

i. Clothing of elytra consisting of distinct and more or less broad scales.
  1. Thorax and elytra with longitudinal bands of brown and white; scales on elytra not concealing striæ; size larger . . . . . T. VENUSTUS, *F.*
  2. Thorax and elytra clothed with uniform grey scales which, in fresh specimens, conceal the striæ of the latter . . . . . T. SQUAMULATUS, *Gyll.*

ii. Clothing of elytra consisting of fine or hair-like scales or simply pubescent.
  1. Posterior femora toothed beneath.
    A. Thorax with three white lines; elytra at least as broad as thorax, with the suture and the alternate interstices white . . . . . T. SCHNEIDERI, *Herbst.* (*lineatulus*, Brit. Cat.)
    B. Thorax with a single central white line; elytra broader at shoulders than base of thorax; suture with a white band . . . . T. POLYLINEATUS, *Germ.*
  2. Posterior femora not toothed.
    A. Rostrum subulate and bright red from the insertion of the antennæ, which are entirely red or red with the apex ferruginous . . . T. MELILOTI, *Steph.*
    B. Rostrum very feebly and almost imperceptibly narrowed from base to apex.
      a. Elytra grey with a broad and very distinct white band at suture, and with very fine pubescence; antennæ red with the apical portion dark . . . . . T. LINEATULUS, *Steph.*, *nec* Brit. Cat. (*Schneideri*, Brit. Cat.)
      b. Elytra without or with an indistinct light band at suture.
        a*. Antennæ entirely red.
          a†. Clothing consisting of rather fine oblong grey scales, which do not cover the striæ of elytra . . . . . T. JUNCEUS, *Reich.* (*curtus*, Bris.)
          b†. Clothing consisting of grey, yellowish-grey, or brownish-grey pubescence or very fine hair-like scales, which in fresh specimens more or less conceal the striæ of elytra . . . . . T. TOMENTOSUS, *Herbst.*
        b*. Antennæ red with the apical portion black or fuscous.
          a. Length 2–2½ mm.; thorax with the sides more strongly rounded . . . . T. TIBIALIS, *Boh.*
          b. Length 1⅓–1½ mm.; thorax with the sides less strongly rounded . . . . T. PYGMÆUS, *Bris.* (*brevicornis*, Wat.)

T. quinquepunctatus, L. Oblong, convex, black, thickly clothed on the under surface with white scales, and on the upper with purplish brown or golden brown scales, the central lines of thorax, a rather broad sutural band, and a broad band on the side of each elytron (interrupted in middle and forming two patches), being white: occasionally the lateral bands are only deeply emarginate and not

quite divided; antennæ red or ferruginous; thorax with the sides strongly dilated and rounded; elytra with the sculpture concealed by the thick scales; femora black or pitchy red; tibiæ and tarsi ferruginous. L. 3–4½ mm.

Male with the anterior femora furnished with a thick fringe of pubescence beneath.

Female with the last ventral segment of the abdomen strongly impressed transversely at apex.

On species of vetch, &c.; the larva has been observed on the Continent on *Pisum arvense*, *Vicia angustifolia*, *Vicia sepium* and *Orobus tuberosus*; rare; on vetch in a lane at Hampstead, also on vetch near Cambridge (S. Stevens); Abbot's Wood (Waterhouse); South Creek, Norfolk (Stephens); New Forest, Brockenhurst, &c.

T. venustus, F. (*vernalis*, Reich.; *parallela*, Ol.). Rather smaller on an average than the preceding, which it somewhat resembles, but it may be easily known by its duller scales, different markings, and by the very slightly rounded sides of the thorax; oblong, not very convex, black, under surface clothed with white scales, upper surface with dark ashy-grey scales, thorax with the central line and sides, elytra with the suture and bands towards sides, white or whitish, giving the insect a banded appearance; antennæ and extreme apex of rostrum ferruginous; thorax about as long as broad with the sides very slightly rounded; elytra with fine punctured striæ which are not covered by the scales; femora obsoletely toothed, pitchy, tibiæ and tarsi dusky ferruginous. L. 2½–4 mm.

The thorax is always banded but in some specimens the elytra are unicolorous; this is the var. *genistæ*, Boh.

Male with the anterior femora furnished with thick pubescence beneath, and the eyes less distant.

On broom; extremely local, but common where it occurs; Shirley, near Croydon (two hundred specimens on broom, July 2nd, 1866 (Power)); Coombe Wood, Darenth Wood, Cowley, Weybridge, Sittingbourne, Birch Wood; Norfolk, Suffolk and Swansea (Stephens); Scotland, very local, Dee and Moray districts; it probably occurs in other parts of England, but has been overlooked owing to its being so very local.

T. squamulatus, Gyll. (*Kirbyi*, Wat.; *flavicollis*, Steph.?). Oval, slightly convex, black, with the rostrum, antennæ and legs ferruginous, very thickly covered with broad and distinct scales, which are of a grey colour with a very faint yellowish tinge, so that the general tint is slightly cream coloured; thorax subtransverse, narrower than elytra, with the sides slightly rounded, closely sculptured; elytra oval, rather broad, with fine striæ which are almost concealed by the scales; legs squamose, with the posterior femora armed with a small but distinct tooth. L. 2–2⅓ mm.

Male with the anterior tibiæ curved at apex.

Chalky places; by sweeping herbage; occasionally found in moss; the larva feeds in the pods of *Lotus corniculatus*; local, but not uncommon where it occurs; Caterham, Mickleham, Charlton; Suffolk; Eastbourne; New Forest; Barmouth.

T. Schneideri, Herbst. (*lineatulus,* Brit. Cat. *nec* Steph ; *polylineatus,* Wat. *nec* Germ.). Black, upper surface clothed with fine greyish scales which have a slight metallic reflection, thorax with three white lines, elytra with the suture and the alternate interstices white, so that the whole insect appears to be lineated ; underside with broader whitish scales ; antennæ and legs ferruginous ; thorax scarcely transverse, with the sides not strongly rounded ; elytra moderately long, subparallel, about as broad at base as base of thorax, with distinct striæ ; posterior femora with a small tooth beneath. L. 2–2½ mm.

Male with the anterior tibiæ curved at apex and the rostrum pitchy black at base, ferruginous at apex.

Female with the anterior tibiæ straight and the rostrum ferruginous.

Chalky places; on *Anthyllis vulneraria,* very local, but common where it is found ; Croydon, Riddlesdown, Caterham, Charlton, Chatham ; Kingsgate ; Folkestone; Hastings; Isle of Wight (common at the end of April and beginning of May at Ventnor, Sandown, &c., at roots of *Anthyllis* on the cliffs); Portsmouth district ; Falmouth ; Whitsand Bay, Plymouth ; it appears to be confined to the South-eastern and Southern counties.

(**T. polylineatus,** Germ., *nec* Wat. Black, upper surface clothed with narrow grey, somewhat shining and metallic scales, underside with broader white scales ; apex of rostrum, tibiæ and tarsi ferruginous ; thorax with a single central white line, transverse ; elytra broader at shoulders than base of thorax with the suture and alternate interstices white ; posterior femora with an obtuse, more or less obsolete, tooth ; the antennæ have joints 4–8 transverse. L. 2¼–2⅔ mm.

On *Trifolium pratense,* on which the larva produces a gall; introduced as British by Mr. Crotch on the authority of a single specimen taken by him about 1863 at Cambridge and named by M. Brisout ; the species is so closely allied to the preceding that it certainly appears to require further confirmation before being finally regarded as indigenous.)

T. meliloti, Steph. Pitchy-red, densely clothed with fine yellowish-brown or greyish brown scales, underside lighter ; rostrum subulate and bright red in front of the insertion of the antennæ, base pubescent ; antennæ entirely red, or with the club sometimes a little darker ; thorax subtransverse with the sides slightly rounded, unicolorous ; elytra broader than thorax, with the striæ either distinct or more or less covered by the scales, unicolorous or with suture lighter ; femora dark, tibiæ and tarsi rufo-testaceous. L. 2–2⅓ mm.

Male with the anterior tibiæ furnished with a small tooth on their internal margin.

On *Melilotus officinalis* ; local, but common where it occurs ; Highgate, Hammersmith, Forest Hill, Reigate, Charlton, Maidstone, Brockley, Chatham ; Ditchingham, Norfolk ; Suffolk ; Dover ; Hastings ; Portsmouth district ; Isle of Wight, Thorness Bay, Ryde, Cowes, Luccombe, Sandown, &c. (common at the end of April and beginning of May) ; Lyme Regis ; Chesil Beach ; Weymouth ; Trench Woods, Bromsgrove ; Repton, Burton-on-Trent (rare) ; it appears to be almost entirely confined

to the south; the larva has been observed by Perris in France on *Melilotus macrorhiza*, living in a gall on the central nervure of the leaves.

T. lineatulus, Steph. *nec* Brit. Cat. (*Schneideri*, Brit. Cat. *nec* Herbst.). Black or fuscous black, upper surface clothed with grey pubescence, which is not very close and allows the upper surface to be in part visible, so that the insect appears to be of a leaden-grey colour; sides of thorax, and a narrow central line, pale, suture broadly white; antennæ red with the apical portion dark; thorax subtransverse with the sides slightly but distinctly rounded, sculpture close; elytra with rather fine striæ; legs dark with the tarsi ferruginous, tibiæ sometimes reddish. L. $2\frac{1}{2}$ mm.

Male with the anterior tibiæ furnished with a small tooth on their inner margin.

Chalky places; by sweeping herbage, &c.; occasionally found in moss; not common; Darenth Wood; Chatham; Herne Bay; Eastbourne; Arundel Park; Portsmouth district; Isle of Wight; New Forest; Portland; Devon; Filey, Yorks (one specimen taken by myself in August, 1878); Scarborough; it appears to be very rare further north than the London and Southern districts.

T. junceus, Reich. (*curtus*, Bris.). Black, with the upper surface closely covered with rather fine but distinct oblong grey scales, which are whiter on the underside and sometimes on suture of elytra; antennæ and apex of rostrum red; thorax almost as long as broad, with the sides moderately rounded; elytra with fine striæ which are not concealed by the clothing of the upper surface; legs red, with the femora sometimes darker. L. $2–2\frac{1}{4}$ mm.

Male with the anterior femora furnished with a distinct fringe of pubescence beneath.

By sweeping vetch and clover (*Lotus* and *Trifolium*), especially in chalky places; local, but not uncommon where it occurs; Caterham, Mickleham, Claygate, Reigate, Woking, Charlton, Horsell, West Wickham, Charlton, &c.; Hastings; Devon.

T. tomentosus, Herbst. Very like the preceding, but distinguished by having the clothing consisting of narrower scales or pubescence, which in fresh specimens more or less cover the striæ of the elytra; the colour is somewhat variable, being sometimes grey and sometimes brownish grey; the thorax is unicolorous, but the elytra have occasionally a rather lighter line at suture; the antennæ, apex of rostrum, and the legs are red, and the femora are simple; the thorax is as long as broad with the sides moderately rounded, the breadth being a little less than that of the elytra, which are rather broad and somewhat cordiform. L. $2–2\frac{1}{2}$ mm.

Male with the anterior tibiæ slightly curved at apex and without a small tooth on their inner margin.

Chalky and sandy places; by sweeping vetch and other plants; local, but not uncommon where it occurs; Caterham, Claygate, Mickleham, Chatham, Reigate, Purley, Tonbridge, &c.; Windsor; Arundel; Lewes; Portsmouth district; Glanvilles Wootton; Swansea; Suffolk; Knowle, near Birmingham.

There seems to be considerable confusion with regard to the two preceding species, more especially *T. junceus*; I have several specimens of both *T. tomentosus* and *T. junceus* from Dr. Power's collection before me, and the latter insect is smaller and narrower and more grey in appearance than the former, and has the suture of the elytra unicolorous; Thomson, however (Skand. Col. vii. p. 302), speaks of *T. junceus* as broader than *T. tomentosus*, and as having the suture furnished with white scales; he mentions, however, that the femora and rostrum are darker in the former species, which appears to be the case; in some way or other he seems to have confused the two insects, which are certainly closely allied; the descriptions of Schönherr referred to by Thomson (Gen. et Spec. Curc. III. 411, 15 & 412, 17), are very slight and of little practical use in separating the two species.

T. tibialis, Boh. (*nigrirostris*, Wat.). Oblong, convex, black with the antennæ, tibiæ and tarsi red, apex of the former dark; upper side covered with uniform grey pubescence, which is lighter on the underside; rostrum dark, reddish at apex; thorax subtransverse, with the sides rounded, usually with a fine fringe of white hairs at base; elytra rather long, with distinct striæ, which are not covered by the pubescence; femora dark, tibiæ usually more or less infuscate at extreme base. L. 2–2$\frac{1}{3}$ mm.

Sandy places; by sweeping herbage; occasionally in sand pits; not common; Shirley, near Croydon; Weybridge; Southend; Deal; Hastings district; Portsmouth district; Trench Woods, Bromsgrove.

T. pygmæus, Bris. (*brevicornis*, Wat.; *pusillus*, Germ.?). Extremely like the preceding, and chiefly distinguished by its very small size; oblong, convex, black, with the antennæ red at base and dark at apex; underside with fine white scales, upper surface with grey pubescence; rostrum dark; thorax subtransverse with the sides moderately rounded; elytra with distinct punctured striæ, pubescence often thicker on suture; femora dark, tibiæ and tarsi red. L. 1$\frac{1}{2}$–1$\frac{3}{4}$ mm.

On broom and other plants; not common; Weybridge, Claygate, Caterham, Hawkhurst (Surrey), Maidstone, Gravesend, Sheerness; Deal; Hastings district; Portsmouth district; New Forest.

MICCOTROGUS, Schönherr.

Six European species belong to this genus; they differ in no way from the ordinary species of *Tychius* except in the fact that the funiculus of the antennæ is six-jointed; like them they are found on *Papilionaceæ*; our single species is the commonest member of the tribe that is found in Britain.

M. picirostris, F. Oblong, convex, black, with the base of the antennæ and the tibiæ and tarsi ferruginous, apex of the former and

the femora black or fuscous; upper surface clothed with uniform greyish hair-like scales, underside with broader whitish scales; rostrum dark in the male, reddish at apex in female, gradually and slightly narrowed towards apex, not much curved; thorax subtransverse with the sides slightly rounded, not much narrower at base than elytra; elytra with distinct striæ; in appearance the species much resembles *Tychius tibialis*. L. $1\frac{3}{4}$–2 mm.

By sweeping herbage; often found in sand pits, haystack refuse, moss, &c.; it is perhaps more particularly attached to *Trifolium pratense;* common and generally distributed from the Midland counties southwards; much rarer further north; Northumberland and Durham district, very rare, "Marsden, Mr. J. Hardy." Scotland, scarce, Solway, Forth and Moray districts; Ireland, Portmarnock, Waterford, Belfast, and probably widely distributed.

SIBINIA, Schönherr.

This genus is very closely allied to the two preceding; in fact the chief point in which it differs is the shape of the apex of the elytra, which are separately rounded at apex, leaving the pygidium in part at least exposed; as a general rule they are of rather broader form, but this is not always the case; some of the species, as for instance *S. arenariæ* and *S. primitus*, may be easily known by the large darker reddish-brown patch on disc of elytra, reaching backwards from the scutellum, but others are quite uniformly clothed with greyish or yellowish grey scales as in the ordinary small *Tychii;* the femora are always simple and the episterna of the metasternum somewhat broader; the thorax is sinuate on each side at base, and produced into a more or less distinct lobe before scutellum, and has the sides more or less rounded and always narrowed in front; the species are all found on *Caryophyllaceæ*, and may in this way be distinguished by collectors from those of the other two genera belonging to the tribe, which always occur on *Papilionaceæ;* the transformations and the male characters appear to be much the same in all the three genera.

The number of species hitherto known is about fifty or sixty, of which rather more than thirty are found in Europe; the remainder appear to be almost confined to North and South Africa and the Canary Islands; five occur in Britain, of which one requires further confirmation as indigenous.

I. Clothing of upper surface pilose; form broader; length $2\frac{1}{2}$–4 mm.
  i. Upper surface greyish-white or greyish-yellow brown, unicolorous or with alternate longitudinal bands lighter and darker; length 3–4 mm . . . (S. PELLUCENS, *Scop.* (*canus*, Herbst.)
  ii. Upper surface more or less variegated minutely with reddish or yellowish brown and whitish scales; length $2\frac{1}{3}$–$2\frac{3}{4}$ mm. . . . . S. POTENTILLÆ, *Germ.*
II Clothing of upper surface consisting of distinct scales; length $1\frac{1}{3}$–$2\frac{1}{3}$ mm.

i. Elytra with a large common yellowish-brown or brownish spot behind scutellum (usually contracted in middle).
  1. Antennæ and anterior portion of rostrum more or less red; length 2–2½ mm. . . . . S. ARENARIÆ, *Steph.*
  2. Antennæ and anterior portion of rostrum black or pitchy; length 1½–2 mm. . . . . S. PRIMITUS, *Herbst.*
ii. Elytra without a spot behind scutellum; antennæ, rostrum and legs red or ferruginous . . . . . S. SODALIS, *Germ.*

(**S. pellucens,** Scop. (*canus*, Herbst.). Ovate, broad, black, upper surface clothed with greyish-white or greyish-yellow brown pubescence or hair-like scales, underside with white pubescence; antennæ pitchy at base, black towards apex; rostrum stout, slightly curved, punctured, pubescent from base to the insertion of the antennæ and from thence glabrous; thorax shorter than its breadth at base, narrowed in front, sinuate at base, closely sculptured, often with a lighter central line; elytra scarcely broader at base than thorax, with the shoulders elevated and rounded, and with narrow and obsoletely punctured striæ, interstices flat, alternate ones sometimes lighter; legs stout, pubescent, black with the claws red, femora not toothed. L. 3–4 mm.

On *Lychnis dioica;* the larva undergoes its transformations in the seed capsules; very rare; two specimens were taken by Mr. Sidebotham early in June, 1864, by sweeping in a lane between Devizes and Poltern, and another about the same time by Mr. Edleston at Knutsford, near Bowdon, in Cheshire.)

S. potentillæ, Germ. Broad oval, black, upper surface thickly clothed with narrow piliform fawn coloured or reddish brown scales, variegated minutely with whitish scales, underside with broader whitish scales; antennæ dark, pitchy at base with the club globose ovate; rostrum gradually narrowed in front, slightly curved; thorax mostly ferruginous, with the central line and sides lighter, transverse, with the sides rather strongly rounded, and much narrowed in front, closely sculptured; elytra broad and ample, rather wider at base than base of thorax, sometimes almost unicolorous, but usually with the shoulders and a sutural band lighter; legs dark or pitchy-red, pubescent. L. 2½–2¾ mm.

Sandy places; on *Spergula arvensis*, &c. (the Corn Spurry); local, but not uncommon where it occurs; Weybridge, Shirley, Woking, Esher, Caterham, Ripley, Wimbledon, Ashtead, Birch Wood, Belvedere, Horsell, Byfleet; Windsor; Ashwicken, Cambridge; Brighton; Shirley Warren, Southampton (abundant, Gorham); Portsmouth district (Moncreaff); Kidderminster (Blatch).

S. arenariæ, Steph. Oblong-ovate, black, with the base of the antennæ, apical portion of rostrum, tibiæ and tarsi reddish; upper surface thickly clothed with greyish-yellow scales, underside with a thick crust of whitish or greyish white scales; rostrum rather long, moderately curved, thorax about as long as its breadth at base, almost conical, constricted before apex, with two broad irregular reddish-brown or

yellowish-brown bands which meet, or almost meet, in front; elytra with a large common spot of the same colour behind scutellum, which reaches at least to middle, and is usually contracted in middle and more or less dumb-bell shaped; striæ fine, concealed by the scales; legs squamose or pubescent. L. 2–2½ mm.

Sandy places near the coast; very local, but sometimes in great abundance where it occurs; on and at the roots of *Arenaria maritima*; Sheerness; Harwich; Hastings district; Portsmouth district, Southsea; New Forest; Lymington Salterns (in profusion at the roots of *Arenaria* at the end of August in hot sun after a thunder shower); Isle of Wight, Black Gang Chine, Chale, Ventnor; Chesil Beach; Devon; it is sometimes found at the roots of grass in September and October.

S. primitus, Herbst. Extremely like a small specimen of the preceding, which it resembles in the general colour and in the markings of the thorax and the elytra; it may, however, be known by its narrower and considerably smaller form, and by having the whole of the antennæ and rostrum black or pitchy-black; if we compare ordinary specimens of both species, the scales of *S. primitus* appear to be darker and more coppery, whereas those of *S. arenariæ* are of a more greyish-yellow tint. L. 1½–2 mm.

Sandy places; by sweeping herbage; often found in sand pits and in moss; very local; London district, not uncommon, Norwood, Shirley, Esher, Mickleham, Birch Wood, Horsell, Caterham, Wimbledon, Ashtead, Chatham, Maidstone, Sheerness, Dartford; Ashwicken, Cambridge; Dover; Hastings district; Southsea; Shirley Warren, Southampton; Glanvilles Wootton; Yardley, near Birmingham (Blatch).

S. sodalis, Germ. (*cretaceus,* Bris.; *statices,* Moncreaff). Oblong-ovate, black or dark ferruginous, densely and entirely clothed, when fresh, with short and rather broad scales which are greyish-brown with a slight reddish tinge, especially on thorax, and with an indistinct sutural and a still more indistinct humeral line composed of slaty-grey scales, which are also scattered about the elytra; the scutellum is greyish-white and the legs, rostrum and antennæ more or less ferruginous; underside with whitish-grey scales; rostrum moderately long, curved; thorax transverse, with the sides rounded, constricted before apex; elytra a little broader than base of thorax, with fine punctured striæ (which are more or less hidden by the scales), interstices flat, with rows of short white setæ. L. 2–2½ mm.

In flowers of *Armeria vulgaris*; very local; taken in plenty at the Island of Portsea by Mr. Moncreaff, who discovered it in the summer of 1866.

GYMNETRINA.

The Gymnetrina, like the Cionina, may be distinguished by having the funiculus of the antennæ composed of five joints; from the latter tribe they may be known by the formation of the ventral segments of the abdomen and the fact that the pygidium is more or less exposed;

Thomson includes *Acalyptus* in the tribe, but it is evidently distinct by reason of its 7-jointed funiculus; the species are small inconspicuous insects, of oval, oblong-oval, or cylindrical form, and are found on various low plants; the larvæ live in the stems or flower heads and in some cases form galls.

I. Anterior coxæ distant; tarsal claws free . . . . . MIARUS, *Steph.*
II. Anterior coxæ contiguous; tarsal claws connate.
  i. Form ovate or oblong-ovate; posterior coxæ broadly distant . . . . . GYMNETRON, *Schönh.*
  ii. Form cylindrical; posterior coxæ less broadly distant MECINUS, *Germ.*

MIARUS, Stephens.

The species of this genus are rather broad black insects, with grey pubescence; they closely resemble the larger and broader species of *Gymnetron* (belonging to Stephens' genus *Rhinusa*), but differ in having the anterior coxæ distant, the tarsal claws free, and the prosternum excavate before the anterior coxæ and excised at apex; the rostrum is received in a pectoral groove; the larvæ live in the capsules of Campanulaceæ or of *Linaria*, and usually form a more or less distinct gall: in the males the rostrum is shorter and duller than in the females; about a dozen species have been described as belonging to this genus, of which eight are found in Europe and the remainder occur in South Africa and Persia; of these four are usually regarded as British, but one of these, *M. micros*, is exceedingly rare, and only two indigenous examples have hitherto been recorded.

I. Striæ of elytra distinct; average size larger.
  i. Form short and broad, rotundate-oval; elytra with at least two rows of hairs on each or on most of the interstices.
    1. Posterior femora not toothed; pubescence of elytra very short and close; male with the last ventral segment of the abdomen excavate behind and terminated by two teeth . . . . . M. CAMPANULÆ, *L.*
    2. Posterior femora angled and toothed on their inferior margin; pubescence of elytra coarse and somewhat raised; male with the last ventral segment of the abdomen simple . . . . . M. GRAMINIS, *Gyll.*
  ii. Form somewhat elongate, oblong-oval; elytra with one row of hairs on all the interstices beginning from the third . . . . . M. PLANTARUM, *Germ.*
II. Striæ of elytra indistinct; average size smaller; posterior femora not toothed . . . . . (M. MICROS, *Germ.*)

M. campanulæ, L. Ovate, short and broad, slightly convex, black, clothed with short depressed whitish-grey hairs, which, on the elytra, are arranged in more or less distinct rows; rostrum elongate; antennæ black, pitchy at base, with the second joint of the funiculus twice as long as the third joint; head and thorax very closely punctured, the latter transverse with the sides rounded and strongly narrowed in front; elytra at base a little broader than base of thorax with regular punctured

striæ, interstices rugose; legs black, posterior femora not toothed. L. $2\frac{1}{2}$–3 mm.

Male with the last ventral segment of the abdomen deeply excavate and terminated by a tooth on each side; anterior tibiæ armed with a large hook.

Female with the pygidium impressed with a small fovea at apex; and the anterior tibiæ armed with a small hook.

On the flowers of *Campanula rotundifolia* and *C. glomerata*; also on species of *Phyteuma* (Rampion); the larva undergoes its transformations in the seed-pods; local; London district, rather common; Barnes, Shirley, Esher, Caterham, Croydon, Mickleham, Gomshall, Boundstone, Sandhurst; Norfolk; Arundel; Portsmouth district; New Forest; Isle of Wight; Dorset; Gloucester; Bromsgrove; Carlisle; Scotland, rare, Dee district.

M. graminis, Gyll. Very like the preceding in size and general appearance; it is, however, somewhat rounder and is very easily distinguished by the shorter thorax, strongly toothed posterior femora (the anterior and intermediate pairs being less strongly toothed), and the much coarser pubescence, which is somewhat raised on the elytra and at the sides of the thorax; the rostrum is long and gently curved, and the antennæ are pitchy with the base pitchy ferruginous; head and thorax very closely and evenly, and rather strongly, punctured, the latter much broader than long, almost semicircular; elytra with distinct punctured striæ, and flat, somewhat rugose, interstices; legs black, pubescent; last ventral segment of abdomen simple in both sexes. L. $2\frac{1}{2}$–$3\frac{1}{2}$ mm.

Chalky hill sides; in the flowers of *Campanula glomerata;* very local, but occasionally common where it occurs; Cuxton, Kent; Mickleham; Devil's Ditch, Cambridgeshire (Power); Arundel (S. Stevens); Isle of Wight, Freshwater (S. Stevens & Gore); Ripley, Hertford and Cambridge (Stephens).

M. plantarum, Germ. In size and general appearance this species much resembles the preceding, but may at once be known by its longer, narrower and more oblong form, the sides of the elytra being subparallel until near apex; the longer thorax will easily separate it from the preceding species, and from *M. campanulæ* it may be known by its coarser and more raised pubescence, and the small tooth on the posterior femora; rostrum gradually narrowed in front, moderately long; thorax elongate, subconical, about as long as, or longer than, its breadth at base; elytra with strong punctured striæ and rather narrow distinctly sculptured interstices; legs black or pitchy black. L. $2\frac{1}{2}$–3 mm.

On *Linaria vulgaris, Lotus,* &c.; very local, but not uncommon in some districts; London district, not uncommon, Shirley, Caterham, Mickleham, Darenth, Cowley, Greenhithe, Dartford; Wrabness and Birdbrook (Essex); Wicken Fen; Littlington and Ashwicken, Cambridge (taken by Dr. Power on one or two occasions in apple trees, in November and January, hybernating); Norfolk.

(**M. micros,** Germ. Allied to the three preceding species, but distinguished by having the striæ of the elytra indistinct, and the average size smaller. Mr. Crotch describes the species as follows:—

"Subovate, thickly clothed with cinereous hairs; rostrum slightly arcuate; thorax thickly punctured; elytra obsoletely punctate-striate; femora unarmed. L. 2–2⅔ mm." ; the following is Thomson's description: "Broadly obovate, slightly convex, clothed rather sparingly with depressed ashy hairs which are arranged in rows on the elytra, black; elytra strongly (*sic*) punctate-striate; femora not stout, simple; rostrum not very elongate; antennæ with the third joint scarcely one and a half times as long as fourth. L. 2–2½ mm.," and he adds, "very like the preceding (*M. campanulæ*) in general form and pubescence, but smaller, with the rostrum shorter, very slightly narrowed at apex, and with the third joint of antennæ one and a half times as long as fourth" (whereas in *M. campanulæ* it is twice as long); it may also be known by not having the pygidium impressed in the female.

According to Perris the species occurs on the Continent on *Helianthemum guttatum* in dry places; two specimens only have been recorded as British; they are mentioned by Mr. Crotch (Entomologist i. 220) as having been captured by Mr. T. V. Wollaston at Whitsand Bay, Cornwall, and as being easily distinguished from *M. campanulæ* by the lightly striated elytra; the insect, however, has not been found either before or since, and requires further confirmation as indigenous.)

GYMNETRON, Schönherr (*Rhinusa*, Stephens, *pars.*).

According to the Munich catalogue this genus contains fifty species, but in the European catalogue forty-seven are described from Europe alone, so that a considerable proportion must have been comparatively recently added, as representatives have been described from North and South Africa, Central Asia, India, &c.; Bedel includes *Mecinus*, which is, however, better regarded as a separate genus; the species certainly bear a close relation to *Gymnetron*, but have quite a different facies; certain of the species belonging to the last named genus are very like the members of the genus *Miarus*, from which they differ in having the tarsal claws connate, the anterior coxæ contiguous, and the prosternum simple; nine species are known as British which fall naturally into two groups, one consisting of the three comparatively large and broad species which closely resemble our species of *Miarus*, and the other of much smaller species, which are in some cases more or less variegated in colour.

The larvæ undergo their transformations in the capsules of various plants (*Veronica, Matricaria, Linaria*, &c.), and in many instances form galls. The sexual differences are usually marked; as a general rule the females have the rostrum less pubescent, more shining, and longer than it is in the males, and in the latter sex the anterior femora are, in several species, more or less dentate, whereas in the females they are simple or almost simple; the abdomen, moreover, in the males is more or less plainly impressed at base.

I. Third stria of the elytra joined to the eighth behind; form smaller and narrower.

i. Thorax with a broad and sharply defined border of scales; lateral pieces of the breast clothed with broad white or yellowish scales.
  1. Elytra ferruginous with suture darker; breast completely covered with scales . . . . . G. VILLOSULUS, *Germ.*
  2. Elytra black, rarely with reddish markings; breast pubescent with the exception of the side pieces . . . . . G. BECCABUNGÆ, *L.*

ii. Sides of thorax (and the whole upper and under surface of the insects) clothed with fine grey hairs or hair-like scales, which do not form a distinct border, and are sometimes undistinguishable from the general pubescence.
  1. Tarsi black.
    A. Tibiæ black; elytra with the sides parallel and the striæ finer; size smaller . . . . . G. MELANARIUS, *Germ.*
    B. Tibiæ red; elytra with the sides rounded, and the striæ coarser; size larger . . . . G. ROSTELLUM, *Herbst.*
  2. Tibiæ and tarsi red; claws black.
    A. Elytra dark with grey pubescence and with or without a large and rather obscure reddish spot towards apex; anterior femora toothed in the male . . . . . G. PASCUORUM, *Gyll.*
    B. Elytra dark with grey pubescence, with more or less distinct waved reddish bands and markings; anterior femora simple in both sexes . . . . . G. LABILIS, *Herbst.*

II. Third stria of elytra joined to the sixth behind; form larger and broader (facies of *Miarus*). (*Rhinusa*, Steph.).

i. Rostrum abruptly subulate from insertion of antennæ . . . . . G. ANTIRRHINI, *Payk.* (*noctis*, Brit. Cat.)

ii. Rostrum not subulate, gradually narrowed in front.
  1. Intermediate and posterior femora strongly toothed; rostrum feebly curved . . . . . G. COLLINUS, *Gyll.*
  2. Intermediate and posterior femora without distinct tooth; rostrum scarcely curved . . . G. LINARIÆ, *Panz.*

G. villosulus, Gyll. Black, elytra ferruginous, with the suture more or less broadly darker, breast and sides of thorax thickly covered with scales, which are of a greyish yellow or slightly reddish colour; rostrum moderately long and scarcely curved, antennæ pitchy with a large club; thorax transverse, with the sides rounded, and narrowed in front, closely but distinctly punctured; elytra broader than thorax, with the shoulders well marked, clothed with recumbent silky pubescence, punctured striæ moderately distinct, interstices flat, very closely punctured; femora dark, tibiæ and tarsi red, the latter sometimes pitchy. L. 2–2¾ mm.

Marshy places; on *Veronica anagallis* (Water Veronica); very local and not common; Notting Hill and Hammersmith (formerly); Esher; Raynham, Norfolk; Deal; Arundel; Knowle, near Birmingham; Repton, Burton-on-Trent (on water-nasturtium, W. Garneys); Scotland, very rare, Tweed district.

G. beccabungæ, L. (*v. veronicæ*, Germ.). Black, with the lateral pieces of the breast and the sides of thorax (occasionally the greater part of the latter), clothed with thick whitish or yellowish white, sometimes reddish, scales, rest of the upper surface scantily pubescent; antennæ dark ferruginous or red at base; rostrum narrowed in front, scarcely curved; thorax transverse, with the sides rounded and narrowed in front, closely punctured; elytra at base a little broader than base of thorax, with distinct punctured striæ, interstices flat, evidently punctured; legs dark, or more or less red, very variable. L. 2 mm.

Male with the antennæ inserted a little further in front of middle of rostrum than in female.

In the type *G. beccabungæ* the legs should be entirely red; whereas in the var. *veronicæ* the femora should be black, but this distinction cannot hold good; according to Thomson (Skand. Col. 312) *G. veronicæ*, which he regards as a separate species, is distinguished from *G. beccabungæ* (in which insect the thorax is entirely covered with scales or "yellowish white tomentose pubescence"), by having the thorax denuded in the middle, the femora black, the thorax evidently broader (*sic*) at base than the elytra and narrowed towards apex, and the elytra with the striæ a little more strongly punctured, the interstices being subseriately punctured; it is also smaller. L. $1\frac{1}{2}$ mm. The species, however, cannot be regarded as distinct as the insect is so variable, and there appears to be no constant variety even.

Marshy places; on *Veronica beccabunga* and *Scrophularia aquatica*; local but not uncommon in some districts; Hammersmith, Shirley, Claygate, Mickleham, Caterham, Woking, Ripley, Esher, Cowley, Cowfold, Colney Hatch, Birdbrook, Eastry, Maidstone, Dartford, &c.; Dover; Arundel; Portsmouth district; New Forest; Glanvilles Wootton; Plymouth; Portishead; Aylsham, Norfolk; Whatcote; Salford Priors; Bewdley; Coleshill; Repton, Burton-on-Trent; Manchester; Heysham, near Lancaster; Northumberland and Durham district, widely spread but not abundant; Scotland, local, Solway, Tweed, Forth and Tay districts.

G. melanarius, Germ. (*intaminata*, Steph.). Oblong, deep black, upper and under surface with scanty greyish pubescence; rostrum moderate, narrowed in front, somewhat rugose; antennæ pitchy or reddish; thorax transverse, with the sides rounded, closely sculptured; elytra parallel-sided, with shallow, but distinctly punctured striæ, interstices finely punctured; legs black; the small size, shape and black legs will easily distinguish the species. L. $1\frac{1}{3}$ mm.

By sweeping herbage, in woods, lanes, &c.; on *Veronica*; Von Heyden mentions it as attached to *Veronica Teucrium* in Germany; very local; London district, not uncommon, Caterham, Mickleham, Claygate, Shirley, Horsell, Darenth and Birch Woods, Dorking, Faversham, Sevenoaks, Chatham; Cambridge; Ashwicken; Suffolk; Folkestone; Hastings district; New Forest; Swansea (doubtful); Gloucester; Stratford-on-Avon; I know of no localities further north.

G. rostellum, Herbst. Oblong-ovate, black, with the base of the antennæ and the whole of the tibiæ red, clothed with erect black and whitish setæ which are very distinct at the sides of thorax in front

and are arranged in rows on the elytra; thorax rather small, transverse, with the sides rounded and narrowed in front, closely punctured; elytra considerably wider than thorax, with rather deep punctured striæ and the interstices punctured in rows; femora not very stout, simple. L. $1\frac{1}{4}$–2 mm.

Damp places, by sweeping *Matricaria*, *Achillea*, and other plants; rare; Weybridge, Claygate, Caterham, Forest Hill, Faversham, Lee, Dorking, Birch Wood, Chatham, Shirley; Windsor Forest; Hastings district; New Forest; Scotland, very rare, Forth district "near Edinburgh, Dr. Lowe," Murray's Cat.; there may be some mistake as to the latter record. The species may easily be known by its size and shape, the erect setæ and the colour of the tibiæ.

G. pascuorum, Gyll. This species much resembles at first sight one of the smaller species of *Tychius;* black, with or without an obscure variable reddish patch towards apex of elytra, rather closely covered with fine grey pubescence, which is thicker at the sides of thorax than on its disc; rostrum curved; antennæ dark, with the base red, or red with apex dark; thorax not much broader than long, narrowed in front, with the sides scarcely rounded, closely and finely, but distinctly punctured; elytra a little broader than thorax, with moderately deep punctured striæ, interstices furnished with rows of erect white setæ; femora rather stout, black, tibiæ and tarsi red, the latter with the claws and apex of onychium pitchy. L. $1\frac{1}{2}$–$1\frac{3}{4}$ mm.

Male with the antennæ inserted a little behind the middle of the rostrum which is short, and with all the femora armed with a small sharp tooth.

Female with the antennæ inserted at the posterior third part of the rostrum which is long and slender, and with all the femora simple.

Chalky and sandy places; by sweeping herbage; according to P. Bargagli (quoted by Bedel) the larva has been found in the seed heads of *Plantago lanceolata;* local but not uncommon and widely distributed from the Midland districts southwards; Weybridge, Claygate, Caterham, Sevenoaks, Tunbridge Wells; Pegwell Bay; Deal; Folkestone; Hastings district; Portsmouth district; New Forest; Isle of Wight; Glanvilles Wootton; Devon; Bewdley; Repton; Church Stretton, Cheshire; Sherwood Forest; Heysham, near Lancaster; very rare towards the north; not recorded from the Northumberland and Durham district; Scotland, very rare, Tweed district only.

G. labilis, Herbst. (*tricolor*, Marsh). Oblong, slightly ovate, black, upper surface clothed with rather scanty ashy white pubescence, which is thick upon the scutellum and in fresh specimens on a spot at base of thorax opposite scutellum; elytra with two oblique and irregular reddish transverse bands, interrupted at suture, and variable; rostrum scarcely curved; antennæ ferruginous with apex darker, club large; thorax transverse, with the sides rounded and only slightly narrowed in front, closely punctured; elytra scarcely broader at base than base of thorax, with deep and rather close striæ, interstices finely rugose; femora stout, without teeth, dark, tibiæ and tarsi red; occasionally the elytra are dark with the apex only red. L. 2–$2\frac{1}{2}$ mm.

By sweeping herbage, in woods, on chalky hill sides, &c.; local, but not uncommon where it occurs; Dorking, Chattenden, Chatham; Norfolk; Suffolk; Ashwicken and Littlington, near Cambridge; Folkestone; Hastings; Arundel; Holm Bush, Brighton; Portsmouth district; Glanvilles Wootton; Leicestershire; North Wales; Scarborough; Mabberley, Cheshire, rare, Morecambe, common (Chappell); Heysham, near Lancaster; Northumberland and Durham district; Scotland, scarce, Solway, Tweed, Forth and Clyde districts; Ireland, Armagh, rare (Rev. W. F. Johnson); the species appears to be very rare in the Midland counties.

G. antirrhini, Payk. (*noctis*, Brit. Cat.). This and the two following species much resemble in general appearance the species of *Miarus*, but may easily be known by the shorter rostrum; oblong-ovate, black, densely clothed with short erect greyish and whitish pilose pubescence; rostrum short and straight, abruptly subulate from the insertion of the antennæ; antennæ pitchy; thorax transverse, with the sides rounded and narrowed in front, closely sculptured, almost granulate; elytra broader at base than base of thorax, with distinct punctured striæ, interstices flat, finely rugose; femora gradually thickened, posterior pair obsoletely toothed. L. $2\frac{1}{2}$–3 mm.

On *Linaria vulgaris*; very local, but often common where it occurs; Mickleham, Birch Wood, Dartford, Crohamhurst, Chatham; Bushey; Norfolk; Brandon, Suffolk; Ashwicken, near Cambridge; Birchington; Deal; Hastings; Brighton; Portsmouth district; Shirley Warren, Southampton (abundant, Gorham); Portland; Glanvilles Wootton; Devon; Repton, Burton-on-Trent, in flood refuse, Twyford Road (W. Garneys). Ireland, near Dublin; it has not been recorded from the north of England or from Scotland.

G. collinus, Gyll. Broad, oblong, slightly ovate, thickly clothed with coarse fulvous grey pubescence, which is arranged in more or less distinct rows on elytra; rostrum rather short, feebly curved, not subulate at apex; antennæ reddish with the apex dark; thorax very transverse, with the sides rounded, closely punctured, with a more or less distinct raised central line; elytra scarcely broader at base than thorax, with rather strong punctured striæ, interstices flat, rugose; legs black or pitchy, intermediate and posterior femora strongly toothed, anterior femora with much smaller teeth. L. 3–4 mm.

On *Linaria vulgaris*; the larva undergoes its metamorphosis in a gall at the roots of the plant; apparently very rare; Charlton pits, Kent (S. Stevens); in Dr. Power's collection there are two specimens from Mr. Walton's collection, and it has also I believe been taken by Mr Scott, but I do not know the localities. Mr. Waterhouse refers the *Rhinusa collina* of Stephen's Manual (p. 218), recorded as taken in Yorkshire, to *G. pascuorum*, but the description appears to accord with the present species.

G. linariæ, Panz. Extremely like the preceding but very easily distinguished by the fact that the femora are simple and not furnished with teeth and by the greyer pubescence; broad, oblong, slightly ovate, somewhat depressed, black, scantily clothed with grey pubescence, which is more distinct on the interstices of the elytra; rostrum scarcely curved; thorax short, very transverse, with the sides rounded, scarcely narrower at

apex than at base, closely punctured; elytra subparallel, with rather strong punctured striæ, interstices closely rugose; antennæ pitchy with apex black; legs pitchy; in both this and the preceding species the antennæ are inserted further in front of the base of the antennæ in the male than in the female, and the abdomen is impressed at base. L. 3–4 mm.

On *Linaria vulgaris;* rare; Charlton Pits, Kent (S. Stevens); Norfolk (Stephens); Scotland, very rare, Forth district, "Dalmeny Park, Dr. Greville," Murray's Cat. Dr. Sharp is however of opinion that this record may apply to *M. campanulæ;* Dr. Power's specimens were partly bred by Mr. Rye and partly obtained from Mr. E. Brown of Burton-on-Trent.

MECINUS, Germar.

This genus comprises seventeen species of which fourteen occur in Europe, and the other three have been described from Algeria, Egypt and Ceylon; they are extremely closely allied to *Gymnetron*, from which they differ in their longer and more cylindrical form and in having the posterior coxæ less broadly distant and the sutural angles of the elytra less rounded; in fact they have by some authors been included under the last mentioned genus, but their facies is so different that it seems best to keep them apart; our three species are attached to species of *Plantago* and the larvæ undergo their transformations in galls which they form in the seed-heads of the plant; in the males the rostrum is shorter and the antennæ are inserted in the middle, whereas in the females it is longer and the antennæ are inserted a little behind middle.

I. Elytra without lighter border; tibiæ black.
  i. Rostrum comparatively long and slender and strongly curved; elytra more cylindrical and duller, with the striæ deeper . . . . . M. PYRASTER, *Herbst.*
  ii. Rostrum short and thick and scarcely curved; elytra less cylindrical and more shining, with the striæ shallower . . . . . M. COLLARIS, *Germ.*
II. Elytra with a broad light border; tibiæ red . . M. CIRCULATUS, *Marsh.*

M. pyraster, Herbst. Elongate, convex, subcylindrical, black, slightly shining, clothed with scanty and fine ashy-grey pubescence; antennæ pitchy-black with extreme base often red; rostrum moderately long and curved, thorax subquadrate, closely and distinctly punctured; elytra long, with broad punctured striæ, interstices about as broad as the striæ, punctured in more or less distinct rows; legs black with the tarsi ferruginous, femora with a small sharp tooth. L. 3–3½ mm.

Male with the antennæ inserted in the middle of the rostrum, which is shorter and punctured.

Female with the antennæ inserted a little behind the middle of the rostrum, which is longer and shining.

On *Plantago lanceolata*, also on *P. media;* the larva appears to form a sort of

gall in the centre of the flowering head of the plant; common and generally distributed throughout the kingdom; in winter it is often found hybernating in cracks of bark, moss, &c.

M. circulatus, Marsh (*marginatus,* Beck.; *fimbriatus,* Germ.). Very like the preceding, but smaller and more depressed and easily distinguished by the broadly light margins of thorax and elytra; pitchy black or pitchy brown; rostrum rather stout, curved, black; antennæ red with the apex dark; thorax as long as broad, closely and finely punctured, with a narrow smooth central line which is often covered with whitish scales; scutellum white; elytra with rather shallow punctured striæ; interstices finely punctured; femora black, not toothed, tibiæ and tarsi red. L. $2\frac{1}{2}$–$2\frac{3}{4}$ mm.

Male with the antennæ inserted in front of middle of rostrum which is evidently shorter.

Female with the antennæ inserted about the middle of rostrum which is evidently longer.

On *Plantago lanceolata;* also on *P. coronopus;* occasionally found by sweeping, and, in the winter, under bark; not common; Weybridge, Sheerness, Chatham; Henley; Barham, Suffolk; Amberley and Arundel Park; Littlehampton; Southsea; Isle of Wight (where I found a fine series in April, 1888, on the cliffs near Sandown); Portland; Glanvilles Wootton; Devon; Swansea; Wallasey, Cheshire.

M. collaris, Germ. This species is less cylindrical and differs considerably in sculpture from the two preceding and forms a sort of transition between *Mecinus* and *Gymnetron,* under which all three species are classed by some authors; oblong-oval, somewhat elongate, black, or reddish black (in immature specimens reddish or reddish testaceous), rather shining, with scanty grey pubescence, posterior margin of thorax and sides of breast closely covered with reddish yellow scales; rostrum short and stout, punctured, nearly straight; antennæ pitchy with the base sometimes lighter; thorax with the sides slightly rounded, and narrowed in front, very closely punctured; elytra elongate-oval, with shallow but distinctly punctured striæ, interstices indistinctly punctured; legs black or pitchy. L. $2\frac{2}{3}$–3 mm.

Male with the antennæ inserted further in front of middle of rostrum than in female.

Salt marshes; on *Plantago coronopus* and *P. maritima;* the larvæ appear to form galls at the base of the flowering head of the plant; occasionally in flood refuse; very local, and, as a rule, rare; Chatham and Sheerness (Walker); Gravesend (S. Stevens); neighbourhood of Southampton; Southsea, Salterns, in numbers (Moncreaff); Cleethorpes, Lincolnshire (Chappell); the insect may be easily reared from the galls.

ANTHONOMINA.

As far as the European fauna is concerned, this tribe, as here constituted, contains the two species *Anthonomus* and *Brachonyx,* which may be distinguished by their very prominent eyes, and by having the tarsal

claws almost always appendiculate; I have followed Thomson and Bedel in their arrangement, but it must be admitted that the tribe is not a very strongly defined one, and by many authors the genera have been included under other allied tribes; the following characters may be further noticed; rostrum long, slender and filiform; antennæ 11-jointed; prosternum very short before the anterior coxæ; scutellum large; elytra with well-marked shoulders, sometimes dilated behind, pygidium covered; anterior legs longer than the rest, this character being sometimes very strongly marked; tibiæ much shorter than femora, tarsal claws free; anterior coxæ contiguous.

I. Elytra, as a rule, at all events behind, considerably broader than thorax, with the sides more or less rounded; femora nearly always toothed; onychium longer with the tarsal claws larger . . . . . ANTHONOMUS, *Germ.*

II. Elytra subparallel, not much broader than thorax; form subcylindrical; femora simple; onychium shorter with the tarsal claws very small . . . . . BRACHONYX, *Schönh.*

ANTHONOMUS, Germar.

This genus contains more than a hunderd species which are widely distributed in Europe, Asia, North and South America, Cuba, Tahiti, &c.; they are easily known by the rather broad elytra, which, as a rule, are somewhat dilated behind, the long or moderately long rostrum and the slender antennæ and elongated anterior legs, of which the femora are usually more or less strongly toothed; twenty-seven are found in Europe, of which eight or nine are usually reckoned as British; they present in some cases considerable difficulty in their determination, and it is somewhat doubtful whether they can be all regarded as distinct.

The larvæ of most of the species attack the buds of various fruit trees in early spring; a few are attached to *Rubi*, and some to different flowers; an interesting account is given by Chapuis and Candéze (Cat. des Larves des Coléoptères, p. 216) of the life history of *A. pomorum*; the perfect insects hibernate under the bark, especially in the cracks of the bark in old trees, and in the first warm days of spring come out upon the boughs; the females then proceed to perforate one of the buds and deposit an egg in its interior; one egg only is laid in each bud; the development of the bud is not, or only partially, checked, and the young larva finds itself in the flower, of which it soon devours the stamens, pistil and ovary or young fruit; when full grown it fastens the petals together and forms a sort of case in which it undergoes its further transformations; in thirty or forty days the perfect insect emerges from the pupa and cuts a hole through the case and escapes; in most cases the flower does not entirely open, after the bud is attacked, so that the insect is contained in a more or less distinct case for the greater part or the whole of its existence.

Occasionally great damage is done by these weevils in cider-producing counties; such was especially the case in 1816, 1831, 1832 and 1838; the best method of prevention is to keep the orchard as free from old trees as possible, as these are particularly attractive for hibernation: I have found them in such trees in some numbers near the Forest of Dean

in January; tarring the trunks in early spring would probably be of service, and also tapping the boughs during the first warm days, as the beetles fall readily if alarmed; as the weevil never attacks the buds after they have begun to open, those orchards that have plenty of light and air, and in which the buds rapidly expand, are less likely to suffer than those in which there is a lot of undergrowth which is retarded for want of proper sunlight and thus affords material that still continues available to the weevils for laying their eggs in; further notes on the species will be found given by Miss Ormerod in her "Manual of Injurious Insects" (1st Ed., p. 269).

The males may be distinguished from the females by having the rostrum proportionately a little shorter, and, as a rule, duller, and the last ventral segment is sometimes somewhat variable in the sexes.

I. Elytra with a transverse or very slightly oblique band of white pubescence on each, behind middle, sometimes meeting at suture; colour red or ferruginous, sometimes darker before the elytral band than at apex.
  i. Thorax and elytra comparatively flat if viewed sideways, sides of the former slightly rounded; elytra with a little oblong tubercle or small prominence at the base of the third interstice.
    1. Teeth of anterior femora very strong; rostrum longer and more slender with the antennæ inserted further from apex; anterior tibiæ very deeply sinuate on their interior margin towards base.
      A. Length 3¼–4 mm.; interstices of elytra dull, distinctly rugose transversely . . . . . A. ULMI, *De G.*
      B. Length 2–2¾ mm.; interstices of elytra rather shining, comparatively smooth . . . . . A. ROSINÆ, *Des Gozis.*
    2. Teeth of anterior femora evidently smaller and less strong; rostrum shorter and thicker, with the antennæ inserted nearer to apex; anterior tibiæ almost straight, and scarcely sinuate on their interior margin . . . . . A. PEDICULARIUS, *L.*
  ii. Thorax and elytra separately convex if viewed sideways, sides of the former strongly rounded; elytra without tubercle or prominence at the base of the third interstice; interstices rather shining, almost smooth . . . . . A. CHEVROLATI, *Desbr.*

II. Elytra with scattered whitish or yellowish pubescence which, however, does not form distinct bands; colour pitchy brown or pitchy black, with the legs more or less testaceous . . . . . A. CONSPERSUS, *Desbr.*

III. Elytra with a strongly oblique (very rarely transverse) band of whitish pubescence on each, sometimes meeting at suture; colour fuscous or pitchy-black, with the legs more or less pitchy or pitchy-ferruginous . . . . . A. POMORUM, *L.*

IV. Elytra without distinct bands or markings of pubescence, but with the pubescence fine and scanty, and evenly distributed over the whole surface, which appears, unless closely examined, to be almost glabrous.
  i. Rostrum shining; anterior femora with a stronger tooth; colour variable, but in British specimens red,

with the head and rostrum, and sometimes margins of elytra, black . . . . . A. VARIANS, *Payk.*

ii. Rostrum dull; anterior femora with a feeble tooth.

1. Colour ferruginous; rostrum short . . . . . (*A. britannus, Desbr.*)

2. Colour black; rostrum long.

A. Thorax with the sides strongly narrowed in front; first joint of funiculus of antennæ much longer than broad; size larger . . . . . A. RUBI, *Herbst.*

B. Thorax with the sides very slightly narrowed in front, almost subparallel; first joint of funiculus of antennæ not much longer than broad; size smaller . . . . . A. COMARI, *Crotch.*

A. ulmi, De G. Brownish-red, or red, clothed with scanty whitish pubescence; head, rostrum and breast pitchy-black or ferruginous; rostrum long, slightly curved, dull, of equal length in both sexes; antennæ reddish-testaceous, darker towards apex, inserted further from apex than in *A. pedicularius;* thorax closely and rather strongly punctured; scutellum elongate-oval, thickly pubescent; elytra diffusely covered with pale hairs, with a slender band in the middle, and a straight transverse fascia of whitish pubescence (also on scutellum) behind middle, with finely punctured striæ and closely sculptured interstices; legs reddish or ferruginous, femora more or less dark, anterior pair with a very strong tooth, posterior pairs feebly toothed; basal half of the tibiæ strongly sinuate on interior margin. L. 3–4 mm.

Male with the antennæ inserted further in front of middle of rostrum than in female.

On elms, &c.; not uncommon in many localities in the London and southern districts and the Midlands; less common further north; Manchester district; Northumberland and Durham district; Scotland rare, Solway, Forth, Moray and probably other districts; Ireland, near Dublin and Belfast.

The colour of this species is very variable, and the points of difference which have usually been given as separating it from the following are sometimes hard to make out satisfactorily; as a rule the very large teeth of the anterior femora afford a decisive character, but in some specimens of *A. pedicularius* the teeth are very much developed, and some of the other distinctions are more or less comparative; the insect, however, may at once be known from the latter species by the strongly sinuate anterior tibiæ and the longer and more slender rostrum, which has the antennæ inserted further from the apex. Bedel appears to class *A. ulmi* and *A. pedicularius* as synonymous, but I cannot think that he is right in so doing. Mr. Walton says he has found *A. ulmi* plentifully on elms, but never in company with *A. pedicularius;* the latter insect appears to occur almost entirely on *Cratægus.*

A. Rosinæ, Des Gozis. Oval, rather convex, of the form of *A. ulmi* and with the sculpture of *A. Chevrolati;* size small; colour varying from reddish-brown to ferruginous; rostrum almost or entirely black; antennæ and legs ferruginous, femora usually dark in the middle;

pubescence ashy white, mixed with yellowish hairs, the white hairs forming a central line on the thorax and covering the scutellum; there is a white transverse band behind middle, and other obsolete white markings; the band is almost straight, wider towards sides and narrowed and interrupted at suture; rostrum elongate, cylindrical, almost straight, and rather dull, at all events behind; thorax transverse, slightly rounded behind; scutellum oblong; elytra flat at base, convex behind, with a well-marked elevation at the base of the third interstice; punctured striæ moderately strong, interstices flat, rather shining, comparatively smooth; anterior femora armed with a long sharp triangular tooth; anterior tibiæ very strongly sinuate on their inner margin, the margin being almost angled in the centre. L. 2–2¾ mm.

By beating hedges (I believe on *Cratægus*); Repton, Burton-on-Trent (Robins Wood and near osier beds at Bull's in the meadows) and Bircham Newton, Norfolk; I had the species separated in my collection for some time, and sent a specimen to M. Bedel, who returned it as *A. Rosinæ*; it certainly looks very distinct; I believe that it is by no means uncommon; M. des Gozis says that it appears to be not rare in France.

A. pedicularius, L. Very like the preceding but on the average slightly smaller; it is, however, very variable both as regards colour and size, the former varying from bright red, almost scarlet, to deep ferruginous or pitchy red; it may be distinguished from *A. ulmi* by its broader scutellum, less prominent eyes, shorter and stouter rostrum, more broadly distant intermediate coxæ and shorter thorax, and especially by the much straighter and scarcely sinuate anterior tibiæ and the less strongly marked teeth of the anterior femora; the underside, moreover, is more thickly clothed with whitish pubescence, and the antennæ are inserted near to apex of rostrum; in fresh specimens the elytra present the appearance of having two white fasciæ and two denuded bands, the anterior fascia being much more scantily pubescent than the posterior; this is also the case more or less in the preceding species. L. 3–3¾ mm.

On the flowers of white thorn and also on other shrubs and trees, but mostly attached to the former; generally distributed and common throughout the kingdom.

A. Chevrolati, Desb. Closely allied to *A. pedicularius*, which it resembles in general colour and size, but shorter and more convex, with the thorax and elytra appearing separately convex if viewed sideways; it may, moreover, be easily known by the shape of the thorax, which is more transverse than in the preceding species, slightly narrowed at the base and very strongly so at the apex, and with the sides conspicuously rounded before the middle; the interstices, moreover, of the elytra are smaller, there is no trace of a tubercle at the base of the third interstice, and the anterior whitish fascia is somewhat curved towards the scutellum; the colour, as in the two preceding species, is variable L. 3–3½ mm.

On white thorn, the service tree, &c.; scarce; Shirley, near Croydon (Champion); Forest Hill; Coombe Wood (S. Stevens); Darenth and Sydenham (Power); Chatham; Deal (C. G. Hall); New Forest (Champion).

A. conspersus, Desb. Allied to *A. pedicularius*, but smaller than the average specimens of that species; it is also evidently narrower and more parallel sided and always of a pitchy black or pitchy brown colour, with the antennæ rostrum and legs reddish testaceous, the club of the former being fuscous; the pubescence on the elytra is coarse and scattered and does not form bands; in the only specimen I have seen this whitish pubescence is thick on the thorax and forms a rather strong central line, and the legs are entirely testaceous; other distinctive characters appear to be found in the fact that the body is more abruptly sloped off behind, and that the tibiæ appear to be more slender at base. L. 3 mm.

On the mountain ash (*Sorbus aucuparia*); rare; Trench Woods, Bromsgrove (Blatch); Chat Moss (Reston); Scotland, rare, Solway and Dee districts (Aviemore, &c., Champion and Sharp); it has occurred in France, Germany, and Switzerland; it may prove to be a variety of one of the allied species.

A. pomorum, L. Pitchy black or fuscous black, clothed with ashy pubescence; head thickly pubescent, with an impression on forehead; rostrum long and rather slender, slightly curved, antennæ long and slender, reddish, fuscous at apex; thorax pitchy, sometimes rufo-piceous at sides, not much longer than broad, closely punctured, with rather scanty coarse whitish pubescence; scutellum thickly pubescent; elytra pitchy, sometimes pitchy ferruginous, with alternate denuded and white fasciæ, the one behind middle composed of whitish pubescence being oblique and much the most conspicuous, punctured striæ distinct and rather strong, interstices very closely punctured; legs more or less pitchy, but variable in colour, femora always more or less dusky, anterior pair with a very strong tooth, intermediate and posterior pairs with much smaller teeth. L. 3–4 mm.

On apple trees and also (but less commonly) on pear trees; somewhat local, but common where it occurs; apparently rather uncommon in the London district, Kent, and Surrey, and also in the south; Peckham; Glanvilles Wootton; Devon; Bristol; Staires Farm, near Newnham-on-Severn; Midland district, widely distributed; Manchester and Liverpool districts; Scarborough; Northumberland and Durham district; Stephens records it from Edinburgh, but Dr. Sharp does not mention it as Scotch in his list; Ireland, near Belfast and Dublin.

A. varians, Payk. (*pubescens?* W. C. *nec* Payk.). A little smaller, on the average, than the preceding species, red, with the head and rostrum black, and the apex of the antennæ and the tarsi pitchy; in continental specimens the colour is very variable and is sometimes entirely black, with the antennæ testaceous at base; upper surface clothed with very scanty greyish pubescence which is evenly distributed and shows no tendency to form fasciæ; thorax transverse, with the sides strongly narrowed in front and moderately rounded behind, closely

and strongly punctured; elytra unicolorous red, or with the margins darker, with deep punctured striæ, and very finely punctured interstices; legs red, tarsi pitchy, anterior femora with rather strong and sharp teeth. L. $2\frac{3}{4}$–3 mm.

Male with the posterior tibiæ slightly curved and the pygidium with a central longitudinal furrow.

On Scotch fir; very local; Scotland, Tay, Dee and Moray districts (Braemar, Aviemore, Rannoch, &c.).

A. rubi, Herbst. Black, unicolorous, clothed with distinct and evenly distributed, but scanty, greyish pubescence, which is closer on the breast and thick on scutellum; head with an impression on forehead; rostrum long, slightly curved, dull; antennæ slender, reddish at base, fuscous towards apex; thorax broader at base than its length, strongly narrowed in front, very closely punctured; elytra with strong punctured striæ, interstices slightly convex; legs elongate and rather slender, black, with the knees and tarsi pitchy, all the femora with a small tooth; tarsal claws bifid. L. $2\frac{3}{4}$–$3\frac{1}{2}$ mm.

Male with all the tibiæ slightly curved.

On various species of *Rubus* and *Rosa*, especially brambles and dog roses; common and generally distributed throughout the greater part of the kingdom.

A. comari, Crotch. Allied to the preceding, of which it has by many authors been regarded as only a variety; apart, however, from its very much smaller size, it may be known by having the thorax much less narrowed in front and almost subparallel, the first joint of the funiculus of the antennæ distinctly shorter and nearly as broad as long, and the femora more strongly dilated in the middle and abruptly narrowed before apex; the elytra are often of a lurid or livid colour; the species appears to occur in places and on a plant where *A. rubi* is never found. L. $1\frac{3}{4}$–$2\frac{1}{4}$ mm.

On *Comarum palustre* (*Potentilla comarum*, (*The Marsh Potentil*)): very local; Northumberland and Durham district plentiful; Scotland, not uncommon in marshy places in several districts; Ireland, near Waterford (Power); Rye (Ent. Monthly Magazine, vi. 88) records it as found by himself and Dr. Sharp in damp parts of small glens near Camachgouran, Perthshire; the only southern record I know of is Dover (C. G. Hall); it is, however, possible that this may refer to small specimens of the ordinary type form, which occasionally occur.

A britannus, Desbr. (*pubescens ?* Walton, Ann. and Mag. Nat. Hist. 1844, 106; *vide* Rye, Ent. Annual, 1870, p. 105). I cannot make anything of this insect which has been retained in all our catalogues; I have never seen a specimen, nor can I obtain any satisfactory information regarding the species: the following is Walton's description:—"Ovate, testaceous, cinereo-pubescent. Head small, round, testaceous, punctulated and pubescent; eyes globose, brown-black; rostrum rather longer than the head and thorax, slender, a little curved, punctulated, deep rufous, shining, and more or less fuscous at apex.

Antennæ rather long, slender, rufo-testaceous, clava elongate and fuscous. Thorax transversely impressed and constricted anteriorly, a little rounded at the sides, bisinuated at the base, moderately convex above, testaceous, closely and deeply punctured and pubescent. Scutellum small, elevated and densely pubescent. Elytra ovate, very convex above, testaceous, deeply punctate-striate, interstices narrow, convex, indistinctly punctulated and sparingly pubescent. Legs long, testaceous: anterior femora minutely dentate, posterior femora scarcely or very obsoletely dentate. Length $1\frac{2}{3}$ line ($3\frac{1}{3}$ mm.). The form of the rostrum, with the place of insertion of the antennæ, and the form of the tibiæ, are very similar to *A. pedicularius;* but the absence of a fascia on the elytra, and the minute tooth on each of the femora, at once distinguish this insect from the pale varieties of *A. ulmi* and *A. pedicularius*, to which it is allied." "Three specimens of this," Mr. Walton continues, "with other British insects, taken in Herefordshire by Mr. Doubleday, were given by him to Mr. Smith, one of which was kindly presented to me by the latter gentleman: it occurs on pines in the north of Sweden" One of these specimens, according to Mr. Rye, was communicated by Mr. Crotch to M. Desbrochers des Loges, who described the species (under the name *A. britannus*) solely from England on its authority: Mr. Walton's remarks as to Sweden being a locality for the insect must therefore have referred to Gyllenhal's *A. pubescens*, with which he identified his insect. Mr. Rye states that "its entirely reddish-ferruginous colour, short dull rostrum, feeble femoral teeth and small size will distinguish it from any other of its genus:" it is not, however, clear that Mr. Rye ever examined one of the three specimens, and I am strongly of opinion that the insect was at most a variety of a closely allied species (probably immature *A. pedicularius*), and that it must, at all events for the present, be omitted from our lists.

Mr. Walton says of this genus:—"There is the greatest imaginable confusion among the species of this very pretty and interesting genus of insects; ten have been catalogued and described as specifically distinct, but I must confess my inability to distinguish out of that number more than four;" the determination of the species has given me a great deal of trouble and I am far from being sure that the table and descriptions above given are altogether satisfactory; it is quite possible that several of the allied continental species, such as *A. druparum* and *A. pyri*, may be found in Britain; the former species has, in fact, been recorded from Somersetshire, but the insect turned out to be a variety of *A. ulmi*. Mr. Walton long ago prophesied that it would probably be found in Britain, if the wild cherry were searched for it, as it occurs plentifully on the latter tree in Sweden.

BRACHONYX, Schönherr.

One species only is contained in this genus, which is rather widely

distributed in Europe, especially in the north; it lives on *Pinus sylvestris*, and the larva undergoes its transformations between two pine-needles, which are joined together and are by the presence of the insect arrested in their development; the species may be known by its elongate and subparallel form and short stout legs, and by having the penultimate joint of the tarsi very strongly bilobed; the rostrum is long, slender and curved, and the antennæ are inserted behind its centre; in Britain the species is confined to the Highland districts of Scotland, in which it is very local.

B. pineti, Payk. (*indigena*, Herbst.). Elongate, linear, subparallel, clothed with scanty but rather coarse pale pubescence, which is stronger on the head and thorax, rather dull; head and thorax dark, elytra reddish testaceous; rostrum shining, black, sometimes reddish-brown; antennæ red; eyes flat, somewhat widely separated on vertex; thorax transverse, slightly narrowed in front, shallowly and not closely punctured; scutellum with whitish hairs; elytra very long, with strongly punctured striæ and narrow interstices, which are furnished with rows of short hairs; legs short and stout, red, tarsi broad; intermediate coxæ contiguous. L. $2\frac{1}{2}$–$2\frac{3}{5}$ mm.

On young Scotch Fir; very local; Tay, Dee and Moray districts (Braemar, Aviemore, Rannoch, &c. (Sharp, Champion and others)); the species was first taken by Turner in 1860, who said he had beaten his first three specimens off birch.

CIONINA.

This tribe is here regarded as including both *Cionus* and *Nanophyes*; it is characterized by the formation of the second, third and fourth ventral segments of the abdomen, which are produced into a tooth at apex near margin; the antennæ are inserted in front of the middle of the rostrum and have the funiculus five-jointed and the club, as a rule, large; the anterior coxæ are contiguous and the posterior coxæ are distant; the tarsal claws are connate; the transformations of *Cionus* closely resemble those of *Hypera*, and will be further noticed.

In the formation of the trochanters the genus *Nanophyes* resembles *Apion*, and on this ground is classed by Bedel with the latter genus as a separate sub-family Apiidæ; the relations, however, of *Nanophyes* to *Cionus* are so strong, and its differences from *Apion*, apart from the trochanters, so great, that it can hardly be separated from the position it has usually occupied among the Cionina, although it may, perhaps, be in some respects regarded as a transitionary genus.

I. Femora not attaining coxæ; trochanters long; scutellum scarcely visible; thorax comparatively large, not much narrower at base than elytra; size small . . . . . NANOPHYES, *Schönh.*

II. Femora attaining coxæ; trochanters short; scutellum large and conspicuous; thorax small, much narrower at base than elytra, which are almost subglobose . . . CIONUS, *Clairv.*

NANOPHYES, Schönherr (*Sphærula*, Steph.).

This genus contains upwards of fifty species which are rather widely distributed throughout the greater part of the Old World; only one has been described from America, and this is somewhat doubtful; twenty-nine occur in Europe, of which two are found in Britain; they are very small, convex, rather prettily variegated insects with long rostrum and antennæ, the latter terminating in a somewhat loose and elongate club; the thorax is conical and is scarcely narrower at base than the base of elytra; the scutellum is inconspicuous; the prosternum is very short before the anterior coxæ, and the legs are long and slender, with the femora either simple or finely denticulate; one of the chief characters, however, lies in the very large trochanters, which, as before stated, cause the genus to be in some measure transitionary towards *Apion*, although its affinities to *Cionus* are too great to allow of its being removed from its present position; Gervais, who has described the habits of the larva of *N. tamaricis*, remarks that the larva, which lives in the ovary of the tamarisk, is able to impart to it a jumping motion; in this it appears to resemble the larva of the small exotic moth *Carpocapsa saltitans*.

I. Femora simple . . . . . N. LYTHRI, *F.*
II. Femora armed on their under surface with one or two distinct sharp spines . . . . . N. GRACILIS, *Redt.*

N. lythri, F. (*marmoratus*, Goeze). Convex, slightly obovate, rather shining, black, clothed with fine greyish pubescence; elytra with an abbreviated fascia and a posterior spot testaceous and covered with whitish hairs; these, however, are somewhat variable; rostrum long and moderately stout, slightly curved, plainly striated, antennæ red with club dark; thorax black, sometimes reddish on disc or almost entirely reddish, scarcely broader at base than its length, very finely punctured; elytra with deep striæ, interstices somewhat convex; legs entirely testaceous, or with the femora more or less black, the latter simple. L. $1\frac{3}{4}$–2 mm.

Damp places; on *Lythrum Salicaria* (Purple Loosestrife); somewhat local but usually common where it occurs and sometimes found in profusion; Wimbledon, Woking, Lee; Norfolk; Monks Wood, and Wicken Fen, Cambridge; Dover; Hastings district; Arundel; Portsmouth district; New Forest; Glanvilles Wootton; Devon; Bath; Bristol; Swansea; Bewdley; Repton; Borth, Central Wales; Liverpool and Manchester district; Northumberland and Durham district, Heaton Burn, Spindlestone Pond and Hetton Hall, near Belford. Scotland, very rare, "Argyllshire, Rev. Geo. Little, Murray's Cat." Ireland, near Waterford, Furnish Island, Co. Galway, Coney Island, Lough Neagh, &c.

N. gracilis, Redt. (*geniculatus*, Aubé). Very closely allied to the preceding, from which it differs in having all its femora furnished with two small sharp spines on the underside, between the middle and the apex, of which the one nearer the apex is much the smallest; it may also be distinguished by its longer and thinner legs, antennæ, and

rostrum, shorter and rather more distinctly punctured thorax, less evident pubescence, and broader and shorter and much less acuminate elytra, of which the interstices are flat; it is difficult to compare the colour, as *N. lythri* is so variable, but in the single specimen I have taken (in the New Forest) there is a large triangular patch covering base, and the whole of the rest of the elytra is reddish testaceous; I have not noticed this colouring in the preceding species. L. $1\frac{1}{2}$–$1\frac{3}{4}$ mm.

Marshy places; by sweeping herbage; very local, and rare; according to Bedel it has been found in France in numbers on *Lotus uliginosus*, and Brisout mentions it as attached to *Erica cinerea*; Champion mentions it as found running up the stems of *Carex*, &c., from the marshy ground beneath, towards evening; Esher (in some numbers, Rye and Champion); Horsell, Surrey (Power); Balcombe, Surrey; New Forest (Champion, myself and others).

CIONUS, Clairville.

The species of *Cionus* are very easily distinguished by their globose form and the black velvety patches on their elytra, which often, but not always, take the form of small or moderate sized circular spots; the thorax is extremely small in proportion to the elytra which are more than twice as broad as its base; the rostrum is rather long and more or less curved; the scutellum is conspicuous; the prosternum is often excavate before the anterior coxæ and excised at apex, and all the femora are armed with a more or less strong tooth; the species known are about thirty or forty in number, of which eighteen occur in Europe; representatives have also been recorded from North and South Africa, Teneriffe, Siberia, Persia and Tasmania. They appear to be attached to *Scrophulariaceæ*, and more especially to species of *Verbascum* (Mullein), and *Scrophularia*; the larvæ feed on the leaves of these plants and appear to a certain extent to mine the parenchyma; they are covered with a glutinous matter which is secreted from a retractile nipple placed on the upper surface of the anal segment; the softness and mobility of their integument enables them to cover their entire body with this substance; it partly serves as a protection against rain or heat, but its chief use is in the formation of the cocoon in which the insect undergoes its metamorphoses; when the time arrives for the change to the pupa state the larva attaches itself to a point of the leaf and thickens the glutinous matter which covers it, and then contracts its body so as to gain in breadth what it loses in length; when the covering has been fixed to the leaf all round and has acquired consistency it manages to detach itself from connection with it and undergoes its change to the pupa; after six or eight days it emerges as a perfect insect, and then cuts a neat spherical hole in its cocoon and so emerges. (Vide Chapuis et Candéze, Catalogue des Larves des Coléoptères, p. 223.)

The sexual differences consist in various characters of the rostrum

and the insertion of the antennæ and of the last ventral segment of the abdomen; they are not however very striking.

Seven species have been regarded as British, but one (*C. olens*) appears to require further confirmation as indigenous.

I. Prosternum concave and deeply incised on its anterior margin; second joint of funiculus of antennæ elongate, as long as the first.
  i. Clothing of elytra consisting of close pubescence only.
    1. Elytra with two common circular black velvety spots, one before middle, and the other at apex.
      A. General colour of elytra black.
        a. Thorax entirely covered with thick yellowish white pubescence . . . . . C. SCROPHULARIÆ, *L.*
        b. Thorax with the sides only clothed with thick yellowish white pubescence; disc bare . . . . . C. TUBERCULOSUS, *Scop.* (*verbasci*, F.)
      B. General colour of elytra grey or greenish grey.
        a. Rostrum subcylindrical, shagreened and pubescent almost to apex in both sexes; circular spot at apex of elytra often less developed than the anterior one . . . . C. THAPSUS, *F.*
        b. Rostrum narrowed from the insertion of the antennæ in both sexes, the narrow portion being glabrous, shining and scarcely punctured in the female; circular spots on elytra of equal size . . . . . C. HORTULANUS, *Fourc.*
    2. Elytra with a large irregular patch behind scutellum and a sharply defined circular spot at apex black, the former often more or less brown; prevailing colour of elytra white . . . . . C. BLATTARIÆ, *F.*
  ii. Clothing of elytra consisting of greenish grey pubescence, and also of erect white setæ; suture of elytra with a small black spot before middle, and another, often absent, at apex . . . . . (C. OLENS, *F.*)
II. Prosternum not excavate before anterior coxæ nor excised on its anterior margin (*Cleopus*, Steph.); prevailing colour of elytra brown, with three longitudinal patches at scutellum, a transverse fascia behind middle, and a small spot before apex, black . C. PULCHELLUS, *Herbst.*

C. scrophulariæ, L. Fuscous black, with two darker velvety black circular spots on elytra, one before middle and another at apex; thorax entirely and breast thickly clothed with yellowish-white pubescence; the former small, transverse-conical, very closely sculptured; rostrum moderately long and curved, punctured, antennæ red, with the club dark; elytra broad, subglobose, with rather irregularly and somewhat strongly punctured striæ, alternate interstices elevated and furnished with subquadrate velvety black and greyish-white spots alternately; there is also a spot of whitish pubescence in front of shoulders, and the sutural

circular spot before middle is bounded behind, and the apical spot before and behind with small whitish patches; legs black, tarsi more or less ferruginous. L. $3\frac{1}{2}$–$4\frac{1}{2}$ mm.

Male with the anal segment of the abdomen furnished with a transverse band of yellowish hairs and subemarginate at apex.

On *Scrophularia*, especially *S. aquatica* and *S. nodosa*, also on *Verbascum thapsus*; rather local, but common where it occurs; Darenth Wood, Coombe Wood, Woking, Cowley; Aylsham and Potter Heigham, Norfolk; Hastings; Winchester; Southampton; New Forest; Glanvilles Wootton; Devon; Bath; Swansea; Midland districts, widely distributed; Manchester district, general; Northumberland and Durham district; Scotland, common on *Scrophularia nodosa*, Solway, Forth, Tay and probably other districts; Ireland, near Belfast, and most likely general.

C. tuberculosus, Scop. (*verbasci*, F.). This species is so like the preceding in general appearance that it does not require a separate description; it may easily be distinguished by having the central part of the thorax quite bare, and the sides thickly covered with yellowish white scales, the lines of separation being sharply defined, so that it may at once be known from rubbed specimens of *C. scrophulariæ* in which the pubescence of the disc of thorax is abraded; the metasternum moreover and the first half of its episterna are without scales; the club of the antennæ is longer, and in the male the last ventral segment of the abdomen is transversely convex and somewhat gibbous at apex. L. $3\frac{1}{2}$–$4\frac{1}{2}$ mm.

Marshy places; on *Scrophularia nodosa* and *S. aquatica*; also on *Verbascum*; very local, but not uncommon where it occurs; Hammersmith, Notting Hill and Battersea Fields (formerly); Merton, Barnes, Ripley, Wimbledon, Lee, Greenwich, Cowley, Forest Hill; Hertford; Hastings district; Glanvilles Wootton; Swansea; Bretby Wood, near Repton (W. Garneys); Scotland, very rare, Forth district, "Dollar, Mr. J. T. Syme," Murray's Cat.; it is possible there may be some mistake as to the latter record.

C. thapsus, F. (*similis*, Munich Cat. *nec* Müll.). Fuscous-brown, clothed throughout unevenly with a greenish ashy pubescence, elytra with the alternate interstices slightly elevated, and tessellated with somewhat ill-defined lighter and darker patches, which are more marked in some specimens than in others, and with two circular black velvety spots, one before middle and another before apex, the latter being as a rule smaller than the former; rostrum moderately stout, not narrowed towards apex; antennæ red; thorax small; elytra with punctured striæ, which are concealed or almost concealed by the clothing; legs dark, pubescent, tarsi red. L. $3\frac{1}{2}$–4 mm.

On *Scrophularia nodosa* and *Verbascum thapsus*; rare; Mickleham (Power); Surrey (Blatch); Portsdown, near Southsea, in May and July (Moncreaff); Glanvilles Wootton (Dale); Llangollen (Chappell); the record of Stephens (Ill. iv. 18) that the species had been "taken in June on *Scrophularia*, rather plentifully in some districts, especially in a chalk pit at Northfleet," is in the Manual (p. 218) apparently referred to *C. hortulanus*.

C. hortulanus, Marsh. Extremely closely allied to the preceding, of which it has been regarded as a variety by many authors; it is, however, larger and may be known by having the rostrum narrowed in front from the insertion of the antennæ, and the narrowed portion glabrous and shining and scarcely punctured in the female, and also by the fact that the two circular patches before the middle and at the apex of the elytra are equal in size. L. 4–5 mm.

On *Scrophularia nodosa* and *Verbascum thapsus*, especially in chalky districts; not uncommon and widely distributed from the Midland districts southwards; London district, Kent and Surrey, common, Darenth Wood, Sevenoaks, Northfleet, Cobham, Weybridge, Dorking, Mickleham, Ripley, Coombe Wood, Gomshall, Gravesend, Chatham, &c.; Hastings district, common: Southampton; New Forest; Portsmouth district; Midland districts, general; Lincoln, Langworth Wood: I know, however, of no locality in England further north, and the species has not been found in Scotland. Ireland near Dublin.

(**C. olens,** F. Fuscous or fuscous-brown, with greenish-grey pubescence, and raised white setæ; antennæ and legs reddish yellow brown; suture of elytra with a small velvety black spot before middle, and a smaller one, often rudimentary or absent, before apex; interstices, as a rule, immaculate; it is about the size of *C. thapsus*, but may easily be recognized by the erect setæ, the more uniform pubescence of the elytra, and the fact that the apical spot is small or absent. L. $3\frac{1}{2}$ mm.

On *Verbascum pulverulentum* (Hoary Mullein); the larva mines the first leaves of this plant; a single specimen has been taken in Britain by Mr. Douglas, who cannot however remember the precise locality in which it was captured: it therefore requires further confirmation; it is not uncommon in France and Central Europe, and will probably be again found in England.)

C. blattariæ, F. (*alaudæ*, Herbst.). A very pretty and conspicuous species, which at once attracts attention in the sweeping net by reason of its white colour and peculiar variegation; fuscous brown, clothed throughout with white or greyish white pubescence; rostrum moderately long, dilated at apex, punctured; antennæ ferruginous, with the apex usually darker; thorax small, with a large brown patch at base; elytra with punctured striæ, alternate interstices obscurely tessellated with dark brown and white, with a large irregular and somewhat interrupted dark patch at base, covering the greater portion of the apical half, and with a clearly defined circular spot before apex; at the sides in middle and on each side of suture there are often very distinct small dark velvety patches; legs testaceous, with the femora infuscate. L. $2\frac{3}{4}$–$3\frac{1}{2}$ mm.

On *Scrophularia aquatica* and *S. nodosa*, also on *Verbascum nigrum;* somewhat local, but generally distributed and not uncommon from the Midland counties southwards; rarer further north; Northumberland and Durham district, "Durham, Ormsby's Durham"; Scotland, scarce, Tweed and Forth districts; it does not appear to have been recorded from Ireland, but probably occurs in that country.

C. pulchellus, Herbst. (*solani*, Gyll. *nec* F.). Brown or fuscous

brown, scantily clothed with greyish pubescence; rostrum moderately stout, punctured, antennæ red or pitchy red with the club fuscous; thorax very small and short with the sides subdilated, more or less clouded with greyish pubescence on each side of the central line; elytra with the alternate interstices slightly elevated, and tessellated with velvety black spots and erect whitish fascicles of hair, and with three more or less distinct longitudinal patches at scutellum, a transverse fascia behind middle, and a small spot before apex black; legs ferruginous or pitchy ferruginous with the femora more or less infuscate. L. $2\frac{1}{2}$–3 mm.

On *Scrophularia nodosa;* local, but occasionally found in abundance; Coombe Wood, Mickleham, Caterham, Dorking, St. Mary Cray, Sevenoaks, Cobham, Darenth Wood, West Wickham, Blackheath, Wimbledon, Westerham, Chatham, &c.; Hastings; Portsmouth district; Southampton; Glanvilles Wootton; Bath; Swansea; Midland counties, generally distributed; Hertford; Cambridge; Liverpool district; Manchester district, general; Northumberland and Durham district; Scotland, rare, Solway district; it probably occurs in Ireland.

OROBITINA.

One genus, *Orobitis,* is contained in this tribe, which is by many authors placed under the Ceuthorrhynchina, but may be distinguished by the quite exceptional structure of the first ventral segment, which is very short and is divided into three equal parts by the posterior coxæ, which reach to the base of the second ventral segment; the body is globose, and glabrous above; the rostrum is received in a groove of the prosternum and the head is retracted; the anterior coxæ are distant; the scutellum is large and distinct; the legs are elongate; the under surface is very thickly pubescent.

OROBITIS, Germar.

One species only is contained in this genus, which is somewhat widely distributed in Central and Southern Europe; it is a small, deep black or bluish black, globose insect, and when it has its legs and rostrum folded may easily be passed over as a seed; it is found on species of *Viola*, and according to Hardy the larva lives in the ovaries of *V. canina*.

O. cyaneus, L. Globose, nigro-cœruleous or black, upper surface smooth shining and almost glabrous;* underside and scutellum densely clothed with white or yellowish-white scales; head punctured, rostrum long, almost straight, punctured at base smooth from the insertion of the antennæ, which are long and pitchy, and terminate in an elongate club; thorax transverse, almost semicircular, very finely punctured, often bluish or violaceous; elytra very convex, gibbous at base, with the

* In fresh specimens the upper surface is sometimes sparingly furnished with narrow indistinct bluish scales.

shoulders rounded, and with rather fine, almost impunctate, striæ, of which the tenth is joined behind to the ninth; interstices broad and flat, smooth or almost smooth; legs long in proportion to the body, more or less pitchy, the femora being usually darker than the tibiæ and tarsi; femora elongate, without teeth; tarsal claws small and connate. L. $2\frac{1}{2}$ mm.

Sandy and chalky places; by sweeping *Orobus, Viola,* &c.; often in moss during winter; somewhat local, but widely distributed, and not uncommon in many districts; it is however never abundant apparently in any one place; London district, not uncommon, Esher, Caterham, Mickleham, Coombe Wood, Darenth Wood, Sevenoaks, Faversham, Maidstone, Chatham, Horsell, Farnham, &c.; Great Yarmouth; Ashwicken, Cambridge; Hastings; St. Leonards Forest; Arundel; Holm Bush, Brighton; New Forest; Glanvilles Wootton; Seaford and Exminster, Devon; Bristol; Swansea; Midland counties, widely distributed; Barmouth; Cheshire; Liverpool district; Ripon; Scarborough; Cumberland; Northumberland and Durham district, not common; Scotland, scarce, Solway, Tweed and Forth districts; Ireland, near Belfast (Haliday), Armagh (Johnson), Galway, not rare (J. J. Walker), and probably general.

CRYPTORRHYNCHINA.

This tribe contains several European genera of which two, *Acalles* and *Cryptorrhynchus*, are found in Britain; the species are dull, rough, scabrous insects, and are characterized by having the tibiæ furnished with a curved hook at their apical external angle, and by the prosternum being strongly grooved for the reception of the rostrum; the legs are stout and the anterior femora are longer than the others; the pygidium is completely covered by the elytra.

I. Scutellum large and distinct; episterna of metasternum not covered by elytra and well developed; size larger . . . . . CRYPTORRHYNCHUS, *Ill.*

II. Scutellum wanting or almost invisible; episterna of metasternum indistinct or concealed by the elytra . . ACALLES, *Steph.*

CRYPTORRHYNCHUS, Illiger.

This is a very large and important genus containing between two and three hundred species, which are very widely distributed in the Southern Hemisphere; very few, however, occur in the Northern Hemisphere, and one representative only is found in Europe; it is a rather large, dull, rough insect, of a variegated black and yellowish-white colour, and is found on osiers; it also attacks poplars and alders; the rostrum is moderately long and curved, and when the insect is at rest it is fitted tightly beneath the thorax; the antennæ are moderately long and terminate in an ovate club; the scutellum is conspicuous, and the posterior coxæ are transverse and almost attain the margin of the elytra; the elytra have the shoulders square and well marked and are somewhat acuminate at apex; the legs are stout, and, as in *Acalles* and other allied

species, are folded when the insect is alarmed or at rest so that the knees project outwards; in this state it is very hard to get the legs out, even when the insect is somewhat relaxed, and the species is therefore one of the most difficult weevils to set properly.

The larva bores galleries, which are slightly winding, in the stems of osiers, and sometimes does considerable damage; the perfect insect appears to be to a certain extent crepuscular; I have found the males and females together in numbers in an osier bed near Repton, Burton-on-Trent, at half-past four or five on a summer's morning; but they appeared to be scarce in the middle of the day or in the afternoon in the same locality.

C. lapathi, L. Black, dull, with the sides of the thorax, a more or less irregular and variegated fascia at base of elytra, and the apex of the same distinctly and more or less broadly, clothed with coarse imbricate yellowish-white scales; rostrum stout, slightly curved, punctured at base, almost glabrous and shining in front; head with black scales; antennæ reddish; thorax scarcely transverse, with the sides rounded and somewhat dilated in middle and narrowed before apex, central line carinate, punctuation consisting of close and coarse round shallow punctures, front portion with fascicles of raised black scales which look like tubercles; scutellum black; elytra with the fascia at base varied with black or fuscous, punctures of striæ very large, round or ovate, comparatively shallow, interstices closely punctured, third, fifth and seventh furnished with fascicles of raised black scales; suture with a very narrow raised margin; underside black, sparingly punctured; legs black, femora thickly scaled and furnished with two very small teeth. L. 8–9 mm.

Male with the first ventral segment of the abdomen longitudinally excavated; Thomson and others mention the femora as furnished with two teeth in the male only, but they appear to be more or less distinguishable in both sexes.

On willows; also, according to Bedel, on poplars and alders; local, but widely distributed and not uncommon in some districts; Putney, Earls Court, Chatham, &c.; Dagenham, Essex; Ramsgate; Norfolk; Dover; Hastings district; Bewdley; Repton, Burton-on-Trent; Southport; Blackpool; York; Northumberland and Durham district; Scotland, rare, in old sallows, Solway and Forth districts.

ACALLES, Stephens.

More than a hundred species belong to this genus, which are very widely distributed; thirty-four are found in Europe and the remainder have been described from the Canaries, Madeira, North, Central and South America, Cuba, the Australian region, &c.; in fact they will probably be found to extend over the whole world; they are small, inconspicuous, rough-looking insects, which are found in dead branches of trees, by beating faggots, &c.; when alarmed they fold up their legs and

remain motionless, and may in this state be easily passed over as bits of earth or fragments of wood; they bear a strong affinity to *Cryptorrhynchus*, but are very much smaller, and have the scutellum wanting or almost invisible, and the episterna of metasternum indistinct or concealed by the elytra.

The three British species very closely resemble one another, but may be distinguished as follows:—

I. Upper surface without or with very short raised setæ.	
i. Thorax uneven with a broad central furrow; average size larger	A. ROBORIS, *Curtis.*
ii. Thorax comparatively smooth without central furrow; average size smaller	A. PTINOIDES, *Marsh.*
II. Upper surface with broad raised setæ, which are distinctly visible if the insect is viewed sideways . . .	A. TURBATUS, *Boh.* (*misellus*, Boh.)

A. roboris, Curtis (*abstersus*, Boh., Thoms.). Subovate, pitchy black, thickly clothed with round depressed ashy scales, upper surface rough and uneven, dull; rostrum stout, bare, ferruginous, with scales at base; vertex of head and two slightly elevated tufts on the fore part of the thorax black; antennæ ferruginous; thorax narrower than elytra, about as long as broad, narrowed before apex, truncate at base, slightly rounded at sides, with a deep broad depressed channel in middle, and uneven at sides; scutellum scarcely visible; elytra somewhat variegated obscurely, rounded at sides and narrowed at apex, with the shoulders not prominent, striæ deeply and coarsely punctured, interstices narrow and convex, furnished, especially towards apex, with very short erect dark scales, the third and fifth elevated towards apex into a blunt tubercle; underside pitchy; legs stout, ferruginous. L. $2\frac{1}{2}$–4 mm.

By beating dead twigs of oaks, &c.; in hedges in woods; local, but not uncommon in some districts; Darenth Wood; Bexley, Kent; Hertford; Suffolk; Wicken Fen; Deal; Hastings district; Amberley, near Arundel; Portsmouth district; Llangollen; Cannock Chase; Buddon Wood, Leicestershire; Robins Wood, Repton; Scotland, very rare, Forth district, "Roslin, Dr. Greville and Rev. W. Little," Murray's Cat.

A. ptinoides, Marsh. Pitchy castaneous, rugose, with large punctures which are partially filled with ashy or ochreous slightly erect scales, forming in fresh specimens four indistinct lines on thorax, and collected into more or less distinct transverse bands on elytra; the markings, however, are often very indistinct; rostrum, antennæ and legs reddish, the former slightly curved, punctured; thorax slightly longer than broad, with the sides rounded, and somewhat constricted before apex, disc almost even, punctuation much less coarse than that of elytra; elytra deeply striated, the striæ being coarsely punctured, interstices narrow and convex, second and fourth slightly elevated, with two oblong black tufts of scales on each (in fresh specimens); the average smaller size, longer and more even thorax, and the absence of tubercles at the

apex of the third and fifth interstices, will easily distinguish this species from the preceding. L. 2–3 mm.

Heathy places; by beating dead branches of fir, &c.; occasionally found in moss and dead leaves, and in sand-pits; not uncommon in many localities; Bishops Wood (Highgate), Esher, Shirley, Caterham, Coombe Wood, Dulwich, Leith Hill, Bexley, Plumstead, Wickham Wood, Weybridge, Tonbridge, Ripley, Chatham; Hertford; Henley; Norfolk; Kingsgate; Deal; Hastings; St. Leonards Forest; New Forest; Dorchester; Devon; Swansea; Cannock Chase; Buddon Wood, Leicestershire; Robins Wood, Repton; Northumberland and Durham district, very rare, Gibside; Scotland, rare, Solway and Forth districts.

A. turbatus, Boh. (*misellus*, Boh.; *echinatus*, Germ.). This species may easily be distinguished from the two preceding, to which it is closely allied, by the comparatively long erect black scales on the thorax and elytra, which are more distinctly visible if the insect is viewed sideways; the upper surface is also clothed with more or less irregular ashy or yellowish ashy scales; rostrum, antennæ and legs ferruginous, the former almost smooth; thorax longer than broad, slightly constricted before apex, sides rounded, closely and strongly punctured, even; elytra very convex, with deep and deeply punctured striæ, interstices narrow and convex. L. 2–3 mm.

By beating dead hedges; in poplar faggots, &c.; very local but not uncommon in the London and southern districts; Mickleham, Coombe Wood, Forest Hill, Darenth, Guildford, Lee, Dartford, Chatham, Gravesend; Deal; Hastings; Portsmouth district; Glanvilles Wootton; Bircham Newton, Norfolk (one specimen taken by myself, August, 1877); Robins Wood, Repton (W. Garneys); Ireland, Carlingford, Co. Louth (Johnson).

CEUTHORRHYNCHINA.

This is a large and important tribe, containing a considerable number of genera and several hundred species; by far the majority are found in the Palearctic region, although representatives of the genera are found widely distributed over the surface of the globe; they are, with very few exceptions, small short and broad insects, with the rostrum, as a rule, long and slender, and received in a distinct pectoral groove, which is variable in length and depth, between the anterior coxæ which are distant; in certain genera, however, the rostrum is short and stout and not, or scarcely received; the antennæ have the funiculus either 6- or 7-jointed; the prosternum is often excised at apex, but is in many cases only broadly emarginate or even truncate; the posterior coxæ are small and do not reach the episterna of the metathorax; according to Leconte and Horn the members of the tribe may be distinguished from their allies with distant front coxæ "by the pygidium being perpendicularly deflexed, and marked with a deep excavation (as in *Mononychus*), or with a continuation of the acute lateral margin of the ventral segments, against which the apical margin of the elytra rests."

The Ceuthorrhynchina appear to be diurnal in their habits and are found on various plants, especially *Cruciferæ*; as a rule, when alarmed,

they contract the rostrum and limbs beneath their bodies and fall and remain motionless; in this condition they are very easily passed over as seeds or little pieces of earth or gravel; a few, however, have the power of leaping sideways and in this way endeavour to escape; this property has especially been noticed in *Rhinoncus perpendicularis* (*subfasciatus*) and is possessed to a less degree by *Rhinoncus Castor* and *bruchoides*, *Cœliodes quadrimaculatus*, and *Ceuthorrhynchus hirtulus*. The larvæ of the tribe do not differ from the ordinary Rhynchophorous type; they are whitish, occasionally yellowish, fleshy grubs; the life history of certain of the species is interesting and will be further referred to.

As regards the division of the tribe into genera, there is great diversity of opinion; in the catalogue published in 1883 by the Rev. A. Matthews and myself the following were enumerated as distinct, *Mononychus*, *Cœliodes*, *Ceuthorrhynchus*, *Ceuthorrhynchidius*, *Amalus*, *Rhytidosomus*, *Rhinoncus*, *Phytobius*, *Litodactylus*, *Eubrychius*, *Tapinotus* and *Poophagus*; of these Thomson (Skand. Col. x. pp. 194-197) includes *Rhytidosomus* under *Cœliodes* (which latter genus he regards as distinct), and *Ceuthorrhynchidius*, *Tapinotus* and *Poophagus* under *Ceuthorrhynchus*; *Amalus* he considers a separate genus, and the remainder he places under *Rhinoncus*; the genus *Mononychus* has always been regarded as distinct, but this does not occur in the Skandinavian fauna.

Bedel goes considerably further than Thomson and reduces the genera which are found in the basin of the Seine, and which are almost identical with ours, to three only, *Amalus*, *Mononychus* and *Ceuthorrhynchus*; of these *Mononychus* is distinct, *Amalus* includes *Rhinoncus* and its allies, and *Ceuthorrhynchus* is made up of the species proper, and those belonging to the genera *Cœliodes*, *Ceuthorrhynchidius*, *Rhytidosomus*, *Tapinotus* and *Poophagus*, and of course to the several subgenera (such as *Stenocarus*, *Megacetes*, *Cidnorrhinus*, &c.), into which one or two of these have been divided by Thomson and others.

M. Bedel, in grouping the species together, makes the following remarks (l. c. p. 162):—"If we pass in review the series of Mediterranean species, we very quickly perceive that the form of the body, the number of joints of the funiculus, the dimensions of the rostrum, the development of the pectoral channel, the structure of the femora and of the tibiæ and their terminating brush of hairs (*corbeille*) have never the value of generic characters; they are excellent characters for the distinction of species, but nothing further;" to a very great extent M. Bedel is right, but certain of the characters are in other groups regarded as generic and we are brought back to the old question "What really constitutes a genus?" which has never satisfactorily been answered, and certainly cannot be answered as far as the Rhynchophora are concerned in the present state of our knowledge; as, however, the characters which have been given for the various genera belonging to the present tribe

have in several cases a tendency to run into one another, and have, in fact, been differently described in some cases by different authors, I was, at first, as I have before stated, strongly inclined to adopt Bedel's arrangement of the genera; on further consideration, however, I have come to the conclusion that this arrangement would probably be very confusing, and that it is the best plan to keep to the genera that have been hitherto usually accepted; it is quite possible that the synthesis of the genera may be adopted, but the whole question regarding the constitution of the tribe is very far from being settled.

I. Prosternum at least as long before the anterior coxæ as the coxæ themselves and deeply incised at throat.
  i. Onychium terminated by a single claw; scape half as long as the funiculus . . . . . MONONYCHUS, *Schönh.*
  ii. Onychium terminated by two claws; scape, as a rule, as long as the funiculus.
    1. Eighth joint of the antennæ independent of the club and resembling the preceding joint; funiculus consisting of seven joints.
      A. Pectoral channel for the reception of the rostrum continued to or beyond apex of the intermediate coxæ and terminating in a more or less prolonged excavation on the metasternum . . . . . CŒLIODES, *Schönh.*
      B. Pectoral channel for the reception of the rostrum sometimes absent, sometimes continued between anterior coxæ, but very rarely attaining the metasternum.
        a. Lateral border of elytra not strongly cut back at shoulders; form elongate, oblong-ovate . . . . . POOPHAGUS, *Schönh.*
        b. Lateral border of elytra cut back deeply and angularly at shoulders; form short and broad, ovate . . . . . CEUTHORRHYNCHUS, *Duval.*
    2. Eighth joint of the antennæ included in the club; funiculus consisting of six joints.
      A. Lateral border of elytra cut back angularly at shoulders.
        a. Form short, ovate; anterior lobe of episterna of metasternum reaching the tenth stria of the elytra . . . . . CEUTHORRHYNCHIDIUS, *Duval.*
        b. Form longer, oblong; anterior lobe of episterna of metasternum not reaching the tenth stria of the elytra . . . . TAPINOTUS, *Schönh.*
      B. Lateral border of elytra not strongly cut back at shoulders; interstices narrow and subcostiform; form short, subglobose . . . RHYTIDOSOMUS, *Schönh.*

II. Prosternum before the anterior coxæ reduced to a narrow border which is truncate or broadly emarginate at throat.
  i. Funiculus of antennæ consisting of seven joints; prosternum broad between the anterior coxæ . RHINONCUS, *Steph.*
  ii. Funiculus of antennæ consisting of six joints;

prosternum very narrow between the anterior coxæ.

A. Rostrum about six times as long as broad, shining in front; sides of thorax without tubercles . . . . . AMALUS, *Schönh.*

B. Rostrum short and broad, only two or three times as long as broad; sides of thorax with more or less distinct tubercles.

a. Tibiæ and tarsi furnished sparingly with long natatory cilia; third joint of tarsi narrow, without distinct lobes . . . . . EUBRYCHIUS, *Thoms.*

b. Tibiæ and tarsi without cilia; third joint of tarsi widened and deeply bilobed.

a*. Antennæ inserted in middle of rostrum; last joint of tarsi elongate . . . . . LITODACTYLUS, *Redt.*

b*. Antennæ inserted in front of middle of rostrum; last joint of tarsi not elongate PHYTOBIUS, *Schmidt.*

MONONYCHUS, Schönherr.

This genus contains about ten species, five of which are found in Europe, and the remainder in Siberia, China, Central Asia, the Canary Islands and North America; they are moderately large, convex and thick-set insects, and may be known by having the onychium furnished with a single claw, and the scape of the antennæ only half as long as the funiculus; they live in the pods of species of *Iris*.

The larva of the single British species, *M. pseudacori*, is described and figured by Westwood (Classification I. p. 345, fig. 41, 20); it considerably resembles the larva of the nut weevil (*Balaninus nucum*), being short, thick, tubercular, and without hairs; it feeds in the pods of *Iris pseudacorus* and is found in profusion in some parts of the Isle of Wight in the seeds of this plant in August; the beetle eats its way out of the seed and pod and, after hybernating, deposits its eggs in spring, like the other weevils.

M. pseudacori, F. Black, slightly glossy, form stout and broad; head hollowed between the eyes which are large, with a few ferruginous scales at the base of the rostrum; rostrum moderately long and slender, a little dilated at apex; antennæ reddish testaceous with the club dark; thorax narrowed in front, rounded and somewhat dilated behind, closely and coarsely punctured, with a very distinct smooth longitudinal channel; elytra with a yellowish-grey spot at scutellum, which is sometimes plain and sometimes obsolete, and with distinct punctured striæ, interstices broader than the striæ very closely sculptured; legs black, robust and rather long; underside thickly clothed with yellowish-grey scales. L. 4–4½ mm.

Male with the pygidium raised longitudinally and the last ventral segment terminated by two subdentiform lobes.

In seed pods of *Iris pseudacorus* (Yellow Flag); extremely local, but abundant

where found; Isle of Wight, Ventnor, &c.; Curtis says that for the first specimen of this insect that he possessed he was indebted to Mrs. Griffiths, of Torquay, Devon, but I have not heard of its capture in that county of late years.

CŒLIODES, Schönherr.

About forty species are included in this genus, which are widely distributed; sixteen or seventeen occur in Europe and the remainder have been described from Algeria, South Africa, Siberia, Persia, and North and South America; they have been divided into several further subgenera (*Stenocarus*, *Allodactylus*, *Cidnorrhinus*, &c.), by Thomson, Weise and Leconte; they may be known by having the pectoral furrow continued on to the metasternum and the mesosternum plainly foveolate; the thorax is usually constricted at apex, and the femora, as a rule, are armed with a tooth beneath; the form is short and broad; the colour is variable, and the underside is more or less thickly clothed with whitish or yellowish-grey scales.

I. Elytra without warty tubercles on interstices, except occasionally at sides and apex.

i. Posterior femora simple or obsoletely toothed; pectoral furrow continued to apex of metasternum; colour red, reddish-brown or yellowish-red. (*Megacetes*, Thoms., *Nedyus*, *auct. pars.*)

1. Thorax without or with a very indistinct projection in middle of sides; posterior femora simple or at most furnished with a small brush-like tuft of hairs on their underside, rostrum more or less infuscate.

A. Elytra red, without transverse waved bands, interstices convex and shining, with one regular row of pale hairs on each; rostrum entirely dark . . . . . C. RUBICUNDUS, *Herbst.*

B. Elytra reddish-brown, with transverse waved bands; interstices flat, with pale hairs or scales set closely in at least double rows.

a. Rostrum entirely dark; suture of elytra dark for its whole length; striæ of elytra coarse . . . . . C. QUERCUS, *F.* (*dryados*, Gmel.)

b. Rostrum red at apex; suture of elytra in part clothed with whitish scales; striæ of elytra fine . . . . . C. RUBEE, *Marsh.*

2. Thorax with an angular projection in middle of sides; male with the second ventral segment of abdomen furnished with a very distinct round fovea; posterior femora obsoletely toothed; rostrum red . . . . . C. ERYTHROLEUCUS, *Gmel.* (*subrufus*, Herbst.)

ii. Posterior femora armed with a strong sharp tooth; colour dark, dull.

1. Pectoral channel deepest behind the intermediate coxæ and there ceasing, not reaching the middle of the metasternum which is almost

truncate; thorax deeply channelled; elytra with a dark hollow velvety patch at suture just before scutellum (s.g. *Stenocarus*, Thoms.) — C. CARDUI, *Herbst.* (*fuliginosus*, Marsh.)

2. Pectoral channel deepest behind the intermediate coxæ, nearly reaching middle of metasternum which is emarginate; elytra without dark patch before scutellum, but with a more or less distinct white spot at each side, about middle (s.g. *Cidnorrhinus*, Thoms.) . . . . . — C. QUADRIMACULATUS, *L.*

II. Elytra with rows of warty tubercles on interstices; upper side deep black, rather shining.

i. Anterior margin of thorax slightly raised; hairs on elytra scarcely visible if viewed sideways; punctuation of thorax less fine . . . . — C. GERANII, *Payk.* (*affinis*, Payk.)

ii. Anterior margin of thorax strongly raised; hairs on elytra raised, plainly visible if viewed sideways; punctuation of thorax very fine . . — C. EXIGUUS, *Ol.*

C. rubicundus, Herbst. (*quercus, var. β.* Payk.; *melanocephalus*, Steph.). Short oval, convex, black or ferruginous with the elytra red, shining, suture fuscous, with a patch of white scales at base; the anterior margin of thorax is often lighter than the hinder portion; rostrum rather long, antennæ slender; thorax closely punctured, very obsoletely channelled; elytra with strong punctured striæ which are almost as broad as the interstices, interstices somewhat convex, with a row of pale hairs on each; legs clear red, apex of tibiæ, and the tarsi, more or less fuscous. L. 2–3½ mm.

Male with the posterior tibiæ armed with a small hook; abdomen broadly impressed at base, with the last segment broadly and deeply impressed.

By sweeping herbage and beating young trees, especially birch; local; London district, not common, Darenth Wood, Faversham, Shirley, Birch Wood, West Wickham, Belvedere; Chobham; Hastings; Holm Bush, Brighton; New Forest; Glanvilles Wootton; Knowle; Cannock Chase; Robins Wood, Repton; York; Burnt Wood, Staffordshire; Chat Moss, and common on all mosses near Manchester on birch; Northumberland and Durham district; Scotland, Solway, Tweed, Forth, Dee and probably other districts.

C. quercus, F. (*dryados*, Gmel.). Brown or ferruginous brown, with the rostrum, disc of thorax and breast dark, with grey scales which are thicker at sides of thorax and on three more or less distinct waved bands on elytra; underside with greyish scales; the suture of the elytra is fuscous for its whole length; thorax closely and rather strongly punctured, without tubercles at sides; elytra with strongly punctured striæ; legs ferruginous, base of posterior femora dark. L. 2-2½ mm.

Male with the posterior tibiæ armed with a small curved hook and the abdomen broadly impressed at base; according to Thomson the last segment is furnished with a deep impression terminated on each side by a rather thickly pilose tubercle.

On young oaks; in woods and hedges; somewhat local in certain districts but not uncommon throughout England and apparently Scotland; and sometimes abundant in the New Forest and other southern localities. Ireland, near Dublin and probably common.

C. ruber, Marsh (*rufirostris*, Steph.). Short oval, convex, larger than the preceding, blackish or brownish, with the anterior margin of thorax, and the elytra, lighter; apex of rostrum red, the colour being sometimes distinct and sometimes rather obscure; upper surface with grey scales which are thicker at sides of thorax and sometimes form an obsolete central band on thorax and are continued on head; and also form three more or less distinct waved bands on elytra; the suture, at least in front, is also clothed with grey scales, as also is the underside; thorax closely punctured, without tubercular prominences at sides; elytra with fine punctured striæ, interstices broad; legs ferruginous, femora concolorous. L. 3–3¼ mm.

Male with the posterior tibiæ armed with a small curved hook, abdomen impressed at base, last segment with a transverse impression at apex.

On young oaks in copses and hedges; rather local; London district, not uncommon, Darenth Wood, Chatham, Sandhurst, Esher, Shirley, Horsell, Woking, Ashtead, Leith Hill; Ashwicken, Norfolk; Dover; New Forest; Glanvilles Woottou; Bristol; Swansea; Caernarvon; Llangollen; rare in the Midlands, the only record I know being Robins Wood, Repton (W. Garneys); I have never found it in the Midland counties, nor is it included in Mr. Blatch's list; Northumberland and Durham district; Scotland, scarce, but widely distributed, Solway, Tweed, Forth, Dee, Moray and probably other districts.

C. erythroleucus, Gmel. (*subrufus*, Herbst.). Very like the preceding in size, shape and general appearance, but easily distinguished by its red colour and the angular projection in the middle of the sides of thorax; the white fasciæ on the elytra are narrower and the male has the abdomen broadly impressed in middle at base, and the last segment plainly impressed transversely; the posterior femora are obsoletely toothed, but the teeth are sometimes scarcely visible; the rostrum and legs are entirely red. L. 3–3¼ mm.

By beating young oaks, &c.; in woods and copses; usually regarded as rare; but it is common in the Midland districts where it apparently replaces the preceding species; in my experience it is also commoner than *C. ruber* in the New Forest district; London district, Kent and Surrey, not common, Darenth Wood, Shirley, Horsell, Charlton, Cowfold, Birch Wood, Maidstone; Hastings; New Forest; Lords Wood, Southampton; Midland counties, general; Lincoln; not recorded from the Northumberland and Durham district; Scotland, very rare, Solway and Forth districts.

C. cardui, Herbst. (*fuliginosus*, Marsh (s.g. *Stenocarus*, Thoms.)). Short and broad, dull black, thickly clothed beneath with whitish scales, upper surface with greyish scales which are thicker on suture at apex and on the alternate interstices of the elytra, and also on head and front of thorax in fresh specimens; towards the base of elytra at suture

there is a very distinct velvety black patch, which will easily distinguish the insect; thorax closely punctured, with a central furrow which is more or less interrupted in middle; elytra with fine punctured striæ and broad shagreened interstices, tuberculate at apex; legs black, squamose, tarsi more or less ferruginous, femora toothed. L. $3\frac{1}{2}$–4 mm.

Male with the posterior tibiæ armed with a hook at apex and the last ventral segment deeply and broadly impressed in the middle.

By sweeping herbage; often on roads and pavements; also found in moss and under decaying seaweed and in sand-pits; rather local, less common in many districts; London district, common everywhere; Southern districts, widely distributed; Midland counties, very local and apparently scarce, Bewdley, Repton, &c.; Lincoln, abundant on pavements, &c., from early spring; Wallasey, Cheshire; Stretford, near Manchester; Northumberland and Durham district; Scotland, scarce, Tweed and Forth districts.

M. Bedel (l.c., pp. 165 and 323) separates *C. cardui*, Herbst. (*guttula F.*) and *C. fuliginosus*, Marsh, which are usually considered as synonymous, as follows:—

Head with a little stria between the eyes; thorax with a lateral raised ridge or tubercle on each side, which is rather strongly developed and continued as far as the external border, if viewed from above	C. CARDUI, *Herbst.*
Head without interocular stria; thorax with a small tubercle on each side, which appears isolated, if viewed from above	C. FULIGINOSUS, *Marsh.*

The former of these species M. Bedel records as being found in sandy places and on sand-hills in spring and autumn, and as occurring in Central Europe, Western Siberia and Syria; the latter, he says, is found in sandy districts and often under shady walls, and occurs in early spring and summer; it inhabits the whole basin of the Seine, Central and Southern Europe, Algeria and Madeira; the larva has been found by Rupertsberger at the roots of *Papaver somniferum*.

It is possible that these two species may be distinct, but, as far as I have been able to judge, intermediate specimens occur, and I should be sorry to separate them on the characters given by M. Bedel unless they were more marked.

C. quadrimaculatus, L. (*didymus,* F. (*s.g. Cidnorrhinus,* Thoms.)). Short and broad, convex, dull black, clothed beneath with thick whitish or yellowish-white scales, which are also present in spots and patches on the upper surface, the most conspicuous being at about the middle of the sides; the base, apex, and sometimes part of suture, are also more or less plainly whitish, but the markings are not conspicuous, and the prevailing colour of the upper surface is black; thorax strongly and very coarsely punctured with a shallow central furrow, and with distinct lateral tubercles; elytra with rather strong punctured striæ, which are almost as broad as the interstices; legs stout, black, tarsi and tibiæ more or less ferruginous, femora toothed. L. 2–$3\frac{1}{4}$ mm.

Male with the posterior tibiæ armed with a hook, and the last ventral segment obsoletely impressed.

On the common nettle, *Urtica dioica*; very common and generally distributed throughout the kingdom; it is perhaps the most universally abundant of all the British Curculionidæ.

C. geranii, Payk. (*affinis*, Payk. (*s.g. Allodactylus*, Weise.)). Short and broad, convex, deep black, shining, without scales on upper surface, underside thickly clothed with whitish scales; head rather coarsely punctured, rostrum moderately long, punctured, with a smooth central line; thorax closely and distinctly punctured, very convex, with very small lateral tubercles; elytra short and broad, with rather deep, almost impunctate, striæ; and with the interstices each furnished with a row of setose tubercles, the setæ being scarcely visible if viewed sideways; legs stout, black, intermediate and posterior femora rather obsoletely toothed. L. $2\frac{1}{4}$–$2\frac{3}{4}$ mm.

Male with the posterior tibiæ armed with a hook.

On various species of *Geranium*, especially *G. sylvaticum*, and also on *G. pratense*, *sanguineum* and *robertianum*; in chalky and sandy places on the sides of cliffs, &c.; commoner near the coast than inland; occasionally in moss in winter; locally common; London district, not uncommon; Bristol; Swansea; Barmouth, sandhills, common; Llandudno; Bewdley; Matlock; Knaresborough, Yorkshire; Manchester district, general but rare; Northumberland and Durham district, Axwell Park, Gibside and Hartlepool; Scotland, widely distributed, Solway, Tweed, Forth, Dee, and probably other districts; Kirkcaldy and Kinghorn (Power); it has not been recorded from Ireland, but almost certainly occurs in that country; the records south of the Midland districts appear to belong to the following species.

C. exiguus, Ol. This species, which by many authors has been considered only a variety of the preceding, may be distinguished by being rather smaller, and by having the anterior margin of the thorax more strongly reflexed, the setæ of the elytra plainly visible if viewed sideways, and the asperities or tubercles on the interstices of the elytra less even; the punctuation of the thorax also is closer and finer; the differences are, certainly, comparative, but seem to be constant. L. $2\frac{1}{4}$–$2\frac{1}{2}$ mm.

In drives and paths through and on the borders of woods; on various species of *Geranium*, especially *G. sylvaticum*, *G. molle* (according to M. H. Brisout), *G. pusillum*, *rotundifolium* and *dissectum*; London district, not uncommon; Darenth, Mickleham, Belvedere, Ripley, Dartford, Chatham, Gravesend, Sheerness, Walton-on-Naze; Whitstable; Deal; Eastbourne; Arundel; Devon; Bewdley; Northumberland and Durham district, taken in plenty on *Geranium sylvaticum* by Mr. Bold; the records of the two species appear to be somewhat confused, but Mr. Champion informs me that he believes that all the southern records for *C. geranii* must be referred to this species, as *Geranium sylvaticum*, which is the chief food-plant of *C. geranii*, does not occur in the south at all; it appears, however, not to be confined to this plant, but to occur on other species of *Geranium*.

POOPHAGUS, Schönherr.

Two species are comprised in this genus, according to the Munich

catalogue published in 1871, but in the catalogue of Heyden, Reitter and Weise five species are referred to it, so that it is probably more extensive than is at present known; in appearance they differ from *Ceuthorrhynchus* in being more elongate and less thick set; the elytra are not strongly cut back at the shoulders nor are they warty at apex; the thorax has no tubercles and is scarcely constricted at apex; the femora are rather slender and the claws are simple.

1. Prevailing colour grey; antennæ and tarsi black; femora without tooth . . . . . P. SISYMBRII, *F.*
2. Prevailing colour greenish; antennæ and tarsi reddish testaceous; femora with a small but distinct tooth . . . . P. NASTURTII, *Germ.*

P. sisymbrii, F. Oblong, rather depressed, black, clothed on both upper and under surface with thick white scales; rostrum long and slender; thorax at least as long as broad, constricted before apex, with two dark longitudinal bands about middle; elytra long, with punctured striæ, with the shoulders, an oblique spot about middle and another before apex, denuded and black; these spots are usually more or less confluent and are very variable in size according to the freshness of the specimens; legs long, black clothed with white scales, femora not toothed. L. $2\frac{1}{2}$–$3\frac{1}{2}$ mm.

Male with the last ventral segment of abdomen slightly impressed and the antennæ inserted a little before middle of rostrum.

Female with the abdomen even and the antennæ inserted in the middle of rostrum.

Marshy places; on *Nasturtium amphibium;* not uncommon and generally distributed throughout England and Wales; Scotland, local, Solway, Tweed and Forth districts; Ireland, Waterford, Galway, Armagh and probably general.

P. nasturtii, Germ. (*olivaceus*, Gyll.). Broader than the preceding, greenish-bronze, thickly clothed with greenish-grey scales on both the upper and under side; rostrum long, black, with extreme apex red, antennæ red with club darker; thorax gradually narrowed in front, scarcely constricted before apex, closely punctured; elytra with rather fine punctured striæ, interstices rather broad, closely punctured; femora dark, clothed with greenish-grey scales, tibiæ in part reddish, tarsi red; in some specimens there are traces of denuded spots and fasciæ on elytra. L. $2\frac{1}{2}$–$3\frac{1}{2}$ mm.

In ditches, &c.; on *Nasturtium officinale;* both this and the preceding species are usually found beneath the surface of the water; rare, but sometimes found in considerable numbers, where it occurs; Hythe (Tylden); Exminster marshes, Devon, rare (Parfitt); Rudham, Norfolk, fairly common (T. Wood); Hunstanton, Norfolk, stream on the road to Heacham (W. G. Blatch and myself); Uphill, Weston-super-Mare (Crotch); Notts and Yorkshire (Stephens).

CEUTHORRHYNCHUS, Duval.

This genus is by far the most important in point of numbers of all

belonging to the tribe ; it contains, as far as is at present known, upwards of two hundred and fifty species, but in all probability is much more extensive ; no less than one hundred and sixty of these are found in Europe ; a certain amount, which will probably be increased, occur in Siberia and Central Asia, and a very few in North and South America ; species have also been described from Algeria, Madeira, Ceylon, &c., but I do not know of any from the Australian region ; they may be known by their short broad form, the 7-jointed funiculus of the antennæ, and the incised shoulders of elytra.

The males of *Ceuthorrhynchus*, according to Bedel, may be known by having a little claw at the apical internal angle of the intermediate or posterior tibiæ ; besides this there is usually a more or less distinct impression or fovea towards the base of the abdomen, or a bunch of hairs or some other mark on the second or fifth ventral segments of the abdomen ; in certain species the proportions of the rostrum are different in the two sexes, in which case that of the female is always the longest.

The larvæ are small, stout, whitish, occasionally yellowish, grubs ; they live on the same plants as the perfect insects, and undergo their metamorphoses in the stalks, flowers or fruits ; some of them form galls or excrescences at the foot of the root-stalk or on the roots themselves, and one or two of our British species are well known as attacking cabbage and turnip plants ; the best known of these is *C. pleurostigma*, Marsh (*sulcicollis*, Gyll.), the larva of which is white when found at the roots of cabbage, and yellowish or flesh coloured when it attacks swedes ; these larvæ form galls or excrescences at the roots, and apparently when full fed they leave their hiding-place and enter the earth to undergo their final transformations ; the perfect beetle gnaws the leaves and in all probability deposits its eggs at the roots of the plant ; figures of the perfect insect, larvæ and galls will be found given by Curtis (Farm Insects, p. 132) ; the damage done to turnips is not of much account apparently, but young cabbages are often much injured by the attack ; Miss Ormerod recommends as a remedy the careful burning of old cabbage stalks and especially a change of crop, as the weevils will not attack carrots, parsnips, corn, &c. ; the use of gas-lime, caustic lime, soot, wood-ashes and spent hops has also been found of great service.

Another very common species that does much damage to the seed-pods of the turnip, and, I believe, of mustard and other Cruciferæ, is *C. assimilis* (Payk.), which is of about the same size as *C. pleurostigma*, but is much greyer, being thickly clothed with grey scales, whereas the latter insect is deep black, rather shining, and almost glabrous on its upper surface ; the small species *C. contractus* (Marsh), is also said to have done very great damage to young turnips by puncturing and destroying the young leaves in much the same fashion as the turnip-flea (*Phyllotreta nemorum*) ; I have not, however, heard of its ever having proved very injurious of late years.

There are thirty-seven British species, some of which are very closely allied ; it is, however, as a rule, not difficult to distinguish fresh specimens, but the scales are very easily rubbed and the identification of such specimens is of course harder in a large genus than in a small one ; in one or two cases, e.g. *C. marginatus*, *C. punctiger* and *C. rotundatus*, the

species are so closely allied that several authors have had considerable doubt as to their being specifically distinct; the following table will be found of considerable service, but as some of the chief characters are not very obvious, it will be found more useful for particular groups than for the species taken as a whole.

I. Femora not toothed.
  i. Tarsal claws dentate beneath or appendiculate on their inner side.
    1. Rostrum black.
      A. Elytra with small tubercles before apex . . C. SYRITES, *Germ.*
      B. Elytra without tubercles before apex.
        a. Elytra black, rather shining, with simple rows of white setæ . . . . . C. SETOSUS, *Boh.* (*atomus*, Boh.)
        b. Elytra covered with moderately close grey scales . . . . . C. CONSTRICTUS, *Marsh.*
    2. Rostrum bright red; form very short and convex with coarse elytral striæ . . . . . C. ERICÆ, *Gyll.*
  ii. Tarsal claws simple, rather slender.
    1. Elytra with a band of white scales extending the whole length of the suture . . . . . (*C. suturalis*, F.)
    2. Elytra without sutural band of white scales.
      A. Elytra with a white patch of scales at scutellum . . . . . C. COCHLEARIÆ, *Gyll.*
      B. Elytra without a white patch at scutellum.
        a. Upper surface thickly clothed with grey scales . . . . . C. ASSIMILIS, *Payk.*
        b. Upper surface without or almost without scales, shining and apparently glabrous.
          a*. Elytra bright blue or violet; punctures of striæ finer, of thorax coarser; thorax with a slight central furrow . . . . . C. ERYSIMI, *F.*
          b*. Elytra with a very slight bluish green or æneous reflection; punctures of striæ coarser, of thorax finer; thorax without central furrow . . . . . C. CONTRACTUS, *Marsh.*

II. Femora, at all events the posterior pair, toothed, as a rule plainly, but in one or two cases with the teeth obsolete in one sex.*
  i. Tarsal claws dentate beneath or appendiculate on their inner side.
    1. Elytra without scales, but with raised hairs, visible if viewed sideways, and forming single rows on each interstice.
      A. Anterior femora with a small tooth; posterior femora with a distinct tooth; elytra bright blue.
        a. Striæ of elytra narrow, interstices flat . . C. CYANIPENNIS, *Germ.* (*sulcicollis*, Payk. *nec* Gyll.)
        b. Striæ of elytra broad, interstices convex. . C. CHALYBÆUS, *Germ.*
      B. Anterior femora without tooth; posterior femora with a small tooth in female and with

* This is the case with *C. hirtulus* only among our species.

the tooth obsolete in the male; elytra black-blue or slaty . . . . . C. HIRTULUS, *Germ.*

2. Elytra with scales, or hairs (recumbent or rarely raised), forming at least two rows on each interstice.

A. Elytra with raised pubescence, visible if viewed sideways.

a. Base of thorax almost straight; pubescence of elytra even, coarse and very distinct, brown with a white scutellary patch and some white dots on the elytra . . . . . C. PILOSELLUS, *Gyll.*

b. Base of thorax bisinuate produced towards scutellum.

a*. Clothing of elytra very distinct, in part consisting of brownish-white scales; general colour brownish . . . . . C. QUADRIDENS, *Panz.*

b*. Clothing of elytra not distinct unless viewed sideways, consisting of fine pubescence; general colour black . . . . . C. PICITARSIS, *Gyll.*

B. Elytra with the clothing variable, but always recumbent, and not, or scarcely, visible if viewed sideways.

a. Elytra metallic blue with a white spot at base of suture . . . . . C. SUTURELLUS, *Gyll.*

b. Elytra not metallic.

a*. Elytra with fine but very distinct white stripes along certain of the striæ, which are also present on thorax, and with oblique white stripes across some of the interstices, forming a pattern; size large. C. GEOGRAPHICUS, *Goeze.* (*echii*, F.)

b*. Elytra without white stripes on the striæ; interstices variably coloured.

a†. Ninth interstice furnished with a row of warty prominences reaching to shoulder . . . . . C. POLLINARIUS, *Forst.*

b†. Ninth interstice resembling the others.

a‡. Elytra without a light patch at scutellum.

*. Outer margin of tibiæ before apex with a projecting tooth followed by a brush of bristles reaching to apex; elytra usually with a white patch on each side towards middle of margin . . . . . C. VIDUATUS, *Gyll.*

**. Outer margin of tibiæ either simple or furnished with bristles before apex but not toothed.

†. Central furrow of thorax fine; scales of elytra fine, subrotundate . . . . . C. ANGULOSUS, *Boh.*

††. Central furrow of thorax deep; scales of elytra filiform.

‡. Thorax almost glabrous; anterior femora with a small tooth-like fascicle.

aa. Sides of breast very closely covered with greyish white scales; tarsi black . . . . C. PLEUROSTIGMA, *Marsh.* (*sulcicollis*, Gyll. *nec* Payk.)

bb. Sides of breast almost bare; tarsi pitchy red . . . . . C. ALLIARIÆ, *Bris.*

‡‡. Thorax clothed with long ashy pubescence or whitish linear scales; anterior femora without fascicle . . . . . C. RAPÆ, *Gyll.*

b‡. Elytra with a white or brownish-white patch at scutellum.

*. Elytra without any pattern of scales.

†. Elytra with a very distinct isolated white spot at apex, opposed to the basal spot . . . . C. VERRUCATUS, *Gyll.* (*biguttatus*, Boh.)

††. Elytra without distinct isolated apical spot.

‡. Tibiæ and tarsi and apex of femora red . . C. RESEDÆ, *Marsh.*

‡‡. Tibiæ black or pitchy black.

aa. Thorax rather convex, covered with small and extremely close circular punctures; elytra convex not at all asperate at the sides; apex of pygidium with a deep incision in both sexes . . . . . C. PUNCTIGER, *Gyll.**

bb. Thorax rather depressed, shagreened; elytra plainly depressed in front, finely asperated towards the sides; pygidium foveolate behind in the male, entire in the female . . . . . C. MARGINATUS, *Payk.**

**. Elytra with a very indistinct pattern of scales, but with more or less defined whitish or yellowish white and blackish spots.

†. Thorax longer, less strongly constricted in front; elytra oval . . . . . C. URTICÆ, *Boh.*

††. Thorax shorter, more strongly constricted in front; elytra shorter, oblong-oval . . . . . C. RUGULOSUS, *Herbst.*

***. Elytra with a distinct pattern of scales.

†. Thorax long, about as long as its breadth at base . . . . . C. MELANOSTICTUS, *Marsh.*

††. Thorax short, evidently transvers.

‡. Scutellary patch separated from the lateral fascia by four interstices.

aa. Antennæ and tibiæ red, club of former sometimes dark.

aa*. Second interstice of elytra without a white spot at base; thorax simply convex at sides; anterior femora with a large tooth C. ASPERIFOLIARUM, *Gyll.*

bb*. Second interstice of elytra with a white spot at base; thorax angularly raised at sides . . . . . C. ARCUATUS, *Herbst.*

bb. Antennæ and tibiæ black . . . . . C. EUPHORBIÆ, *Bris.*

‡‡. Scutellary patch joined to the lateral fascia

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* With regard to these two species I have followed M. Bedel, and I have also followed him in placing *C. distinctus* under the sub-genus *Ceuthorrhynchidius*; these species have always been a great difficulty to collectors; I have never seen a specimen of M. Brisout's *C. rotundatus* which has been recorded from France and Britain; M. Bedel entirely omits it.

by a series of spots or linear patches, or only interrupted at fourth interstice.

aa. Thorax shorter, evidently transverse, raised at apex; second joint of the funiculus of the antennæ equal to the first . . . . . C. CHRYSANTHEMI, *Germ.*

bb. Thorax longer, not or scarcely raised at apex; second joint of the funiculus of the antennæ a little shorter than the first. . . C. TRIANGULUM, *Boh.*

ii. Tarsal claws simple, rather slender.*

1. Scutellary patch entirely white; tarsi dark; tubercles at sides of thorax completely surrounded with white scales . . . . . C. LITURA, *F.*

2. Scutellary patch yellowish in middle and white on each side; tarsi red; tubercles at sides of thorax not entirely surrounded by white scales. C. TRIMACULATUS, *F.*

C. assimilis, Payk. (*brassicæ*, Foc.). Oblong-oval, upper surface rather depressed, leaden-black, underside thickly clothed with white scales, upper surface with moderately close grey scales; rostrum long and slender; thorax narrowed and considerably constricted in front, closely and rather strongly punctured, with the anterior margin raised, and with a central furrow (which is deeper in front and behind and often more closely covered with scales); on each side there is a raised transverse line or tubercle; elytra with shoulders well marked, and with comparatively fine, but distinct, punctured striæ, interstices flat, apex feebly muricate; legs rather long and slender, femora simple, tarsal claws not cleft or toothed. L. 2–3 mm.

Male with the posterior tibiæ armed with rather a strong hook, and the last ventral segment of the abdomen furnished at apex with a rather broad and shallow fovea; antennæ inserted in middle of rostrum.

Female with the tibiæ simple, the last ventral segment with a small fovea, and the antennæ inserted a little behind middle of rostrum.

On *Sisymbrium*, *Erysimum* and other *Cruciferæ*; the larvæ have been found in the pods of the cultivated cabbage; generally distributed and common throughout the kingdom.

C. syrites, Germ. Allied to the preceding, but much broader, with the thorax at base nearly twice as broad as long, more strongly constricted before apex, strongly and deeply punctured, the elytra more broadly and distinctly muricate at apex, with the interstices granulosely-punctate, and furnished with rather broader scales arranged in biseriate rows; the club of the antennæ also is shorter and the tarsal claws are bifid; the black colour of the upper surface has no metallic reflection; in the female the antennæ are inserted further behind the middle of the rostrum than is the case with *C. assimilis*. L. $2\frac{3}{4}$–3 mm.

By sweeping herbage; very rare; found by sweeping in the field opposite the inn at Birch Wood corner, July 11th, 1860, on *Silene inflata* by Dr. Power; Birch Wood, July, 1860 (S. Stevens); Erith, June 26th, 1860; Knowle, Bewdley and Tewkesbury (Blatch).

* See page 342, twelve lines from bottom.

C. setosus, Boh. (*atomus,* Boh.). A small black, rough-looking, rather shining species, upper side scantily clothed with white setæ, underside with whitish scales; rostrum slender, scarcely as long as head and thorax; head closely punctured, rather depressed between eyes, which are not prominent; thorax rather short, with the anterior border raised, narrowed and constricted in front, coarsely punctured, with a more or less distinct central furrow, and a very feeble tubercle on each side; elytra with deep punctured striæ, nearly as broad as the interstices, which are, at least in part, divided into squares by transverse striæ, and are furnished with rows of white setæ; legs moderately stout, black, femora not toothed. L. 1½ mm.

Male with the posterior tibiæ armed with a small hook at apex and with the rostrum shorter than in female.

Sandy places; on *Iberis amara* (Bitter Candytuft) and *Nasturtium officinale;* extremely local, but not uncommon where found; Claygate, Esher, Mickleham, Horsell, Ashtead, Reigate, Dartford; Bushey, Herts; St. Faiths Norwich; Brandon, Suffolk; Cowley; Plymouth; Whitsand Bay, near Plymouth.

C. constrictus, Marsh. Short ovate; entirely clothed with greyish scales, which are thicker on the under side than on the upper, and are arranged in biseriate rows upon the elytra; head closely punctured, eyes not prominent, rostrum moderately long and slender, antennæ dark, ferruginous at base; thorax a little broader than long, with the anterior margin raised, constricted at apex, but with the sides before the constriction subparallel and slightly rounded, closely and distinctly punctured, central furrow not very plain; elytra rounded at shoulders, with broad striæ, which are nearly as wide as the interstices; legs rather stout, black, with grey scales, femora not toothed. L. 1½ mm.

On *Erysimum alliarium* (=*Alliara officinalis,* Garlic Mustard) and (rarely) on *Sisymbrium;* local, but not uncommon where it occurs; Hammersmith, Highgate, Norwood, Putney, Mickleham, Caterham, Belvedere, Lee, Faversham, St. Mary Cray, Tonbridge, Bearstead, Boundstone, &c.; Folkestone; Hastings; Portsmouth district, sometimes common in June on the garlic mustard; Glanville's Wootton (common); Swansea; Woodbastwick and Horning, Norfolk; Scotland, rare, Forth and Moray districts; the Scotch records are rather remarkable as it has not occurred in any intervening districts.

C. cochleariæ, Gyll. (*atratulus,* Gyll.). Short and broad oval, convex, deep black, rather shining, upper surface with scanty greyish pubescence, which is hardly apparent, and a distinct patch of white scales at base of suture of elytra; underside thickly clothed with whitish scales; head closely punctured between eyes, rostrum moderately long, rather dull, antennæ pitchy with club black; thorax narrowed and constricted in front, with anterior margin raised, central furrow distinct, punctuation strong and not very close; on each side there is a small tubercle; elytra rounded at shoulders, with deep punctured striæ, interstices rugose; legs moderately long, black, femora not toothed, tarsal claws simple, rather slender. L. 1½ mm.

On *Cochlearia officinalis* and *Cardamine pratensis*, especially in marshy places; local, but sometimes found in abundance; Hammersmith, Mickleham, Esher, Woking, Coombe Wood, Darenth, Wimbledon, Highgate, Cowfold, Ripley, Haslemere, Faversham, Snodland, Chobham, Chatham, Maidstone; Aylsham, Norfolk; Wrabness, Essex; Folkestone; Hastings; Amberley; Holm Bush, Brighton; Portsmouth district; Knowle, near Birmingham; Alton; Aigburth shore, near Liverpool; Scotland, not common, Solway and Forth districts.

(*C. suturalis*, F. Dull black, with the base of the antennæ and the legs ferruginous; underside clothed with thickly set whitish scales; upper side with greyish or brownish-grey hairs, and a broad line of white scales extending from the neck to the apex of the elytra, a character that will at once distinguish it; thorax with the anterior margin moderately raised, sides without tubercle; elytra with punctured striæ; legs moderate, femora not toothed, tarsal claws simple, rather slender. L. 2–2½ mm.

On flowers of species of *Allium* (leeks, onions, &c.); a single specimen only has been recorded as British, which was taken by Mr. T. Sidebotham in May, 1865, crawling on the sand at Llandudno, on the Welsh Coast; no other specimen has occurred, and the species appears to require further confirmation as British.)

C. ericæ, Gyll. (*albo-setosus*, Gyll.; *s.g. Micrelus*, Thoms.). A small, short species, black, in fresh specimens powdered with yellowish-green scales, antennæ, legs and rostrum red; base of suture of elytra, and underside, thickly clothed with white scales; eyes separated by a very narrow punctured space, rostrum long and slender; thorax comparatively long, not strongly constricted in front, deeply punctured, with an interrupted, and often obsolete, central furrow, and a small tubercle on each side; elytra short and broad, much broader than thorax, with prominent shoulders and deep punctured striæ, interstices narrow, with small sharp rough tubercles and rows of erect white setæ; femora robust, not toothed, tarsal claws bifid. L. 1⅓–1¾ mm.

Male with the posterior tibiæ armed with a hook, and the last segment of the abdomen impressed.

On ling and heather (*Calluna* and *Erica*); local, but common where it occurs, and generally distributed throughout the kingdom from the New Forest and the Scilly Islands to the Shetland Islands.

C. erysimi, F. Short oval, upper surface not strongly convex, æneous or brassy black with the elytra bright metallic blue or greenish blue, very scantily pubescent, apparently glabrous, underside with scanty whitish scales; thorax comparatively long, strongly constricted before apex, sparingly but deeply punctured on disc, with an interrupted central furrow, and a small tubercle on each side; elytra with moderately strong punctured striæ, muricate at apex, interstices rather broad, slightly convex; antennæ, rostrum and legs black, the latter moderately long, not toothed, claws simple. L. 1½–1¾ mm.

Male with the posterior tibiæ armed with a hook, and the last ventral segment with a fovea in middle.

On *Erysimum* and other *Cruciferæ*; common and generally distributed throughout the kingdom.

The *v. chloropterus*, Steph., is more brassy, with the elytra brassy green and more feebly striated: it appears to be generally distributed.

C. contractus, Marsh. Smaller than the preceding, which it resembles, but easily distinguished by its colour which is black, with the elytra bluish-black or greenish-black, slightly metallic; the head and thorax in *C. erysimi* are distinctly brassy but in this species are dull black or only slightly shining; the punctures of the thorax are closer and finer and those of the striæ of the elytra are coarser and the interstices are narrower; the fovea of the last segment in the male is also smaller. L. 1–1½ mm.

V. pallipes, Crotch. This variety has the legs quite pale, and the elytra greener and more metallic; it has only occurred on Lundy Island, where it was found by Mr. Wollaston.

On various *Cruciferæ*; very common and generally distributed throughout th whole kingdom; by far the commonest of the smaller species.

C. cyanipennis, Germ. (*sulcicollis*, Payk; *nec* Gyll.). Oblong-ovate or subovate, upper surface depressed, without scales, underside with sparing white scales, black, with the abdomen somewhat æneous, and the elytra bright metallic blue; head closely punctured, rostrum long; thorax strongly constricted at apex, strongly and deeply punctured, with a distinct central channel and a lateral tubercle on each side; elytra with comparatively narrow and fine punctured striæ, interstices flat, rugose, with single rows of fine hairs; legs rather long and moderately stout, femora toothed. L. 2–2½ mm.

Male with the posterior tibiæ armed with a strong hook, and the last segment of the abdomen impressed in middle.

On *Sisymbrium officinale*, *Erysimum alliaria*, *Capsella bursa-pastoris*, &c.; local, but common where it occurs; London district, Kent and Surrey not uncommon, Caterham, Shirley, Esher, Norwood, Hammersmith, West Wickham, Chatham, Sheerness, Dartford, Maidstone; Dover; Folkestone; Hastings; Isle of Wight, Ventnor, cliffs on west of town, not uncommon; Leicester; Findern, near Repton; Llangollen; Heysham, Lancaster; Stretford, Manchester; Northumberland and Durham district, Gilsland, Hetton Hall, near Belford, and Gosforth; Scotland, scarce, Solway, Tweed and Moray districts; not recorded from Ireland but it probably occurs.

This species is of about the size, shape and general external form of *C. assimilis*; it resembles *C. erysimi* in colour and in the sculpture of the thorax, but is larger and is easily known by the sculpture of the elytra and the toothed femora.

C. chalybæus, Germ. (*cærulescens*, Gyll.). Smaller and more convex than the preceding, and easily distinguished by its general shape and the broader striæ and narrower and more convex interstices of the elytra; black, with the underside rather thickly clothed with whitish scales, elytra deep blue; thorax with the anterior margin almost truncate and somewhat raised, deeply punctured, with a central channel

and a distinct tubercle on each side; elytra with strong and broad punctured striæ which are almost as broad as the interstices, interstices narrow and convex with rows of whitish setæ; legs moderately long. L. $1\frac{1}{2}$ mm.

Male with the posterior tibiæ armed with a hook, the teeth of the femora almost obsolete, and the last segment of the abdomen with an impressed fovea.

Female with the tibiæ simple and the femora, at all events the intermediate and posterior pairs, distinctly toothed.

On *Sisymbrium officinale, Thlaspi arvense* and other *Cruciferæ*; the larva has been found at the foot of the latter plant; local, but not uncommon where it occurs; Barnes, Weybridge, Caterham, Hammersmith, Notting Hill, Hampstead, Lewisham, Claygate, West Wickham, Belvedere, Dartford, Rusper, Chatham, Sheerness, Gravesend; Norfolk, near Hunstanton; Deal; Hastings; Southampton district; Llangollen; Llandudno; Findern, near Repton (W. Garneys); Heysham, Lancaster; Stretford, Manchester; Scotland, rare, Moray district.

I believe *C. viridipennis*, Bris., to be a variety of this species, perhaps bearing the same relation to it that the *v. chloropterus* bears to *C. erysimi*. I have not, however, had an opportunity of examining a type of the insect; Dr. Sharp omits the species in the second edition of his catalogue, and M. Bedel does not notice it at all in his work, even as a synonym. Mr. Champion records it from Whitstable and also from Caterham (on *Mercurialis perennis*), and it has been recorded also from Hammersmith and Llangollen.

C. hirtulus, Germ. A small, short oval species, rather convex, under surface clothed rather sparingly with whitish scales, upper surface black with the elytra obscurely blue or black blue, with the interstices furnished with distinct rows of black setæ; rostrum rather long, head depressed between eyes, closely punctured; thorax closely and strongly punctured, constricted in front, with a central channel and a distinct tubercle on each side; elytra with rather strong punctured striæ, interstices moderately broad; legs somewhat stout. L. $1\frac{1}{4}$–$1\frac{1}{2}$ mm.

Male with the posterior tibiæ armed with a hook at apex, the last ventral segment of abdomen impressed with a small fovea, and the posterior femora furnished with an obsolete tooth.

Female with the tibiæ simple and the posterior femora furnished with a small but distinct tooth.

On *Sisymbrium officinale* and other *Cruciferæ*; the larva has been observed on *Draba verna*; it lives in a gall on the stems and undergoes its transformations in the earth; rare; Deal (Champion); Portsmouth district (Moncreaff); Isle of Wight (Blatch); York (Hey); Scotland, very local, Tweed and Forth districts, Rannoch, Aberlady, &c.; Mr. S. Stevens has received it from Mr. Wollaston, and I believe that Dr. Power once took it at Mickleham, but I am not quite sure of his record.

In size and general appearance the species somewhat resembles *C. contractus*, but may be known by its colour, the setæ of the elytra

and the small femoral teeth of the female; the latter character, the colour of the elytra, and the less strong setæ will separate it from *C. setosus*.

C. suturellus, Gyll. Short-oval, convex, black, with the elytra blue, suture black with a spot of white scales at base, underside clothed with white scales which are very close beneath shoulders; thorax very sparingly furnished with whitish scales, rufescent beneath on apical margin, broader than long, strongly punctured, with a central furrow and a lateral tubercle on each side; elytra without raised setæ, and with distinct obsoletely punctured striæ, interstices rather depressed, finely rugose; legs black, femora toothed. L. 2–2½ mm.

On *Cardamine pratensis;* rare; Snodland, Kent (Champion); Hythe (Tylden); Bearstead, near Maidstone (Gorham).

C. pilosellus, Gyll. (*hispidulus*, Stevens, M.S.). Short, ovate, moderately convex; black, rather shining; underside clothed with yellowish scales; thorax with a short line in middle of front of thorax, and elytra with a spot at scutellum covered with whitish or yellowish-white scales, and some of the same scales scattered over disc; elytra rather closely covered with brownish hairs, upright and inclined backwards; these are also present to a less degree on thorax; thorax with a central furrow and conical lateral tubercles, constricted at apex, anterior margin rather strongly raised, base almost straight; elytra with rather deep punctured striæ, interstices convex, rugose and roughened towards apex. L. 2–3 mm.

Sandy places; by sweeping herbage; the food plant does not appear to be known; very rare; Birch Wood, Charlton and Plumstead (S. Stevens); Deal; Seaton, Devon, January 1st to 5th, 1864 (Power, two specimens).

C. quadridens, Panz. Oblong ovate, upper surface rather depressed, upper and under sides clothed with greyish-brown or whitish-brown scales, which are thicker beneath, black, with the antennæ, extreme apex of tibiæ, and tarsi, reddish-testaceous; thorax long, strongly and broadly constricted before apex, closely punctured, with a central furrow and lateral tubercles; elytra with an æneous reflection when denuded of scales, strongly tuberculate at apex, with fine, scarcely punctured, striæ and broad flat interstices, which are furnished with upright pubescence; the base of the suture is more thickly clothed with scales; the species appears to be very easily rubbed, and unless in fresh specimens the scales of the upper surface are often scanty and abraded; legs moderately long, femora with small teeth. L. 2¼–2¾ mm.

Male with the posterior tibiæ armed with a large hook and the last segment of the abdomen impressed in middle.

On *Sisymbrium*, *Brassica* and other *Cruciferæ;* the larva lives in the stems or at the roots; locally common; generally distributed in the London district and

southern counties; not common in the Midlands; I have never found it in the Midland counties myself nor is it in Mr. Blatch's list; Mr. W. Garneys has, however, taken it at Repton; Mablethorpe, Lincolnshire; Filey, Yorks; Holy Island; Northumberland and Durham district; Scotland, common, Solway, Tweed, Forth, Moray and probably other districts; Ireland, Waterford, and near Belfast.

This species somewhat resembles *C. melanostictus*, but may be known by having the thorax more narrowed in front, by the absence of a distinct pattern of scales on the elytra, and also by the upright pubescence, which is distinctly visible if viewed sideways.

C. geographicus, Goeze (*echii*, F.). A large and conspicuous species, black or fuscous black, with the underside thickly clothed with greyish-white scales, which on the upper surface are arranged in distinct slender lines forming a pattern; the thorax has the posterior margin and three narrow lines white, and on the elytra the most conspicuous line is an oblique flexuous one arising at the base of the suture; rostrum long, antennæ in part ferruginous; thorax about as long as its breadth at base, constricted before apex, very closely punctured, without distinct central furrow and with lateral tubercles, sides notched in front; elytra with fine striæ and broad flat interstices, and with small spines at sides and towards apex; legs stout, femora strongly toothed. L. $4\frac{1}{2}$–$5\frac{1}{2}$ mm.

On *Echium vulgare* and occasionally on thistles; the larva lives in the roots of the plant and undergoes its transformations in a cocoon below the surface of the earth; the perfect insect appears in June; locally common; London district, Kent and Surrey, not uncommon; Mickleham; Caterham; Whitstable; Deal; Dover; Sandgate; Purfleet, Essex; Hastings; Amberley; Southampton; Portsmouth district; Bristol; Rodborough, Gloucestershire; Swansea; Northumberland and Durham district, rare; Scotland, very rare, Tweed and Forth districts.

This species is the largest of the British Ceuthorrhynchina and cannot possibly be mistaken for any other.

C. pollinarius, Forst. Black, or brownish-black, underside clothed with yellowish-grey scales, upper side with rather scanty cinereous and brownish scales which are much thicker in quite fresh specimens, antennæ and tarsi ferruginous; head depressed between eyes, antennæ inserted before middle of rostrum; thorax moderately long, narrowed and broadly constricted in front, closely and strongly punctured, with a deep central furrow and very strong sharp lateral tubercles; elytra broad, with strongly marked shoulders and fine striæ, interstices flat, rugose; ninth interstice entirely and the rest at apex, muricate; legs long, femora strongly toothed. L. 4 mm.

Male with the posterior tibiæ armed with a small hook at apex and the last ventral segment impressed with a small fovea.

On nettles (*Urtica dioica*); abundant and generally distributed throughout the kingdom.

C. viduatus, Gyll. (s.g. *Thamiocolus*, Thoms.). Black, dull, upper

side sparingly and underside thickly clothed with whitish scales, elytra with a lateral patch at sides and another lunulate spot before apex white; rostrum rather long and stout, antennæ in part ferruginous; thorax comparatively short, with the anterior margin raised, strongly constricted before apex, very closely and strongly punctured, with an indistinct central furrow, chiefly represented by a deep depression before scutellum, lateral tubercles absent; elytra with fine striæ and broad rugose interstices; legs mostly reddish-brown, femora strongly toothed, tibiæ before apex armed externally with a sharp tooth. L. $2\frac{3}{4}$–$3\frac{1}{2}$ mm.

Male with the posterior tibiæ armed with a large hook, and the last segment of abdomen strongly impressed.

On *Stachys arvensis;* rare; Surbiton, Surrey (Power); Claygate (Power); Dagenham, Essex; Sheerness; Portsmouth district (Moncreaff); Suffolk (Garneys); Wicken Fen (Blatch); Sherwood Forest (Hardy); Robins Wood, Repton (Garneys); Fallowfield, near Manchester (Chappell); Heysham, Lancaster (Reston); Northumberland district, banks of Irthing (Bold); Scotland, rare, Solway, Forth and Clyde districts.

This species much resembles the very common *Cœliodes quadrimaculatus* in general appearance, but, apart from the character of the pectoral groove, it may be known by the tooth before apex of tibiæ, and also by the fact that the white marks on the elytra are nearer the shoulder; it is also larger; it is, however, very probably passed over in mistake for this species by collectors.

C. angulosus, Boh. (*impressicollis,* W.C. *nec* Gyll.). About the size of *C. pollinarius,* but with a longer, narrower, and subconical thorax; black, antennæ, tibiæ and tarsi yellowish-brown; body covered with greyish scales, which are thicker on the underside, and on the elytra are fine and subrotundate; rostrum moderately stout, thorax scarcely broader than long, somewhat conical, very slightly constricted towards apex, closely and finely punctured, central furrow fine, lateral tubercles small and acute, anterior margin not reflexed; elytra with fine punctured striæ, interstices scarcely convex, not muricate at apex; legs long and slender. L. 3–$3\frac{1}{2}$ mm.

In marshy districts; probably attached to a Cruciferous plant; very rare; Scotland, Solway district; received from Mr. Little, taken in the North of England (S. Stevens); in Dr. Power's collection there is a specimen from Mr. Hardy and another, without locality, labelled "*rugulosus,* Germ., *impressicollis,* W. C. coll. Wollaston."

C. picitarsis, Gyll. (*tarsalis,* Boh.). Ovate, black, base of antennæ and the tarsi reddish-testaceous; occasionally the antennæ are entirely reddish; underside diffusely covered with greyish scales, upper surface without scales, but with raised greyish or brownish-grey hairs which are visible if viewed sideways; head depressed between eyes, rostrum rather long; thorax broadly and strongly constricted towards apex, with anterior margin strongly raised, coarsely punctured,

with moderate central furrow and small lateral tubercles; elytra with comparatively fine punctured striæ, and rather broad flat interstices, apex muricate; legs rather stout, femora toothed. L. 2–2½ mm.

Male with the posterior tibiæ furnished with rather a strong hook at apex.

On *Sisymbrium officinale* and (very rarely) on *Erysimum alliaria*; also on *Brassica*; the larva has been found at the roots of *Brassica napus*; very local and, as a rule, rare, but sometimes found in abundance in a particular spot; Erith; Belvedere, Kent, taken by Dr. Power and Mr. Champion in plenty; Saltwood, Kent; Bearsted (Gorham, one specimen); Sheerness; Folkestone; Hythe; Portsmouth district (Moncreaff); Llangollen (Chappell).

This species might at first sight be easily passed over in mistake for the common *C. pleurostigma*, but the reddish-testaceous tarsi will at once distinguish it; from *C. alliariæ*, which has the tarsi pitchy red, it may be separated by the upright pubescence of elytra.

C. pleurostigma, Marsh. (*sulcicollis*, Gyll. *nec* Payk.). Oblong ovate, black, upper side with scanty greyish recumbent pubescence, underside thickly clothed with whitish scales, which are especially thick on the mesothoracic epimera; thorax strongly constricted before apex, coarsely and not very closely punctured as compared with other species, with a strong central channel and a small lateral tubercle on each side; elytra with deep but comparatively fine striæ, interstices broad and flat, rugose, muricate at apex; legs entirely black, femora not strongly toothed. L. 2–2½ mm.

Male with the posterior tibiæ armed with a hook, the last segment of the abdomen deeply and widely impressed, and the penultimate furnished with two small tubercles before apex.

On various *Cruciferæ*; common and generally distributed throughout the kingdom.

C. alliariæ, Bris. (*inornatus*, Wat.). Closely allied to the preceding, from which it may be known by the pitchy red colour of the tarsi and the fact that the under surface of the body is sparingly furnished with white scales, the mesothoracic epimera being comparatively denuded; in the male the penultimate ventral segment of the abdomen is simple and the depression on the last segment is bounded by a conical tubercle. L. 2½–3 mm.

On *Erysimum alliaria*; local but not uncommon where it occurs; Highgate, Norwood, Hammersmith, Mickleham, Caterham, Putney, Box Hill, Ripley, Belvedere, St. Mary Cray, Boundstone, Bearsted; Portsmouth district (Moncreaff); it appears to be confined to the London, South-Eastern and Southern districts.

C. rapæ, Gyll (*inaffectatus*, W. C., *nec.* Schön.). Rather a large species which at first sight resembles *C. assimilis* and *C. syrites*, but may be known by the more robust legs, toothed femora and cleft tarsal claws; leaden black, upper surface rather closely, underside very closely clothed with greyish-white scales; thorax rather long, narrowed in front,

moderately strongly punctured, with the anterior margin scarcely raised, broadly and not strongly constricted before apex, with a deep central furrow and small lateral tubercles; elytra with comparatively fine and distinctly engraved striæ, interstices rather broad, flat, interstices rugose, not strongly muricate at apex; femora with small and inconspicuous teeth. L. 3–3½ mm.

Male with a rather blunt hook at apex of posterior tibiæ.

On *Sisymbrium officinale*; local and usually rare; Barnes and Lee (Champion); Lee (Sharp); Tottenham (Waterhouse); Putney; Hammersmith and Belvedere (S. Stevens and Power; Dr. Power took twenty-two specimens at the former place on August 18, 1867); Lewisham; Portsmouth district (Moncreaff).

C. verrucatus, Gyll. (*biguttatus*, Boh.). Rather a large and conspicuous species; oblong-ovate, rather depressed on disc, dull black, with the underside and a spot at base and another at apex of elytra thickly clothed with whitish scales, remainder of upper surface with brown scales; single white scales are also dotted over the interstices; rostrum moderately long; antennæ inserted before middle of rostrum, more or less ferruginous; thorax rather long, with a central greyish-brown line, strongly constricted before apex, anterior margin raised, finely and very closely punctured, with indistinct central furrow and small lateral tubercles; elytra with fine and narrow, scarcely punctured, striæ, interstices broad and flat, only slightly muricate at apex; legs in part reddish-brown, femora dark, toothed. L. 3–4 mm.

On the Horned Poppy or Sea Poppy (*Glaucium luteum*); very local, but common where it occurs; Southend; Bopeep, near Hastings; Worthing; Hayling Island, common in autumn; Mr. Moncreaff, who has taken it in this locality, says that it is found at the roots among the dried leaves of the plant, and that it feigns death for a long time, so that much patience has to be exercised in searching for it; Seaton Beach, Devon, in abundance (Power); it appears to be confined to the south-eastern and southern coast, where it probably occurs wherever the food plant is found.

C. resedæ, Marsh. Black, depressed on disc, with scanty light-fuscous scales above and thick brownish-grey scales beneath; tibiæ, tarsi and apex of femora reddish; at the base of suture there is a shiny spot of light scales; the sides of the thorax are also more thickly clothed with scales, as also are certain parts of the elytra; rostrum long; thorax rather long, constricted in front, closely and strongly punctured, with a central furrow marked by a line of scales, and small lateral tubercles; elytra with fine striæ and broad flat interstices, muricate at sides and apex; legs rather stout, femora strongly toothed. L. 2½ mm.

On *Reseda luteola* and *R. lutea*; very local and, as a rule, rare; Gravesend; Greenhithe; Strood; Chatham; Dover; Deal; Arundel; Eastbourne; Portsmouth district; Freshwater, Isle of Wight; Swansea; Suffolk; Cromer, Norfolk (abundant, J. J. Walker).

C. punctiger, Gyll. Short oval, black, sparingly clothed with fine cinereous scales above, and with a conspicuous patch of white scales at

base of suture, underside thickly clothed with whitish scales, which are also present at the sides of the elytra; thorax transverse, covered with small and very close circular punctures, strongly constricted in front, apical margin raised, with an obsolete central furrow, and without lateral tubercles; elytra with fine punctured striæ, interstices broad, slightly roughened at apex, but with the sides smooth; apex of pygidium with a deep incision both in the male and female; intermediate and posterior femora rather feebly toothed. L. 2–2½ mm.

Male with the posterior tibiæ armed with a hook, the last ventral segment of the abdomen broadly and deeply impressed, and the pygidium narrowly but deeply incised at apex.

Female with the tibiæ simple, the last ventral segment impressed with a narrow line at apex, and the pygidium with a short incision.

On *Taraxacum officinale* (Common Dandelion); the larva lives in the plant-head; also found in moss on chalky hill sides, &c.; rare; Caterham; Dorking; Highgate; Darenth; Hythe; Deal; Scotland, rare, Solway, Moray and probably other districts.

C. marginatus, Payk. Very closely allied to the preceding, of which it has been considered merely a variety, or rather *C. punctiger* has been considered a variety of this species; it differs in having the thorax sub-depressed and shagreened, and the elytra evidently depressed in front and finely asperate at the sides; the second joint of the antennæ is shorter, the thorax is less widely constricted before apex and less convex, and the elytra are broader towards apex; the rostrum of the female is also shorter and broader; the pygidium is foveolate behind in the male and entire in the female. L. 2½–3 mm.

Chalky and sandy places; by sweeping herbage; often found in flowers; the larva lives in the heads of *Hypochæris maculata;* local; London district, rather common, Caterham, Mickleham, Darenth, Reigate, Shirley, Weybridge, Haslemere, West Wickham, Cowley, Horsell, Bearsted, Wimbledon, Chatham, Gravesend, Bushey; Birchington; Deal; Dover; Folkestone; Sandwich; New Forest; Knowle; Lincoln; Barmouth; Llandudno; Yorkshire; Manchester district, general, but not common; Northumberland and Durham district; Scotland, Balmuto, Fifeshire (Power); Ireland, Rathkurby, near Waterford (Power).

(*C. rotundatus,* Bris. This species of M. Brisout, which is recorded as from France in the catalogue of Heyden, Reitter and Weise, but is not referred to at all by M. Bedel, appears to be intermediate between the two preceding species; it is described as near *C. punctiger*, but of shorter form and greater convexity, with relatively wider striæ, and its pygidium not deeply excised. L. 2–2½ mm.

By sweeping herbage; sometimes found on flowers, &c.; rare; first mentioned as taken by Mr. Crotch, near London; Reigate, Caterham and Weybridge (G. C. Champion).

C. urticæ, Boh. An inconspicuous-looking species, dull black, with the base of the antennæ and the tarsi yellowish-red, upper side scantily and unequally covered with greyish scales which form no pattern but are

thicker towards base of suture, underside thickly clothed with greyish white scales ; thorax rather long, closely punctured, with a fine central furrow, and with distinct lateral tubercles, rather broadly constricted before apex which is not much raised ; elytra oval, with the shoulders rounded, with deep punctured striæ and rather convex interstices, feebly roughened at sides and apex; legs rather robust, femora not strongly toothed. L. 2–2½ mm.

On nettles; rare; Caterham, Mickleham, Bearsted, Maidstone, Boundstone; Amberley, near Arundel; Portsmouth district; Llangollen; received from Mr. Walton, taken, I believe, in Yorkshire (S. Stevens).

C. rugulosus, Herbst. (*gallicus*, Gyll.; *melanostigma*, Marsh). Short ovate, rather convex, but depressed on disc, black or brownish-black, with the antennæ, tibiæ and tarsi ferruginous ; underside thickly clothed with greyish scales ; thorax with a central line, and two other lines parallel to this, of greyish scales, often more or less abraded ; elytra with lines and dashes of whitish scales, which are thicker on parts of suture, and with a central sutural black patch ; the pattern, however, is indistinct ; thorax short, very strongly constricted before apex, with an indistinct central furrow and a small tubercle on each side ; elytra short and broad with rather fine striæ and broad interstices, which are muricate at apex ; legs rather stout, femora strongly toothed. L. 2 mm.

Male with the posterior tibiæ armed with a hook and the last ventral segment impressed.

Marshy places ; by sweeping herbage and often in moss and at roots of grass ; it is found on *Corymbiferæ ;* the larva has been observed in the stems of *Matricaria chamomilla* and *Chamomilla nobilis ;* local, but not uncommon ; Claygate, Norwood, Forest Hill, Warlingham, Dartford, Lee, Cowley, Horsell, Birch Wood, Dulwich, Faversham, Chatham, Sheerness; Drayton, variety with hardly any markings; Dagenham ; Hastings; Eastbourne ; Brighton ; Worthing; Isle of Wight ; Portsmouth district ; Portland ; Bristol ; Swansea ; Knowle ; Windsor Forest ; Twyford, near Repton ; Northumberland and Durham district, rare ; Scotland, rare, Tweed district only.

C. melanostictus, Marsh. (*concinnus*, Gyll. ; *lycopi*, Gyll.). Rather elongate, black, base of antennæ, tarsi, and often more or less of tibiæ, reddish-testaceous or brownish yellow, underside with closely set whitish scales, upper surface with brownish white, brownish and dark scales, which form a distinct variegated pattern on elytra, the suture being whitish except at middle where it is interrupted by a longitudinal dark patch ; thorax long, scarcely constricted in front, with the central line and sides pale, anterior margin only slightly raised, lateral tubercles small ; elytra oblong, subquadrate, with fine punctured striæ, interstices rather flat ; femora distinctly toothed. L. 2½ mm.

In damp places, especially in woods ; on species of *Labiatæ*, particularly *Lycopus* and *Mentha ;* the larva has been observed at the roots of *Lycopus europæus* and *Mentha silvestris ;* local, and not common ; Shirley, Woking, Surbiton, Lee, Balcombe, Merton, Cowley, Bearsted ; Folkestone Warren ; Hastings ; Arundel ;

New Forest; Portsmouth district; Glanvilles Wootton; Aylsham, Norfolk; Repton; Mabberley, Cheshire.

C. asperifoliarum, Gyll. (*quadrimaculatus*, Marsh). Black, rather depressed above, under surface thickly clothed with white scales, elytra with a white spot at base of suture and a white lunate spot towards the margin on each side, situated about middle; the apex is also furnished with white markings; in fresh specimens there are a considerable number of white scales, besides these patches, both on the thorax and the elytra; antennæ long, red, with club darker; thorax short, deeply and narrowly constricted before apex, without lateral tubercles, but with the sides simply rounded and convex; elytra with narrow indistinctly punctured striæ, interstices broad and flat; tibiæ and tarsi red, femora dark, strongly toothed. L. 2–2½ mm.

Male with the anterior and posterior tibiæ armed with a small hook, and the intermediate pair with a larger one; last ventral segment of abdomen impressed.

On various species of Boraginaceæ; found on *Echium*, *Anchusa*, *Symphytum*, *Lithospermum*, *Myosotis* and *Cynoglossum*; locally common; generally distributed in the London district and the Southern counties; Midlands, local, Leicester, Tamworth, Bewdley, Birmingham district, &c.; Cromer, Norfolk; Mablethorpe, Lincolnshire; Southport, Lancashire; Northumberland and Durham district; not recorded from Scotland.

C. arcuatus, Herbst. (*occultus*, Gyll.). Closely allied to the preceding from which it differs in having the thorax distinctly raised angularly at sides, and in having the second interstice of each elytron furnished with a white spot at base, which makes the white patch at suture much more conspicuous; the teeth of the femora also are smaller; the underside is less thickly clothed with scales and the white markings at the sides of the elytra are also smaller; besides these characters the thorax is only slightly constricted before apex and the anterior margin is less raised; the antennæ, tibiæ and tarsi are yellowish-brown. L. 2–2½ mm.

On Labiatæ, probably *Lycopus* and *Mentha*; very rare; Manchester (Hardy, Taylor and Sidebotham); Chat Moss (Reston); Cleethorpes, Lincolnshire, and Southport (Chappell); received from Sherwood Forest (Gorham); Mickleham, Surrey (Power).

C. euphorbiæ, Bris. (*crux*, W.C.). About the size of the two preceding species and resembling them in general appearance, but easily distinguished by having the antennæ, tibiæ and tarsi black; ovate, rather convex, black, thorax with a whitish central line, not strongly constricted before apex, with rather obsolete lateral tubercles, closely punctured; elytra with a patch at scutellum, a lunate spot on each side, and markings at apex, white, with rather strong punctured striæ; underside clothed with whitish scales; femora strongly toothed. L. 2–2½ mm.

On *Veronica;* according to M. Brisout, however, it occurs on *Euphorbia sylvatica*, whereas M. Bedel thinks it is attached to one of the *Labiatæ*, probably *Teucrium scorodonia;* in chalky and sandy places; rare; Mickleham and Darenth (Power); Mickleham, on *Veronica* (S. Stevens); Headley Lane (Gorham); Shirley, Dartford and Deal (Champion); Whittlesea (Blatch); Scotland, rare, Solway district, Dumfries (Sharp).

C. chrysanthemi, Germ. Rather short ovate; black, antennæ ferruginous with club dark, tibiæ reddish, tarsi light, reddish or reddish-testaceous, underside clothed with whitish scales; thorax with the sides and a central line whitish, elytra with the base of suture and a line on each side of the longitudinal patch white, and with various white lines, centre of disc behind middle black with a surrounding of whitish scales, fourth interstice with a white line; rostrum long and curved; thorax strongly constricted before apex, with the apical margin raised, and with obtuse lateral tubercles, closely punctured; elytra with feeble punctured striæ; intermediate and posterior femora moderately strongly toothed, anterior femora feebly toothed. L. $2\frac{1}{2}$–$2\frac{3}{4}$ mm.

On *Chrysanthemum leucanthemum;* local but not uncommon where it occurs; Claygate, Caterham, Ashtead, Forest Hill, Woking, Walton-on-Thames, Lee, Chatham, Cowfold, Maidstone, Rusper; Riddlesdown; Bushey (in plenty); Drayton; Dover; Hastings; Portsmouth district; Glanvilles Wootton; Norfolk; Gloucester; Knowle; Bewdley; Knaresborough, Yorkshire.

This species has usually been regarded as synonymous with *C. campestris*, but, according to Bedel, the last named species is the same as *C. variegatus*, Ol. (*lepidus*, Gyll.), which is closely allied to *C. chrysanthemi*, but differs in the fact that the fourth interstice of the elytra has no special white stripe, and that the scales of the elytra are white and cinereous, whereas in *C. chrysanthemi* they are white, black, and yellowish; it is very probable that both species are British, but I do not feel sure whether they can be regarded as distinct.

C. triangulum, Boh. (*vicinus*, Kraatz.). Very like the preceding, which it resembles in the general arrangement of the scales, but easily distinguished by its rather smaller size, and longer subtrapezoidal thorax, which has the apical margin not or scarcely raised; the elytra are subrectangular (whereas in *C. chrysanthemi* they are almost rounded), and the black patch behind middle of disc is reduced to a comparatively narrow streak of the same width as the white longitudinal patch before scutellum; the general clothing of the upper surface is thicker and greyer; in the male the anal ventral segment is terminated by two tufts of white hairs. L. 2 mm.

Sandy places on the coast and also inland; on *Achillea millefolium;* rare; Birch Wood, rare (S. Stevens); Southend (Gorham); Wrabness, Essex, and Brandon, Suffolk (J. J. Walker); Deal (Champion and Garneys); Horsell, Bungay and Ditchingham Suffolk, Weybridge and Folkestone (Power).

C. litura, F. Short oval, depressed on disc, dull black, with the

tarsi slightly ferruginous; underside thickly clothed with white scales; thorax moderately long with the sides and front thickly clothed with light scales, which are also present on a short band at base, lateral tubercles strong, black, completely surrounded by the scales, margins strongly constricted before apex; elytra with a cruciform spot of white scales at base of suture, and a lunate band on each side and other markings towards apex, punctured striæ rather fine, interstices rather broad, rugose; femora strongly toothed, claws simple rather slender. L. 3–4 mm.

Male with all the tibiæ armed with a strong hook and the last ventral segment of abdomen slightly impressed.

Female with the tibiæ simple, the teeth of the femora stronger, and the elytral markings larger.

On thistles; local but not uncommon and generally distributed throughout the kingdom.

C. trimaculatus, F. (*crucifer*, Ol.). Very like the preceding in general appearance, but easily distinguished by the scutellary patch, which is yellowish in the middle with a white patch and small spot on each side, and by the fact that the tubercles of the thorax are not surrounded with white scales, as well as by the light reddish testaceous tarsi; the antennæ also are reddish, except the club; the teeth of the femora are strong and the tarsal claws are simple and rather slender. L. 3–4 mm.

On thistles; local and much less common than the preceding; Mickleham, Caterham, Shirley, Purley, Headley Lane, Chatham; Dover; Folkestone; Hastings; Littlehampton; Brighton; Portland; Glanvilles Wootton; Whitsand Bay, Plymouth; Swansea; Ashbourne, Derbyshire; Scarborough; Ireland, Armagh, one specimen (Rev. W. F. Johnson).

CEUTHORRHYNCHIDIUS, Duval.

This genus contains comparatively few species, seventeen only being recorded in the Munich catalogue of 1871, all of which, with the exception of one from South Africa, are recorded from Europe; in the European catalogue, however, of Heyden, Reitter and Weise, published in 1883, twenty-four species are enumerated; about sixteen of these have been recorded as British; they are very closely allied to the species of *Ceuthorrhynchus*, but are, on the average, considerably smaller, although one or two species, e.g. *C. horridus*, are comparatively large: they may be distinguished from the three preceding genera (*Cœliodes Poophagus* and *Ceuthorrhynchus*) by having the eighth joint of the antennæ included in the club and the funiculus consisting of only six joints; this distinction, it must be allowed, does not always appear to be very evident as certain species have been placed in both genera by different authors; from *Tapinotus* the species may easily be known by

their general shape, and from *Rhytidosomus* by having the elytra cut back more angularly at the shoulders.

I. Tarsal claws simple; femora, as a rule, not or very obsoletely toothed.*
  i. Elytra with strong rows of closely set punctures, but without distinct engraved striæ; interstices narrow; upper surface shiny . . . . . C. POSTHUMUS *Germ.* (*pumilio*, Gyll.).
  ii. Elytra with distinct striæ: interstices broader; upper surface usually rather dull.
    1. Thorax finely and very closely punctured, the punctuation being almost concealed by the scales.
      A. Thorax trapezoidal; base almost straight . C. NIGRINUS, *Marsh.*
      B. Thorax not trapezoidal; base bisinuate, slightly produced towards scutellum.
        a. Elytra with a row of white hairs inserted in the striæ.
          a*. Anterior margin of thorax not raised; suture of elytra more thickly clothed with whitish scales than disc . . . . C. MELANARIUS, *Steph.*
          b*. Anterior margin of thorax raised; clothing of elytra evenly distributed . . C. HEPATICUS, *Gyll.*
        b. Elytra without white hairs inserted in the striæ.
          a*. Thorax with a small but distinct tubercle on each side . . . . . C. FLORALIS, *Payk.*
          b*. Thorax without or with a very indistinct tubercle on each side.
            a†. Tibiæ and more or less of rostrum red; thorax not strongly transverse . C. PYRRHORHYNCUS, *Marsh.*
            b†. Tibiæ in great part and rostrum black; thorax strongly transverse . C. PULVINATUS, *Gyll.*
    2. Thorax distinctly and rather coarsely punctured; upper surface black with a patch of white scales at base of thorax and at scutellum and with the apex of elytra more or less plainly reddish . . . . . C. TERMINATUS, *Herbst.*
II. Tarsal claws dentate beneath or appendiculate on their inner side; femora, as a rule, at all events the posterior pair, plainly toothed.
  i. Size large; upper surface rough and scabrous; interstices of elytra with single rows of long stiff upright setæ; colour reddish-brown . . . . . C. HORRIDUS, *Panz.*
  ii. Size smaller; elytra not scabrous, bearing on each interstice one, two or three rows of recumbent hairs.
    1. Upper surface black or pitchy black; thorax without longitudinal grey lines.
      A. Club of antennæ pyriform; thorax rather convex; elytra convex and rounded, with the

* In the case of *C. terminatus* some specimens have the posterior femora plainly toothed, whereas in others the teeth are obsolete or absent; I am not sure whether this difference is sexual or not.

shoulders not marked; (species extremely closely resembling *Ceuthorrhynchus punctiger*) . . . . . C. DISTINCTUS, *Bris.*

B. Club of antennæ fusiform; thorax somewhat depressed, short; elytra rather depressed, quadrangular, with the shoulders well marked.

a. Elytra with a distinct white patch at scutellum; thorax with a feeble tubercle at each side . . . . . C. QUERCICOLA, *Payk.* (*versicolor*, Bris.) (*V. Crotchi*, Bris.)

b. Elytra without or with an indistinct light patch at scutellum; thorax without tubercles at sides . . . . . C. MIXTUS, *Muls.* (*nigroterminatus*, Woll.)

2. Upper surface reddish-brown; thorax with three more or less distinct longitudinal grey lines.

A. Rostrum unicolorous, pitchy or dark ferruginous.

a. Forehead without a white patch between eyes . . . . . C. TROGLODYTES, *F.*

b. Forehead with a white patch between eyes.

a*. Size larger; thorax longer; scutellum with a white patch on each side . . . C. CHEVROLATI, *Bris.* (*minimus*, Walton ?)

b*. Size smaller; thorax shorter; scutellum without a white patch on each side . . C. RUFULUS, *Dufour.* (*frontalis*, Bris.)

B. Rostrum clear red with the apex black; size very small . . . . . C. DAWSONI, *Bris.*

C. floralis, Payk. Short oval, moderately convex, black, with cinereous pubescence, upper side clothed with greyish scales, which are lighter at suture, underside thickly clothed with whitish scales; rostrum long and slender; thorax a little broader than long, rather strongly constricted before apex, with an interrupted central furrow and a small tubercle on each side, closely punctured, base bisinuate, anterior margin raised; elytra with deep punctured striæ, interstices somewhat convex, scarcely muricate at apex. L. $1\frac{1}{4}$–2 mm.

Male with the posterior tibiæ armed with a hook and the last segment with a broad fovea, more deeply impressed at apex; antennæ inserted in middle of rostrum.

Female with the tibiæ simple and the last segment with an obsolete fovea; antennæ inserted a little behind the middle of rostrum.

On various species of *Cruciferæ* (*Capsella*, *Erysimum*, &c.); common and generally distributed throughout England and Scotland, and probably Ireland.

C. hepaticus, Gyll. Closely allied to the preceding, but on the average larger, and more convex, with no sutural lighter streak, shorter limbs and lighter coloured tarsi; the elytra are furnished with a row of white hairs inserted in the striæ; according to Schönherr the tibiæ

should be light testaceous, and the elytra fuscous or liver-coloured, dull, with scattered shining cinereous scales; the striæ of the elytra are narrow and the interstices flat. L. $1\frac{1}{4}$–2 mm.

On *Brassica cheiranthus* and other Cruciferæ; occasionally in moss; rare; Faversham (Walker); Chatham (Walker and Champion); Eastry and Wingham, Kent (Gorham); Littlington (Cambridge), Ditchingham (Norfolk), and Hurstpierpoint (Power); Dorking (S. Stevens); Seaford (Waterhouse); near Repton (Garneys).

C. pyrrhorhynchus, Marsh (*erythrorhynchus*, Gyll.; *cochleariæ*, Thoms. *nec* Gyll.). Closely allied to *C. floralis*, but rather broader, on the average larger, and usually of a more fuscous colour; it may be known by having the rostrum red, black at base, and the anterior margin of the thorax and the tibiæ reddish; the red colour is lighter in some specimens than in others; the thorax is shorter, feebly transverse, and more strongly and somewhat rugosely punctured, with the constriction before apex stronger and the sides behind the constriction more convex and rounded; the scales on the interstices of the elytra are rather broader, and the external tuft at the apex of the tibiæ is more conspicuous; the last joint of the tarsi also is darker. L. $1\frac{3}{4}$–2 mm.

Male with the posterior tibiæ armed with a large straight hook, the last ventral segment impressed and the antennæ inserted in the middle of the rostrum; in the female they are inserted a little behind the middle.

On *Sisymbrium officinale*; locally common; generally distributed in the London district and the South-Eastern and Southern counties; Swansea; Bewdley; Repton; Norfolk; Manchester district, general; Northumberland and Durham district, not common; Scotland, very rare, Solway district.

C. pulvinatus, Gyll. This species is considered by Thomson (Skand. Col. viii. 256), whose views, as Mr. Rye remarks, are usually the reverse of synthetical, to be merely a variety of the preceding which has the upper surface more thickly clothed with scales; M. Bedel, however, separates it as a species on the ground that the thorax is more strongly transverse, the general form is broad oval instead of oblong oval, and the anterior margin of the thorax, the rostrum, and the greater part of the tibiæ are black. L. $1\frac{1}{2}$–2 mm.

Very rare; the food plant apparently is not known but it is probably one of the *Cruciferæ*; Hastings, August, 1867 (Power, confirmed by Brisout); Evesham and Hunstanton, Norfolk (Blatch).

C. nigrinus, Marsh. (*depressicollis*, Gyll.). This species may be distinguished from its close ally, *C. floralis*, by having the thorax less strongly constricted at apex and the base almost straight; the scales of the upper surface are more scanty and are very seldom thicker at the suture of elytra; this latter character will distinguish it from *C. melanarius*, which is on the average a smaller insect; the descriptions of some of these allied species, however, as given by different authors, are very contradictory, and this small group is one of the most difficult

among the Curculionidæ to determine from descriptions merely, although when placed side by side the differences are much more obvious. L. 1¼–2 mm.

By sweeping herbage; especially in chalky places; probably on *Cruciferæ;* local, but not uncommon where it occurs; Shirley, Croydon, Riddlesdown, Mickleham, Darenth, Chatham, Dartford, Faversham, Maidstone, Cowley, Dorking, Claygate, Crohamhurst, Tottenham, &c.; Littlington, Cambridge; Brighton; Exmouth; Repton (W. Garneys); Northumberland district, rare, Wooler Haugh.

C. melanarius, Steph. (♂ *convexicollis,* Boh., ♀ *glaucus,* Boh.). Black, upper surface rather scantily clothed with whitish scales, underside thickly clothed with compact scales; on the upper side the scales are thicker at sides and at suture, where they generally form a strong or distinct band, which is nearly always absent in *C. nigrinus* and less marked in *C. floralis;* from the latter species it may further be known by having a row of white hairs inserted in the striæ of the elytra, and the anterior margin of the thorax less raised; the shape also of the elytra is less round and the shoulders are more marked; from *C. nigrinus* it may easily be separated by having the base of the thorax plainly bisinuate and produced into a point before scutellum. L. 1¼–1¾ mm.

In marshy places, ditches, &c.; on *Nasturtium officinale:* local, but not uncommon where it occurs; Weybridge, Horsell, Cowley, Lee, Staple (Kent); Cromer; Ditchingham; Wroxham; Arundel; Lymington; Portsmouth district; Bewdley; Salford Priors; Evesham; Tewkesbury; Repton; Manchester district, general; Northumberland and Durham district; the only record is "Durham," *Ormsby's Durham,* and it has not been recorded from Scotland.

C. posthumus, Germ. (*pumilio,* Gyll.; ♂ *asperulus,* Boh.; *Poweri,* Rye). A pretty and very distinct little species; short, ovate, pitchy-brown or reddish-brown, shining, with the head and thorax except the anterior margin of the latter darker; the colour, however, is somewhat variable; rostrum reddish-brown, somewhat pitchy at apex; antennæ fuscous, with the club darker, globose-ovate; legs reddish-yellow, femora sometimes darker; upper side with rather scanty greyish scales, underside rather thickly set with scales; rostrum long, thin, and curved, very finely striate, shining; thorax short, transverse, strongly constricted before apex, bisinuate at base, closely punctured, with an obsolete tubercle on each side; elytra short and broad, almost round, with rows of strong crenate punctures, and narrow interstices, which are furnished with double rows of white setæ, sides and apex slightly muricate. L. ¾–1¼ mm.

Sandy places; on *Teesdalia nudicaulis;* rare; Weybridge, Frensham, near Farnham, and Boundstone, Surrey (Power); Silverdale, near Lancaster (Sidebotham); the species is found in April and May; Dr. Power's are dated May 2nd, 1869, and April 10th to 16th, 1873.

C. terminatus, Herbst. (*apicalis,* Gyll.). Black, moderately shiny, with very scanty and scarcely apparent greyish pubescence; underside

very thickly clothed with white scales, upper surface with a large patch of white scales at base of suture and a few at apex of elytra, which is more or less distinctly reddish; rostrum long thin and curved, very finely striate, shining; thorax transverse, coarsely and closely punctured, strongly constricted before apex, bisinuate at base, with a more or less distinct central furrow, and a small, sometimes obsolete, tubercle on each side, anterior margin raised in middle; elytra with deep, crenate, striæ, interstices flat, moderately broad, plainly rugose; femora black, tibiæ dark, in part reddish, tarsi red. L. 2–2½ mm.

On *Daucus maritimus;* local, but not uncommon where it occurs; Caterham, Mickleham, Reigate, Dorking, Forest Hill, Purley Oaks, Claygate, Cowley, Chatham, Whitstable; Kingsgate; Hythe; Folkestone; Hastings; Amberley; Worthing; Portsmouth district; Isle of Wight, Ventnor and Sandown, on the sides of the cliffs on *Daucus;* Glanvilles Wootton; Brandon, Suffolk; Repton (W. Garneys); Northumberland and Durham district, rare; Scotland, very rare, Tweed district; Ireland, Ballina.

C. horridus, F. (*spinosus*, Goeze). A large and conspicuous species; pitchy-red, or ferruginous with the elytra, antennæ and legs lighter, underside with comparatively scanty greyish scales; forehead depressed, with rather thick greyish scales, rostrum rather long, striate; thorax spinose, notched at sides in front, very rough, coarsely and closely punctured, constricted narrowly before apex, with an obsolete central furrow, sides raised and rounded; elytra broader than thorax, with rather deep striæ, interstices raised and bearing single rows of strong black and white setæ, with hairs intermixed; legs moderately long, intermediate and posterior femora rather strongly toothed. L. 3½–5 mm.

On thistles (*Onopordon, Carduus, Cirsium,* &c.); very local, but not uncommon where it occurs; Mickleham, Caterham, Shirley, Headley Lane (Esher), Chatham, Sheerness, Whitstable; Dover; Folkestone; Thorness Bay, Isle of Wight; Portland; Kingsbridge, Devon; Whitsand Bay, Plymouth; Bristol; Norfolk; Cleethorpes, Lincolnshire; Northumberland and Durham district, very rare, Westoe.

C. distinctus, Bris. I have hitherto regarded this species as merely a variety of *C. marginatus*, and Dr. Sharp has included it under the latter species in the second edition of his catalogue; the sole point in which it appears to differ from *C. marginatus* is the sub-generic character that the funiculus of the antennæ is six-jointed, and Mr. Rye (Ent. Annual, p. 50) mentions the fact that he had captured a specimen with six joints to one funiculus and seven to the other, which forms a sort of "reductio ad absurdum" of the whole question; I have followed Bedel in retaining the species in its present position; this author regards it as "facile à confondre avec le *C. punctiger* dont elle a tout le faciès;" I must say that even after seeing M. Bedel's work, I still feel that the question of this difficult little group (*C. marginatus* and its allies) is far from being satisfactorily settled. L. 2–3 mm.

The species has been taken at Horsell and Weybridge by Dr. Power and also by

Mr. Rye in company with *C. marginatus* at Dover; Mr. Rye was strongly of opinion that they are nothing but a variety of *C. marginatus* (v. Ent. Monthly Mag. VI. 229).

C. quercicola, Payk. (*versicolor*, Bris.; *uniguttatus*, Marsh.). A small and rather conspicuous species; black, upper surface depressed, underside thickly clothed with whitish scales, upper surface with variegated grey and dark scales, the latter sometimes having a slight violet reflection; at the base of the suture of the elytra there is a conspicuous oblong white patch, situated on the two sutural interstices; thorax not strongly constricted before apex, with the disc depressed, plainly channelled at base, closely punctured, with lateral tubercles, basal margin almost straight; elytra with rather fine punctured striæ, interstices moderately broad, apex slightly muricate, legs black. L. $1\frac{3}{4}$–2 mm.

By sweeping herbage; occasionally found in moss; locally rather common, but apparently never abundant; Mickleham, Darenth, Haslemere, Cobham, Belvedere, Chatham, Faversham, Cowley, Crohamhurst, Bearsted; Brighton; Exeter (on horse radish, very rare (Parfitt)); Foremark, near Repton; Old Trafford, Manchester, rare; Northumberland and Durham district, rare, Heaton and Little Benton; Holy Island; Scotland, rare, Forth district; Balmuto, Fifeshire (Power).

The var. *Crotchi* (*C. Crotchi*, Bris.) differs from the type form by its more depressed thorax, of which the anterior margin is less reflexed, and by its testaceous tarsi, of which the claws are smaller. I do not know of any localities for this variety, which was described by M. Ch. Brisout from England only.

C. mixtus, Muls. (*nigroterminatus*, Woll.). Short and broad, black, scantily covered on the upper surface with white scales, which are thicker on an obscure patch at scutellum; the hinder margin also of the elytra is more or less densely clothed with white scales; occasionally the scutellary patch is very obsolete or absent; thorax without, or with very obsolete, lateral tubercles, anterior margin raised; elytra short, subquadrate and narrowed behind, interstices rugose; antennæ dark; legs black, tarsi yellow red, last joint black at apex, femora toothed; the species may be known by its short form and abbreviated elytra; *C. mixtus* is characterized by M. Bedel as having no special raised tubercle at sides, and no spot at scutellum, and he allows that the identity of this species with Wollaston's *nigro-terminatus* needs confirmation; they appear, however, to belong to one species. L. 2–$2\frac{1}{2}$ mm.

Very rare; Gainsborough (one specimen, Crotch); one specimen in Dr. Power's collection, without locality, labelled "*mixtus*, Muls."; the species seems to require some further confirmation as British.

C. troglodytes, F. (*spiniger*, Herbst.). Lighter or darker reddish brown, rather shining, moderately convex, underside comparatively scantily clothed with greyish scales, thorax with three more or less

distinct lines of grey scales, elytra with blackish suture, and with rows of upright setæ on the interstices; head without white spot, rostrum long, ferruginous, antennæ red; thorax long, closely and rather deeply punctured, without lateral tubercles, not strongly constricted before apex, posterior margin slightly sinuate, nearly straight; elytra subquadrate, narrowed behind, with rather strong punctured striæ which are nearly as broad as the interstices, interstices slightly convex, apex with distinct tufts of yellowish-white bristles; legs red, femora toothed. L. 2–2½ mm.

Male with the anterior tibiæ armed with a small tooth and the posterior with a larger one; last ventral segment slightly depressed.

On *Plantago lanceolata*, and other species of Plantain; common and generally distributed throughout the kingdom.

C. Chevrolati, Bris. (*minimus*, Walton?). This species has been by many authors considered a variety of the preceding; it may be at once known by the variegated colouring of the upper side, which is covered with a thickly set pattern of white scales, the central and side lines of thorax, a patch on each side of the scutellum and certain markings behind the middle of the elytra being most conspicuous; the head between eyes is thickly covered with scales; the thorax is furnished with obsolete, but visible, lateral tubercles and the elytra are rather broader in proportion to the thorax; these characters, however, are somewhat variable, and it must be confessed, that, apart from the clothing of scales, the species is extremely closely allied to *C. troglodytes*. L. 2 mm.

On *Achillea millefolium*; very local; Lee, Weybridge, Cowley, Claygate, Boundstone, Brentford, Chatham, Birch Wood, Forest Hill; Dover; Hythe.

C. rufulus, Dufour (*frontalis*, Bris.). Short and broad, convex, with the elytra subquadrate; reddish brown or fuscous with the elytra red brown, upper side scantily, underside rather thickly, clothed with greyish scales, suture of elytra darker; forehead and three longitudinal lines on thorax covered with grey scales; rostrum rather long; thorax about as long as its breadth at base, closely punctured, gradually and not strongly constricted in front, posterior margin almost straight, lateral tubercles small but distinct; elytra with rather strong punctured striæ, interstices convex, with rows of recumbent hairs; legs red. L. 1½ mm.

On *Artemisia maritima* and *Plantago lanceolata*; also found at the roots of *Reseda*, *Plantago*, &c.; very local, and, as a rule, rare, but not uncommon in some places where it occurs; Sheerness, Whitstable and Chatham (Champion); Rye (Butler); Kingsgate (T. Wood); South Coast (S. Stevens); Portland Island; Seaford, Sussex, and Sheerness, on *Artemisia* (Power).

C. Dawsoni, Bris. One of the smallest species of the British *Ceuthorrhynchina*; short and broad, ovate, reddish-brown or brownish-red with the antennæ and legs red yellow; rostrum long, clear red with the apex black; the suture of the elytra also is dark; underside closely,

upper side scantily, clothed with greyish scales; thorax long, scarcely constricted at all in front, closely punctured, with lateral tubercles obsolete or absent, anterior margin scarcely raised, basal margin almost straight; the three longitudinal lines of scales are often very obsolete or almost absent; elytra short, almost round, with comparatively strong striæ and somewhat convex interstices, which are rather roughened behind and are furnished with rows of very short recumbent hairs; legs rather long. L. 1–1½ mm.

On *Plantago coronopus*, Buckthorn Plantain, and perhaps also on *Plantago maritima*; very local, but abundant where it occurs; I have found more than thirty specimens on one plant of the former species on the cliffs near Ventnor, Isle of Wight, at the end of April or beginning of May; Strood; Dover; Folkestone; Seaford, Sussex; Southsea; Portsmouth district; Isle of Wight, Ventnor and Sandown; Whitsand Bay, Plymouth, abundant (J. J. Walker); Scotland, rare, Solway district (Sharp); when disturbed the insect folds its limbs, falls, and remains motionless and may very easily be passed over; I used to consider it a great rarity in the Isle of Wight, although collecting in the place in which it was most abundant, until I discovered its habits; it is probably much more widely distributed than is at present known, if we may judge from the Scotch record.

TAPINOTUS, Schönherr.

This genus contains a single species which is extremely rare in Britain; it may be known by its oblong and rather depressed body taken in conjunction with the six-jointed funiculus of the antennæ and the fact that the elytra are strongly cut back angularly at shoulders; the antennæ are inserted a little before the middle of the rostrum which is rather stout; the thorax is even, subcylindrical, scarcely constricted before apex, and bisinuate at base; the legs are rather long with the femora obsoletely toothed and the claws of the tarsi bifid; the elytra are not roughened at apex; the insect occurs very rarely on *Lysimachia* in marshy places and the larva feeds at the base of the stem or in the root of the plant.

T. sellatus, F. (*lysimachiæ*, Ol.). Oblong, black, clothed on both the upper and under sides with white scales, with two broad dark streaks on thorax and a common black transverse fascia on elytra abbreviated at sides; antennæ, tibiæ and tarsi ferruginous; head with the vertex carinate behind depressed between eyes; rostrum stout, clothed with scales and punctured, shining at apex; thorax half as broad at base as elytra, subcylindrical, a little shorter than broad, scarcely constricted at apex, with the sides almost straight; elytra with sides parallel and humeral tubercles marked, depressed on disc, rather finely punctate-striate, excised at shoulders; legs rather long, prosternum deeply excised at apex. L. 4 mm.

Male with the intermediate tibiæ armed with a small hook and the last ventral segment impressed at apex.

On *Lysimachia vulgaris*; extremely rare; in Power's and Wollaston's collections;

Dr. Power's specimen was taken by the Rev. Laundy Brown at Horning Fen, Norfolk, in 1838; it appears to be spread over Central and Northern Europe and Siberia.

RHYTIDOSOMUS, Schönherr.

Three species are known as belonging to this sub-genus, one from Greenland and two from Europe; the single British species is a small round convex black insect, which may be known from all the other sub-genera of *Ceuthorrhynchus*, except *Poophagus*, by not having the elytra so strongly and more roundly cut back at shoulders;* from the last named sub-genus it may easily be separated by its shape as well as by the six-jointed funiculus of the antennæ; the rostrum is stout and is received in a rather shallow fovea on the mesosternum; the tibiæ are broad and the tarsal claws are armed with a tooth; the prosternum is enlarged behind the anterior femora, and the interstices of the elytra are narrow and subcostiform.

R. globulus, Herbst. Short and broad, convex, subglobose, black, rather shining, with the underside and, as a rule, the basal portion of suture, thickly clothed with white scales; rostrum stout; antennæ black, pitchy or pitchy red at base; thorax comparatively long, coarsely punctured, constricted before apex, with a broad central furrow at base; elytra with very broad and strong coarsely punctured striæ, interstices much narrower than the striæ, convex, somewhat asperate behind; legs black, rather stout. L. $1\frac{1}{3}$–$1\frac{1}{2}$ mm.

Male with all the tibiæ armed with rather a large hook; abdomen with the first and second segments broadly impressed.

On sallows; according to M. Bedel it is found on the shoots of *Populus tremula* and *P. alba;* rare; Coombe Wood, Surrey (Stephens); Hampstead (Power); Hampstead and Wimbledon Common (S. Stevens); New Forest (Power); Langworth Wood, Lincoln, where I captured a pair by general sweeping on September 26th, 1881; Northumberland district, Wallington (Power).

AMALUS, Schönherr.

This genus forms a sort of transition between *Ceuthorrhynchus* and its allies and the *Rhinoncus* group; it resembles the former in the greater length of the rostrum, but differs in the formation of the prosternum, which is reduced to a narrow border before the anterior coxæ and is not incised at throat; the anterior coxæ are almost contiguous and the rostrum is not received in a groove; the antennæ are ten-jointed; the thorax is not constricted at apex and has neither tubercles at sides nor a central channel; the femora are simple and the tarsal claws are armed with a sharp tooth; both the described species are found in Europe, and one occurs locally in Britain.

* This character is not so obvious in this species as in *Poophagus* and is, perhaps, rather misleading; the emargination, however, is blunter, and the sides of elytra near it more rounded than in *Ceuthorrhynchus*.

A. hæmorrhous, Herbst. (*scortillum*, Herbst.). Short convex, pitchy black, upper side subglabrous, slightly shining, underside thickly clothed with white scales; upper surface of thorax and elytra strewn with very small greyish scales which are thick at base of suture and form a spot; base of antennæ and legs red; rostrum long; thorax long, scarcely transverse, gradually constricted before apex, closely punctured, with the sides rounded and without lateral tubercles or central furrow; elytra subglobose, broadly reddish at apex, with strong punctured striæ and narrow convex interstices, which are not muricate at apex; legs moderately long. L. $1\frac{1}{2}$ mm.

Male with the intermediate tibiæ armed with a small hook.

By sweeping herbage; often found in moss and haystack refuse; local; London district, Kent and Surrey, and South East Coast, generally distributed; Ipswich; Lowestoft; Ashwicken, Norfolk; Amberley, Arundel; Brighton; Shirley Warren, Southampton; Southsea; Bewdley; Salford Priors; Kidderminster; Cleethorpes, Lincolnshire; Mabberley, Cheshire; Northumberland district, rare, Wallington; Scotland, rare, Solway and Forth district; Ireland, rare, Dublin and Armagh.

RHINONCUS, Stephens.

About a dozen species are known as belonging to this genus, which appear to be somewhat widely distributed as single specimens have been recorded from India and the Cape of Good Hope; they are short, thick-set insects with the rostrum stout, the eyes large and round and strongly prominent, the thorax not strongly constricted before apex, the femora simple, the prosternum not excised at apex, and the anterior coxæ distant; the tarsal claws are appendiculate on their innerside; the species are chiefly found on *Rumex;* the larvæ live on the stems of the plants and devour the centre and fleshy portions; as a rule they appear to form a cocoon in which they undergo their final transformations; as observed above, some of the species have the power of leaping sideways, notably *R. perpendicularis* (*subfasciatus*); this power is not strongly developed, and, as far as my own observation has gone, the insect does not appear to make much use of it; it appears to be a protective property in course of development and is rather strange as being opposed diametrically to the usual protective habit of the Ceuthorrhynchina which is to shut the legs and rostrum beneath the body and remain quite motionless.

All the European species, with the exception of *R. albocinctus*, Gyll., are found in Britain; they may be separated as follows:—

I. Anterior margin of thorax without tubercles in middle.
  i. Interstices of elytra rugose but without distinct tubercles or asperities.
    1. Form short and broad; size larger; elytra not, or only slightly, longer than together broad.
      A. Sides of thorax without a distinct tubercle; striæ of elytra nearly as broad as the interstices . . . . . R. PERICARPIUS, *L.*

B. Sides of thorax with a pointed tubercle; striæ of elytra much less broad than interstices . . . . . R. GRAMINEUS, *F.* (*inconspectus*, auct.)

2. Form longer, narrower, and more oblong; size smaller; elytra evidently longer than together broad . . . . . R. PERPENDICULARIS, *Reich.* (*subfasciatus*, Gyll.)

ii. Interstices of elytra, at least in part, furnished with distinct tubercles or asperities.

1. Elytra with a very distinct white patch at scutellum . . . . . R. CASTOR, *F.*

2. Elytra without or with a very indistinct white patch at scutellum . . . . . R. BRUCHOIDES, *Herbst.*

II. Anterior margin of thorax with two raised tubercles in middle placed near one another . . . . . R. DENTICOLLIS, *Gyll.*

R. pericarpius, L. (*gramineus*, F. (*auct. nec vere*) *inconspectus* Herbst. *nec auct.*). Short oval, broad, convex, black, underside thickly clothed with yellowish-white scales; upper surface with fine grey hairs, sides of elytra and a patch at base of suture covered with whitish scales; antennæ and legs pitchy-red or ferruginous; thorax transverse, deeply punctured, with the apical margin depressed, gradually constricted before apex, with very obsolete lateral tubercles; elytra with strong punctured striæ, interstices flat, finely granulated; legs stout. L. $2\frac{1}{2}$–$3\frac{1}{2}$ mm.

Male with the posterior tibiæ armed with a hook and the last ventral segment of abdomen with a small almost glabrous fovea at apex.

On species of *Polygonum*, especially *P. amphibium* var. *terrestre*, also on *Rumex obtusifolius* and, according to Stephens, on thistles; common and generally distributed throughout the kingdom. There is a small variety in Dr. Power's collection taken by him at Balmuto, Fifeshire.

R. gramineus, F. (*inconspectus, auct. nec* Herbst.). Of about the same size as the preceding, or, on an average, a little larger, with the under surface thickly clothed with ashy scales and the upper surface thickly chequered with greyish and yellowish-grey scales which are thicker on suture and form a patch towards base; the species may easily be known from *A. pericarpius* by the duller and greyer appearance of the upper surface and especially by its longer thorax which has a distinct tubercle on each side and the central channel evident, at all events behind; the apical margin, also, is slightly elevated and produced; the antennæ and legs are reddish or ferruginous. L. 3–4 mm.

Marshy places; on *Polygonum amphibium;* also in flood refuse, moss, &c.; very local and, as a rule, rare; Weybridge, Walton-on-Thames, Darenth, Merton, Egham, Forest Hill, Staines, Sunbury, West Wickham, Kingsbury; Norfolk; Deal; Sandgate, near Folkestone; Amberley; Faygate, Sussex; Portsmouth district; Exeter district; Weston-super-Mare; Tewkesbury; Coleshill, near Birmingham; Wicken Fen; Lincoln (one specimen in flood refuse); Northumberland and Durham district, very rare, South Shields; Scotland, very rare, Solway district.

R. perpendicularis, Reich. (*subfasciatus*, Gyll.; *guttalis*, Grav.).

Much smaller than either of the two preceding species, oblong-oval, moderately convex, black, with the sides of the thorax and the underside clothed with white scales, which are also scattered more or less thickly over the upper surface and form a patch at scutellum; base of antennæ, tibiæ and tarsi, and sometimes femora, ferruginous or pitchy yellowish brown; thorax subcylindrical, about as long as broad, with sides rounded in middle and narrowed in front and behind, deeply and coarsely punctured, without central channel or lateral tubercles; elytra evidently longer than together broad, with deep punctured striæ, interstices narrow, somewhat rugose; in quite fresh specimens there are distinct oblique bands of scales on the elytra and sometimes the suture behind middle is thickly clothed with white scales. L. 2–2½ mm.

In damp places; on species of *Polygonum;* somewhat local, but rather common and generally distributed from the Midlands southwards; rarer further north; it is recorded from the Northumberland and Durham district but has not hitherto been found in Scotland; Ireland, Galway, common (J. J. Walker) and Armagh.

R. castor, F. (*granulipennis*, Gyll.). Short oval, moderately convex, black or pitchy black, underside thickly clothed with whitish scales, sides of thorax and central line with more or less distinct greyish or greyish-yellow scales, elytra with the interstices more or less thickly speckled with the same scales which are thicker and form a conspicuous oblong patch at the base of suture; antennæ reddish testaceous, with club darker, legs reddish testaceous with the extreme apex of tibiæ and apex of tarsi dark; thorax slightly transverse, obsoletely channelled, with a blunt tubercle on each side, strongly and closely punctured; elytra much broader than thorax, with the shoulders well marked, and with punctured striæ, interstices moderately broad, tuberculate. L. 2–2¾ mm.

In sandy places; by sweeping herbage; perhaps, according to M. Bedel, on *Polygonum aviculare;* also found at roots of *Rumex acetosella* and in moss; by no means uncommon, but somewhat local in its distribution; London district, Kent, Surrey, and the South-Eastern counties, generally distributed and common; also widely distributed along the South coast; Devon, rare; Bristol; Swansea; Barmouth; Norfolk; Suffolk; Midland districts, very local, Repton, Matlock, &c.; Scarborough; Liverpool; Manchester district, general; Northumberland and Durham district, rare, Gibside, near Gilsland, and Hetton Hall, near Belford; Scotland, common, Solway, Tweed, Clyde, Forth, Tay, Moray and probably other districts; Ireland, Dublin and Belfast, and probably general.

R. bruchoides, Herbst. (*asperatus*, Gyll.). Rather smaller, on an average, than the preceding, which it resembles in having the interstices of the elytra tuberculate or asperate; it may however be easily known by its darker, more pitchy, colour and by having no distinct greyish patch at the base of suture; short, convex, thickly clothed with whitish scales beneath, upper surface with scanty cinereous scales which, in quite fresh specimens, sometimes form three whitish lines on thorax; antennæ and legs ferruginous; thorax broader than long, not strongly

constricted in front, with a central channel and a lateral tubercle on each side, anterior margin scarcely raised; elytra with evidently deeper and stronger striæ and more convex interstices than in *R. castor*, with the asperities more remote. L. 2–2½ mm.

Male with the posterior tibiæ armed with a hook.

Marshy places; by sweeping herbage; also in flood refuse; according to Bedel it is attached to species of *Polygonum*; the larva has been observed by Buddeberg in the stems of *P. lapathifolium* vars. *nodosum* and *incanum*; not common; Wimbledon (Champion); Horsell (Power); Ashwicken, Norfolk (Power); London district and Bristol (Stephens); I have found a few specimens at Lincoln in flood refuse in autumn, but know of no record further north.

R. denticollis, Gyll. A small and inconspicuous species which may be known from all the preceding by the fact that the anterior margin of the thorax is furnished with two raised tubercles in middle placed near one another; oblong ovate, convex, black, antennæ and legs more or less ferruginous, the tibiæ being always reddish; underside thickly covered with greyish scales, of which there is also a patch at the base of suture of elytra; the rest of the upper surface in fresh specimens is sprinkled with whitish scales, but they are very easily rubbed off as appears also to be the case with the scutellary patch; thorax comparatively long, very coarsely punctured, scarcely at all constricted in front and with a central channel and a rather strong lateral tubercle on each side behind; elytra with rather deep punctured striæ, interstices rather convex, finely rugose or scratched; legs moderately long. L. 1½–2 mm.

Chalky and sandy places by sweeping herbage; sometimes found in moss; rare; London district, rather widely distributed but always rare, Shirley, Mickleham, Forest Hill, Box Hill, Chattenden, Walton-on-Thames, Chatham; Hythe; Holm Bush, Brighton; New Forest; Windsor Forest, rare (S. Stevens).

This species is most closely allied to *Phytobius quadrinodosus* from which, according to M. Bedel, it can only be distinguished by the generic characters; my single specimen, however, is very different in appearance, having the sides of the thorax much straighter, with the surface more coarsely and less closely punctured, and the elytra much narrower in proportion to the thorax, with the shoulders rounded and not prominent and the interstices much less asperate; the striæ also are deeper and more strongly punctured.

EUBRYCHIUS, Thomson.

The single species which forms this genus occurs both in Europe and North America, and is distinguished from the two following, which resemble it in their aquatic or subaquatic habits, by having the tibiæ and tarsi furnished sparingly with long natatory cilia; the tarsi are elongate, with the three first joints compressed and not tomentose beneath, and the last very long; the tarsal claws are simple and stout; the anterior coxæ are almost contiguous; the antennæ are ten-jointed,

with the club elongate, and are inserted in the middle of the rostrum; the thorax is obsoletely channelled and furnished with four tubercles; this insect and *Litodactylus leucogaster* in both the larval and perfect state appear to live almost entirely under water; they resemble the species of *Phytobius* in constructing cocoons in which to undergo their final transformations, but differ from them in the fact that they form their cocoons on their food plant under the surface of the water, whereas the species of *Phytobius* construct them above the surface; the following note on the habits of the species was published by myself in the Entomologist's Monthly Magazine, xxii. p. 186:—"At the November meeting of the Entomological Society, Mr. C. O. Waterhouse exhibited some living specimens of *Eubrychius velatus*, Beck., in order to show that they swim with their hind legs after the fashion of a Dytiscide, or a frog; these specimens he kindly gave me after the meeting, and I kept them alive for some time; they were not only able to swim on the surface but could dive beneath it, and although their natural buoyancy appears to force them upwards yet they are able to dive quite far enough to seize the aquatic plants, to which they cling, in case they do not project above the surface; if they do, they prefer to seize them near the surface and crawl down them; a short while afterwards Mr. J. J. Walker sent me two living *Litodactylus leucogaster*; these swim in exactly the same way as *E. velatus*, except that their buoyancy seems to be somewhat greater, and their power of diving below the surface somewhat less in consequence. These sub-aquatic Curculionidæ seem to be able to sustain life under water as well as, if not better than, the Dytiscidæ. As I was going from place to place at the time Mr. Waterhouse gave me his specimens, they were often corked up in a small tube of water for many hours together, but did not seem to be any the worse."

E. velatus, Beck. (*aquaticus*, Thoms.). Short, convex, black, thickly clothed both on the upper and underside with greenish yellow scales, which become much duller after death; the head, sides and central line of thorax, and sides and suture of elytra are more closely covered than the rest of the upper surface, which is darker, and except in quite fresh specimens, more or less denuded; antennæ and legs clear yellow, except the extreme apex of the former, and the knees and apex of part of the tarsal joints and of the claws, which are black; thorax broader than long, narrowed in front, but not constricted, very closely punctured, obsoletely channelled, with two small tubercles on anterior margin, and a larger one on each side before base; elytra short and broad, much broader than thorax, with the shoulders rounded but prominent and well marked, striæ deep, interstices broad, the fifth somewhat raised at base; legs long. L. 2–2½ mm.

In stagnant or slowly moving water; on aquatic or sub-aquatic plants, especially *Potamogeton*, *Hippuris* and *Myriophyllum*; the larva has been observed

by M. Ferris forming a cocoon on *M. spicatum*; very local, and not common; London district rare, Woking, &c.; Aylsham, Norfolk; Wicken Fen; Swaffham; Whitstable; Birchington; Pegwell Bay; Deal; Rye; Arundel; Old Trent, Repton; Cleethorpes, Lincolnshire; Wallasey, Cheshire (one specimen); Newcastle; Rothley Lakes, Northumberland.

LITODACTYLUS, Redtenbacher.

Two species belong to this genus, one from Europe and one from Ceylon; they differ from *Eubrychius*, which they very closely resemble in habits, in the fact that the tibiæ and tarsi are not furnished with cilia, and from *Phytobius* by having the antennæ inserted in the middle of the rostrum, and the legs longer and more slender with the last tarsal joint elongate; the claws are long and simple; the club of the antennæ is ovate; the thorax is furnished with four tubercles of which the posterior pair are the most distinct.

L. leucogaster, Marsh (*myriophylli*, Gyll). Black, dull, upper surface somewhat depressed on disc, underside thickly clothed with white scales, as well as the sides of the thorax and a spot at the base of suture; the elytra are besides more or less distinctly variegated with greyish scales and sometimes have a slight silvery reflection; scape of antennæ and the legs yellow, knees and tarsi, and sometimes more or less of tibiæ, black; thorax narrowed in front, but scarcely constricted, with a channel extending for its whole length, and with four tubercles, two, more or less indistinct, at anterior margin, and two large pointed ones on each side at base; elytra much broader than thorax with rather deep striæ, fifth interstice elevated at base. L. $2\frac{1}{2}$ mm.

Male with the intermediate tibiæ armed with a small hook.

In ditches, &c., on aquatic or sub-aquatic plants; sometimes found in moss and flood refuse; local, but not uncommon; Woking, Walton-on-Thames, Sunbury; Gravesend; Whitstable; Sheerness; Birchington; Pegwell Bay; Eastbourne; Arundel; New Forest; Southsea (at roots of rushes); Isle of Wight; Glanvilles Wootton; Bristol; Bewdley; Old Trent, Repton; Aylsham and Rudham, Norfolk; Liverpool district; Northumberland and Durham district; Scotland, rare, Solway district (Sharp); Loch Gelly (Power); Ireland, near Dublin and Belfast.

PHYTOBIUS, Schmidt.

This genus contains upwards of twenty species which are found in Europe and North America; they are short and broad insects with a short stout rostrum and ten-jointed antennæ which are inserted in front of the middle of the rostrum; the tarsi have the last joint not elongate and the claws are either simple (*Phytobius*, i. sp.) or appendiculate on their inner side (*Pachyrrhinus*, Steph.); the species are sub-aquatic in their habits, but do not live or undergo their transformations beneath the water, as is the case with the two preceding sub-genera; an account of the larva is given by Chapuis and Candèze (Catalogue des Larves des

Coléoptères, p. 219); they live on the leaves of their food plants and protect themselves with a covering partly formed of excrement and partly of a viscous fluid secreted from the terminal segment; when about to change to the pupa state the insect retires to a fold of a leaf and there spins over itself a cocoon; the transformation to the perfect state does not occupy more than eight or ten days, at the end of which period the beetle makes its exit through an irregular opening in the cocoon.

I. Tarsal claws simple (*Phytobius*, i. sp.).	
i. Anterior margin of thorax without distinct tubercles or little teeth; elytra very distinctly marked with marbled grey scales (in fresh specimens) .	P. COMARI, *Herbst.*
ii. Anterior margin of thorax with two small tubercles or little teeth.	
1. Rostrum longer, three times as long as broad; thorax without central furrow	P. WALTONI, *Boh.*
2. Rostrum shorter, twice as long as broad; thorax with a more or less distinct central furrow.	
A. Lateral interstices of elytra slightly asperate; suture without a dark velvety patch behind scutellum	P. QUADRITUBERCULATUS, *F.*
B. Lateral interstices of elytra not asperate; suture with a dark velvety patch behind scutellum	P. CANALICULATUS, *Fähr.*
II. Tarsal claws appendiculate on their inner side (*Pachyrrhinus*, Steph.).	
i. Thorax without central furrow; anterior margin of thorax furnished with two tooth-like tubercles the interval between which is as broad as the forehead	P. QUADRICORNIS, *Gyll.*
ii. Thorax with central furrow; anterior margin of thorax furnished with two tooth-like tubercles the interval between which forms a small incised angle	P. QUADRINODOSUS, *Gyll.*

P. comari, Herbst. (*s.g. Pelenomus*, Thoms.). Short ovate, black, under surface and sides of thorax closely covered with white scales, which also form more or less distinct scattered spots on the elytra; in quite fresh specimens the elytra are very prettily variegated and there is a large patch of scales towards scutellum and another behind middle; scape of antennæ, tibiæ, except apex, and most of tarsi reddish yellow; thorax rather long, gradually narrowed in front, but not constricted, with a feeble central furrow, and with two lateral tubercles, but without distinct tubercles on anterior margin; elytra with deep, rather indistinctly punctured, striæ, interstices not muricate; legs long. L. 2 mm.

Male with the intermediate tibiæ armed with a rather large hook and the fifth abdominal segment slightly impressed.

Marshy places; on aquatic plants; local and not common; Barnes, Shirley, Esher; Dagenham, Essex; Woodbastwick; Arundel; New Forest; Bristol; Norfolk; Huntingdonshire; Wicken Fen; Mablethorpe, Lincolnshire; Askham Bog, York; Liverpool district, rare; Stretford, near Manchester; Hale Moss; Northumberland district, rare, on *Comarum palustre*, Prestwick Carr; Scotland, local, Solway district.

This species may be distinguished from those that follow by having the anterior margin of the thorax almost simple, and the lateral tubercles of the thorax somewhat obsolete, and also by having the anterior coxæ separated by a narrow space and almost contiguous.

P. Waltoni, Boh. (*notula,* Gyll., *nec* Germ., *nec* Thoms.). Short, rather convex, black, under surface and a broad streak on each side of thorax covered with white scales, elytra variegated with white; antennæ and legs red or yellowish-red, femora furnished beneath with a nigro-fuscous spot before apex; thorax rather long, narrowed in front, without central furrow, and with four moderate tubercles; elytra with rather deep punctured striæ, interstices not muricate; rostrum comparatively long, a point which, in conjunction with the absence of a channel on the thorax, will easily distinguish it from its near allies. L. 2 mm.

Male with the intermediate tibiæ armed with a small hook.

Marshy places; on aquatic plants; very local, but sometimes not uncommon; Esher; Mickleham; Woking; Cowley; Barnes Common, formerly in abundance (S. Stevens); Windsor; Woodbastwick, Horning (Norfolk); Hastings; in moss, canal near Southsea, common in spring (Moncreaff).

P. quadrituberculatus, F. (*notula,* Germ., *nec* Thoms., *nec* Gyll.). Short, upper surface rather depressed, under surface and sides of thorax closely covered with greyish scales, upper surface variegated with the same; antennæ, except club, ferruginous, legs dark, tibiæ ferruginous with a fuscous ring before middle; rostrum short; thorax rather strongly punctured, narrowed in front, with four foveæ, a more or less distinct central furrow, and four distinct tubercles, two on anterior margin and two behind middle; elytra with moderately deep punctured striæ, interstices convex, the fifth to the eighth set with small rough tubercles, especially behind; anterior coxæ rather broadly distant; prosternum excavate, with the excavation margined on each side; anterior coxæ rather broadly distant. L. 2–2½ mm.

Male with the posterior tibiæ armed with a hook.

Marshy places; on aquatic plants; not uncommon; London district, generally distributed, Weybridge, Caterham, Shirley, Lee, Faversham, Chatham, Dulwich, West Wickham, &c.; Loughton, Essex; Deal; Hastings; Southsea; New Forest; Devon, Westward Ho! common on stones near the Pebble ridge in August; Norfolk; Hertford; Midland counties, general; Liverpool; Manchester; Heysham, Lancaster; Northumberland and Durham district; Scotland, local, Solway, Tweed and Forth districts; Ireland, near Dublin, Waterford and Belfast and probably general.

This species may be distinguished by the rather widely distant anterior coxæ, the muricate sides of elytra, the distinct tubercles of the thorax which is foveate on disc, and the margined excavation of the prosternum; the scales on the upper surface are, as a rule, very scanty.

P. canaliculatus, Fähr. (*notula,* Thoms., *nec* Germ., *nec* Gyll.). This species may be known from *P. comari* by the more evident tubercles of the thorax and the dark velvety patch at base of suture;

the latter character will also distinguish it from *A. Waltoni* and *A. quadrituberculatus*, from the former of which it may at once be further separated by the evident channel on the thorax, and from the latter by not having the forehead excavate between eyes and the elytra not roughened behind at sides; the colour is black with the underside and sides of thorax thickly clothed with white scales and the elytra variegated with patches of the same; the scape of the antennæ, and the tibiæ, are ferruginous or yellowish, the latter being sometimes fuscous in middle. L. 2 mm.

Male with the intermediate tibiæ armed with a small hook and the last segment of the abdomen transversely impressed at apex.

Marshy places; on aquatic plants; local, but not uncommon in some districts; Woking, Caterham, Esher, Walton-on-Thames, Loughton, Chatham, Sheerness; Windsor Forest; Portsmouth district; New Forest; not as yet recorded from the Midland counties; Heysham, near Lancaster; Northumberland and Durham district, Prestwick Carr and Gosforth; Scotland, scarce, Solway and Moray districts.

P. quadricornis, Gyll. Black, not very dull, with the under surface, sides of thorax, and a spot at base of suture thickly clothed with white scales, the remainder of the upper surface with very scanty and often scarcely apparent scales; legs ferruginous with the apex of femora, and the tarsi, fuscous; rostrum very short and thick, base of antennæ red; thorax transverse, gradually narrowed but not or scarcely constricted in front, closely and rather strongly punctured, without central furrow and with four tubercles, two, widely separated, at apical margin, and two before base; elytra with deep and rather broad punctured striæ, interstices finely rugose, somewhat asperate at sides, tarsal claws bifid. L. 2–2½ mm.

Male with the intermediate tibiæ armed with a hook and the fifth ventral segment of the abdomen transversely impressed at apex.

Marshy places; on aquatic plants, especially *Polygonum lapathifolium;* rare; London district (Stephens); Sheerness (J. J. Walker); formerly in Battersea Fields, also in marshes near Broxbourne (S. Stevens); Ireland, near Dublin (McNab); I believe that it was also taken by Mr. Sidebotham but I do not know the locality.

P. quadrinodosus, Gyll. Short oval, convex, black, with the underside and a patch at suture (sometimes obscure) thickly clothed with greyish scales, which are also somewhat thick towards apex and are very scantily scattered over the rest of the upper surface in fresh specimens; antennæ and legs ferruginous; thorax deeply and closely punctured, narrowed and somewhat constricted in front, with four tubercles, two at anterior margin, the interval between which forms a small incised angle, and two behind middle, disc channelled; elytra rather broad, with deep and rather broad striæ, interstices at sides with a few rather large tubercles. L. 2 mm.

Male with the posterior tibiæ armed with a hook, abdomen with segments 2–5 rather strongly impressed, the impression being longitudinal and bounded with white pubescence on each side.

Marshy places; on aquatic plants, especially *Polygonum amphibium;* also in moss and at roots of grass; very local and rare; Lee, Kent (Champion and Power); London district and Bristol (Stephens); Bexhill, near Hastings, rare (Butler); Leasowe, near Liverpool, adhering to floating chips in pools (Chappell).

According to M. Bedel this species is so closely allied to *Rhinoncus denticollis* that it can only be distinguished by the six-jointed funiculus of the antennæ and the fact that the prosternum is very narrow between the anterior coxæ.

BARINA.

This is rather an important tribe, containing a considerable number of genera and species; they are, however, more characteristic of tropical than of temperate countries; according to the European catalogue of Heyden, Reitter and Weise, four genera and fifty species are found in Europe, of which forty-seven belong to the genus *Baris;* M. Bedel, however, separates off *B. T-album* as a distinct genus *Limnobaris* and says (l. c. p. 182) that, independently of *Lissotarsus*, Herbst., the tribe is only represented in Europe by two genera, *Limnobaris* and *Baris;* the following are some of the chief characteristics of the tribe; body more or less elongate, oblong, usually without or with very scattered scales above; rostrum not received in a pectoral groove, never very long or slender, as a rule rather short and stout, antennæ short and robust, with a rather large oval or oblong-oval club; prosternum not excavate; elytra on the underside cut off from thorax by the side pieces of the mesosternum; anterior coxæ distant, posterior coxæ not globose, reaching the episterna of the metasternum; tibiæ armed with a strong curved hook; tarsal claws simple.

M. Bedel, in separating off his genus *Limnobaris*, divides it from *Baris* on the following characters.

I. Pygidium invisible; head without any line of demarcation between the front and the rostrum; second joint of the funiculus of the antennæ plainly longer than the third joint . . . . . LIMNOBARIS, *Bedel.*

II. Pygidium exposed; head with a transverse line at the base of the rostrum; second joint of the funiculus of the antennæ about equal to the third joint . . . BARIS, *Germ.*

LIMNOBARIS, Bedel.

The species which has been adopted by M. Bedel as the type of this genus is spread over the whole Palearctic region; it is always found in damp and marshy places among reeds and rushes; it is common in some districts in cold weather in the spathules of the bulrush; according to Von Heyden it lives on *Cladium mariscus*, but it is apparently attached to several other *Juncaceæ* and *Cyperaceæ;* the genus approaches *Centrinus* in the fact that the pygidium is entirely covered by the elytra; this latter genus, which is considered a separate tribe by Lacordaire and Leconte, contains upwards of two hundred species which are confined to North, Central and South America.

L. T-album, L. Elongate, black, upper surface more or less distinctly, but scantily, clothed with recumbent grey hairs, inserted in the punctures, underside thickly clothed at sides with whitish or yellowish white scales; rostrum curved, smooth on its dorsal central line; thorax longer than broad, distinctly, closely and regularly punctured; elytra with deep striæ, interstices with single rows of punctures. L. $3\frac{1}{2}$–4 mm.

Male with the abdomen longitudinally impressed at base; in the female it is convex.

Marshy places; on aquatic plants; also by general sweeping; local, but not uncommon in many districts; London district, common in most ditches (S. Stevens); Faversham; Chobham; Maidstone; Hertford; Suffolk; Hastings; St. Leonards; Amberley; Portsmouth district; Glanvilles Wootton; Burnham, Somerset, in abundance; Bristol; Crymlyn Bog, Swansea, on *Erica tetralix* (this was probably accidental); Llanberis; Sutton Park and Coleshill, near Birmingham; Wicken and Burwell Fens; Repton; Scarborough; Northumberland and Durham district; Scotland, local, Solway, Tweed and Clyde districts.

BARIS, Germar.

This genus is a very extensive one, containing upwards of three hundred species; they are widely distributed throughout the world; although the majority are found in tropical countries yet the genus is well represented in the Palearctic region and no less than forty-seven species occur in Europe; of these six only are found in Britain, and one of these seems to require further confirmation; it is very possible, as Mr. Champion observes (Ent. Monthly Magazine, xxv. 37), that *B. cuprirostris*, which occurs at Calais, may be found along our southern coast, if its food plants *Diplotaxis*, *Brassica*, *Erysimum* and *Sinapis arvensis* are examined in various districts, especially when we remember that *B. scolopaceus* has only occurred in one locality and might easily have hitherto escaped observation; besides the characters above mentioned both our genera of the Barina may further be known by the distinct scutellum, vertically oval and free eyes and simple femora.

The larvæ do not call for any particular remark; they undergo their transformations in the stems or at the head of the root of their food plants; according to Plieninger (Isis, 1837, p. 525), however, the larva of *B. chloris* forms small galls at the roots of its food-plant, which it leaves when full fed, and undergoes its transformations in the earth.

The sexual characters are not marked; in the males the rostrum is a little thicker and more closely punctured than in the females, and the base of the abdomen is longitudinally excavate in the middle.

The British species may be separated as follows:—

I. Thorax and elytra glabrous, entirely, or almost entirely, without scales.
  i. Elytra unicolorous, deep black . . . . . B. LATICOLLIS, *Marsh.*
  ii. Elytra unicolorous, deep blue, or greenish-blue.
    1. Interstices of elytra narrower; body oblong.

A. Thorax with round, rather closely set, punctures . . . . . B. PICICORNIS, *Marsh.* (*abrotani*, Germ.)

B. Thorax with somewhat oblong and much more diffuse punctures . . . . . B. LEPIDII, *Germ.*

2. Interstices of elytra broader; thorax closely punctured; body oval . . . . . B. CHLORIZANS, *Germ.*

iii. Elytra black, with the apex broadly red . . . B. ANALIS, *Ol.*

II. Thorax and elytra covered with somewhat scanty, but very distinct, greyish scales . . . . . B. SCOLOPACEA, *Germ.*

B. laticollis, Marsh (*picina*, Germ., *glabra*, Munich Cat., *nec* Herbst.). Oblong, comparatively broad, black, shining; upper and under surface glabrous; rostrum rather thick, punctured; thorax longer than broad, sparingly and finely punctured, with a more or less distinct smooth central line; elytra with fine, obsoletely punctured, striæ, interstices with rows of punctures; femora robust. L. $3\frac{1}{2}$–4 mm.

On species of *Cruciferæ;* at roots of *Sisymbrium officinale;* the larva has been observed in the stems of the cultivated cabbage; very local; London district, rare; Battersea and Southend (Stephens); Charlton (S. Stevens); Suffolk; Deal; Folkestone (common); Rye; Shirley Warren, Southampton; Isle of Wight, Ventnor (one specimen taken by myself on a wall); Portsmouth, abundant (J. J. Walker); Portland; Mr. Moncreaff has found the species abundant at Southsea "in galled roots of *Sisymbrium officinale*—as many as fifty from one root—July and August;" the species appears to be entirely confined to the Southern and South-Eastern counties.

In Mr. Waterhouse's catalogue Stephens' specimens, named by him as *B. artemisiæ*, are referred to this species; he expressly says, however (Manual, p. 217), that they were taken at roots of *Artemisia vulgaris*, whereas *B. laticollis* is attached to *Cruciferæ;* the species are allied, but cannot well be confounded, as the true *B. artemisiæ* of Herbst. has the thorax coarsely and rather closely punctured, whereas in *B. laticollis* the punctuation is fine, shallow and diffuse; it is quite possible that the former species may be found in Britain as it is widely distributed throughout Northern Europe and Siberia.

B. picicornis, Marsh (*abrotani*, Germ.). Oblong, black or blue-black, with the elytra blue or greenish-blue; rostrum about as long as thorax, punctured; thorax longer than broad, distinctly and rather closely punctured, the punctures being round; elytra with moderately fine, but variable striæ, interstices with rows of punctures; legs black. L. 3–$3\frac{1}{2}$ mm.

Chalky places; on *Reseda lutea;* the larva lives at the base of the stalks and in the roots; very local, but sometimes common where it occurs; Caterham, Mickleham, Darenth Wood, Reigate, Gravesend, Maidstone, Eastry, Headley Lane, Riddlesdown, &c.; Chatham (in great profusion, Champion and J. J. Walker); Lowestoft; Kingsgate; Folkestone (common); Portsmouth district; Glanvilles Wootton; Cromer; Brandon, Suffolk (common, J. J. Walker).

B. lepidii, Germ. Very like the preceding, but easily distinguished by the punctuation of the thorax, which has the punctures larger, some-

what oblong, and evidently more diffuse; the elytra are a little more ovate and somewhat dilated behind the shoulders; the striæ are moderate and the interstices are furnished with single rows of feeble punctures; the colour appears to be, as a rule, of a darker blue than in *B. picicornis*, but in this respect both species are variable. L. $2\frac{3}{4}$–$3\frac{1}{4}$ mm.

Marshy places; especially on the sandy banks of rivers; at the roots of *Tanacetum vulgare*, &c.; also on *Nasturtium sylvestre* and *Lepidium latifolium*; very local; London district, not uncommon, Putney, Hammersmith, Norwood, Egham, Walton-on-Thames, Weybridge, Mickleham, Lewisham, Bearsted, Rusper, Catford, Tottenham, Staines, Shooters Hill, Cowley, Horsell, Sunbury, Enfield, Chatham, &c.; Shipley; Dover (Hall); Amberley; Portsmouth district, in moss (Moncreaff); Seaton Down, Devon (Power).

B. chlorizans, Germ. Closely allied to *B. picicornis*, but rather smaller, and with shorter elytra, which have the humeral angles more prominent; according to M. Bedel the interstices are at least three times as broad as the striæ, whereas in both the preceding they are only about twice as broad; this character, however, appears to be somewhat variable; the general form also is more ovate; the closer punctuation of the thorax will separate it from *B. lepidii*. L. $2\frac{2}{3}$–3 mm.

On *Cruciferæ* belonging to the genus *Brassica* and its close allies; the larva has been observed in the lower part of the stems of *B. oleracea*; extremely rare, and apparently requiring further confirmation as British; it has only hitherto been recorded from Devizes by Mr. Sidebotham.

B. analis, Ol. Oblong, black, rather shining, apex of elytra broadly and brightly red; rostrum and head sparingly punctured; thorax about as long as, or a little longer than, broad, closely and strongly punctured, with a smooth central line; elytra with distinct striæ, interstices with indistinct rows of punctures and a series of white hairs on each; legs punctured, with minute white hairs. L. $3\frac{1}{2}$ mm.

In damp places; extremely rare; on *Inula dysenterica*; Isle of Wight, first taken by the Rev. G. J. Rudd near Ryde, and subsequently by Mr. Crotch and the Rev. A. Matthews; there is also a specimen in the York Museum; no specimen had, however, been captured for many years until Mr. Champion found one near Sandown on June 27th, 1887.

B. scolopacea, Germ. (*vestita*, Perris). Black or blackish-brown, rather shining, sides of thorax and the elytra more or less thickly variegated with whitish and brownish-yellow scales, underside with rather sparing whitish scales; the amount of scales is variable; rostrum as long as head and thorax, punctured and furrowed; thorax longer than broad, very closely punctured, without smooth central line; elytra with fine striæ, interstices finely punctured; legs black, tarsi pitchy; my specimens are much smaller than the average examples of any of the preceding species, but in this point the species appear to be variable. L. 2–$2\frac{3}{4}$ mm.

Salt marshes; by sweeping *Atriplex portulacoides* (Sea Purslane), and other

plants; according to M. Perris it is attached to *Glaux* and *Salicornia*; June to August; extremely local; the species was first discovered in Britain by Mr. Champion at Sheerness in June, 1871, and both he and Mr. J. J. Walker have since captured it in numbers in the same locality; it has not, however, been hitherto met with in any other part of the country.

BALANINA.

The members of this tribe, which contains the single genus *Balaninus* (divided by some authors into two, *Balaninus* and *Balanobius*), are distinguished not only from all the other Rhynchophora, but from all known Coleoptera by the fact that the mandibles have a vertical instead of a horizontal motion; they are also remarkable for their very long slender rostrum, which varies in length, but is sometimes longer than the whole of the rest of the body; the length of the rostrum enables the insects to pierce the thick husks, or surrounding pulps, of the nuts or kernels of fruits in which they lay their eggs (walnuts, chestnuts, beech-nuts, hickory-nuts, filberts, sloes, &c.); the following characters of the tribe may also be noticed:—antennæ long and slender, usually inserted a little before the middle in the male, and at or behind the middle in the female, with seven-jointed funiculus of which the penultimate joints are variable in length in different species; eyes large, rather flat; prosternum long in front of anterior coxæ, which are contiguous; thorax not or only slightly constricted at apex; scutellum very distinct; elytra narrowed behind; abdomen with the first segment longer than the second; intermediate coxæ moderately distant, posterior coxæ widely distant; legs rather long, femora usually, but not always, toothed; tarsi dilated, claws toothed or appendiculate.

BALANINUS, Germar.

This genus contains about fifty species which are very widely distributed, representatives having been described from North and South America, South Africa and Madagascar and the Australian region; eighteen occur in Europe, of which ten belong to *Balaninus* proper and eight to the sub-genus *Balanobius*, Jekel, which cannot, however, be well regarded as distinct; the larvæ are small fat white grubs with a dark or yellowish head, and strong mandibles, and do not call for any particular description; that of *B. nucum* is well known to the most casual observer as it is the maggot that we so often find in filberts and other nuts; *B. venosus* and *B. turbatus* in like manner attack acorns, *B. betulæ* (*cerasorum*) lays its eggs in the kernel of *Prunus spinosa* (the common sloe) and *B. elephas*, which is not found in Britain, in chestnuts; the insects appear to bore a hole into the kernel during the early development of the nut or fruit and there deposit an egg; this happens in early summer or as soon as the nuts or fruits have become set; the larva hatches and continues feeding until autumn, when the nuts or

fruits drop; it then makes its way into the ground and changes to a pupa, whence it emerges as a perfect insect in the following spring; certain of the smaller species, e.g. *B. salicivorus* (*brassicæ*), do not attack nuts or kernels of fruits but form galls, or lay their eggs in the galls formed by certain Hymenoptera, on the under side of willow leaves, in which the larva feeds; when the leaves fall it makes its way into the earth and there undergoes its transformations.

The sexual characters are variable and consist in differences in the length of the rostrum and the insertion of the antennæ, and in the presence of impressions or tufts of hairs on the anal segment of the males.

The British species may be distinguished roughly by the following table; the synonymy, however, of some of them is very confused; I have followed Bedel in dropping the name *glandium*, Marsh, altogether, for, as observed by him (l.c., p. 189), it is applied by Mr. G. R. Waterhouse to *B. nucum*, L., and by M. Desbrochers des Loges to *B. venosus*, Grav., whereas in the opinion of M. Bedel it must be referred without doubt to *B. turbatus*, Gyll.; *B. turbatus* has been considered by many authors as synonymous with the *Curculio tessellatus* of Fourcroy, but Bedel points out that it is impossible even to determine the genus to which this insect must be referred, much less the species.

I. Club of antennæ long and pointed with the first two joints of equal size; tarsal claws appendiculate for half their length; upper surface variegated with scales; size, as a rule, much larger (*Balaninus*, i. sp.).

i. Rostrum ferruginous; upper surface (at all events in undenuded specimens) brown or red, variegated with greyish or light greyish-brown scales.

1. All the femora armed with a strong triangular tooth; size larger.

A. Scutellum narrow; rostrum shorter, not as long as body, more thickened at base . . . B. VENOSUS, *Grav.*

B. Scutellum broad; rostrum longer and more slender, about as long as body, less thickened at base.

a. Last joints of funiculus of antennæ pyriform, stout, and not much longer than broad, entirely clothed with blackish hairs . . . . B. NUCUM, *L.*

b. Last joints of funiculus of antennæ elongate, slender and much longer than broad, with hairs at apex only . . . . . B. TURBATUS, *Gyll.*

2. Posterior femora with a small but distinct, sharp, tooth; size small; rostrum and antennæ longer . . . . . B. BETULÆ, *Steph.* (*cerasorum*, Herbst.)

3. All the femora simple; size small; rostrum and antennæ shorter . . . . . B. RUBIDUS, *Gyll.*

ii. Rostrum black, at all events from base to insertion of antennæ, sometimes slightly reddish in front;

upper surface black, variegated with grey or white scales . . . . . B. VILLOSUS, *F.*

II. Club of antennæ oval, with the first joint as long as the following taken together; tarsal claws toothed at base only; upper surface black, without scales, clothed with fine greyish pubescence; size very small (*Balanobius*, Jekel).

i. Teeth of femora comparatively large, distinct; metasternum and metasternal episterna clothed with white scales; funiculus of antennæ black or pitchy; rostrum black in both sexes; interstices of elytra broader . . . . . B. SALICIVORUS, *Payk.* (*brassicæ*, F.?)

ii. Teeth of femora small, often more or less obsolete, at all events on anterior pair; metasternum simply pubescent, metasternal episterna clothed with white scales; funiculus of antennæ red; rostrum red in front in male; interstices of elytra narrower . . B. PYRRHOCERAS, *Marsh.*

B. venosus, Grav. (*glandium*, Brit. Cat., *nec* Marsh). Black, upper and under surface entirely covered with greyish-yellow or light brownish yellow scales, variegated with bands and markings of brownish or yellowish brown scales, antennæ and legs ferruginous, the latter thickly scaled; rostrum lighter or darker red, usually darker at base and apex, strigose, punctured and pubescent at base, where it is thickened; last joints of the funiculus elongate; thorax with three longitudinal lighter bands, with the sides rather strongly rounded and considerably narrowed in front but not constricted, the long scales meeting in a sort of longitudinal line on the raised central line; scutellum narrow, longer than broad; elytra broader than thorax, with well marked shoulders, gradually narrowed to apex, which is much narrower than base, with the long scales set more thickly and raised on the hinder half, striæ fine, interstices broad; all the femora armed with a strong tooth. L. 6 mm.

Male with the antennæ inserted in front of middle of rostrum which is rather shorter.

Female with the antennæ inserted at about middle of rostrum which is rather longer.

On oaks—in woods and hedges; local; rather common and generally distributed in the London district and the South of England as far as the New Forest, where it is rather plentiful at times; Swansea; not common in the Midland districts, Bretby Wood, Repton and Sherwood Forest; I know of no record from further north than the last-named locality.

B. nucum, L. Of about the same size as, or rather larger than, the preceding, and closely allied to it, but easily distinguished by the broader and less convex form, broader scutellum, and the evidently longer rostrum of the female, which is longer than the whole body, as well as by the plainly shorter and stouter, and somewhat pyriform last joints of the funiculus of the antennæ, which are entirely clothed with blackish hairs; the general colour and arrangement of the scales is much

the same as in *B. venosus*, except that the latter are rather more dense, and that the elytral markings are sometimes more obscure; as in the preceding species the hair-like scales are thickly set and upright on the apical half of suture of elytra; all the femora are armed with a strong tooth. L. 6–7 mm.

Male with the rostrum shorter than the body, the antennæ inserted in the middle of the rostrum, and the last ventral segment impressed in middle and tomentose on each side.

Female with the rostrum a little longer than the body and the antennæ inserted at some little distance behind the middle of rostrum.

On hazel; in woods and hedges; local; generally distributed in the London district and the South of England, but less common further north; Swansea; Bretby Wood, Repton; Sherwood Forest; the only record from further north that I know of is Scotland, Forth district; the insect seems rather peculiar in its distribution; M. Bedel records it as occurring generally in the basin of the Seine, but as rare in the environs of Paris.

B. turbatus, Gyll. (*tessellatus*, auct. *nec* Fourc. (?); *glandium*, Marsh, *sec* Bedel; *nucum*, Germ. *nec* L.). More ovate, smaller, and shorter than the preceding, with the rostrum longer in proportion; it may easily be distinguished, moreover, by having the last joints of the funiculus of the antennæ slender and elongate and only furnished with long hairs at apex; the scales are rather more scanty and are as a rule darker, and the variegated markings are not very distinct; the legs also are more scantily clothed with scales and therefore appear redder; the suture of elytra has the raised scales towards apex much less marked; in the female the rostrum is considerably longer than the body; the whole insect, as a rule, presents a more ferruginous or ferruginous-brown appearance than is usual with either of the two preceding species. L. $4\frac{1}{2}$–$5\frac{1}{2}$ mm.

Chiefly on species of oak (*Quercus robur*, *ilex*, &c.), but occasionally on hazel; not common; Shirley, Croydon, Coombe Wood, Horsell, Cowfold, Claygate, Darenth, Dulwich, Birch Wood, Westerham, Shipley, near Horsham, Chatham, Sheerness, &c.; Hastings; New Forest; Mr. W. Garneys has recorded it from Bretby Wood, near Repton, Burton-on-Trent, but I know of no other record from any locality north of the London district.

B. betulæ, Steph. (*Herbsti*, Gemm., *cerasorum*, Herbst.). A small and pretty lighter or darker ferruginous species, variegated with pale yellowish-grey and reddish scales; antennæ, rostrum, and legs red; underside evenly clothed with light scales; thorax with fine and very close granulate punctuation, narrowed in front, with three lines of pale pubescence which are more or less distinct; scutellum large; elytra very gradually and not strongly narrowed behind, with distinct punctured striæ, interstices rugosely punctured; anterior and intermediate femora simple, posterior femora with a small but distinct and sharp tooth. L. 3–4 mm.

Male with the antennæ inserted in the middle of the rostrum, which is shorter than the body.

Female with the antennæ inserted behind middle of rostrum, which is longer than the body.

On birch (*Betula alba*) and sloe; rare; Esher; Headley Lane (Gorham); Coombe Wood and Wimbledon Park (Stephens); Plumstead (S. Stevens); Exeter (Parfitt).

B. rubidus, Gyll. (*betulæ*, Desbr., *nec* Steph.). Extremely like the preceding in general appearance, but rather smaller, and distinguished by having the rostrum considerably shorter and all the femora simple; the legs also are shorter; the thorax is rather less narrowed in front and the scales on the thorax are more even with the lines of lighter ones scarcely indicated; the scales on the elytra, moreover, are greyish white instead of being yellowish. L. $2\frac{1}{2}$–$3\frac{1}{2}$ mm.

On birch (*Betula alba*); often by sweeping herbage under birch trees; very local, but less uncommon than the preceding; recorded by Mr. Champion as not uncommon in the London district and taken by him at Shirley, Mickleham, Farnham and Esher, at the latter place in abundance; Forest Hill; Ashwicken, Norfolk (Power).

B. villosus, F. (*cordifer*, Fourc.; *cerasorum*, F., *verisim*, *sec* Bedel). Black; base of antennæ red; rostrum black, at all events from base to insertion of the antennæ, beyond which it is often more or less reddish; in all the preceding species the rostrum is red or ferruginous if viewed sideways against the light, even when, if viewed from above, it appears partially dark; underside evenly and closely, upper side scantily and irregularly clothed with grey hair-like scales, scutellum (which is rather large) and a fascia or spot behind middle of each elytron thickly clothed with white scales; rostrum long; thorax closely sculptured, slightly constricted at apex; elytra with distinct striæ, interstices broad, granulose; legs more or less thickly clothed with scales; femora with not very large but sharp and distinct teeth. L. 4–5 mm.

Male with the antennæ inserted in the middle of the rostrum which is shorter than the body, rugosely striate at base, and red at apex.

Female with the antennæ inserted a little behind the middle of rostrum, which is as long as the body, smooth and shining at base and brown at apex.

On oaks and hazels, especially the former; local, but widely distributed; London district, not uncommon, Mickleham, Ashtead, St. Mary Cray, Darenth, Dulwich; Birch Wood, Rusper, Whitstable; Suffolk; Hastings; Portsmouth district; Glanvilles Wootton; Swansea; Devon; Stoke Wood, rare; Bristol; Swansea; Llangollen; Sutton and Knowle, near Birmingham; Burnt Wood, Staffordshire; Bretby Wood, Repton; Sherwood Forest; Lincoln; Northumberland and Durham district, rare on hazel; not recorded from Scotland.

B. salicivorus, Payk. (*brassicæ*, F.? *brassicæ*, Brit. Cat.). Black, base of antennæ reddish-yellow, upper side very scantily covered with grey pubescence, scutellum and underside of body, together with the metasternum, thickly covered with white scales; rostrum long and

slender; thorax with sides slightly rounded and not strongly narrowed in front, closely and comparatively coarsely punctured; elytra broader than thorax, with distinct striæ and flat granulose interstices; all the femora armed with a small, but sharp and distinct, tooth. L. $2\frac{1}{2}$ mm.

Male with the antennæ inserted in the middle of rostrum and the tibiæ, especially the anterior pair, armed with a large curved hook.

Female with the antennæ inserted behind the middle of the rostrum, which is longer.

On willows; the larva has been observed by Perris in galls formed by a species of *Nematus* on the osier, *Salix vitellina*; common and generally distributed throughout the kingdom, and often very abundant.

B. pyrrhoceras, Marsh. Very like the preceding, but rather smaller and easily distinguished by having the metasternum simply pubescent or very sparingly squamose, and also by the fact that the antennæ are red with a dark club, and that the front part of the rostrum is red in the male; the teeth of the femora are smaller, and the thorax is a little more strongly punctured, and the interstices of the elytra are narrower; the fifth ventral segment of the abdomen is broadly foveolate in the middle in the male, and the femoral teeth of the female are rather sharper than in the other sex. L. 2–$2\frac{1}{2}$ mm.

On oak, willows, hazels, &c.; less common than the preceding, but widely distributed from the Midlands southwards; not recorded, however, from any district north of the Midland counties, as far as I have been able to discover.

CALANDRINA.

This tribe contains several genera of which by far the most important are *Sphenophorus* and *Calandra;* these are the only two genera that are represented in Europe and neither of them can be regarded as really indigenous, although *C. granaria* has to a great extent become naturalized; the members of the tribe are chiefly found in tropical climates; some of them are very large; the larvæ are fleshy grubs which bore grain, rice, sugar-cane, the pith of the palm, &c.; that of *Calandra palmarum* is two inches long and is considered a great delicacy, when cooked, by the natives of the country where it occurs; it is, perhaps, the *Cossus* of the ancients; the following are the chief characteristics of the tribe, which by some authors is included under the Cossonidæ as a separate family; form oblong or oblong-ovate, usually glabrous; antennæ geniculate, inserted near base of rostrum, with the first joint of the club glabrous and shining; rostrum moderately long; thorax often very large, fitting closely to base of elytra; all the coxæ globose and more or less distant; anterior tibiæ with a ridge on their posterior surface; scutellum small; elytra with punctured striæ, with a very narrow membranous border at apex, pygidium not quite covered; prosternum broad before the anterior coxæ, situated on the same plane as the mesosternum; tarsi, as in the *Cossonina*, with the last joint elongate,

the fourth more or less conspicuous and the third not broad, tarsal claws free and simple.

In the European catalogue of Heyden, Reitter and Weise *Sphenophorus mutilatus*, Laich, is assigned to Britain; it may have occurred in this country, but if so is evidently an importation; the insect is closely allied to *Calandra*, but is about twice the size of either of our species, and may be known by having the club of the antennæ widened, and inarticulate, and bevelled off at apex.

CALANDRA, Clairville (*Sitophilus*, Schönherr).

This genus contains about twenty-five species, which are chiefly natives of warm or tropical countries; three occur in Europe, but appear to be all importations, although *C. granaria* has to a certain extent been naturalized and has been found on growing wheat; they may be known by their very long thorax, which is as long as the elytra, and the exposed pygidium; the rostrum is slightly curved; the funiculus of the antennæ is 6-jointed and is much longer than the club, which is oblong with the apex conical; the posterior coxæ attain to the episterna of the metasternum, and the latter are free.

Both the British species do considerable damage to stored wheat, and *C. granaria*, the "weevil" *par excellence*, is often exceedingly destructive; *C. oryzæ*, as its name implies, is originally a devourer of rice, but also attacks grain: a long account of the two species is given by Curtis ("Farm Insects," pp. 321—329); the female of *C. granaria* makes a hole in the grain of wheat and deposits an egg; from this there issues a small white maggot, about 2 mm. in length, with a large, round, horny, yellowish head and strong mandibles; this devours the substance of the grain and changes to a clear white transparent pupa in its interior; in eight or ten days the perfect insect issues forth; it has been calculated that a single pair are capable of producing 6045 individuals in one season, so that we cannot wonder at the amount of corn sometimes destroyed in granaries, where the temperature is warm and the enemies of the beetle are few; it is hard to detect the amount of the damage done, as the outside of the grain is not touched and often the presence of the weevil can only be detected by throwing a handful of the grains into water, when the attacked grains float; many remedies have been suggested, but none is so effective in our climate as keeping granaries clean and well whitewashed and the woodwork and planks as sound as possible; when the weather is warm the beetles keep to the corn heaps, but when it gets cold they leave them and take to holes, crevices and cracks; in the colonies the following method is adopted sometimes for getting rid of weevils from rice, corn, &c., and it might perhaps be used with advantage; a tank is filled with the grain to within a short distance of the top; a candle is then set on the top of the grain, and the tank is covered and rendered air-tight by the use of white lead; the candle

exhausts the air and, on the tank being opened next day, a very large number of the weevils will be found dead.

I. Thorax with very large, diffuse, oblong punctures; colour unicolorous, pitchy-ferruginous or pitchy-black; average size larger . . . . . C. GRANARIA, *L.*

II. Thorax with moderate, closely set, subrotundate punctures; colour pitchy-black or pitchy-red, with two reddish spots on each elytron . . . . . C. ORYZÆ, *L.*

C. granaria, L. Pitchy-black or dark ferruginous, antennæ and legs ferruginous; oblong, rather depressed; rostrum moderately long, slightly curved, dilated a little in front of base at the insertion of the antennæ; thorax about as long as elytra, gradually narrowed in front and constricted before apex, with very large oblong punctures placed not very closely together; elytra with deep punctured striæ, interstices narrow, alternate ones somewhat raised at base; breast very coarsely punctured. L. 2–3½ mm.

Male with the rostrum shorter than in female, and the metasternum and abdomen slightly impressed at base.

In granaries, bakers' shops, &c.; widely distributed and only too common throughout the greater part of the kingdom.

C. oryzæ, L. Very like the preceding, but on the average considerably smaller, and easily distinguished by its colour, which is pitchy with two reddish spots on each elytron; in light examples these spots are not very apparent, but the species may easily be known by the punctuation of the thorax, which is closer, with the punctures smaller and rounder; the striæ of the elytra also are more strongly punctured and the interstices are narrower, and are furnished with very short yellowish bristles. L. 2–3 mm.

In rice and grain of various sorts; not so common as the preceding but widely distributed in various parts of the kingdom; Scotland, occasional, Forth and Solway districts; Ireland, near Dublin.

I have specimens of a third species, smaller than either of the preceding and of a reddish testaceous colour; they are, however, evident importations; the same may perhaps be said of *C. oryzæ*, but I have thought it best to include the species.

COSSONINA.

This tribe may be distinguished from the Calandrina by the fact that the pygidium is entirely covered by the elytra and the thorax is less, and the elytra more, elongate; the form is cylindrical and the colour uniform, varying from pitch black to ferruginous; the antennæ are usually inserted at or in front of the middle * of rostrum and not nearly at base as in *Calandra*, and the scape of the antennæ scarcely reaches

* This does not always hold good: in the male of *Rhopalomesites Tardyi*, the antennæ are inserted just before base.

the eyes ; the posterior coxæ are transverse and ovate ; the femora are unarmed, as is also the case with *Calandra*, and the tibiæ are usually armed with a strong curved spine at their apical angle.

The tribe contains a considerable number of genera and species ; these are all, or almost all, wood feeders, and, as observed by M. Bedel, the greater part are found not far from the sea, and two-thirds of the species that have been described belong to insular faunas ; this point has received great attention from Mr. Wollaston, who has described one genus, *Microxylobius*, containing thirteen species, all of which are peculiar to St. Helena ; in fact the Cossonidæ are most interesting as being the archaic remnants of ancient fauna in these detached islands.

About sixty species are found in Europe, of which nine occur in Britain ; the number of genera assigned to the tribe in the catalogue of Heyden, Reitter and Weise is seventeen, of which six are found in our country ; different authors have, however, arranged the genera in different fashions ; Wollaston, for instance, divided off the genera *Brachytemnus* and *Stereocorynes* from *Rhyncolus*, but they are now again included under it by M. Bedel, who, on the other hand, places our two species *Phlœophagus œneopiceus* and *P. spadix* under two distinct genera, *Caulotrypis*, Woll., and *Codiosoma*, Bedel, and regards *Phlœophagus* as including part of the species which are now placed under *Rhyncolus*.

I. Scutellum distinct ; metathoracic episterna well marked.
  i. Funiculus of antennæ 5-jointed . . . . . PENTARTHRUM, *Woll.*
  ii. Funiculus of antennæ 7-jointed (rarely with 6 joints).*
    1. Rostrum terminated by an abrupt triangular flat dilatation ; anal segment with two small silky hairs on its posterior margin . . . . . COSSONUS, *Clairv.*
    2. Rostrum without an abrupt quadrangular dilatation at apex ; anal segment without hairs.
      A. Metathoracic episterna rather broad ; rostrum very different in the sexes ; antennæ inserted at the base of the rostrum in the male and in front of middle in female . . . . . RHOPALOMESITES, *Woll.*
      B. Metathoracic episterna linear ; rostrum similar in the sexes . . . . . RHYNCOLUS, *Steph.*

II. Scutellum not visible.
  i. Episterna well marked along the whole length of the metasternum ; upper surface glabrous . CAULOTRYPIS, *Woll.*
  ii. Episterna indistinct ; upper surface with distinct pale hairs . . . . . CODIOSOMA, *Bedel.*

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* Two European species of *Rhyncolus*, *R. culinaris* and *R. submuricatus* have the funiculus 6-jointed ; these form the genus *Hexarthrum*, Wollaston, which ought apparently to be retained.

PENTARTHRUM, Wollaston.

This genus contains three species, one from St. Helena, another from Ascension Island, and a third which is found in England and France on both sides of the English Channel; they may be known by the five-jointed funiculus of the antennæ; the rostrum is moderately long and robust, not dilated at apex as in *Cossonus*, with the scrobes deep and commencing in middle; club of antennæ small; scutellum small but distinctly visible; mesosternum rather broad.

P. Huttoni, Wollaston. Reddish brown, or pitchy, with the head and thorax often darker than the elytra, rather shining, glabrous, antennæ and legs ferruginous; rostrum longer than the head, eyes slightly prominent; antennæ with the funiculus five-jointed; thorax considerably longer than broad, narrowed in front and constricted before apex, strongly punctured, less closely on disc than at sides, broadest near base; elytra cylindrical, with deep roughly punctured striæ, which are at least as broad as the interstices; interstices punctured; tarsi with the third joint bilobed. L. $2\frac{3}{4}$–$3\frac{1}{4}$ mm.

Male with the rostrum thicker and plainly punctured at base.

Female with the rostrum less thick, very shining, and almost smooth.

In damp and decaying wood, especially of casks, &c.; very local; Plymouth (J. H. Keys); Portsmouth district (H. Moncreaff);* Portland; it has also been recorded from Alphington (Devon) and Plymouth in dead cherry wood.

COSSONUS, Clairville.

This is a large and important genus containing upwards of a hundred species, of which three only occur in Europe, and one in Britain; the remainder are very widely distributed, but are chiefly found in tropical countries; they may be known by having the rostrum furnished with a depressed triangular dilatation at apex; the antennæ are inserted in front of the middle of the rostrum in both sexes and the scrobes commence considerably in front; the club of the antennæ is large; the eyes are subrotundate; the anterior coxæ are plainly distant, and the mesosternum is placed on the same level with the prosternum; the species are found in decaying wood.

C. ferrugineus, Clairv. (*parallelopipedus,* Herbst.; *linearis,* F. *nec* Boh. *et* Gyll.). Pitchy black or ferruginous, with the head and thorax often darker than the elytra, which are depressed on disc;

* Mr. Moncreaff has sent me the following note on this species: "This rare species I have found in numbers in a piece of spruce fir that at one time formed a portion of a wine bin in a grocer's cellar at Southsea and which I had purchased for firewood; the larvæ make oval burrows in the soft portions of the wood, and with them I have found several specimens of a parasite (*Cerocephala formiciformis ?*)."

antennæ and legs pitchy red or ferruginous; rostrum more than twice as long as head with a broad quadrangular depressed dilatation at apex; thorax a little longer than broad, very feebly constricted just before apex, comparatively finely and not closely punctured; elytra with deep punctured striæ, interstices smooth, slightly convex, a little broader than the striæ; femora robust, tibiæ widened internally in middle. L. 4–6 mm.

Male with the dilated part of the rostrum rather shorter than in female, and the abdomen broadly impressed at base and clothed with yellow pilose pubescence.

Female with the abdomen not pilose.

In decaying willows, elms, oaks, &c.; very local and, as a rule, not common; Highgate (Power, in plenty); Greenwich; Battersea; Richmond Park (Champion); Hampstead (S. Stevens); Plymouth and Exeter; Swansea; Sherwood Forest (under oak bark (Blatch)).

As the name *C. linearis* has been adopted for three different species belonging to the genus, I have thought it best to drop it altogether.

RHOPALOMESITES, Wollaston.

The genus *Mesites*, with which the single British species has usually been united, contains about fifteen species which are widely distributed in the Canaries, Madeira, Ceylon, St. Vincent, &c.; the genus *Rhopalomesites*, containing the single species *R. Tardyi*, is slightly less cylindrical than *Mesites*, and somewhat more convex, with the eyes more approximate, the antennæ more elongate, the club much larger and abrupt, the legs rather longer, the thorax more oblong and the rostrum of the male considerably longer and more slender; the genus may at once be known by having the rostrum very different in the sexes, and by having the antennæ inserted near the base in the male, and considerably in front of middle, where the rostrum is dilated, in the female. The species is found very locally in hollies and beech trees, especially in Ireland.

R. Tardyi, Curt. Elongate, rather depressed, extremely variable in size in both sexes, not very shining; antennæ and legs ferruginous; upper surface with very fine, scarcely evident, whitish pubescence; rostrum moderately curved, very different in the sexes; thorax much longer than broad, with sides narrowed in front and constricted before apex, closely and rather strongly punctured with more or less distinct traces of a central raised smooth line which sometimes appears as a smooth patch in the centre; elytra with moderately deep, but not plainly punctured, striæ, interstices broader than the striæ, flat, rugosely punctured; femora angled beneath. L. 6–12 mm.

Male with the rostrum narrower than in female, angularly dilated just before base, where the antennæ are inserted, punctured at base, and smooth and shining in front of the insertion of the antennæ.

Female with the rostrum dull, broadly and not angularly dilated before middle, where the antennæ are inserted, sides of rostrum raised and rather shining at the dilated portion.

In old holly trees; also occasionally in beech; very local, but not uncommon where it occurs; Mount Edgcumbe Park, near Plymouth (rather common); Ilfracombe (remains, J. J. Walker); Scotland, very rare, Clyde and Argyle districts; it is especially an Irish species, where it has been found in greater or less abundance in several localities; Powerscourt, near Dublin; Tollymore Park, Westport, co. Mayo; Belfast district; Bantry, June, 1886, abundant under dead beech bark (J. J. Walker).

RHYNCOLUS, Steph.

This genus has been differently constituted by different authors, and, as here constituted, includes *Stereocorynes*, Woll.; it contains more than fifty species; fifteen of these occur in Europe and four in Britain; they most closely resemble the two following genera, from which they may be known by having the scutellum small but distinct; the rostrum is not dilated at apex and the scrobes are narrow and continued beneath the eyes: the antennæ are inserted at about the middle of the rostrum and have a small club; the anterior coxæ are narrowly distant, and the mesosternum is narrow and linear.

I. Club of antennæ not truncate, pubescent from base.
  i. Rostrum narrower and longer than head.
    1. Eyes evidently, although slightly, convex; form broader; thorax constricted before apex . . . . . R. LIGNARIUS, *Marsh.* (*cylindrirostris*, Ol.)
    2. Eyes almost flat; form narrower and more elongate; thorax not constricted before apex . . . . . R. GRACILIS, *Rosenh.*
  ii. Rostrum as broad as, and almost shorter than, head . . . . . R. ATER, *L.* (*chloropus*, F.)

II. Club of antennæ truncate, pubescent only at apex; eyes depressed, on a level with the surrounding surface (*Stereocorynes*, Woll.) . . R. TRUNCORUM, *Germ.*

R. lignarius, Marsh. (*cylindrirostris*, Ol.). Oblong-cylindrical, pitchy black, glabrous, rather shining, antennæ and legs dark ferruginous; rostrum longer than the head, cylindrical, almost straight, thorax distinctly and rather closely punctured with a not very evident smooth dorsal line, sides regularly rounded and constricted before apex; scutellum small but plainly visible; elytra with strong punctured striæ, interstices with a regular row of minute punctures. L. 3–3½ mm.

In decaying elms, oaks, ivy, &c.; local, but common in some districts; London district, Kent, Surrey, and most of the southern counties, generally distributed and common; Devon, scarce; Windsor; Llangollen; I have no record from the Midland counties or in fact from any place north of the London district, except "Scotland, very rare, Solway district (Sharp)"; it most probably, however, occurs in some of the intervening districts.

R. gracilis, Rosenh. Elongate, rather depressed, narrower than the preceding species; pitchy brown, shining, glabrous; antennæ and legs pitchy red; rostrum nearly as long as thorax, cylindrical, shining, slightly curved; thorax scarcely longer than broad, strongly punctured, with a smooth central line, sides not constricted before apex; elytra a little broader than thorax, with deep punctured striæ, interstices irregularly punctured; according to M. Bedel the interstices of this species are smooth or imperceptibly punctured; it may be known from the preceding by its more elongate form, almost flat eyes, and by not having the sides of the thorax constricted before apex, and from those that follow by the longer rostrum. L. $3\frac{1}{2}$–4 mm.

In rotten wood of beech, &c.; very rare; Esher (Hamlet Clark); Smallheath, Birmingham, and Sherwood Forest (in birch twigs) (W. G. Blatch).

R. ater, L. (*chloropus*, F.). This species may be known from the two preceding by its short and stout rostrum; it is more elongate and parallel-sided than *R. cylindrirostris;* pitchy black, glabrous, with the antennæ and legs pitchy ferruginous; rostrum subquadrate with a central channel; thorax evidently longer than broad, narrowed in front, regularly, closely and moderately strongly punctured; elytra with broad strongly punctured striæ, interstices punctured in minute rows and somewhat strigose. L. $3\frac{1}{2}$–4 mm.

In decaying elm, fir, &c.; local and, as a rule, rare; Sittingbourne, Kent (Hodgson); Chatham (J. J. Walker); Walton-on-Naze (Blatch); Sherwood Forest (Turner); Scotland, in stumps of Scotch fir, local, Tay and Dee districts.

R. truncorum, Germ. (s.g. *Stereocorynes*, Woll.). This species may be known by having the eyes quite flat and the club of the antennæ truncate and pubescent only at apex; the anterior femora are angularly dilated on their underside and the first joint of the tarsi is elongate; of rather shorter and broader form than the preceding, pitchy black or dark pitchy ferruginous, with the antennæ and legs lighter; rostrum short and broad, closely punctured; thorax longer than broad, narrowed in front, regularly, moderately closely, and strongly punctured, with traces of a smooth central line; elytra slightly broader than thorax, with moderately strong punctured striæ; interstices rather convex, punctured in minute rows and slightly strigose. L. $3\frac{1}{2}$ mm.

Male with the rostrum slightly narrowed towards apex, one and a half times as long as its breadth at base.

Female with the rostrum cylindrical, twice as long as its breadth at base.

In decaying maple, &c.; rare; London district (Janson); Wanstead (Power); Leytonstone (Gorham); Epping Forest (Blatch).

Thomson (Skand. Col. vii. pp. 342, 343) separates *R. cylindrirostris* from *R. lignarius*, chiefly on the ground that the former species has the elytra furnished with series of punctures, whereas in the latter they are

transversely substrigose; Bedel, on the other hand, expressly states that *R. lignarius* has all the interstices marked with a distinct series of punctures; the latter author also says that *R. ater* (*chloropus*) has the interstices almost impunctate and that in *R. gracilis* they are smooth or imperceptibly punctured; in some examples, however, the interstices are certainly visibly punctured or strigose, or both; the character seems to vary somewhat in the same species; it is better therefore to keep *R. lignarius* and *R. cylindrirostris* united, as they are otherwise virtually identical.

CAULOTRYPIS, Wollaston.

The old genus *Phlœophagus*, as it has hitherto stood in the British catalogues, has included the two species *P. æneopiceus* and *P. spadix*, which have been distinguished from *Rhyncolus* and *Stereocorynes* by the rather longer scape and more elongate second joint of the funiculus of the antennæ, and from *Cossonus* and *Rhopalomesites* by the less distant anterior coxæ; the absence of the scutellum, however, is a much better character on which to separate them; our two British species have been placed by M. Bedel in the genera *Caulotrypis* and *Codiosoma* respectively; the latter genus he has formed to receive *P. spadix* which may be easily separated from the present genus by the shape of the metathoracic episterna and especially by the presence of pale hairs on the upper surface of the elytra.

The genus *Phlœophagus*, as constituted in the Munich catalogue, contains thirty species which are very widely distributed, representatives occurring in the Canaries, the Azores, Madeira, Ceylon, St. Vincent, Algeria, South Africa, Mexico, New Caledonia, &c.

C. æneopiceus, Boh. Pitchy brown, shining, with a slight bronze reflection, antennæ and legs red, the former rather slender, with the club ovate; rostrum broad and robust, longer than broad, finely and closely punctured; thorax longer than broad, nearly oval, with sides broadest about middle, moderately strongly and not very closely punctured, not constricted before anterior angles; scutellum invisible; elytra subparallel, scarcely dilated at sides, with punctured striæ, interstices minutely punctured and transversely strigose. L. 3 mm.

In rotten wood of old wine casks, old posts, &c.; local, but common where it occurs; London district; St. Margaret's Bay, Deal; Plymouth; Ilfracombe; Fowey; Falmouth (abundant, J. J. Walker); Barmouth, under ivy bark (Chappell); Dr. Power has taken it in his cellar in Burton Crescent, St. Pancras, London.

CODIOSOMA, Bedel.

This newly-formed genus differs from the preceding, as has been above pointed out, by the presence of light hairs on the elytra and also by the fact that the metathoracic episterna are indistinct, whereas in *Caulotrypis* they are well marked; the single species is extremely local

in Britain, but is sometimes found in abundance on our South-Eastern coasts in old decaying wood on the sea-shore.

C. spadix, Herbst. Convex, dark pitchy-brown or reddish, shining, with fine grey pubescence, which is recumbent on the thorax and somewhat raised on elytra; rostrum narrower and longer than the head, a little longer in the female than in the male, antennæ comparatively slender, with the club oval; thorax suboval, rather longer than broad, strongly punctured; scutellum invisible; elytra oval and convex, with deeply punctured striæ, interstices narrow, with rows of punctures, and transversely strigose. L. 3–3½ mm.

In old posts, on the sea-shore and on the banks of large rivers near their mouths; locally common; Harwich (Walker); Gravesend (Janson); Sheerness (Walker); Dovercourt; Walton-on-Naze; Pegwell Bay (common, T. Wood); Hastings district; Eastbourne; near Cowes (Gorham); Seaford, Devon.

MAGDALINA.

This tribe is made up almost entirely of the single genus *Magdalis*, taken in its wide sense; the following are its chief characteristics; form elongate, upper surface glabrous or almost glabrous; thorax with the anterior angles projecting, often sharp and considerably prominent; elytra separately rounded at base and advanced towards thorax; anterior coxæ contiguous; thorax at base a little narrower than elytra, not or scarcely transverse; femora usually, but not always, armed with a tooth; tibiæ short, shorter than the femora; tarsal claws usually simple, but occasionally toothed at base; pygidium exposed in both sexes.

MAGDALIS, Germar. (*Magdalinus*, auct.; *Thamnophilus*, Schön.; *Rhinodes*, Steph.; *Panus*, Steph. pars.).

This genus contains about forty species which are scattered over the greater part of the Northern Hemisphere; one has been described from Brazil and another from the Australian region; they are deep black or bluish insects (rarely, in the case of some foreign species, reddish), as a rule without a trace of pubescence, and may be known by the characters above given; many live on fir and pine trees, and the remainder on the oak, elm, birch, black poplar and various fruit trees; the larvæ undergo their transformations in the small branches of the trees and form galleries under the bark or in the wood; the sexual differences are often very distinct, the males having the rostrum shorter and duller than in the female and the club of the antennæ sometimes very strongly developed; of the twenty-six European species eight are usually regarded as British; these may be distinguished as follows:—

I. Anterior femora armed with a strong sharp tooth (*Magdalis*, i. s.p.).

i. Thorax with the anterior angles not produced into a long spinose tooth at anterior angles, as a rule simple, but occasionally (as in *M. carbonarius*) produced into a blunt tooth.
  1. Thorax without asperities in front; elytra bluish or greenish blue.
    A. Head distinctly punctured.
      a. Eyes prominent . . . . . M. PHLEGMATICA, *Herbst.*
      b. Eyes depressed . . . . . M. DUPLICATA, *Germ.*
    B. Head almost impunctate; eyes depressed . . M. VIOLACEA, *L.* (*Heydeni*, Desbr.)
  2. Thorax with a group of small asperities in front; elytra shining black . . . . . M. CARBONARIA, *L.*
ii. Thorax quadrate with the anterior angles produced into a long sharp spinose tooth; elytra dull black M. ARMIGERA, *Fourc.* (*atramentaria*, Marsh.)

II. Anterior femora simple or furnished with a very small tooth; colour black (*Rhinodes*, Steph.; *Panus*, Steph.).
i. Sides of thorax simple.
  1. Femora with small, more or less obsolete, teeth; antennæ black . . . . . M. CERASI, *L.*
  2. Femora without teeth; antennæ red at base; male with the club of the antennæ at least as long as the remainder . . . . . M. BARBICORNIS, *Latr.*
ii. Sides of thorax with distinct lateral tubercles; femora simple; antennæ red, at least at base . . M. PRUNI, *L.*

M. phlegmatica, Herbst. Blue-black or greenish-black, elytra dark blue, sometimes with a greenish or violaceous reflection; forehead elongate, closely and distinctly punctured, rostrum as long as thorax, nearly straight, eyes rather prominent, not approximate; thorax longer than broad, slightly constricted before apex, closely and rather strongly punctured; elytra widened behind, with distinct, rather strongly punctured, striæ, interstices closely and comparatively strongly punctured; femora robust, teeth of anterior pair large and sharp. L. 4–5 mm.

On Scotch fir; very local; a northern species; Scotland, Forth, Tay, Dee and Moray districts (Paisley, Rannoch, Braemar, Aviemore, Alvie, &c.). I have received a single specimen from Mr. Moncreaff, which is labelled as from Southwick in the Portsmouth district; from the general distribution of the insect, however, I cannot but think that there has been some mistake made with regard to this specimen.

M. duplicata, Germ. Closely allied to the preceding in colour and sculpture, but distinguished by its more cylindrical form, depressed eyes, shorter head and strongly curved rostrum; the forehead is distinctly but less closely punctured; the thorax is shorter, subquadrate, and the elytra have the interstices very finely rugose, besides being punctured. L. 3½–4 mm.

Male with the antennæ inserted in the middle of rostrum; in the female they are inserted a little behind middle.

On Scotch fir; very rare; Scotland, Dee and Moray districts (Rannoch, Braemar, &c.); Morayshire, June, 1863, R. Hislop (Power's collection).

M. violacea, L. (*Heydeni*, Desbr.). Blue-black, elytra bluish, antennæ pitchy-red at base; forehead smooth not punctured; thorax not transverse, compressed at apex, closely punctured; scutellum linear; elytra with punctured striæ, interstices distinctly but not very strongly punctured; the species is very closely allied to the preceding, but may be known by its more robust rostrum, impunctate forehead, and wider striæ of the elytra. L. 3–4½ mm.

Male with the antennæ inserted on the anterior third part of the rostrum, which is stout, nearly straight, and almost shorter than thorax.

Female with the antennæ inserted a little before middle of rostrum, which is slightly curved and longer than the thorax.

On pines; very rare; introduced by Dr. Sharp in 1871 on the authority of M. Desbrochers des Loges, who stated that he possessed a specimen from England of the species described by him as *M. Heydeni*, which is now by M. Bedel identified with *M. violacea*, L.; it is possible that all our specimens of *M. duplicata* must be referred to this species.

M. carbonaria, L. (*atrata*, Gyll.). Black, rather shining, breast with a small spot of white scales on each side; rostrum about as long as thorax, curved; thorax subquadrate, but a little longer than broad, compressed at apex, strongly punctured, with the sides denticulate in front; elytra with deep punctured striæ, interstices narrow and convex, very finely strigose transversely; anterior femora strongly toothed; size very variable. L. 3½–6 mm.

Male with the rostrum almost shorter than thorax, somewhat thickened at apex, antennæ inserted at the anterior third part of the rostrum, with a large club, and shorter funiculus.

Female with the rostrum half as long again as thorax, curved; antennæ inserted in the middle of the rostrum.

On *Betula alba* (birch); very local and not common; Chartley Moss, Staffordshire (W. Garneys); Northumberland district (near Gibside? Bold); Scotland, on birch and hazel, rare, Solway, Tay, Dee and Moray districts.

M. armigera, Fourc. (*atramentaria*, Marsh.; *aterrima*, F.). Black, dull, antennæ at base, and tarsi, pitchy; rostrum rather short and stout, only slightly curved; forehead very finely punctured; thorax quadrate, produced on each side at anterior angles into a sharp spinose tooth, finely and rather closely punctured, dull; elytra more or less dilated behind, with moderate punctured striæ, interstices flat, finely coriaceous; anterior femora with a strong pointed tooth. L. 3–4½ mm.

Male with the antennæ inserted at the anterior third part of the rostrum which is stout; in the female they are inserted at about middle.

By beating dead hedges, dead twigs, &c.; according to Bedel it occurs on *Ulmus campestris* (the common elm); local; London district, rather common, Norwood, Forest Hill, Ripley, Shirley, Caterham, Belvedere, Dulwich, Lee, Darenth, Dorking, Sheerness, Chatham, Whitstable, &c.; Windsor Forest; Guestling, near Hastings; Portsmouth district; Devon; Glanvilles Wootton; Swansea; Hereford; Knowle;

Trench Woods; Hunstanton; Sherwood; Northumberland and Durham district; Scotland, very rare, Clyde and Forth districts.

M. cerasi, L. Black, dull; rostrum distinctly punctured at base, antennæ black; thorax broader than long, compressed at apex, simple at sides, very closely punctured; scutellum contracted on each side in front, leaving a space between the elytra and its sides; elytra with rather strong and distinctly punctured striæ, interstices convex, granulosely coriaceous; all the femora furnished with a small indistinct tooth. L. 3–4½ mm.

Male with the rostrum shorter than thorax, slightly curved; antennæ inserted at the anterior third part of rostrum, with a very large club, which is covered with silky pubescence and is longer than the funiculus.

Female with the antennæ inserted in the middle of the rostrum, which is curved and a little longer than the thorax.

In dead hedges, dead blackthorn twigs, &c.; it appears to be attached to various species of *Rosaceæ;* the larva attacks the branches of the pear, apple, hawthorn, &c.; local; London district, not uncommon, Forest Hill, Caterham, Wimbledon, Darenth, Lee, Cobham, Birch Wood, Shirley, Chatham, Chingford, &c.; Hastings; Portsmouth district; Shirley Warren, Southampton; New Forest; Bewdley; Cannock Chase; Bretby Wood, Repton.

M. pruni, L. This species may easily be distinguished from its allies by the distinct lateral tubercles of the thorax; black, rather dull, with the antennæ red at base, or red with the club black; rostrum short, about as long as head, straight, very finely punctured; thorax transverse, truncate at base, rounded at sides, very closely punctured; scutellum not contracted at sides in front; elytra subcylindrical, with broad and rather deep punctured striæ, interstices narrow and convex, transversely strigose; femora simple. L. 2–3 mm.

Male with the antennæ inserted at the anterior third part of rostrum; in the female they are inserted in the middle.

In dead hedges, &c.; the species is attached chiefly to species of *Prunus;* rather common and generally distributed from the Midland counties southwards; rarer further north and not recorded from the Northumberland and Durham district; Scotland, very rare, Forth district, "Dalmeny Park, Edinburgh, Mr. R. N. Greville" Murray's Cat.

M. barbicornis, Latr. (♂ *claviger,* Küst.). Black, with the antennæ ferruginous, club dark; rostrum a little longer and more curved than in *M. pruni;* thorax transverse, compressed at apex, with the disc obsoletely foveolate on each side, very closely punctured; elytra slightly shining, with deep punctured striæ, interstices slightly convex, transversely strigose; femora simple. L. 2–3 mm.

Male with the club of the antennæ very long, twice as long as the funiculus and clothed with silky pubescence; antennæ inserted at the anterior third part of the rostrum which is only slightly curved.

Female with the club of the antennæ shorter than the funiculus, and

the antennæ inserted a little before the middle of the rostrum which is plainly, but not strongly, curved.

In hedges, &c.; attached to certain *Rosaceæ;* the larva has been found in the branches of *Malus communis*: rare; Wimbledon; Lee (Champion); Darenth, June 25, 1854 (Power); Ashford; Lewisham; Cowley, July, 1860 (Power); Guestling, near Hastings; Portsdown Hill, near Portsmouth (Moncreaff); Forest of Dean, on hawthorn blossom; Bewdley (Blatch).

SCOLYTIDÆ.

The members of this family are small, usually cylindrical, insects, of a reddish, brownish, or testaceous colour; in very rare instances, as in the male of *Xyleborus dispar*, the body behind the thorax is sub-globose; in form and general appearance they are closely allied to the Bostrychidæ and Cissidæ, but although they may be considered as presenting affinities towards these families, they are in reality true Rhynchophora, and are closely allied to certain of the Cossonina; in fact the genera *Stenoscelis* and *Pseudostenocelis*, belonging to the latter tribe, are practically indistinguishable from the Scolytidæ, except by dissection; they come nearest in appearance to *Hylastes;* the following may be mentioned as the most important characters of the family:—Mandibles stout, curved, more or less toothed on their inner side; labrum, as a rule, very feebly developed; antennæ inserted on the sides of the head, between the eyes and the mandibles, club large, usually solid, rarely with the joints distinct, scape long, funiculus, as a rule, short, with the number of joints very variable (in our genera from 3- to 7-jointed); rostrum short and broad, sometimes quite rudimentary; head prominent in some tribes, covered by the thorax in others; thorax variable, especially in sculpture, but usually large, and very rarely distinctly narrower than the elytra; elytra nearly always cylindrical; mesosternum large, metasternum long or very long; anterior coxæ usually contiguous, intermediate and posterior coxæ more or less separated; legs moderate or stout, and compressed, anterior tibiæ almost always denticulate or crenulate on their outer margin; tarsi somewhat variable, last joint long, with the claws simple, tarsal joints not spongy beneath.

The species are nearly all wood-feeders* and in many cases are among the most formidable enemies to trees; occasionally they cause widespread devastation, especially to pines, elms, &c.; as a rule they burrow between the wood and the bark, but some species (such as *Platypus* and *Trypodendron*) bore into the solid wood; it has been supposed that only decaying trees are attacked, but the truth appears to be that sound trees are first penetrated by the perfect insects and thus become enfeebled and afford a favourable breeding-place for the larvæ which complete the destruction.

* The species belonging to the genus *Thamnurgus*, Eich., feed in the stems of *Euphorbia*, *Delphinium*, *Origanum*, &c.

The larvæ are white or yellowish-white, fleshy, grubs and are very closely allied to those of the ordinary Rhynchophora; in fact they cannot be distinguished from them by any really trustworthy characters (v. Perris, Larves des Coléoptères, p. 412, and Chapuis and Candèze, Cat. des Larves des Coléoptères, p. 228); the only differences are those pointed out by Erichson, who remarks that the head is a little longer and stronger and the mandibles a little longer; these differences, however, are slight and may of course be accounted for by their habits, on the principle of Natural Selection; the integument, moreover, is stouter and more or less shrivelled into rugose folds (étiolé); the head is of a paler colour; the body is cylindrical with the posterior extremity obtuse; the thoracic segments are larger and the anal aperture is in the form of an X and bears no appendage serving for locomotion; in most, if not in all cases, there are no legs; this character used to be regarded as a distinctive one between the Rhynchophora and the Lamellicornia, Ptinidæ and Bostrychidæ, but cannot now be regarded as of so much importance, as certain of the Rhynchophorous larvæ have been found to possess more or less developed legs.

The larvæ of the Scolytidæ bear a strong resemblance to one another, and, with the exception of *Platypus*, which is a little abnormal, they do not require separate notice; many of them, however, may be recognized by their habits, and especially by the shape and nature of their galleries.

The following general description of the life history of the Scolytidæ has been kindly communicated to me by Mr. W. F. Blandford, who is doing very good work at the group; and I would here take the opportunity of thanking him very much for many valuable notes regarding the family, which I have embodied in the descriptions that follow:—

"In the fact that the female enters the plant or trunk to lay her eggs the Scolytidæ differ from all other Rhynchophora, by which the eggs are deposited from the outside.

"The process of establishing a brood begins in every case by the formation of a vertical entrance-hole through the bark, which in the wood-boring forms is continued deeply into the tree, but which in the bark-feeding species only reaches at most the surface of the wood.

"To begin with the latter: The entrance-hole is usually gnawed by the mother; but some species are polygamous and in these the male performs the operation. He then hollows out a small irregular cavity—the brood-chamber—and thither certain females betake themselves, and after impregnation commence the 'mother galleries' at the junction of wood and bast; in the monogamous species the female is fertilized in the entrance-passage or just outside it.

"From the termination of the entrance-hole the 'mother galleries' run—sometimes two in number; in the polygamous species they form a star-shaped system radiating from the brood-chamber. The eggs are laid alternately on the right and left of the galleries in small excavations from which the larval galleries start. Occasionally they are laid in a

clump and the larvæ feed in an irregularly advancing column without forming distinct galleries. The dead body of the mother is usually to be found at the end of her gallery, and it may thus often serve as a clue to a species which is met with in the larval state.

"The larval galleries usually commence at right angles to the mother galleries—at least at their middle; but they often change their direction irregularly—the different shapes being characteristic of the species.

"Their length is variable and depends on the extent to which they are channelled on the wood. In some species the galleries, which score the wood deeply, are only about one inch in length, while in others they are often between four and five inches long and sometimes very irregular; they end in an oval pupal chamber from which the imago escapes by gnawing a flight-hole. Besides these holes others are made at intervals along the 'mother galleries' for ventilation.

"In the wood-borers the females alone make the entrance-holes, which lead sometimes to tangential galleries from which the larval workings start, as in *Trypodendron;* or they form a series of repeatedly bifurcating passages, as in *Xyleborus*, in which larvæ, pupæ and immature beetles occur together. In the second case there are no larval galleries and the larvæ appear to feed on sappy exudations or on the mycelium of a fungus growing on the walls.

"In the wood-boring forms pupal chambers and flight-holes are not found, the imagos emerging by the entrance-tunnel. In certain genera, as *Xyleborus*, the males are apterous, and do not quit the tree in which they are bred; here they fertilize the females immediately after metamorphosis."

The family as catalogued by Gemminger and Von Harold (Munich, 1872), comprises seventy genera and seven hundred and fifty species, which are very widely distributed; in the European catalogue of Heyden, Reitter and Weise thirty-two genera and about one hundred and thirty species are enumerated, and other genera have since been created; the number of British species is about fifty: M. Bedel (in the Faune des Coléoptères du bassin de la Seine, p. 3) separates the Platypodidæ from the Scolytidæ as separate families on the shape of the metatarsus: in sketching out the arrangement of the family for this work I had, however, come to the conclusion that there was not sufficient difference to warrant this separation, and was afterwards pleased to find that on page 305 of his work (foot-note 1) M. Bedel has again united them as subfamilies of one family Scolytidæ; the family will therefore be thus divided:—

I. First joint of tarsi (or metatarsus) much shorter than the remaining joints united; sides of thorax not emarginate for the reception of the legs; eyes oblong or divided; head never broader than thorax . . . . . SCOLYTINÆ.

II. First joint of tarsi (or metatarsus) almost as long as the remaining joints united; sides of thorax emarginate for the

reception of the legs; eyes round, subconvex; head broader than thorax . . . . . PLATYPODINÆ.

SCOLYTINÆ.

This sub-family contains the whole of the genera of the Scolytidæ with the exception of *Platypus*, from which it differs as above stated; the shape of the various genera is somewhat variable but is almost always cylindrical; in the subdivision into tribes and species good characters are afforded by the sculpture of the thorax, which is in many cases furnished with strong warty asperities in front, and by the formation of the apex of the elytra which is often more or less excavate and, in one sex at least, dentate; the shape of the club of the antennæ and the number of joints of the funiculus of the antennæ are also of great importance.

The sexual differences are in many cases very marked, the males in some instances differing entirely from the females and being extremely rare. Our species may be divided into the three following tribes:—

I. Thorax not prolonged over the head which is always in part visible from above and is terminated by a short snout; thorax without any marked asperities on its anterior portion; third tarsal joint nearly always bilobed.*
  i. Abdomen strongly raised obliquely from near apex; thorax bordered at sides . . . . . SCOLYTINA.
  ii. Abdomen not, or only slightly, raised, as a rule regularly cylindrical; thorax not bordered at sides . . . . . HYLESININA.
II. Thorax prolonged over the head, which is sunk in the thorax when the insect is at rest, and is more or less globose; thorax almost always furnished with more or less distinct warty asperities in front; third tarsal joint simple . . . . . DRYOCÆTINA.

SCOLYTINA.

This tribe comprises the single genus *Scolytus*, which may easily be known by the shape of the abdomen and by its short broad form, projecting head, and the absence of asperities in front of the thorax, which is usually finely punctured, and very shining; the thorax is margined at sides and base; the scutellum is distinct and sunk in a deep impression, and the elytra are not excavate and only slightly sloped at apex; the antennæ are inserted near the eyes and are 11-jointed, with a large club which is longer than the funiculus; the latter is composed of seven joints; the tibiæ are armed externally with a strong hook and the third joint of the tarsi is broad and strongly bilobed; the posterior coxæ are rather widely distant; the species are very destructive to trees, and appear to attack especially the elm, oak, hornbeam and birch, besides various fruit trees; none of them appear to attack *Coniferæ*.

* This character is indistinct in the smaller species of *Hylesinus*, and is absent only in one genus, *Polygraphus*; in the Dryocætina there may occasionally be a vestige of a snout, but it is not found in any indigenous genus.

SCOLYTUS, Müller (*Eccoptogaster*, Herbst.).

This genus contains about thirty species, of which about half are found in Europe, and the remainder have been described from North, Central and South America, and from Java; several of the European species also occur in Northern and Central Asia; the characters given for the tribe will be sufficient to distinguish this the single genus belonging to it; the life history of the species is of great economical interest, as the ravages that the beetles commit upon forest and fruit trees are often most serious; the commonest British species is *S. destructor*, which destroys vast numbers of elm trees throughout the country, whole avenues of fine trees being sometimes ruined by its devastations: the larva of this species is figured by Westwood (Classification I. p. 350, fig. 42, 4); it is a thick fleshy grub, of a whitish colour, broader in front than towards apex where it is somewhat narrowed; the head is corneous and provided with powerful jaws; the back is much wrinkled, and there are no traces of legs; a very interesting paper on "Observations of the economy of the British species of Scolytus," was published in the *Entomologist's Monthly Magazine* (vol. vi. 1869–70, p. 126), by Dr. Algernon Chapman; this gentleman still continues his valuable observations on the group, and two years ago (November, 1888) I received letters from him regarding certain species; as the subject is one of such general interest, it may be of service to quote a portion of his remarks at length, more especially those referring to *S. destructor*, concerning which he says:—"This, the commonest of our species, may be found early in June making its galleries of oviposition in any elm trees felled during the previous winter, and usually in such numbers as to ensure the destruction of the bark; I do not remember to have seen it in timber smaller than 8 in. diameter. The female makes her way along the bottom of some crack in the bark, often by widening it for some distance, before commencing to burrow, so that the real opening of the gallery is some distance from where the little heap of outturned frass lies which marks its orifice.

"The male is present for only a brief interval, viz. after the burrow is well commenced, but before any eggs are laid. The burrow is usually about three inches long (very rarely five inches), almost always close to the wood and slightly encroaching on it. Its construction occupies about three weeks. The eggs are laid along either side close to the bark, the cavities in which they lie being somewhat irregular, not nicely fitting the egg as with *Hylesinus*. The eggs in a burrow number about 100, but I have met with more than 160 in one. They are covered by a rather thick continuous layer of frass, which also lines the floor of the burrow, and extends partially into the roof.

"The young larvæ, starting at right angles to the parent gallery, which is parallel with the axis of the tree, form a very regular 'typograph,' at least in those somewhat rare instances in which contiguous

broods do not interfere with each other. Most of the larvæ are full fed towards the latter part of July, and I daresay that, in favourable seasons, there are sometimes two broods in a year.* A certain proportion assume the pupal state at the end of the larval burrows, become perfect and emerge during August; but what becomes of these beetles I do not know. I find no trace either of their ovipositing during the autumn, or of their hybernating; for, though *S. destructor* begins its burrows earlier than the other *Scolyti*, it is several weeks later than the *Hylesini* and other bark beetles that pass the winter in the perfect state. The greater number of the larvæ when full fed burrow about half-an-inch into the wood, where they form a little longitudinal chamber, the entrance of which is tightly filled with frass, and in this they pass the winter in the larval state, completing their transformations in this cavity in the spring, and emerging about the end of May. In trees with tolerably thick bark, they sometimes form their hybernacula in the latter.

"The object of this difference in instinct between the beetles emerging in autumn, and those remaining as larvæ until spring, is obvious. The bark, especially when riddled by *Scolytus*, soon becomes loose from the action of the weather during the winter, and, when it falls off, birds and numerous enemies quickly remove all exposed larvæ; but those buried in the wood are quite safe, the little circles of frass marking their openings, when the wood has lost the slight staining it receives from the decomposing bark, being hardly visible, though the little patches of white wood frass in the removed bark are very conspicuous.

"I do not remember seeing a *felled* elm trunk that *S. destructor* had not attacked, frequently whilst still trying to throw out shoots; yet I have never seen a trace of it in healthy growing trees; these are supposed to resent and repel the attacks of the *Hylesinidæ* by pouring out sap into their burrows; and, in the case of *S. pruni*, I have observed burrows less than an inch long, some of which, containing a few eggs already laid, had been abandoned uncompleted by the beetles, apparently on account of the presence of a fluid which must have been sap, as no rain had fallen to account for it; these burrows had been formed in bark that was still nearly healthy, though near some dying bark which had doubtless attracted the beetles."

Dr. Chapman has observed the habits of all the British species, with the exception of *S. Ratzeburgii* (which has only occurred at Rannoch), in the district around Abergavenny, and in the paper just quoted from gives an account of each; next to *S. destructor* he has found *S. intricatus* the commonest species; in conclusion he remarks that in all the species the female dies in the burrow after oviposition is completed: *S. destructor*, *intricatus*, and *pruni* are able to make an audible stridulating noise

* M. Bedel (l. c. p. 385) makes the following remark:—"A part des *Scolytus*, ils ont habituellement deux générations par an."

by a rapid movement of the abdomen against the elytra, the loudest sound being produced by *S. intricatus*.

The Scolyti are very much infested by parasites, and but for this fact their ravages might be much more serious; these parasites consist in great measure of Hymenoptera of the family Chalcididæ; half-a-dozen species of these were bred by Dr. Chapman, *Cheiropachus quadrum* being much the most numerous; he found the larvæ of *S. rugulosus* the most liable to attack, a fact explained by its being notable among the Scolytidæ for not taking any pains to hide the entrance to its galleries; this again is explained by the fact that this species attacks fruit trees the bark of which is often very smooth, and affords no crevices such as those afforded to *S. destructor* by the elm.

Miss Ormerod ("Manual of Injurious Insects," p. 184) refers to several methods for preventing or lessening the damage done by *S. destructor*; as above remarked, healthy trees often repel the attack of the beetles by pouring sap into the burrows; a Frenchman, M. Robert, acting upon this principle, adopted the plan of removing the whole of the rough outer bark from elm trees (which can be done conveniently by a scraping-knife shaped like a spokeshave); this operation caused a great flow of sap in the inner lining of the bark, and the grubs were found to perish in almost all cases soon after; the application of coal-tar, whitewash, &c, might be in some cases of service, but only to a limited extent; the greatest preventive of all, however, is to clear away and burn all the old elm trunks which are left everywhere lying on the ground in our parks and fields and wood-yards with the bark still on; these in most cases are soon found to be swarming with *Scolytus* maggots, which will very soon infest and destroy numbers of neighbouring trees.

The British species are usually regarded as six in number, but I believe that *S. carpini* exists in our collections, and have added it doubtfully in the hope that it may be confirmed as indigenous.

I. Second ventral segment of abdomen without projection on its posterior margin.
  i. Elytra shining with the dorsal striæ very distinct and regular and in no way confused with the punctures of the interstices which are evidently finer.
    1. Sutural region of the elytra with a fine series of punctures behind scutellum; abdomen of female simple, of male with a strong tubercle on the third segment and a transverse raised prominence on the fourth segment; size larger. . . . . S. RATZEBURGI, *Jans.*
    2. Sutural region of the elytra thickly punctured behind scutellum; third and fourth segments of abdomen in both sexes furnished with a small tubercle . . . . . S. DESTRUCTOR, *Ol.* (*Geoffroyi*, Goeze).

ii. Elytra rather shining with the punctured striæ fairly regular but not strongly impressed, and with the punctures of the interstices not much finer than, or equal to, those of the striæ.
1. Thorax with the punctuation very fine on disc; less fine but not extremely close at sides; punctures of striæ evidently a little stronger than those of interstices . . . . . S. PRUNI, *Ratz.*
2. Thorax with the punctuation rather fine on disc, considerably stronger and very close at sides; punctures of striæ and interstices equal (S. CARPINI, *Ratz.*)

iii. Elytra dull with very close striæ, striæ and interstices often more or less confluent, the sculpture being rugose.
1. Thorax very finely punctured on disc (the punctures being round), more closely and coarsely punctured at sides; elytra of a uniform pitchy ferruginous or castaneous-red colour; size larger . . . . . S. INTRICATUS, *Ratz.*
2. Thorax comparatively coarsely punctured on disc (the punctures being elongate), strongly and more or less confluently punctured at sides; elytra black with the apex broadly reddish . . . . . S. RUGULOSUS, *Ratz.*

II. Second ventral segment with a strong horizontal projection on its posterior margin; elytra with close deeply impressed striæ, interstices with regular rows of distinct punctures . . . . . S. MULTISTRIATUS, *Marsh.*

S. Ratzeburgi, Jans. (*destructor*, Ratz., Thoms.). Black, shining; head deeply strigose, thickly, coarsely and deeply punctured behind and at the sides, clypeus with a broad triangular emargination in front; thorax a little longer than broad, broader at base, narrowed in front, rounded at the sides, coarsely and deeply punctured at sides and in front, finely and more diffusely on disc and behind; elytra as wide as thorax, parallel-sided, with the suture depressed throughout, more strongly so towards scutellum, behind which there is a fine series of punctures; punctured striæ rather strong, interstices flat, with a somewhat irregular row of exceedingly minute punctures; legs black, femora narrowly, tibiæ broadly, pitchy-red at the apex; tarsi testaceous; abdomen much depressed, the surface of the second segment nearly perpendicular, very sparingly and rather obscurely punctured, the apical (fifth) segment with a broad deep impression, and with the punctures coarser and a litle closer. L. 5–6 mm.

Male with the forehead slightly excavate and thickly clothed with long erect yellowish villose pubescence; abdomen with a round glabrous tubercle on the middle of the anterior edge of the third segment, and the fourth segment with a sinuate transverse raised space on its anterior margin; last segment without tufts of hairs.

Female with the forehead shallowly depressed and scantily furnished with long depressed fulvous hairs, and with a keeled line

which is peculiar to the species;* abdomen with the segments simple.

In stumps of birch trees; rare; Scotland, Tay district, Rannoch, Perthshire; the species occurs in Northern, Eastern and Central Europe and in the western part of Central Asia; it is often common and very destructive in East Central Europe and in Russia; it is, apparently, confined exclusively to the birch.

This species is closely allied to *S. destructor*, but may be distinguished by its larger size, deep shining black colour, narrower thorax, more parallel elytra, which have a single row of punctures on the interstices, the comparatively naked head of the female, the great length of the pubescence on that of the male, the more deeply emarginate clypeus, and especially by the structure and puncturing of the abdomen—for in *S. destructor* the third and fourth segments have a minute tooth on their anterior margin in both sexes, and the punctures, although fine, are deep and close, particularly on the fifth segment (Vide Ent. Annual, 1856, 88-89).

S. destructor, Ol. (*scolytus*, F., *Geoffroyi*, Goeze,† *Ratzeburgi*, Thoms.). Black, shining, with the elytra more or less rufescent, usually more or less suffused with fuscous, the dark colour sometimes taking the form of a cross and dividing off four more or less distinctly marked reddish patches; in ordinary specimens, however, the colour is not distinctly divided; head black, longitudinally rugose; thorax large, longer than broad, with the sides scarcely rounded and gently narrowed in front, diffusely and very finely punctured on disc, more strongly punctured in front and at sides; sutural region of elytra thickly punctured behind scutellum which is much depressed; elytra with distinct punctured striæ, interstices plainly and diffusely punctured (the rows being usually double); antennæ and legs ferruginous, femora pitchy in middle; third and fourth segments in both sexes furnished, as a rule, with a small tubercle. L. 4–5 mm.

Male with the forehead clothed with short and thick pale villose pubescence, and the abdomen sparingly villose; last segment with two tufts of reddish hairs.

Female with the forehead dull, and the abdomen closely punctured.

In elms; common and generally distributed from the north Midland districts southwards; more local and less common further north; it has not been recorded from Scotland, nor have I any record from Ireland, but it most probably occurs in the latter country; it is found as far north as the Northumberland and Durham district.

S. pruni, Ratz. This species at first sight much resembles the pre-

* This character will distinguish the species from *S. pruni* and *S. destructor*, with which small females may be confounded.

† The name *S. Geoffroyi*, Goeze (1777), is adopted by several writers; Bedel adopts *S. scolytus*, F. (1775), which has the priority, but the repetition is very awkward; I have thought it best to retain the ordinary name *S. destructor*, Ol. (1795).

ceding, but is easily distinguished by the sculpture of the elytra, which have the punctured striæ much less strongly impressed and the punctures of the interstices not much finer than those of the striæ and arranged in single rows; it is also a little narrower; the colour is shining black with the elytra ferruginous, and the antennæ and greater part of the legs are red; the thorax is very finely punctured on disc and less finely but not very closely at sides, and the ventral segments of the abdomen are simple in both sexes. L. $3\frac{1}{2}$–$4\frac{1}{2}$ mm.

In decaying apple, apricot, pear, cherry and other fruit trees; Ratzeburg has also found it in whitethorn and elm; very local, but not uncommon where found; Peckham; Hammersmith (Stevens); Tonbridge (Horner); Southsea, on blackthorn (Moncreaff); Monmouthshire and Herefordshire, freely (Chapman); Lindow and Urmston, Cheshire (Chappell); Stretford, near Manchester (Reston); Scarborough (Lawson).

(*S. carpini*, Ratz. This species is very closely allied to the preceding, but is smaller, and may be distinguished by having the punctuation of the thorax stronger and closer at the sides, and the punctuation of the striæ and the interstices equally strong, whereas in *S. pruni* the punctuation of the interstices is a little finer; the general punctuation of the elytra is also less regular than in the last mentioned species. L. 3–$3\frac{1}{2}$ mm.

This species occurs in France, Germany and Austria, on the Hornbeam (*Carpinus betulus*), and has been introduced into one or two of our collections, but I know of no authentic specimen, although it very probably occurs in Britain; in fact, Mr. E. W. Janson has seen workings in Hornbeam which were almost certainly to be referred to it; the differences between the species and *S. pruni* are so very slight that the two insects may very easily be confused.)

S. intricatus, Ratz. Black, shining, elytra duller, with the antennæ and legs ferruginous, and the femora and elytra pitchy-brown or pitchy-red, the latter with very close rows of punctures and extremely narrow interstices, more or less rugose, with short erect yellow bristles at sides and towards apex; underside with close grey pubescence; thorax longer than broad very finely and rather closely punctured on disc, more closely and sub-rugosely punctured at sides; suture depressed behind scutellum; the colour is variable, the thorax occasionally being reddish. L. 3–4 mm.

Male with the forehead depressed and clothed with short thick fuscous villose pubescence.

Female with the forehead convex and somewhat strigose.

In decaying oak; not common; Darenth; Chatham; Forest Hill; Dulwich; Hastings district; New Forest; Monmouthshire and Herefordshire rare (Chapman); Sherwood Forest; Dunham Park, Manchester; Northumberland and Durham district, rare, Little Benton.

S. rugulosus, Ratz. The smallest of our species; black, shining,

with the elytra dull, black, with the apex of the elytra more or less broadly red, the latter sparingly pilose, very closely punctured, the punctuation appearing almost uniform; thorax comparatively coarsely punctured on disc (the punctures being elongate), strongly and more or less confluently punctured at sides; abdomen dull, clothed with thick ashy pubescence, gradually ascending from base to apex; legs ferruginous; in the male the forehead is rather thickly villose. L. 2–2½ mm.

In decaying oak, cherry, apple, pear, elm. &c.*; very local, but not uncommon where it occurs; Esher, Notting Hill, Birch Wood, Darenth, Whitstable, Forest Hill, Caterham; Isle of Wight; Monmouthshire and Herefordshire, abundant (Chapman); Bewdley; Bromsgrove; Cheshire.

S. multistriatus, Marsh. (*ulmi*, Redt.). Black, shining, with the elytra duller, pitchy-red, antennæ and legs ferruginous, femora pitchy at base; thorax longer than broad, very finely punctured on disc, more strongly and closely at sides; elytra with close and regular punctured striæ, which are deeply impressed, interstices with regular rows of distinct punctures; abdomen with the third to the fifth segments thickly clothed with ashy pubescence, second ventral segment with a strong horizontal projection on its posterior margin, which, according to some authors, Eichhoff among them, is confined to the male; in the latter sex the forehead is thickly villose. L. 2½–3¼ mm.

In decaying elm, cherry, pear, oak, &c.; local, but rather common where it occurs; Mickleham, Birch Wood, Forest Hill, Merton (in plenty, July 8, 1865, size very variable (Power)), Darenth, Esher, Wimbledon, Sheerness; New Forest; Monmouthshire and Herefordshire, common (Chapman); Bowdon, near Manchester, rare (Chappell).

This species is allied to *S. intricatus*, from which it may be known by its narrower form, more finely punctured thorax, and the more regular sculpture of the elytra; the shape and the sculpture of the elytra will distinguish it from *S. pruni*, the interstices and the striæ being evidently more closely punctured; it may, moreover, be separated from all our other species by the structure of the second ventral segment of the abdomen; the tooth on the second ventral segment appears, from the weight of authority, to be common to both sexes; there is, however, a variety, or possibly a separate species (recorded from Thuringia),—*S. triornatus*, Eich.—in which the third ventral segment bears a sharp spine behind the middle in the male only.

HYLESININA.

This tribe may be easily separated from the preceding by the even

* Altum says that this species lives on *Armeria vulgaris*, although it occurs more commonly under plum bark; Mr. Blandford, referring to Altum's statement, tells me that he has taken a single example on Braunton Burrows, Devonshire, a locality far from any plum trees, and close to the sea.

ventral surface of the abdomen and the fact that the thorax is not bordered at sides; the projecting head and the sculpture of the thorax will distinguish it from the Dryocætina; through *Hylastes* it presents affinities towards the Cossonidæ (the antennæ being much the same in form), and through several of the other genera towards the Platyrrhinidæ (*Choragus*, &c.); the shape of the club of the antennæ and the number of joints to the funiculus of the antennæ afford good characters for the distinction of the genera, which cannot, however, be considered as quite settled; all the European genera, as at present constituted, appear to be represented in Britain with five exceptions (*Hylurgus*, containing only the two species *H. ligniperda* and *H. Micklitzi*, *Carphoborus*, containing only *C. minimus* and *C. pini*, *Dendroctonus*, *Phlœosinus* and *Phlœotribus*); their names are very much confused by different authors.

I. Eyes not divided; third tarsal joint nearly always dilated and bilobed.
  i. Funiculus of antennæ with seven joints.
    1. Club of antennæ globose or ovate.
      A. Anterior coxæ contiguous; first joint of the club of the antennæ very large, shining, the following very short . . . . . HYLASTES, *Er.*
      B. Anterior coxæ widely distant; first and second joints of the club of the antennæ large, almost equal, the following very short . . . HYLASTINUS, *Bedel.*
    2. Club of antennæ compressed, oblong . . . . HYLESINUS, *F.*
  ii. Funiculus of antennæ with six joints.
    1. Anterior coxæ narrowly separate; thorax with long villose hairs at sides; length 4–5 mm. . . MYELOPHILUS, *Eich.* (*Hylurgus pars*, Brit. Cat.).
    2. Anterior coxæ rather widely separate; thorax evenly pubescent; length 2½ mm. . . . . CISSOPHAGUS, *Chap.*
  iii. Funiculus of antennæ with five joints.
    Club of antennæ oval, nearly globose, formed of four joints fitting closely together . . . . XYLECHINUS, *Chapuis.* (*Carphoborus*, Brit. Cat.).
    Club of antennæ formed of three loose detached joints . . . . . PHLŒOPHTHORUS, *Woll.*
II. Eyes completely divided; third tarsal joint entire not broader than the preceding; antennæ with a solid ovate club, and with the funiculus five-jointed . . . . . POLYGRAPHUS, *Er.*

HYLASTES, Er. (*Tomicus*, Latr., *teste* Bedel).

This genus contains about forty species which are chiefly contained in Europe, Asia and North America; a few, however, have been described from Central and South America, New Zealand, Madeira, &c.; twelve species have been considered as occurring in Europe of which six are found in Britain; one of these, however, *H. obscurus*, has lately been placed in a separate genus, *Hylastinus*, by Bedel; they may be known by the seven-jointed funiculus and the globose or ovate club of the antennæ; the head has a short but distinct rostrum with rather deep transverse

scrobes; the tarsi have the third joint bilobed and scarcely broader than the preceding; in size the species are rather variable; they attack firs and pines, and are often found at the roots as well as under the bark; the sexual differences are not striking, but in one or two of the species the males have a small pubescent fovea on the last ventral segment of the abdomen.

I. Thorax longer than, or at least as long as, broad, punctured on disc, with the exception of a broader or narrower central line.
  i. Length 4 mm.; central line of thorax not raised; elytra glabrous or with very short hairs at apex only.
    1. Thorax considerably longer than broad, with the sides subparallel; elytra longer . . . . . H. ATER, *Payk.*
    2. Thorax not much longer than broad, with the sides somewhat rounded; elytra shorter . . . H. CUNICULARIUS, *Er.*
  ii. Length 2–3 mm.; central line of thorax more or less raised; elytra with rows of recumbent or slightly erect hairs on the interstices.
    1. Rostrum without furrow; sides of thorax rounded . . . . . H. OPACUS, *Er.*
    2. Rostrum with a fine longitudinal furrow at base; sides of thorax almost parallel behind . . . . H. ANGUSTATUS, *Herbst.*

II. Thorax broader than long, somewhat rugose, with central line raised and somewhat carinate; third tarsal joint dilated and bilobed; mesosternum with a small prominence between the intermediate coxæ (*Hylurgops*, Lec.) . . . . . H. PALLIATUS, *Gyll.*

H. ater, Payk. (*pinicola*, Bedel). Elongate, cylindrical, black, shining, nearly glabrous; head much produced in front, antennæ ferruginous; thorax considerably longer than broad with the sides subparallel, rather closely and strongly punctured on disc, much more closely at sides, with a more or less distinct impunctate, but not raised, central line; elytra with coarse crenate striæ, interstices granulately rugose; legs black or pitchy black, tarsi, and often apex of tibiæ, red or reddish. L. 4–4½ mm.

Male with the posterior tibiæ thickly villose on their inner margin towards apex, last ventral segment clothed in middle with thick yellow tomentose pubescence.

Varieties occur in which the thorax is pitchy and the elytra brown, and occasionally the whole insect is ferruginous; these variations in colour, which occur also in many of the allied species, are in great measure due to imperfect maturity.

Under the bark of decaying trunks of various species of pine (*Pinus silvestris, maritima*, &c.); also in stumps; it is especially a root feeder like other members of the genus; often found in sandpits and by sweeping herbage; rather common and generally distributed throughout England; Scotland, common in the bark of fir logs; Ireland, Rathfarnham, Armagh, &c., and probably common.

H. cunicularius, Er. Closely allied to the preceding which it

much resembles in general appearance; it may, however, be very easily known by its somewhat broader and shorter form, and shorter thorax which has the sides evidently rounded, and broader in the middle, and is much duller and more thickly punctured, with scarcely a trace of an impunctate central line; the elytra, moreover, are more coarsely and deeply sculptured. L. 4 mm.

In decaying firs; local and not common; first taken in Britain under bark of fir, near Guildford, Surrey, by Mr. E. W. Robinson, in 1858; Shirley; Westerham, Kent; Weybridge; Birdbrook, Essex; Devils Dyke; Stretford district, near Manchester; Scotland, very rare, Moray district.

H. opacus, Er. Oblong, black, dull, with the base of the antennæ, and the tarsi, ferruginous; rostrum not carinate; thorax a little longer than broad, with the sides slightly rounded and somewhat narrowed in front, rather strongly punctured, with a distinct smooth raised central line; elytra pitchy, usually a little lighter than thorax, dull, with deep crenate striæ, interstices narrow, somewhat rugose, with rows of recumbent or slightly erect hairs; the species is allied to *H. palliatus*, but is narrower and duller with the thorax evidently longer and the rostrum not furrowed; the colour also is, as a rule, darker, but this cannot be depended on as reddish varieties often occur. L. $2\frac{1}{2}$–3 mm.

In decaying firs, &c.; also occasionally in elm and ash; not uncommon locally; Shirley, Mickleham, Woking, Esher, Forest Hill, Wickham, Tonbridge, Chatham; Compton Wyniatt (oak and ash in numbers, Power); Hertford; Faygate, Sussex; St. Leonards Forest; Arundel; New Forest; Glanvilles Wootton; Colton Pits, Somerset; Swansea; Llangollen; Chat Moss; Repton; Sherwood Forest; Northumberland and Durham district; Scotland, Tweed and Clyde districts.

H. angustatus, Herbst. Very closely allied to the preceding, from which it differs in being narrower and more elongate; the punctuation of the thorax is rather coarser, the small spaces between the punctures being shining instead of dull; the sides of the thorax also are almost parallel behind; the tibiæ are a little more dilated, differing also slightly in the spines on their outer edge; and the rostrum exhibits a delicate but decided longitudinal channel; in *H. opacus* there is no trace of such a channel. L. 3 mm.

Under bark of fir logs; very rare; one specimen taken at Holm Bush, near Brighton, by Mr. Rye, who says he has no doubt that it is mixed with *H. opacus* in collections; Mr. W. G. Blatch records it from Mickleham. The *H. angustatus* of Stephen's Illustrations (III. 364) is only *H. opacus*.

H. palliatus, Gyll (*Hylurgops*, Leconte). Pitchy-black, slightly shining, often more or less ferruginous; base of antennæ, tibiæ, and tarsi reddish; rostrum furrowed; thorax transverse, much narrowed and somewhat constricted in front, closely and rather coarsely punctured, with a smooth raised central line, sides rounded and more or less dilated; elytra with deep punctured striæ, interstices granulate and rugose; the thorax and the elytra (except side margins) appear to be, as a general rule, reddish brown, but the colour is somewhat obscure and variable;

the formation of the thorax will easily separate the species from the two preceding. L. 3–3½ mm.

In decaying firs; local, but common where it occurs; Shirley, Mickleham, Esher, Ripley, Cowfold, Birdbrook, West Wickham, &c.; Windsor Forest; The Holt, Farnham; Hastings district; Faygate, Sussex; Portsmouth district; New Forest; Glanvilles Wootton; Bath; Llangollen; Sutton, near Birmingham; Hopwas Wood, Tamworth; Chat Moss; Bridlington Quay; Liverpool district, rare; Dunham Park, Manchester; Northumberland and Durham district; Scotland, common in the bark of fir logs, Solway, Forth, Tay, Dee and Moray districts; it appears to be the commonest species of *Hylastes* in some parts of the South of England.

HYLASTINUS, Bedel.

This genus has been formed by Bedel for the reception of the single species *H. obscurus*, Marsh, which has hitherto been included under *Hylesinus*; it may be distinguished from the latter genus by having the anterior coxæ widely distant, the first and second joints of the club of the antennæ large and almost equal and the following very short; it occurs in Western and Central Europe and also in Madeira (Woll. Cat. of Mad. Col. p. 99); it lives in the thick part of the stems of various Papilionaceæ, especially *Trifolium*, *Ononis*, *Ulex*, *Sarothamnus*, &c., and has been known to do considerable damage to clover fields. The habits of the species have been carefully observed and described by Dr. Chapman (Ent. Monthly Mag. vi. (1869) p. 7); he has chiefly found it in furze, but has also met with it in broom; with regard to its occurrence at the roots of clover (its recognized habitat) he believes that it may attack them, but is inclined to disbelieve that the beetles ever deposit their eggs in that plant; the parent gallery of the insect appears only to have one branch, which is very straight, accurately transverse to the stem, and ¾ of an inch to an inch in length; the eggs are laid at the bottom of little cavities on either side of the burrow, and covered by frass, which fills the cavities to the level of the wall of the burrow, of which there is usually a small unoccupied portion between each cavity; the number of eggs laid is small, a dozen on either side being above the average; the larvæ burrow upwards and downwards; many of the beetles assume the perfect state in the autumn, and either continue the larval burrow until spring, after the manner of *Phlœophthorus rhododactylus*, or, escaping, make a fresh longitudinal burrow in a higher portion of the same stick in which they hybernate, apparently eating a little all the winter; some assume the perfect state during the winter, and not a small proportion pass the winter as larvæ; the period of oviposition is rather later than in *P. rhododactylus*, and occupies nearly a month.

H. obscurus, Marsh (*trifolii*, Müll.). Rather short, subparallel, moderately convex, dull, pitchy or brownish, with the elytra lighter pitchy or dull red; upper surface with rather short pubescence; thorax about as long as broad, with the sides slightly narrowed in front, very

closely and rather strongly punctured, with an obscure dorsal carina; elytra with deeply punctured striæ, interstices somewhat rugose, clothed with short rigid hairs; abdomen fuscous; legs and antennæ ferruginous; episterna of metasternum covered with whitish scales, which, however, are only apparent in fresh specimens. L. $2\frac{1}{2}$ mm.

On broom and furze; also on low plants such as clover, *Ononis*, &c.; occasionally found by sweeping herbage; local, but not uncommon where it occurs; Croydon, Riddlesdown, Claygate, Forest Hill, Ashtead, Birch Wood, Tottenham, Darenth, Bushey Park, Bearsted, Dartford, Sheerness, Gravesend; Folkestone; Eastbourne; Portsmouth district; Plymouth; Swansea; Llangollen; Monmouthshire, freely; Scarborough; Scotland, rare, Tweed, Forth and Moray districts.

HYLESINUS, Fabricius.

This genus contains about forty species, which are very widely distributed; eleven are found in Europe, and the remainder occur in North and South America, Ceylon, the Australian region, &c.; four inhabit Britain, one of which, *H. fraxini*, is among the most abundant of our wood-boring beetles, and sometimes does considerable damage to young ash trees; the species vary considerably in size and may be distinguished by having the funiculus of the antennæ seven-jointed and the club of the same compressed and oblong; the episterna of the metasternum are broad and the anterior and intermediate coxæ are more or less broadly distant; the eyes are entire and transversely elongate and the tarsi have the third joint evidently longer than the preceding.

The life history of all our species has been described by various authors: that of *H. fraxini* has, however, been more fully discussed than the others; all Entomologists who have ever worked the bark of dead ash trees are well acquainted with the formation of its burrows, which consist of a deep parent gallery and a large number of larval galleries which run off at right angles to it, and are quite adjacent to and sometimes even overlap one another at apex, forming a ramification of galleries that once seen can never again be mistaken; Dr. Chapman has given an account of the operations of the species in the Entomologist's Monthly Magazine, vol. v. p. 121, with further notes as to the economy of *H. crenatus* and *H. vittatus*; the latter insect attacks the elm (rarely the ash), and the two former, as well as *H. oleiperda*, attack the ash; in other countries, the latter species, as its name implies, is mostly attached to the olive tree; the most abundant of the species is *H. fraxini*, which in May attacks recently fallen ash trees; the beetles bore very rapidly into the bark, and usually before the female beetle has quite buried itself in the bark the male arrives, and in a few days the two beetles are to be found rapidly extending the gallery in both directions from the aperture of entry; as a rule most insects on their escape from the pupal state contain their eggs ready to be laid and requiring only fertilization, but in these, as in many of the more active *Coleoptera*, the eggs are developed after attaining the perfect state; in

the case of *H. fraxini*, as observed by Dr. Chapman, the female is often bulkier when the burrow is half completed than on entering it, and the eggs laid by a single beetle must often exceed in aggregate mass the original bulk of the female. The eggs are laid along both sides of the burrows, usually at very regular intervals, in little hollows dug out to receive them; they are covered with a gummy material, which soon gets a coating of fine frass; the gallery is finished and the eggs laid in it in from ten to twenty days; when the task of oviposition is finished both beetles usually die in the burrow; the female always does so; the dead beetles may still be found lying in the burrows after several years; the larvæ are straight, white, footless fleshy grubs, with a rather large head and powerful mandibles, and appear to hatch out towards the end of May. In the autumn they assume the pupa state, and shortly afterwards emerge as perfect insects. In cases where the beetles attack young trees it is a good plan to rub a good coat of soft soap into accessible parts of the tree by means of a common scrubbing-brush; some authorities are of opinion that it is the want of dying timber that forces them to attack the live trees, and advise that the old trunks should be left as traps, whereas others consider that these harbour the beetles, and advise their removal; if the old trunks or pieces of trunks are burnt at intervals, it is probable that the plan of leaving them on the ground will be found to be of service.

Dr. Chapman has made an important observation with regard to *H. crenatus*, viz. that it takes two years to undergo its transformations, the larvæ assuming the pupal state at the end of the second summer; as felled timber would be unable to support this long larval existence, the beetle is never met with except in living trees, and, while an affected tree continues alive, they appear never to desert it for another; "they economise it," Dr. Chapman says, "as much as possible, the destroyed bark being more completely riddled and devoured by them than by any other beetle of the family I am acquainted with; the burrows of the larvæ are much more irregular also, so that it is impossible to find one of those perfect maps of their voyages (as in *H. fraxini*), which have earned for the *Xylophaga* as a family the name of '*typographers*.'"

H. vittatus attacks fallen elm, as *H. fraxini* does the ash; its burrows are shorter, and the two branches are very uniformly of equal length, rarely exceeding $\frac{3}{4}$ of an inch long; the number of eggs laid is seldom as many as twenty, and, being usually placed more widely apart than those of *H. fraxini*, the burrows of the larvæ are nearly parallel; the species never appears to attack live trees and is therefore unimportant from an economical point of view.

It should be remembered that all these beetles that bore into the solid wood play a most important part in clearing the ground of dead trees: this is especially the case in the tropical forests, which would utterly be choked up and destroyed in the course of ages but for the insects that drill holes into them which admit the moisture that causes them to

decay, and so opens the way for hundreds of other insects which bring about their complete disintegration.

I. Upper side black, with at most the suture of elytra greyish white.	
i. Size larger (4–5 mm.); sculpture coarser; funiculus of antennæ as long as the club; elytra unicolorous black .	H. CRENATUS, *F.*
ii. Size much smaller (2¼–2½ mm.); sculpture less coarse; funiculus of antennæ shorter than club; elytra black with the suture greyish white	H. OLEIPERDA, *F.*
II. Elytra brown or pitchy-brown, variegated with greyish scales, presenting a patchy appearance; length 2–3 mm.	
i. Episterna of metasternum very broad and rather short; size larger; elytra without a white patch extending from shoulder to middle of suture	H. FRAXINI, *Panz.*
ii. Episterna of metasternum very long and narrow (*Pteleobius*, Bedel); each elytron with a white patch extending from shoulder to middle of suture, the patches enclosing between them a common, more or less marked, oval dark patch	H. VITTATUS, *F.*

H. crenatus, *F.* Of rather short and broad form, convex, black, somewhat shiny, subglabrous; antennæ ferruginous or pitchy ferruginous, with the scape and funiculus furnished with very long ciliate hairs on their external margin, the funiculus being as long as the club; thorax slightly transverse, with the sides narrowed and somewhat compressed in front, coarsely and somewhat granulosely punctured in front, less closely and more distinctly behind; elytra with very strong crenate striæ, interstices very rough muricate or tuberculate, with the punctures of the striæ almost meeting in places; legs black or pitchy, with the tarsi usually lighter; the colour is usually deep black, but the elytra are often more or less reddish and occasionally ferruginous. L. 4–5 mm.

In decaying ash trees; as a rule rather scarce, but widely distributed, and sometimes very abundant where it occurs; Shirley, Dorking, Forest Hill, West Wickham, Cobham, Reigate, Ealing; Windsor Forest; Abbey Wood, Kent; Norfolk, Cromer, &c.; Hastings; Netley; New Forest; Glanvilles Wootton; South Devon; Monmouthshire and Herefordshire, very local; Swansea; Midland districts, very local, the only locality I knew of being Repton, Burton-on-Trent, until Mr. Blandford informed me that he had found it very common and destructive about Madeley in North Staffordshire;* Liverpool and Manchester district, general; Scarborough; Northumberland and Durham district; Scotland, Forth and Tay districts, "near Edinburgh, Kinross-shire, Forfarshire, Murray's Cat.;" it is probably general throughout the kingdom, but through being very local in many districts it is passed over.

H. oleiperda, *F.* Short and broad, convex, but depressed on disc, black, slightly shining, elytra covered with somewhat raised blackish or

* Mr. Blandford says of this insect: "I believe this is really a very injurious insect when it occurs; I have often found it in well grown dead ash trees, which showed no signs of injury or decay beyond the presence of this insect;" Eichhoff has remarked the same; in young trees the very long horizontal galleries of the larvæ may completely encircle the tree, thus entirely cutting off the circulation.

greyish-black hairs, which are also present on thorax, and with a band of whitish grey hairs along the suture, which is rarely obsolete or absent, and as a rule is very distinct and at once distinguishes the species; antennæ ferruginous with the club somewhat darker than the funiculus; thorax transverse, with the sides gradually and not strongly narrowed towards the front, very thickly granulated, the granulations being very fine behind, base strongly and angularly produced before scutellum; elytra with rather deep and distinct regular striæ, interstices more or less broad, very closely rugose; legs black, with the tarsi ferruginous. L. $2\frac{1}{2}$–3 mm.

In decaying ash; occasionally found by sweeping herbage beneath old trees; local, but not uncommon in some districts; it appears, however, to be rarely abundant in any locality; Putney, Forest Hill, Caterham, Cobham, Croydon, Shirley, Cowfold, Richmond Park, Mickleham, Wimbledon, Esher, Ripley, West Wickham, Sheerness; Cromer; Littlington and Ashwicken near Cambridge; Compton Wynniat, Somerset (Power); Herefordshire (one specimen sent me in 1888 by Dr. Chapman, who had not before found the species); Repton, Burton-on-Trent (one specimen found by myself, beaten, I believe, off a furze bush under an ash tree; also taken in the district by Mr. Garneys); Ripon; Scotland, Solway district, "Raehills, Rev. W. Little, Murray's Cat."; the late Mr. W. Garneys once told me that he took the species in large numbers off the window of a cottage to which he had gone to visit a patient; a log of wood (presumably ash) had been put on the fire, and the beetles had been driven out by the heat; the species has been found abundantly in beech near Frankfort.

H. fraxini, Panz. (*varius*, F.; *melanocephalus*, F.). Rather short, convex, dull, upper side pitchy or reddish, variegated with ashy and fuscous scales, underside with ashy pubescence, which is thicker at the sides of the breast; antennæ ferruginous, with the club darker, large and acuminate; thorax transverse, with the sides somewhat narrowed in front, very finely and granulately sculptured; elytra with fine but distinct punctured striæ, interstices broad, rugosely sculptured, granulate towards base; legs black, tarsi red or ferruginous; reddish varieties often occur, with the legs entirely reddish testaceous; they are, however, more or less immature. L. $2\frac{1}{2}$–$3\frac{1}{2}$ mm.

In decaying ash-trees; often found by sweeping herbage; generally distributed and common throughout the greater part of the kingdom.

H. vittatus, F. The smallest of our species of *Hylesinus;* black or fuscous with the elytra pitchy, brownish or reddish-brown, variegated with yellowish-grey scales, and a more or less distinct lighter curved patch of scales extending from the shoulder to middle of suture of each elytron, and enclosing between them a common, more or less marked, oval dark patch; the markings, however, are often more or less confused; thorax transverse, with the sides slightly rounded behind and somewhat narrowed in front, closely and granulately sculptured, variegated with yellowish grey and greyish scales which in fresh specimens are often arranged in irregular longitudinal lines; elytra with fine but distinct punctured striæ, interstices broad, very closely rugose; besides the markings above mentioned there is usually a more or less distinct

whitish circle near apex; legs more or less ferruginous with the femora darker and the tarsi lighter. L. $1\frac{1}{2}$–2 mm.

In decaying elms; also rarely in ash; local, but common where it occurs; Forest Hill; Brockley; Greenwich; Wickham; Compton Wynniatt, Somerset, in ash and elms in numbers in April (Power); Cowley, Gloucestershire; Monmouthshire and Herefordshire, abundant (Chapman); Salford Priors, Evesham; Needwood, Staffordshire; Repton, Burton-on-Trent; Northumberland and Durham district; Scotland, Solway district; "Raehills, Rev. W. Little, Murray's Cat."

MYELOPHILUS, Eichhoff (*Hylurgus, pars* Brit. Cat.).

This genus contains a few species which are found in Europe, Northern Asia and North America; they have usually been included under *Hylurgus*, but are now separated off through having the anterior coxæ scarcely distant from the cephalic margin of the prosternum (which is also excavated as far as the coxæ), the club of the antennæ ovate, and the upper side of the body shining and clothed with scanty hairs; in *Hylurgus* proper the anterior coxæ are situated at some distance behind the cephalic border of the prosternum, the club of the antennæ is globose, and the upper side of the body is dull, granulate or shagreened; the funiculus of the antennæ is six-jointed, the anterior coxæ are narrowly separate, and the thorax is furnished with long villose hairs at the sides; the eyes are entire, and the tarsi have the third joint broader than the preceding.

The life history of *M. piniperda* is discussed by Miss Ormerod in the Manual of Injurious Insects, p. 217; the beetles are destructive to pine plantations in all stages of growth by boring through the sides of the tender shoots into the pith, and eating their way for an inch or two along the centre; this is done in the summer, and in the following spring, during high winds, the affected shoots are blown off; if the leading shoot, as is often the case with young trees, is thus lost, the tree as it grows becomes bushy headed, its growth is retarded, and its ultimate value is reduced; in April or May the female beetle bores a parent burrow through and beneath the bark in which she lays her eggs; the young larvæ, when hatched, as in the case of *Hylesinus* and other genera, bore galleries at right angles to the parent burrow and form a "typograph"; at this stage, however, they do but little harm as the eggs are nearly always laid in felled or decaying trees; it is in the perfect state that they commit the greatest ravages, by boring into the young shoots as before stated. The best method for the prevention of the damage done by the beetle is to remove and burn all brushwood and old trunks in young plantations as the beetles propagate in these in multitudes; and all standing trees that are sickly should be observed, and, if found to be infected, should be felled and removed.

1. Second interstice of elytra flattened and without tubercles at apex . . . . . M. PINIPERDA, *L.*

II. Second interstice of elytra not depressed and with a row of small tubercles at apex . . . . . M. MINOR, *Hart.*

M. piniperda, L. (*testaceus,* F.). Black or pitchy black, or black with the elytra dull red, often entirely testaceous, shining; oblong, subcylindrical, clothed with rather scanty pilose pubescence; head somewhat strongly produced, distinctly punctured; antennæ ferruginous; thorax near base, about as broad as, or a little broader than long, much narrowed and somewhat compressed in front, rather finely punctured, the punctuation, however, being variable in different specimens, and being closer and stronger at sides than on disc; scutellum rather large, punctured; elytra separately and broadly rounded at base, with comparatively fine punctured striæ, interstices punctured, somewhat granulose at base and raised into asperate tubercles at apex, apex of second interstice depressed and without tubercles; legs black, tarsi red. L. $3\frac{1}{2}$–4 mm.

In decaying firs; somewhat local in England and Wales, but only too plentiful where it occurs; Scotland, abundant in the bark of fir logs, Solway, Tay, Dee and Moray districts and probably all the others; Ireland, Cranmore and Armagh and most likely general.

M. minor, Hart. Very like the preceding, but on the average a little smaller (although according to Thomson it is of the same size), with the striæ of the elytra finer and more finely punctured, and the interstices more closely punctured, the second not being depressed and being furnished with a series of small tubercles on its apical declivity; it is also distinguished by the fact that the posterior tibiæ are furnished with a small tooth situated in the middle and a second at some distance from the apex; in *M. piniperda* the first of these is situated behind middle; the elytra are usually brownish red. L. $3\frac{1}{2}$–$3\frac{3}{4}$ mm.

In the bark of fir logs; very rare; Dee district, Braemar; it probably occurs also in the other neighbouring districts, and may very probably be passed over as its near ally is so abundant that it is unnoticed by collectors.

CISSOPHAGUS, Chapuis.

This genus was formed for the reception of the small species formerly known as *Hylurgus hederæ* = *Hylurgus pilosus* (Wat. Cat., Chapman, &c., *nec Carphoborus pilosus,* Ratz.); from *Myelophilus* it may be known by having the anterior coxæ rather widely separated and the thorax evenly pubescent, and from *Carphoborus* by the six-jointed funiculus* of the antennæ and the distinctly bilobed third joint of its tarsi; it may further be distinguished by having the mentum rotundate-ovate at base; one species only is known, which attacks the ivy,

* Schmidt speaks of the funiculus as seven-jointed, but, as pointed out by Rye, he has evidently counted in the scape.

forming galleries under the bark; it is found in England, France, Italy and Algeria; the species has been found in some numbers by Dr. Chapman attacking stems of ivy, in which the parent beetles make a burrow, and the larvæ, as in the case of *Hylesinus fraxini*, eat galleries at right angles to this; neither healthy twining ivy, nor faggots cut from the tree, suit its taste, but when sickly or dying, it is at once attacked; in many parts of the country a custom prevails of destroying ivy by cutting through the stem; the plant, which partly derives its sustenance as a parasite from the tree to which it clings, is not immediately killed, but usually survives for a year or two; in this state it seems to be especially subject to the attacks of the beetles.

C. hederæ, Schmidt (*vicinus*, Com.). Cylindrical, brownish, with the antennæ, legs, anterior portion of the thorax, and the elytra, reddish or ferruginous; pubescence close, yellowish brown, which is, in consequence, the general colour of the insect; thorax at least as long as broad, with the sides subparallel behind and slightly narrowed in front, covered with recumbent hairs, very closely sculptured, with a slightly raised central line; elytra very slightly broader behind middle, with distinct and rather strongly punctured striæ (the punctures being quadrangular), interstices finely and closely granulate, thickly covered with hairs and furnished besides with a row of larger raised setose hairs, which are plainly visible in certain lights; the elytra are, apparently, nearly always lighter than the posterior portion of the thorax. L. 2–2½ mm.

In decaying ivy; extremely local and, as a rule, rare; Dartford and St. Mary Cray, Kent (Champion); Lyne near Rusper (Horsham, Sussex) (Gorham); Plymouth (J. J. Walker); Monmouthshire, very local (Chapman); Barmouth and Dunham Park, Manchester (Chappell); Scarborough (Lawson).

XYLECHINUS, Chapuis (*Carphoborus*, Brit. Cat., *nec* Eichhoff).

This genus appears to be represented by one European and two North American species; they may be known by their small size, widely separated intermediate and posterior coxæ, 5-jointed funiculus, and ovate-globose scarcely compressed club of the antennæ; the thorax is evenly pubescent; the eyes are very slightly emarginate in the middle of their inner margin; the tibiæ, especially the anterior ones, are armed with a long sharp apical spine, and the first segment of the abdomen is furnished with a transverse process between the posterior coxæ; the third joint of the tarsi is simply cordate and the mentum is cordiform.

X. pilosus, Ratz. Oblong, subcylindrical, dull, clothed with thick greyish pubescence, black, with the antennæ and legs ferruginous or testaceous; the thorax appears to be often lighter than the head and the elytra than the thorax; thorax as long as broad, slightly narrowed at

sides towards apex, evenly pubescent; scutellum small, subtransverse; elytra more than double as long as thorax, parallel-sided, with the suture thickly clothed with greyish-white pubescence, punctured striæ regular, interstices furnished with short erect whitish setæ; abdomen clothed with thick greyish pubescence, second segment about twice as long as third. L. $2\frac{1}{2}$–3 mm.

Under fir-bark; very rare; near Scarborough (R. Lawson); it does not appear to have been taken in any other British locality.

This insect superficially resembles *Hylastinus obscurus* and more closely *Polygraphus pubescens*, from both of which it may be separated by its generic characters; from *C. hederæ* it may be known, apart from its 5-jointed funiculus and not bilobed third tarsal joint, by being usually darker, and by its more elongate form, and by having the elytra less abruptly rounded behind, with the punctured striæ less clearly defined and the setæ on the interstices not so stout or long; the anterior tibiæ, moreover, are more triangularly dilated and have only two or three teeth at the apex, and the antennæ are stouter and shorter.

The species has been placed in our British catalogues under the genus *Carphoborus*, Eichhoff, but Eichhoff includes under the latter only the two species *C. minimus* and *C. pini*, and adopts the genus *Xylechinus* for *pilosus*; the characters of the two genera are as follows:

Antennæ with five-jointed funiculus and short oval non-compressed club. Anterior coxæ placed apart. Eyes with outline almost entire in front. Third tarsal joint simple . XYLECHINUS, *Chap.*

Antennæ with five-jointed funiculus and narrow compressed club. Eyes reniform, deeply hollowed in front. First tarsal joint very short, the third slightly cordiform. Thorax entire in front . . . . . CARPHOBORUS, *Eich.*

PHLŒOPHTHORUS, Müller.

Only four or five species have been described as belonging to this genus; two occur in Europe, one in North America and one in Madeira (the latter perhaps being synonymous with our species); the single British species is a very small pitchy-black insect with reddish tarsi; the club of the antennæ is rather loose and consists of three joints, the funiculus being 5-jointed; the prosternum is very short before the anterior coxæ; the abdomen is not raised towards apex; the episterna of the metasternum are elongate and rather narrow, and the intermediate and anterior coxæ are rather broadly distant; the third joint of the tarsi is bilobed and scarcely broader than the preceding.

The life history of *P. rhododactylus* has been most carefully worked out by Dr. Algernon Chapman and described by him in the Entomologist's Monthly Magazine, vi. (1869), p. 6; his remarks on the species are here quoted at length:—"In May, and earlier or later, according to the season, *Phlœophthorus rhododactylus* makes the galleries in which its eggs are deposited in the bark of furze (*Ulex Europæus*). That the

furze be dying, or recently dead, seems the only requisite to its attack. I have found it in furze killed by being cut, and in that which appeared to have died of old age ; and, though preferring branches about or under an inch in diameter, it is found in all—from the largest to the smallest. As branches of old and sickly plants die from year to year it attacks them, and probably accelerates the death of the plant. It is equally abundant in broom. The only apparently suitable materials in which I have not found it were a number of furze bushes smothered out of existence by the rapid growth of some fir trees, larch, and spruce.

"The gallery is formed directly upwards for nearly a quarter of an inch, and then divides into two branches, at first at right angles to each other, but, as they go upward, tending to become parallel. They are usually of unequal length, and one is sometimes absent. The largest I have seen was less than an inch in length, and half an inch would be a fair average. I always find in them a pair of beetles during their construction, and would note here the analogy with *Hylesinus*, where a two-branched burrow is also associated with the habit of both beetles being engaged in its construction. The entrance of the gallery is placed out of sight behind a loose scale of bark, or some slight projection. The ejected frass, which all appears to have been eaten, lies closely agglutinated together outside, but no operculum covers the opening. I have several times met with an inverted gallery—that is, one going downwards instead of upwards from its entrance. The eggs are laid along both sides of the branch burrows, twenty-five being a maximum for one side of one branch, and the total rarely exceeding forty. The time occupied in their construction I do not know ; in some kept under observation, about a dozen eggs had been laid in three weeks from the date of commencement of a burrow. The eggs are situated rather closely together, each in a little hollow scooped out of the bark ; and they, as well as the interspaces between them, are covered over with a layer of fine frass, which does not appear to have been eaten ; so that the sides of a completed burrow are formed of this frass, behind which are the eggs. The larvæ start in every direction from the parent gallery, but tend to travel vertically ; so that, when full grown, most of them do so. The greater part of the broods become perfect beetles in late autumn, and pass the winter at the ends of the larval burrows, slowly eating a gallery upwards or downwards, according to the direction the larval gallery has assumed. I have seen galleries so eaten for winter sustenance more than an inch long ; the majority, however, eat very little.

" What becomes of those beetles that escape in autumn I do not know ; their number is not great. Others, also few in number, remain as larvæ throughout the winter ; and I have found odd beetles, and even larvæ, under bark from which the broods had apparently gone during the previous year."

P. rhododactylus. Marsh. One of the smallest of the British

Scolytidæ; short and comparatively broad, convex, pitchy-black, dull, with rather scanty but distinct greyish pubescence, base of antennæ, and the tarsi, testaceous; head finely punctured; thorax subtransverse, with the sides gradually and not strongly narrowed in front, rather finely and not very closely punctured on disc, subgranulate at sides; elytra deeply crenate-striate, interstices raised, subcarinate, furnished with rather short, erect, rigid setæ, which are arranged in more or less distinct rows; in the male the forehead is excavated. L. $1\frac{1}{3}$–$1\frac{3}{4}$ mm.

In dead stems of furze, broom, &c.; local, but, as a rule, not uncommon where it occurs; Shirley, Reigate, Mickleham, Woking, Birch Wood, Wimbledon, Darenth, Coombe Wood, West Wickham, Dartford, Chatham, Sheerness, Rusper, Southend, Whitstable; Eastbourne; Southsea; Shirley Warren, Southampton; New Forest; Monmouthshire and Herefordshire, abundant; Bewdley Forest; Liverpool district; Scarborough; Northumberland and Durham district; Scotland, scarce, Tweed, Forth, Tay and Moray districts; it almost certainly occurs in Ireland.

POLYGRAPHUS, Erichson.

This very distinct genus is easily separated from all our other Hylesinina by the fact that each of its eyes are almost entirely divided into two parts, through an encroachment of the lateral piece from which the antennæ springs (not of the forehead, as stated by Redtenbacher); by the third joint of its tarsi not being wider than the preceding; by the club of the antennæ not being articulated; and by the five-jointed funiculus; the club, moreover, is very large, flattened, and ovate, and considerably longer than the funiculus. The anterior coxæ are very close to each other, and the intermediate pair are widely separated (Ent. Monthly Mag. viii. 82); two species are known, one occurring in Europe and the other in Canada and Alaska; the former of these has been found very rarely in Britain; it appears to live under bark of fir, especially spruce fir.

P. pubescens, Bach. (*polygraphus*, L.). Oblong, subcylindrical, slightly shining, black, brown, or yellow brown, clothed with squamose pubescence, antennæ and legs pale; thorax transverse, thickly and very finely punctured, somewhat compressed at apex, with a fine raised central line; elytra delicately and confusedly and very closely granulose-punctate, with indistinct traces of striæ, clothed with scanty scale-like pubescence and very short setæ; the species resembles *Hylastinus obscurus*, but the sculpture will easily separate it and also the fact that the tibiæ are in a much less degree and less abruptly dilated, and are only slightly denticulate-serrate on their outer edge. L. 2–3 mm.

In the male the forehead is clothed with thick pale villose pubescence, and in the female the forehead is more sparingly pubescent.

Under fir bark; very rare; near Scarborough (R. Lawson); the *Polygraphus pubescens* of Stephens (Manual, 206) appears to be *Pityophthorus micrographus*.

DRYOCÆTINA.

This tribe, which is co-extensive with the Ipina of Bedel and the Tomicina of Thomson, contains a considerable number of genera; as in the case of the preceding tribe, however, their final constitution cannot be as yet said to have been settled with any certainty. Seven genera have usually been regarded as British, but these have been further sub-divided in two or three instances: the new genus *Pityogenes* recently founded by Bedel for the reception of the three species *chalcographus*, *bidentatus* and *quadridens*, formerly referred to *Tomicus*, must certainly be adopted, and I have also, after some hesitation on my own part, been convinced by Mr. Blandford that Eichhoff's genus *Taphrorychus* must stand; I still, however, feel somewhat in doubt as to Löwendal's genus *Lymantor* (containing *L. sepicola* = *D. coryli*); the members of the tribe may easily be distinguished by the head being globose, or nearly so, and deeply sunk in the thorax, and by the presence of warty asperities in front of the thorax in all but a very few species; the eyes are transverse and sometimes divided; the antennæ have the scape long and stout, the funiculus short with the number of joints variable, and the club large and compressed, and varying in shape in the different genera; the elytra are in many cases excavated behind, with the edges of the excavation either simple or dentate; the femora are stout and the tarsi slender.

Certain of the species are extremely hurtful to forest trees, more especially pines and firs: Westwood (Classification I. p. 352) relates how "the great pine forests in Germany are, in certain seasons, very much damaged by *Tomicus typographus*, which is there called the 'Turc,' and the injury caused by which is known under the name of the 'wurmtrœkniss.' The evil is occasionally so great, that prayers are offered up in the churches against its extension. In 1783, the number of trees destroyed in the Hartz forest alone amounted to a million and a half.

I have preferred to adopt the name of Dryocœtina for the tribe as Bedel applies the name *Tomicus* to *Hylastes* which is a member of the Hylesinina, and the names *Bostrychus* (which has been applied to *Tomicus*) and *Ips* have been for so long applied to genera not connected with the group at all, that it seems likely to cause endless confusion to revive them in this connexion.

I. Funiculus of antennæ with three joints; size very small . . . . . HYPOTHENEMUS, *Westw.*

II. Funiculus of antennæ with four or five joints; size variable.

i. Eyes entirely divided; club of antennæ without sutures . . . . . TRYPODENDRON, *Steph.*

ii. Eyes entire or slightly emarginate.

1. Elytra clothed with scale-like pubescence and sometimes with fine raised hairs in addition, not excavate at apex; scutellum very small; club of antennæ with distinct sutures . . . CRYPHALUS, *Er.*

2. Elytra without scale-like pubescence, glabrous or with outstanding hairs; club of antennæ orbicular and compressed.
   - A. Base of thorax finely bordered; prosternum with a short process; size very small; club of antennæ divided by three constricting sutures into four joints . . . . . PITYOPHTHORUS, *Eich.*
   - B. Base of thorax not bordered.
     - a. Club of the antennæ with the second joint crescent-shaped and completely embracing the sides of the first joint which is oval; scutellum rudimentary; elytra with reflexed portion dentate in the male, not dentate in the female . . . . . XYLOCLEPTES, *Ferr.*
     - b. Club of antennæ with the second joint variable in shape but not embracing the sides of the first joint; scutellum distinct.
       - a*. Prosternum with a sharp and distinct angular process between the anterior coxæ.
         - a†. Elytra not excavate at apex which is applied to the abdomen.
           - a‡. Club of antennæ simple, orbicular, with curved sutures, concave towards apex; mentum oblong-quadrate, sub-mentum invisible . . . . . TAPHRORYCHUS, *Eich.*
           - b‡ Club of antennæ truncate at apex, the basal joint being corneous and the remaining oints lying within it; mentum broadly cordate, sub-mentum large and concave anteriorly DRYOCŒTES, *Eich.*
         - b†. Elytra excavate at apex which is horizontal or almost horizontal behind the apex of abdomen . . . . . TOMICUS, *Latr.*
       - b*. Prosternum without or with a very short process between the anterior coxæ.
         - a†. Tibiæ almost linear without furrows for the reception of the tarsi; apex of elytra with large teeth in the male, and with a strong impression on each side of suture in the female . . . . PITYOGENES, *Bedel.*
         - b†. Tibiæ dilated, furnished with furrows for the reception of the tarsi; apex of elytra without large teeth or deep impressions in the sexes . . . XYLEBORUS, *Eich.*

Before Mr. Blandford pointed out to me further distinguishing characters I had included both *Taphrorychus*, Eichhoff, and *Lymantor*, Löwendal, under *Dryocœtes;* I had, however, thinking that others might not be of the same opinion as myself, appended the extracts given below from Bedel (Faune, Col. du Bassin de la Seine, p. 396) and from Löwendal's table in the Entomologiske Meddelser-Andet. Bild. Forste Hefte. p. 8. The following is a portion of the table given by M. Bedel :—

I. Prothorax plus ou moins gibbeux, nettement verruqueux en avant, ponctué en arrière.
  i. Hanches antérieures isolées de la tete, en avant, par une bande prosternale assez large. Sommet des élytres excavé et dentelé en dessus, fermé horizontalement derrière l'abdomen en dessous . . . . . IPS = TOMICUS.
  ii. Hanches antérieures atteignant à peu prés le bord antérieur du sternum. Sommet des élytres simplement rétus en dessus, appliqué contre l'abdomen en dessous . . . . . TAPHRORYCHUS.
II. Prothorax non gibbeux, couvert de grains écrasés ou chagriné. Élytres obtuses à la déclivité postérieure . . . . . DRYOCÆTES.

For the following extract from Löwendal's work and for its translation I am indebted to the kindness of Mr. W. F. H. Blandford:—

I. Funiculus of antennæ 5-jointed; club jointed on both sides, longer than funiculus . . . . . TAPHRORYCHUS.
II. Funiculus of antennæ 5-jointed; basal joint of club chitinised on nearly its whole posterior surface, covering closely the remaining softer joints.

This section contains *Xylocleptes*, *Tomicus* and *Dryocætes*, the latter being characterized as follows:—Club of antennæ chitinised on anterior side at base, softer towards apex, with indistinct cross-sutures. Body cylindrical. Thorax nearly uniformly granulated or rugose. Elytra behind without depression or spines.

III. Funiculus of antennæ 4–5-jointed; the last (5th) joint more or less rudimentary, generally closely united with the club, which is unjointed on both sides. Body long, cylindrical. Thorax anteriorly granulated, posteriorly punctured. Elytra behind without depression or spines . . . . . LYMANTOR.

In the detailed description it is further stated that the thorax has no elevated border at base; the prosternum has a prolongation between the anterior coxæ; the tibiæ are broad towards apex, obliquely truncate, toothed on outer side, ending on the inner side in a thorn-like prolongation; and the anterior tarsi fold up into a groove in the tibiæ; it will be seen that with the exception of the rudimentary fifth joint of the funiculus and the absence of sutures in the club (a character often indistinct in *Dryocætes*) and the fact that the thorax is apparently more granulated anteriorily, which is certainly not an important point, the genus agrees entirely with *Dryocætes* and can hardly be reasonably separated from it on the characters given by Löwendal.

HYPOTHENEMUS, Westwood (*Stephanoderes,* Eichhoff).

This genus was formed by Professor Westwood for the reception of a very small insect which he found in some numbers in the binding of an old book; the locality is therefore uncertain and the species is perhaps identical with the *Bostrichus ruficollis* of Fabricius (Syst. El. ii. p. 388) which is described as from South America; it has also been identified with *Stephanoderes arecæ*, Horn. by Eichhoff, and with *St.* (*Cryphalus*) *aspericollis*, Woll.* by Sharp; the genus may be known, apart from the

* The former of these species has occurred in Columbia and New Guinea; I do not know the locality of the latter insect.

minute size, by the three-jointed funiculus of the antennæ, which has the first joint very large and the second and third transverse and equal; the club is very large, compressed and oval, showing traces of sutures; the mentum is elongate and parallel-sided, and the apical declivity of the elytra is rounded.

H. eruditus, Westw. Very small, cylindrical, covered with fine white short erect hairs, black or pitchy-black, with the thorax reddish-yellow or brownish-yellow; thorax about as long as broad, convex and plainly tuberculate in front, with the sides rounded and gradually narrowed at apex, subparallel behind; elytra more than twice as long as thorax, with punctured striæ, interstices finely rugose set with rows of very distinct white setæ; antennæ and legs clear yellow or reddish-yellow. L. $\frac{3}{4}$–$\frac{4}{5}$ mm.

In the cover of an old book; found in some numbers by Professor Westwood; probably an introduced species.

CRYPHALUS, Erichson.

The members of this genus are very small and obscure dark-coloured insects and much resemble at first sight small species of *Cis;* they have been divided by Thomson and others into several separate genera; in its wide sense the genus contains about two dozen species which are very widely distributed, representatives occurring in Europe, North and South America, Cuba, Guadeloupe, Madagascar, Australia, &c.; the following are their chief characters:—Eyes entire or slightly emarginate; antennæ with sutures of the club distinctly marked, the club itself being somewhat variable in shape; thorax tuberculate in front, margined at base; scutellum small, punctiform; elytra not strongly reflexed and not excavate at apex, clothed with scale-like pubescence and sometimes in addition with fine raised hairs; about twelve species are found in Europe and six have been recorded as British; they attack various trees (willow, lime, beech, fir, &c.) and are usually considered as very rare; they appear, however, to have been found on several occasions in great abundance where they have occurred, and must probably be regarded as very local and as often passed over owing to their obscure appearance and habits; their life history has been described by Nördlinger (Nachtr. z. Ratz. Först. p. 29), and by Dr. Algernon Chapman (Ent. Monthly Mag. v. 1868, pp. 198-9); Eichhoff has also described the life history of *C. piceæ* and *C. abietis* and figured their workings (Die Europaischen Borken Käfer, pp. 172 et seqq.); as very little is generally known of the habits of these beetles, and as an account of them may perhaps lead to further discoveries of their habitats, I have thought it advisable to quote Dr. Chapman's remarks at length. "On some aspens growing near Abergavenny I have detected certain beetles, which are interesting not only on account of their rarity, but also on account of their habits. Last spring (1868) I observed that

two of these trees, which are from twenty to thirty years old, had been blown over in a manner similar to that in which poplars often suffer, viz., they had been snapped across at about the level of their lower branches; one of them had fallen last winter, the other during the previous one. On both I found evidence of their having begun to decay before they yielded to the storm, but the more recent one was still so far alive as to be attempting to throw out leaves, yet many of its branches had long been dead and one side of the stem was so also; this I soon found to be caused by a small beetle belonging to the family *Hylesinidæ*. This beetle, *Cryphalus binodulus*, Ratz., appears not to have been taken in England since its original capture by Mr. E. W. Janson at Highgate; and I may observe that very few of my specimens present the (sexual) spines at the apex of the elytra; and that, when present, the spines are very small. This species, unlike *Hylesinus crenatus*, which commences its attack close to the ground, first attacks the branches and then advances downwards. A colony is probably commenced by one, or only a few pairs; but they rapidly multiply. There are about a dozen of the young aspen trees (*Populus tremula*) on which I find them, and of these, besides the two already mentioned, they have this season killed a third tree. The leaves which it threw out abundantly last spring are now all black and dead, and I suspect that this is entirely the work of the present season. A fourth tree is far gone and several others are invaded. Like most of the *Xylophaga* it only attacks the bark. In the genus *Hylesinus*, and others of the family, the parent beetles make a long straight burrow, and the eggs are deposited more or less regularly along either side. Unlike these, *Cryphalus binodulus* makes what may be called a little irregular cavern rather than a burrow. This is always immediately beneath the outer bark, and does not penetrate to the wood. I find invariably a pair of beetles in each cavern, even when nearly all the eggs are deposited, or when the eggs are hatched; these are laid in little confused heaps in the recesses of the cavern, sometimes all in one heap, generally in three or four, and to the number of from thirty to sixty. The larvæ when hatched burrow without any regularity, but tend to travel in a vertical direction. They are footless grubs, with strong jaws, and a distinct head like the larvæ of the other *Xylophaga*. I found that the eggs laid in May had in August produced some perfect beetles, though many still remained in the larval and pupal states. This has also been the case this season with *Hylesinidæ* I have been watching, and I suspect that this species, like the others, does not usually come to maturity until a month or two later, and then hybernates before emerging. This species appears only to attack the living trees, and though so minute, is from its numbers able to cause the destruction of any tree it colonises. A branch is usually first attacked by several pairs, whose progeny then, laying their eggs in it, complete its destruction. Wherever a brood has been reared a wide rough crack is observable in the bark, and a

destroyed branch presents the same appearance in an exaggerated form; the whole bark looks bloated and cracked, and is pierced by the exit holes of the beetles. A branch is often attacked in sufficient force to destroy it in one season, and I have already mentioned my belief that the destruction of a whole tree has been accomplished during the present season. The trunk is rarely attacked till most of the branches are dead, and its vitality is then so much reduced that no distortion occurs from their ravages, except of course that it becomes quite decayed."

In the ivy growing on these fallen aspen trees Dr. Chapman found *Cissophagus hederæ* in numbers; the occurrence of these two usually very rare beetles in abundance and in such close proximity is curious, as showing us that probably very few beetles are really rare if only we can get to understand something of their habits.

The British species belonging to the genus may be divided as follows: one or two of them are, however, rather difficult to distinguish from descriptions:—

I. Funiculus of antennæ five-jointed; club rather elongate oval, acuminate at apex; thorax and elytra somewhat shiny; scutellum distinct (*Trypophlœus*, Fairm.; *Glyptoderes*, Eich.).
  i. Punctured striæ of elytra not distinct near suture; size smaller; legs pitchy . . . . . C. BINODULUS, *Ratz.*
  ii. Punctured striæ of elytra distinct near suture; size larger; legs in part yellow . . . . . C. GRANULATUS, *Ratz.*

II. Funiculus of antennæ four-jointed; club rather short oval, rounded at apex; scutellum very punctiform (*Cryphalus*, i. sp.).
  i. Club of antennæ with the sutures transverse, almost straight; body behind thorax only twice as long as broad.
    1. Eyes entire; thorax with four transverse rows of granules in front . . . . . C. TILIÆ, *Panz.*
    2. Eyes emarginate on their anterior border; thorax confusedly granulate.
      A. Elytra with very short, scarcely visible, hairs; rows of punctures on elytra not very fine and placed in somewhat impressed striæ . . . . . C. ABIETIS, *Ratz.*
      B. Elytra with long raised hairs; rows of punctures on elytra very fine . . . . . C. PICEÆ, *Ratz.*
  ii. Club of antennæ with the sutures strongly curved; body behind thorax three times as long as broad; elytra without striæ . . . . . C. FAGI, *Nord.*

C. binodulus, Ratz. (*asperatus*, var. Gyll., s g. *Trypophlœus*, Fairm.). Subcylindrical, black or fuscous black, rather shiny, scantily clothed with greyish scale-like hairs and other short hairs; antennæ and legs pitchy testaceous, club of former often darker than funiculus; thorax subtransverse, with the sides slightly rounded, anterior margin with four prominences in the middle and with concentric rows of granules, united in places almost into sharp lines; elytra with feeble

punctured striæ, which are effaced towards suture and moderately distinct towards sides. L. $1\frac{1}{2}$–$1\frac{3}{4}$ mm.

In dead branches of aspen (*Populus tremula*) and willow; rare, or rather extremely local; first taken in Britain by Mr. E. W. Janson at Highgate; Forest Hill (Champion); Monmouthshire, very local (Chapman); Wallasey, Cheshire, one specimen (Ellis); Drinkwater Park, Manchester (Reston); Scarborough.

C. granulatus, Ratz. Very closely allied to the preceding, but considerably larger, with the funiculus of the antennæ and the legs partially yellow, and the striæ of the elytra distinctly punctured near suture as well as at sides, the first two rows appearing impressed on their apical declivity. L. 2 mm.

A single specimen was taken by Dr. Power in June, 1867, near Surbiton, Surrey, and was confirmed as this species by Herr Eichhoff.

C. tiliæ, Panz. (*Ratzeburgi*, Ferr.). A small species which, however, is variable in size; subcylindrical, fuscous, fuscous brown or yellow-brown, dull, clothed with fine pale pubescence; antennæ and legs testaceous or pitchy testaceous; thorax with the sides rounded, with concentric rows of small prominences on their anterior portion; elytra with fine punctured striæ, which are distinct both near suture and at sides, often lighter than thorax, and usually lighter at apex; mature specimens are brownish-black, with rows of strong greyish pubescence on the elytra; the species is readily distinguished from all others found in Britain by the structure of its thorax, the tufted processes surmounting which are limited to the upper and anterior part and do not extend to the lateral margins, and are moreover symmetrically arranged in four distinct rows placed in transverse curves, with clear intervals between them; on the median line the absence of tufts produces the appearance of a smooth space connecting the outer spaces. L. 1–$1\frac{1}{2}$ mm.

On *Tilia parvifolia;* extremely local; Bridgenorth (Turner); Forest of Dean, Christmas, 1860 (Turner); neighbourhood of Lincoln in the bark of a tree called "bass" by the country people, in numbers (Turner); the locality is mentioned as "Fisherwick," near Lincoln, but I know of no such place; it may perhaps be "Fiskerton"; the "bass" is abundant in Langworth Wood, and I have found *Epuræa parvula*, &c., in its faggots but have not come across this species.

As remarked by Rye (Ent. Annual, 1866, p. 113), this species is placed by Redtenbacher in a section of the genus wherein the anterior margin of the thorax is armed with teeth; and, under a moderately high power, these teeth can be distinctly seen, assuming the form of four small, closely-packed, longitudinal ridges, exactly in the middle of the anterior margin.

C. abietis, Ratz. (s.g. *Tænioglyptes*, Bedel). Oblong, subcylindrical, compressed and very convex; fuscous or fuscous-brown, dull, antennæ and legs reddish-brown, club of the former usually darker, rounded at apex; thorax subglobular, very finely punctured at sides and behind,

front part confusedly granulate ; elytra rather more than double as long as thorax, with distinct punctured striæ, and extremely finely punctured interstices, covered throughout with extremely short scale-like hairs, and also very diffusely with short erect hairs, which are wanting behind ; the colour of the antennæ and legs is somewhat variable ; the species may easily be recognized by the tubercles on the anterior portion of the thorax being few in number and irregular in their distribution, and by the regular and comparatively strong rows of punctures and very short pubescence of the elytra. L. 1–2⅔ mm.

In dead shoots of the Scotch fir; rare; West Wickham Wood (Champion); Cowfold (Power); Shipley, near Horsham, Sussex (Gorham); Monmouthshire (Chapman); Gumley, Leicestershire (where it was first taken in Britain by the Rev. A. Matthews); Bungay, Suffolk (W. Garneys); Bretby Wood, near Repton, Burton-on-Trent (W. Garneys).

C. piceæ, Ratz. (s.g. *Tænioglyptes,* Bedel). Very closely allied to the preceding from which it may be known by having the club of the antennæ acuminate at apex, and the thorax furnished with five or six crowded rows of granules forming a tolerably broad diamond-shaped figure ; the elytra, moreover, are furnished with long raised hairs and the striæ are very finely punctured. L. 1⅓ mm.

Under bark of firs; very rare; two specimens have been taken by the Rev. A. Matthews, near Weston-on-the-Green, Oxon; Claygate, Esher, one specimen (Power).

C. fagi, Nord. (*Thomsoni,* Ferr., s.g., *Ernoporus,* Thoms.). Elongate, cylindrical, rather thickly clothed with pale ashy subsquamose pubescence, black or fuscous black, dull or very slightly shiny, antennæ and legs red or reddish-testaceous, club of former rather darker ; thorax longer than broad, scabrous and more or less plainly tuberculate in front, the tuberculate portion scarcely reaching middle ; elytra three times as long as broad, very closely and finely punctured, without striæ, or with traces visible at the sides only; tibiæ narrow; the elongate form and the sculpture of the thorax and elytra will easily distinguish the species. L. 1¼–1¾ mm.

In decaying beeches; rare; Hampstead (Janson); Tonbridge (Horner); Westerham, Kent (Gorham); New Forest.

PITYOPHTHORUS, Eichhoff.

About thirty species are contained in this genus, which are all very small insects, and live exclusively on Coniferæ; the majority are found in North and South America; five or six occur in Europe of which one only, *P. micrographus,* has hitherto been supposed to inhabit Britain ; it seems, however, to be now proved that this species has not, as yet, occurred at all in our country (although it most probably will be found to be indigenous), and that our specimens must be referred to two

species, *P. Lichtensteinii* and *P. pubescens*; it is possible that those now considered to belong to the former of these species may be proved eventually to be distinct, in which case they must stand under the name *P. Scoticus*, Sharp *in. litt.*; the genus is here taken as including only the species of *Pityophthorus* proper and not *Tomicus chalcographus*, *bidentatus* and *quadridens*, which were associated with it by Ferrari, but are now included under the new genus *Pityogenes*, Bedel; the following description and notes are chiefly taken from Mr. Blandford's account of the genus in the Entomologist's Monthly Magazine, Vol. II. (Second Series), p. 15; the genus, as defined by Eichhoff, presents the following characters:—antennæ with a five-jointed funiculus and an oval non-compressed club, which is constricted by transverse sutures dividing it into four distinct joints; thorax as long as or longer than broad, bordered at base, and distinctly narrowed in front; elytra cylindrical with simple rows of punctures, and with impunctate interstices; the apex is obliquely truncate, and presents a depression on either side of the suture; it is not armed with spines or teeth, but the raised sides of the apical depression and the sutural margins sometimes possess a row of small setigerous tubercles.

All our specimens of so-called *P. micrographus* must really be referred to *P. ramulorum*, Perris, which latter insect is synonymous with the *Tomicus pubescens* of Marsham; the latter name must therefore stand.

The three species (including *P. micrographus* for convenience sake, and also because it may be mixed with *P. pubescens* in our collections), may be distinguished as follows:—

I. Apex of elytra bluntly rounded, not acuminate.
  i. Apical depressions of elytra wide and deep, their surface glabrous and shining; size larger . . P. LICHTENSTEINII, *Ratz.*
  ii. Apical depressions of elytra narrow and inconspicuous, their surface wrinkled; size smaller . . . . . P. PUBESCENS, *Marsh.*
II. Elytra acuminate at apex . . . . . (P. MICROGRAPHUS, *Gyll.*)

P. Lichtensteinii, Ratz. (? n. sp. *Scoticus*, Sharp *in. litt.*). Similar in size and appearance to a small female of *Tomicus bidentatus*; cylindrical, convex, shining, pitchy brown or black with disc of thorax and elytra lighter, with very scanty fine pubescence on front and sides of thorax and sides of elytra. Forehead with strong wrinkled punctures, in the male with a fringe of yellow hairs above the mouth, in the female with a dense brush of yellow hair, forming a circular patch in the middle of the forehead. Thorax convex, scarcely longer than broad, strongly narrowed in front, sides straight to middle, thence sinuate to apex which is strongly rounded, posterior angles distinct, but rounded, disc impressed on either side behind middle, covered in front with strong transverse asperations, the posterior half very shining, with somewhat diffuse punctures, deep in male, finer in female, with a broad smooth central line; scutel-

lum small, depressed, shining; elytra as wide as thorax and less than twice as long, with humeral angles rounded, sides straight to near apex which is bluntly rounded, moderately shining, with rows of rather deep punctures, interstices impunctate, the inner ones subrugose transversely, especially round scutellum; sutural stria impressed throughout its length; apical impressions wide and deep, with their central portion glabrous and shining, and their lateral margins abruptly raised and bearing five or six setigerous tubercles, as also do the sutural margins which are slightly raised at the apical declivity; underside thinly pubescent; femora and tibiæ pitchy brown, tarsi and antennæ testaceous. L. 2–2$\frac{1}{5}$ mm.

Under bark of Scotch firs, &c.; rare, Scotland, Dee and Moray districts, Braemar, &c.

The points in which this species appears to differ from the continental *P. Lichtensteinii* are its greater size, the more abundant and yellower frontal pubescence, the greater narrowing of the thorax in front, and its more sparse and less rugose punctuation behind; these hardly seem, however, to be sufficient to justify its separation as a distinct species.

P. pubescens, Marsh. (*ramulorum*, Perris; *micrographus*, Brit. Cat. *nec* Gyll.). Somewhat elongate, pitchy or pitchy-ferruginous, shining, with thin grey pubescence, antennæ and legs testaceous or reddish, femora and tibiæ sometimes with a fuscous tinge; head in female with a conspicuous brush of greyish-yellow hair; thorax as long as, or slightly longer than, broad, narrowed towards apex, which is rounded, scabrous and dull in front, finely and sparingly punctured and shining behind, with a smooth central line, the punctures being large and deep, base distinctly bordered; scutellum distinct; elytra cylindrical, with conspicuous rows of strong punctures, interstices with slight transverse wrinkles, sutural stria not impressed, suture slightly raised at apex with a narrow, somewhat rounded, depression on either side, the lateral walls of which are only slightly raised and are punctured by the continuation of the striæ of the elytra and are not furnished with conspicuous setigerous tubercles. L. 1$\frac{1}{3}$–1$\frac{1}{2}$ mm.

Several authors assign the villose forehead to the male, but it appears to be characteristic of the female.

In dead branches of Scotch fir; local, but common where it occurs; London district, Kent and Surrey, not uncommon; Kew, Shirley, Esher, Forest Hill, Woking, West Wickham, Faversham, Birch Wood, Wimbledon, Farnham, Kingsgate, &c.; Hertford; Shipley, near Horsham; Hastings district; Bournemouth; New Forest; Glanvilles Wootton; Monmouthshire, rare; Malvern, Old Hills, bred by myself in early summer in great abundance from small twigs collected from the ground under fir trees in January; Leominster; Repton; Burton-on-Trent; Ireland, Bray, Co. Wicklow; the Scotch records appear to apply to the preceding species.

(*P. micrographus*, Gyll. Elongate, cylindrical, reddish or pitchy

brown, moderately shining, antennæ and legs reddish brown; thorax longer than broad, hardly narrowed in front, apex bluntly rounded, anterior exasperations concentrically disposed, punctuation of hinder part fine and scattered; elytra produced at apex—not obtusely rounded—with fine punctuation; the apical depressions are distinct, deep and rather dull, with their outer margins raised, convex and shining, without punctures, but with distinct setigerous tubercles, which are also present on the raised sutural margins. L. $1\frac{1}{3}$–$1\frac{1}{2}$ mm.

As before remarked, no authentic British specimens of this species are known, as all that have hitherto been examined must be referred to one of the two preceding; it is, however, very probable that it exists in our collections; it is especially attached to the spruce-fir.

The longer shape, brighter colour, and finer punctuation, as well as the acuminate elytra will distinguish this insect from either of the other species).

The members of the genus can be taken in localities where they occur, by examining the smaller terminal shoots and branches of Conifer brushwood; most of the species breed in these and do not touch the bark of large branches; *P. micrographus*, however, appears to be an exception to this rule.

XYLOCLEPTES, Ferrari.

This genus contains three species, one of which is found in Europe, and the others have been described from Venezuela and Bogota; *X. bispinus*, the single European species, is exclusively attached to species of *Clematis;* it may be known by having the second joint of the club of the antennæ crescent-shaped and completely embracing the sides of the first; the funiculus is five-jointed; the scutellum is indistinct, and the apical portion of the elytra is strongly inflexed in the male and feebly inflexed in the female.

X. bispinus, Duft. Cylindrical, chestnut brown, shining, clothed with rather scanty long upright greyish hairs, which are very distinctly visible if the insect is viewed sideways; thorax longer than broad, scabrous in front, with the angles rounded; scutellum scarcely distinct; elytra with moderately fine and rather close punctured striæ. L. 2–$3\frac{1}{2}$ mm.

Male with the thorax shining and diffusely punctured behind; apex of elytra much inflexed, raised at suture and armed with a large sharp tooth.

Female with the thorax dull and shagreened behind, except on the central line; apex of elytra feebly inflexed with the suture and raised edges projecting and finely tuberculate.

In dead stems of *Clematis Vitalba;* local; London district, common, Mickleham, Darenth, Cobham, Reigate, Caterham, Bearstead, Chatham, Gravesend; Henley; St. Peter's, Kent; Eastbourne; Portsmouth district; Isle of Wight; Glanvilles

Wootton; Bath, in profusion by beating clematis; Monmouthshire and Herefordshire; Malvern; Sutton, near Birmingham; Robin's Wood, Repton, near Burton-on-Trent. I know of no localities further north.

DRYOCŒTES, Eichhoff.

This genus contains about a dozen or thirteen species which are widely distributed; six or seven of these occur in Europe and the remainder inhabit North and South America from Alaska to Brazil; one or two have been described from India; Eichhoff has separated off *D. bicolor*, Herbst., and *D. villifrons*, Duft., as a distinct genus *Taphrorychus*; the species, with the exception of *D. villosus*, are extremely scarce; the chief character that has been used in distinguishing the species lies in the sculpture of the hinder part of the thorax, but as a matter of fact it is often very difficult to make out whether it is closely punctured or granulate, and this is proved by authors often using directly opposite terms in speaking of the same species; thus in two descriptions before me, one author says of the common *D. villosus*, "thorax punctured throughout," while the other partly distinguishes it from *D. autographus* by the fact that the thorax is shagreened towards the base, whereas in the last-named species it is punctured.

The genus may be distinguished by having the prosternum furnished with a sharp and distinct angular process between the anterior coxæ and the elytra not excavate at apex which is applied to the abdomen; the scutellum is distinct and the base of the thorax is not bordered; the club of the antennæ has the sutures straight and the funiculus is five-jointed; the tibiæ are more or less dilated; the thorax is usually scabrous in front but not strongly so, and the elytra are furnished with rows of punctures which are sometimes very regular and placed in impressed striæ and sometimes more or less irregular with the striæ scarcely marked.

I. Upper surface with long villose pubescence; form broader; length $2\frac{3}{4}$–4 mm.	
i. Sutural striæ of elytræ not deeply impressed; suture not raised; size larger	D. AUTOGRAPHUS, *Ratz.*
ii. Sutural striæ of elytra deeply impressed and sulciform behind; suture raised; size smaller . . .	D. VILLOSUS, F.
II. Upper surface with comparatively short and much less distinct pubescence; form narrower; length $1\frac{1}{2}$–$2\frac{1}{2}$ mm.	
i. Thorax granulate in front, granulately sculptured and dull behind; elytra with distinct striæ, and the interstices more finely punctured than the striæ .	D. ALNI, *Georg.* (*Marshami*, Rye).
ii. Thorax granulate in front, rather diffusely and very distinctly punctured behind; elytra uniformly punctured without distinct striæ	D. CORYLI, *Perris.*

The last mentioned species appears to be very probably synonymous with the *Lymantor sepicola* of Löwendal; the genus *Lymantor* has been

discussed above (pp. 426, 427), and may perhaps have to be adopted; the differences, however, appear to be very slight as given by Löwendal in the second part of his paper; after giving a description he writes as follows:—"Cum hac specie quæ ad similitudinem *Dryocœtæ coryli* (mihi ignoti) proxime accedere videtur, characteres generis *Dryocœtæ*, qui a scriptoribus afferuntur, mimime congruunt; differt enim nova hæc species et clava plane integra et quinto articulo funiculi variante, sæpe evanido, et diversa prothoracis sculptura.

"Quare non potui quin novum genus constituerem.

"Quodsi postea apparuerit, hoc genus a genere Dryocœtarum distingui non posse, necesse erit characteres generis Dryocœtæ aliter definire.

"Ne descriptiones quidem speciei, quæ appellatur *coryli*, quas Perris et Eichhoff confecerunt, inter se plane concinunt, et haud scio an illi diversas species ante oculos habuerint."

It is therefore quite obvious, as Mr. Blandford remarks in a note to me in which he kindly furnished me with the above quotation, that Löwendal is not sure that his species is distinct from *D. coryli*, and it is therefore hardly safe at present to say that his genus *Lymantor* contains two distinct species.

D. autographus, Ratz. (*septentrionis*, Mannh.). Oblong, cylindrical, shining, clothed with long pale villose pubescence, of a uniform reddish brown colour, antennæ and legs reddish-testaceous or clear red; thorax longer than broad, with the sides very slightly rounded and gently and slightly narrowed in front, closely and rather strongly punctured, the sculpture being close and slightly rough on the anterior margin which is dull; occasionally there are feeble traces of a central line; scutellum distinct; elytra parallel-sided, with strong punctured striæ, interstices distinctly punctured in rows, apex entire, sutural striæ not impressed or sulcate; legs rather stout. L. $3\frac{1}{2}$–4 mm.

Under bark of stumps and dead trunks of firs; taken in some numbers by Mr. Lawson near Scarborough, who first found it in the beginning of April, 1869, in some young larch trees in a fir plantation about a mile and a half from that town; from the appearance of the trees it must have been very abundant in the previous year.

D. villosus, F. Smaller than the preceding, and clothed with longer and stouter hairs; oblong, rather shining, covered with very long pale villose pubescence, which will easily distinguish the species; of a uniform reddish-brown colour, antennæ and legs red or reddish-testaceous; thorax longer than broad, very closely shagreened or granulately punctured (Thomson calls the sculpture "imbricate-punctuate"), the anterior portion being rougher and duller than the posterior, sides rounded and gradually narrowed in front; scutellum distinct; elytra with rather deep and strongly punctured striæ, interstices narrow with rows of somewhat strong punctures, apex somewhat inflexed, sutural striæ sulcate behind

and suture raised; tibiæ less dilated than in the preceding species. L. $2\frac{1}{2}$–$3\frac{1}{2}$ mm.

In decaying oaks; also sometimes in chestnuts and holly; common and generally distributed from the Midland districts southwards; abundant in Sherwood Forest; Manchester and Liverpool districts; apparently less common further north and scarce in the extreme northern counties of England; Northumberland and Durham district; "Gibside, in oak bark, August" (Bold); not recorded from Scotland; it probably occurs in Ireland.

D. alni, Georg. (*Marshami*, Rye; *Bulmerincqui*, Kol., *teste* Sharp; ? *fuscus*, Marsham (Rye)). Oblong, almost cylindrical, pitchy black, with the elytra lighter, antennæ and legs ferruginous; upper surface clothed with fine and scanty pale hairs, which are more conspicuous and arranged in rows behind; thorax, except on a smooth central line at base, dull, with transverse granulations which are distinct at apex and become feebler towards base, which is granulately sculptured and not punctured; elytra rather shining, parallel-sided, with distinct and rather strongly and closely punctured striæ, interstices with much less close rows of punctures, rather abruptly rounded and scarcely visibly reflexed, and without tubercles, at apex; the species, which is about equal to *P. bidentatus* in its average size, is, compared with *T. bicolor*, less hairy, narrower, with the thorax behind not so shining and granulate instead of punctured (the latter character, however, being somewhat hard to distinguish), and with the elytra not nearly so evidently flattened behind at apex. L. $2\frac{1}{2}$–$3\frac{1}{4}$ mm.

Under bark of decayed beech trees; rare; first taken by Mr. Morley in beech trees lying on the ground in a wood near Prestwich, Manchester, in February, 1866; Weybridge, Surrey, and Yardley, near Birmingham (Blatch); Drinkwater Park, Manchester (Reston); Agecroft, near Manchester, and Wilmslow, Cheshire (Chappell).

D. coryli, Perris (*Lymantor sepicola?* Löwendal). Elongate, narrow, cylindrical, shining, pitchy-black, pitchy-brown or brownish red, with the thorax often lighter in front, antennæ and legs reddish yellow; upper surface with rather scanty pubescence; thorax considerably longer than broad, closely granulate and dull in front, rather diffusely and distinctly punctured behind with an impunctate central line, sides straight or almost straight; elytra obliquely reflexed at apex, somewhat impressed near suture behind, without distinct striæ but with rows of moderately strong punctures which are often more or less irregular. L. $1\frac{2}{3}$–2 mm.

In dead branches and twigs of hazel and hornbeam; rare; Darenth (Kent), and Ashtead (Surrey) (Champion); Darenth (Sharp and Rye); Darenth, Birch Wood and Weybridge (Power); Kidderminster (Blatch).

TAPHRORYCHUS, Eichhoff.

This genus may be distinguished from *Dryocœtes* by the simple orbicular club of the antennæ, which has curved transverse sutures on

both sides and is not hairy at apex; the funiculus is much shorter than the club; the mentum is oblong quadrate and the submentum is not visible; the tibiæ are straight and sublinear with the apex obliquely truncate; in *Dryocætes* the club of the antennæ is truncate, being truncate at apex with the basal joint corneous and the remaining joints lying within it; the flat surface at apex is set with bristles; the funiculus is as long as the club; the mentum is broadly cordate and the submentum is large and concave anteriorly; the tibiæ are spathulate with the apex rounded. The genus contains the species *T. bicolor* and *T. villifrons*; *T. Bulmerincqui* may be identical with *T. bicolor*, but is probably distinct; it has been represented as synonymous with both the last-mentioned species.

T. bicolor, Herbst. (*fuscus,* Marsh.? *Bulmerincqui,* Kol.?), Elongate, cylindrical, pitch black or brown, with rather scanty and moderately long whitish grey hairs; antennæ and legs pale yellow brown; thorax longer than broad, with the anterior half rather strongly granulate, especially in front, hinder portion very closely punctured, sides slightly rounded from base to apex; elytra with distinct and rather strongly punctured striæ, smooth and without tubercular asperities at apex, which in the male is reflexed and raised at the suture. L. 2–2½ mm.

In decaying oaks; very rare; Down, near Beckenham, Kent (Crotch); Darenth Wood (Champion); the *Tomicus fuscus* of Marsham (with which this insect has been, by some authors, identified), is recorded by Stephens as from the London district, Devonshire, Cornwall and Swansea, but Stephens' insect does not appear to be really the same as Marsham's, and cannot be referred to the present species. Mr. Waterhouse seems to be of opinion that the *T. fuscus* of Marsham may be *Xylocleptes bispinus*, and a part, at all events, of Stephens' *T. fuscus* are nothing but *Pityogenes bidentatus* (*Tomicus bidens*).

TOMICUS, Latreille (*Ips,* De Geer; *Bostrychus,* Herbst.).

This genus, regarded as including *Pityogenes,* which has only recently been separated off by Bedel, contains about sixty species which are widely distributed in Europe, Asia, North, Central and South America, the Australian region, &c.; they may be easily distinguished from *Dryocætes* by having the elytra excavate at apex and from *Pityogenes* by the fact that the prosternum is furnished with a sharp and distinct angular process between the anterior coxæ; the species appear to attack exclusively pines and other Coniferæ and sometimes do considerable damage on the continent; the ravages of *T. typographus* have been before alluded to (p. 425); the larvæ of *Tomicus* are formed as in *Scolytus* and *Hylesinus,* but the pupæ of the first-mentioned genus are terminated by two spines, whereas in the two latter the apex is simple; the parent beetles lay their eggs in a central gallery and the larvæ eat galleries at right angles to this, forming strongly marked patterns which have earned for them the name of "typographers."

Many species of *Tomicus* are polygamous, and by these instead of the

usual "typograph" in the bark, there is formed a stellate system radiating from a breeding-chamber (Rammel-kammer).

The most efficacious way of proceeding against the ravages of *Tomicus typographus* is by the establishment of "fangbaümen;" that is, by ringing the trunks of a number of trees selected at intervals in the forest, shortly before the flight-time of the insects; these trees will be selected as breeding-places and may then be cut down, and the bark with the contained broods destroyed. There may be as many as three generations of *Tomicus typographus* in the year, with favourable weather; it is therefore imperative to see that the trees thus prepared are punctually destroyed before the insects have time to develop.

Of the fourteen or fifteen European species five are found in Britain; these may be distinguished as follows:—

I. Posterior excavation of elytra not abrupt, usually very oblique, and occupying from a third to a half of the suture.	
i. Posterior excavation of elytra with six teeth on each side, the three upper ones being small and the fourth the largest; length 5½–8 mm.	T. SEXDENTATUS, *Börn.* (*stenographus*, Duft.).
ii. Posterior excavation of elytra with four teeth on each side, the uppermost one being often indistinct, and the third the largest; length 4½–5½ mm.	T. TYPOGRAPHUS, *L.*
iii. Posterior excavation of elytra intermediate in abruptness between the two preceding and the two following species, with three teeth on each side, the lowest one being the largest.	T. ACUMINATUS, *Gyll.*
II. Posterior excavation of elytra abrupt occupying only the apex of the elytra.	
i. Elytra with more strongly punctured striæ and with the posterior excavation larger and more strongly toothed at the sides; club of antennæ rounded at apex, with the sutures between its joints straight	T. LARICIS, *F.*
ii. Elytra with less strongly punctured striæ and with the posterior excavation smaller and less strongly toothed at the sides; club of antennæ subtruncate at apex, with the sutures between its joints curved	T. NIGRITUS, *Gyll.*

T. sexdentatus, Börn. (*stenographus*, Duft.; *typographus*, Steph. *nec* L.). A large and conspicuous species; pitchy black with the elytra reddish brown, but variable in colour, somewhat immature specimens being lighter and often entirely testaceous, shining, clothed with very long yellowish grey villose pubescence, which is thicker at sides and extremities; antennæ and legs ferruginous; thorax large, longer than broad, scabrous in front, diffusely and finely punctured behind; elytra only a little longer than thorax, with deep punctured striæ, interstices smooth on disc, rugose at sides and apex, apex excavated, the excavation being oblique and occupying from a third to a half of the

suture, circular and shining, and furnished with six teeth on each side, of which the fourth from the upper surface is the largest. L. $5\frac{1}{2}$–7 mm.

In fallen or recently dead firs; rare; London district and Swansea (Stephens); Dukinfield, Manchester district, in some numbers (Chappell).

T. typographus, L. (*octodentatus,* Payk.). Smaller than the preceding, pitchy black, but variable in colour, sometimes being light brown or testaceous, rather shining, clothed with long greyish-yellow villose pubescence; antennæ and legs ferruginous; thorax longer than broad, scabrous in front, finely punctured behind; elytra with deeply punctured striæ, and the apical excavation of the elytra much as in the preceding species, but dull and furnished on each side with four teeth, the third being the largest, and the first or uppermost being often indistinct; the sutural striæ of the elytra are broader behind than in the preceding species and transversely rugose. L. $4\frac{1}{2}$–$5\frac{1}{2}$ mm.

Under the bark of various Coniferæ (*Abies, Picea, Pinus,* &c.); fortunately this pest is very scarce in Britain; London district (Stephens); Hyde, Cheshire (Chappell); Scarborough.

T. acuminatus, Gyll. Rufo-piceous, shining, clothed with pale pilose pubescence; antennæ and legs testaceous; thorax longer than broad, scabrous in front and distinctly punctured behind; elytra scarcely longer than thorax, with rather fine punctured striæ, interstices with rows of smaller punctures, posterior excavation occupying less of suture than in the two preceding species, but less abrupt than in the two following, shining, punctured, with three teeth on each side, the lowest one being the largest; in the female the third tooth is bent into a hook; the fine striæ of the elytra and the formation of the posterior excavation will easily separate this species from all the others. L. 4 mm.

Under bark of firs and pines; local; Robin's Wood, Repton (W. Garneys); Dukinfield, Manchester district (Chappell); Scotland, Forth, Tay and Dee districts (Braemar, Aviemore, Rannoch, &c.).

T. laricis, F. Oblong, pitchy black, or reddish, sometimes reddish-testaceous, rather shining, clothed with pale pilose pubescence; antennæ ferruginous, rounded at apex, sutures between the joints straight; legs ferruginous; thorax longer than broad, scabrous in front, rather closely and strongly punctured behind; elytra with very deep punctured striæ, posterior excavation very abrupt, and only occupying apex, dull and rugosely punctured, with two or three teeth on each side situated at a little distance from the raised margins which are denticulate; in the female these teeth are larger and sharper. L. $3\frac{1}{2}$–$4\frac{1}{2}$ mm.

Under bark of larches, firs and pines; local; London district, not common, Shirley, Leith Hill, Mickleham, Headley Lane, Esher, Westerham, Midhurst; Windsor; Glanvilles Wootton; Monmouthshire; Robin's Wood, Repton; Sherwood

Forest; Liverpool district; Dunham Park and Dukinfield, Manchester district (Chappell); Scotland, Forth and Dee districts; the species extends to Siberia.

T. nigritus, Gyll. (*suturalis*, Gyll. ♀). Very closely allied to the preceding from which it differs in being, on an average, slightly smaller, with the pilose pubescence white, and the punctured striæ of the elytra less strong, and also by having the posterior excavation less extensive, more obsoletely punctured, and less strongly denticulated at the sides, and the club of the antennæ subtruncate at apex instead of rounded, with the divisions of the joints curved instead of straight. The female has the posterior excavation of the elytra denticulated at the sides, with three larger sharp teeth, whilst in the male the apex is pitchy red and the sides of the excavation are crenulate and the teeth are smaller. L. 4 mm.

Under bark of Coniferæ (firs, pines, &c.); very rare; Scotland, Moray district, Strath Glass, Inverness-shire (Sharp); Mr. Chappell also records it from Dukinfield in the Manchester district, but this may be in error.

It is very possible that *T. amitinus*, Eich. (*xylographus*, Redt.) may be found mixed with *T. typographus* in British collections; it may be distinguished by its smaller size (4–4½ mm.) and the following characters: thorax more narrowed in front, dorsal interstices of the elytra flat and somewhat rugose with a distinct row of punctures; apical concavity of elytra shiny with scattered rugose punctures: in *T. typographus* the dorsal interstices of the elytra are convex smooth and impunctate; the last-mentioned insect is more attached to the pine than *T. amitinus* which is, as a rule, a spruce feeder.

PITYOGENES, Bedel.

This new genus contains three species only, which are separated from *Tomicus* by the fact that the prosternum has no intercoxal process, and that the females have a deep impression at the apex of the elytra near suture; in the males only the apex is excavate and is furnished with strong teeth; the tibiæ are linear and have no furrows for the reception of the tarsi, a point that will distinguish them from *Xyleborus*, while from *Xylocleptes* they may be known by the distinct scutellum and the shape of the second joint of the antennæ; they appear to be somewhat closely allied to *Pityophthorus* and have been included under that genus by several authors, but the absence of an intercoxal process to the prosternum and of a basal border to the thorax will serve to separate them.

I. Sides of elytra smooth behind; male with the internal margin of each elytron armed behind with three equidistant teeth; forehead of female with a deep impression . . . . . P. CHALCOGRAPHUS, *L.*

II. Sides of elytra punctured to apex; forehead of female always convex.

i. Body behind thorax twice as long as broad;

male with the terminal excavation of the elytra terminated behind with small setigerous crenulations . . . . . P. BIDENTATUS, *Herbst.*

ii. Body behind thorax two and a half times as long as broad; male with the terminal excavation of the elytra without setigerous crenulations . . P. QUADRIDENS, *Hart.*

The following character is given for Section II. by some authors :— "Male with the internal margin of each elytron armed behind with a very small tooth, followed by a large somewhat curved spine"; in *P. bidentatus*, however, this tooth does not occur in the type form, but only in certain specimens which must be referred to the var. B. of Eichhoff's monograph; the same applies to *P. quadridens;* the small third tooth is not found in the type; there is a larger form with the three teeth on each elytron (*P. bistridentatus*, Eich.) which has been thought to be a distinct species; the females of *P. bidentatus* and *P. quadridens* have small tubercles bearing hairs instead of the large teeth in the males, and in the latter species the female often has a thick greyish mass of hairs clothing the forehead; it is, however, doubtful whether the two species are really distinct.

A confusion regarding the sexes has sometimes arisen; Eichhoff in his monograph "Ratio Tomicinorum, 1878," follows Thomson and Chapuis and calls the toothed forms the female; in his "Europaischen Borkenkäfer, 1881," he corrects this, and says he does so after microscopical examination of the generative organs, and also because the details of their life history require it as formerly shown by Ratzeburg; this appears to settle the question.

P. chalcographus, L. Reddish-brown, with the thorax and base of elytra pitchy, or entirely reddish-brown, shining, with scanty pubescence; antennæ and legs testaceous; thorax longer than broad, scabrous in front, finely and rather closely punctured behind, with a central line and the side portions of the punctured space smooth; elytra with very fine punctured striæ which are almost obsolete on disc, and wanting at sides towards apex, apical impression near suture deep and broad and furnished on each side with three tubercles, of which the first is situated a little behind the middle. L. $1\frac{1}{2}$–2 mm.

Under bark of firs and pines; not common; Mickleham (Power); London district, old pines (Stephens); Scarborough; Northumberland and Durham district, "Sunderland," Rev. R. Kirwood; Scotland, very local, Clyde district (Glasgow).

P. bidentatus, Herbst. (*bidens,* F.). Pitchy-black, rather shining, clothed with fine and scanty pale pubescence; antennæ ferruginous; legs fusco-testaceous; thorax longer than broad, scabrous in front, rather strongly punctured behind, with a narrow elevated central line and a round space at sides smooth; elytra with punctured striæ at sides and rows of rather large punctures on disc, interstices with rows of smaller punctures. L. 2–$2\frac{2}{3}$ mm.

Male with the apex of the elytra strongly inflexed and with the internal margin of the excavation of the elytra bordered with slight setigerous crenulations.

Under bark of firs and pines, especially in dead fir branches; local, but not uncommon in many districts and widely distributed; London district, not uncommon, Esher, Horsell, Weybridge, Shirley; Hastings district; Holm Wood; Glanvilles Wootton; Chat Moss; Robins Wood, Repton; Lincoln; Northumberland and Durham district; Scotland, common in bark of fir logs, Solway, Tweed, Forth, Clyde, Tay, Dee and Moray districts.

P. quadridens, Hart. Very closely allied to the preceding, of which it has by some authors been regarded as a variety; it is, however, smaller on an average, and may be distinguished by having the punctuation of the thorax finer and more scattered, and by the finer pubescence of the elytra and the feebler rows of punctures on their disc; the body behind thorax is two and a half times as long as broad; the male has four distinct teeth at the apex of the elytra, two at the summit of the apical declivity which are large and hooked and two rather more than half way down it, but not as far down as the apex; the border between these two teeth is not crenulate and is quite devoid of setigerous tubercles, which are always present in *P. bidentatus;* the female has four small tubercles in the situation of the male teeth. L. $1\frac{3}{4}$–$2\frac{1}{3}$ mm.

Under bark of pine; rare; Scotland, Tay, Dee and Orkney districts; Rannoch (Turner); Orkney (Syme).

TRYPODENDRON, Stephens (*Xyloterus*, Er.).

This genus contains about a dozen species which are almost confined to the Northern hemisphere and have chiefly been described from Europe and North America; one or two appear to be somewhat doubtful; a single species is recorded by Wollaston from the Canary Islands; they are small cylindrical insects, with the head and thorax more or less dark, and the elytra testaceous, with or without longitudinal dark bands, and almost glabrous except towards apex; they may be known by having the eyes entirely divided and the club of the antennæ without sutures; the funiculus is four-jointed; the scutellum is moderately large, and the second abdominal segment is rather long; the males have the forehead excavate and the thorax transverse, whereas in the female the forehead is convex and the thorax almost globose; the perfect insects bore circular galleries perpendicularly into the limbs of fallen trees, appearing to prefer the hard and solid wood; they are, in consequence, somewhat difficult to obtain; they may be seen sitting with their heads just projecting from the galleries, but at the least alarm they drop back into them. The three British species may be divided as follows:—

I. Apical declivity of elytra with a very distinct furrow on each near suture; elytra without distinct longitudinal streaks at sides; thorax black . . . . . T. DOMESTICUM, *L.*

II. Apical declivity of elytra without, or with an indistinct, furrow on each near suture; elytra with more or less distinct longitudinal streaks at sides; thorax more or less red, at all events behind.

i. Elytra with the punctured striæ moderately deep; club of antennæ subsecuriform, straight on one side and somewhat rounded on the other . . . . . T. QUERCUS, *Eich.* (*signatum*, F.)

ii. Elytra with the punctured striæ superficial; club of antennæ rounded on both sides and at apex . . . . T. LINEATUM, *Ol.*

T. domesticum, L. Subcylindrical, shining, clothed with scanty pale pubescence and long pilose hairs, which are very distinct if viewed sideways; at first sight, however, the insect appears to be almost glabrous; head and thorax black, antennæ testaceous or reddish-testaceous with the club subsecuriform, straight on one side and somewhat rounded on the other; thorax very convex, nearly as long as broad, plainly tuberculate in front, shagreened or granulately rugose at base; scutellum distinct; elytra livid testaceous or pale griseous-yellow, with the suture and lateral margins black, with regular fine punctured striæ, interstices obsoletely punctured in more or less evident rows, sutural striæ deeper behind; legs black, with the tarsi red. L. $2\frac{1}{2}$–$3\frac{1}{2}$ mm.

Male with the forehead broadly and deeply excavate, and the villose hairs on the anterior margin of the thorax thicker and longer.

Female with the forehead convex and the thorax more strongly asperate.

In the dead wood of beech, alder, maple, birch, holly, oak, and probably other trees; local; Mickleham; Shirley; Westerham, Kent; Brasted, Surrey; Hastings district; New Forest; Dean Forest; Sutton, near Birmingham; Hopwas Wood, Tamworth; Sherwood Forest; Stretford and Dunham Park, Manchester; Scarborough, in solid wood of dead holly (R. Lawson); Northumberland and Durham district; Scotland, rare, Solway, Dee and Moray districts; Ireland, Westport, Co. Mayo (J. J. Walker).

T. quercus, Eich. (*signatum*, F.). Very like the preceding in general appearance, but with the elytra of a less livid testaceous colour, and the thorax always more or less red, at all events behind; it may easily be distinguished by having a broad longitudinal dark band between the suture and side margins, which is sometimes much abbreviated or divided and sometimes only visible at apex, but is rarely absent; the apical declivity of the elytra has no furrow near suture; the striæ of the elytra are also more distinctly punctured, and the legs are red or brownish red; the club of the antennæ is shaped much as in *T. domesticum.* L. $3\frac{1}{2}$ mm.

In dead wood of oak, beech, birch, maple, lime, &c.; not common, or rather very local; it occurs in considerable numbers in Sherwood Forest, where it has been

taken by Mr. Matthews, Mr. Blatch, myself and others; I have records from Scotland, but they probably apply to the next species, and I have also a record from the Manchester district for *T. lineatum*, which must most probably be referred to this species.

T. lineatum, Ol. Very closely allied to the preceding, with which it has been often confused, as it strongly resembles it in colour and general appearance; it is, however, smaller and may be known by the shape of the club of the antennæ, which is rounded on both sides and at apex; the sculpture of the thorax is very much finer, the anterior tubercles being much smaller and more depressed, and the pubescence is more scanty and shorter; the punctures of the striæ on the elytra are finer, the interstices are not rugose (in *T. quercus* they are finely wrinkled), and the general lineation is less dark and less defined. L $2\frac{1}{2}$–3 mm.

In bark of fir logs; not common, or rather very local; Scotland, Tay and Dee districts (Braemar and Rannoch).

XYLEBORUS, Eichhoff.

This genus contains about seventy or eighty species which are very widely distributed throughout the greater part of the world, representatives occurring in Europe, Asia, North, Central and South America, South Africa, the Australian region, Tahiti, &c.; they vary considerably in general appearance and are in many cases remarkable for the great difference in the sexes; this is very noticeable in *X. dispar* as its name implies; about nine species occur in Europe, of which three are found in Britain; the males are by far the scarcer of the two sexes and, as a rule, are comparatively seldom met with; the species are usually supposed to bore galleries into the sap wood of the trees they are attached to, but some of them inhabit various trees; Mr. Blandford has kindly sent me the following note on the genus:—

"The species do not merely live in the sapwood but burrow deeply into the tree; certain exotic ones follow the habits of Anobiidæ and live in such various substances as sugar-cane, corks, bamboos, &c. I have specimens of *X. perforans* (Woll.). from sugar-cane and cacao tree, and Wollaston has found it in corks, the stems of *Jatrophea*, &c.

"The males do not leave the spot where they are bred and where they impregnate the females; the small assemblages of males sometimes found are widowers whose wives have deserted them. The males are much rarer than the females; in sugar-cane from S. Vincent I have found between two and three hundred examples of *X. perforans* among which was one solitary male; and Mr. Waterhouse has found much the same in the same species."

The chief characters of the genus are as follows:—tibiæ broad, more or less serrate and furnished with furrows for the reception of the tarsi which are rather short; prosternum excised as far as the coxæ and

furnished with a very short process; thorax rough in front and not margined behind; elytra without an impressed line along suture, with the apex not excavated but slightly reflexed, furnished with more or less distinct tubercles, which are sometimes almost obsolete; punctured striæ distinct, interstices closely and rather finely punctured in rows; eyes emarginate; the club of the antennæ has the sutures very slightly curved and the funiculus is five-jointed.

The males are so different from the females that I have followed Bedel's arrangement and given a table for each sex; in the former the elytra are much shorter in proportion to the thorax, and in each case the wings are developed in the females, whereas in the males they are atrophied and obsolete; this fact probably has a great deal to do with their scarcity in proportion to the females; it appears to be a somewhat strange reversal of the ordinary rule, (of which we have many examples both among the Lepidoptera and Coleoptera, and, to a certain extent, among the Hymenoptera also), that the female is the sex in which the wings are rudimentary or wanting.

MALES.

I. Thorax rounded, rather flat, elytra globular or subglobular, convex	X. DISPAR, *F.*
II. Thorax and elytra oblong.	
i. Upper surface of thorax broadly concave in front and terminated on its anterior border by a short horn-like projection	X. DRYOGRAPHUS, *Ratz.*
ii. Upper surface of thorax without excavation or projection in front	X. SAXESENI, *Ratz.*

FEMALES.

I. Form broader, oblong; elytra about one and a half times as long as broad; thorax with the sides more or less rounded (*Anisandrus*, Ferr.).	X. DISPAR, *F.*
II Form narrower, subcylindrical; elytra at least twice as long as broad; thorax with the sides subparallel.	
i. Hinder part of thorax distinctly and somewhat strongly punctured, rather shining; apical declivity of elytra without, or almost without, tubercles	X. DRYOGRAPHUS, *Ratz.*
ii. Hinder part of thorax impunctate or almost impunctate, rather dull; apical declivity of elytra with distinct tubercles arranged in longitudinal rows	X. SAXESENI, *Ratz.*

X. dispar, F. (*thoracicus*, Panz.; ♀ *Ratzeburgi*, Kol.). Short and broad, clothed with rather long yellowish or greyish-yellow pubescence, shining, black or pitchy-black, with the elytra castaneous or pitchy-red, antennæ and legs testaceous, femora and tibiæ often darker; thorax scabrous and tuberculate in front, finely punctured and almost smooth behind; elytra with regular punctured striæ, interstices closely and

finely punctured; elytra simply reflexed at apex and armed with a few very small tubercles. L. $2\frac{1}{2}$–$3\frac{1}{2}$ mm.

Male smaller with the thorax almost round, disciform, and depressed and more finely scabrous in front; elytra subglobose, but depressed on middle of disc towards base; tibiæ scarcely dilated. L. $2\frac{1}{2}$ mm.

Female larger, oblong, subparallel, with the sides of thorax subparallel behind, and the disc very convex; the front part also is much more strongly scabrous; elytra oblong; tibiæ more strongly dilated. L. 3–$3\frac{1}{2}$ mm.

"In decaying oaks, &c.; female very rare, male extremely rare; Chobham, Surrey, one specimen (Saunders); New Forest (Turner); the single male in Dr. Power's collection was taken by Turner in the New Forest, on October 10th, 1867; very few British examples of this sex are known."

I have not altered the above record, which was correct when I wrote it, but within the last two years the insect has been found so plentifully in the orchards at Toddington, near Cheltenham, that it has done very serious damage to young plum trees; Miss Ormerod, who investigated the injury, records that in September, 1889, the females were very largely in excess of the males; among fifty or sixty females there was only one of the opposite sex; in December, however, she found a large proportion of males, and, on or about January 10th, 1890, from a piece of plum stem two inches and a quarter across she took *seventeen* males to *six* females; Herr Eichhoff has before noticed this gathering of the males; for full particulars as to the method of attack of the beetle the student is referred to Miss Ormerod's "Report of Observations on Injurious Insects during 1889," pp. 92—98, and Appendix, pp. 125—127; the injury begins with a shot-like hole being bored in the side of the attacked stem, from which a tunnel runs to the pith, and a branch about the eighth of an inch runs across horizontally about half or two-thirds round the stem; from these horizontal borings other borings were made up and down the stem, and the injury caused by these borings fully accounted for the death of the stem; the only real remedy in the case of young trees, appears to be to cut down all those that are infested and burn them, as if once attacked they are doomed, and the injury will spread from them; for older trees some wash or mixture, which will not hurt the bark, but will prevent the beetle getting in or out, may be serviceable; a thick coat of whitewash with some Paris green in it, or a thick soft-soap wash with a little carbolic acid added to it, has been recommended; the spread of the beetle may be more or less prevented (Miss Ormerod, l.c. p. 126), by removing all fallen or injured wood, which, by reason of the sluggish movement of the sap, is particularly acceptable to the beetles for breeding purposes, and also by placing poles ("trap-wood") to attract the beetles, and then destroying the poles that are infested. In England the beetle has only damaged the Plum, but in Europe and America it has done great injury to the Apple and the Pear, as shown by its names "Apple-bark Beetle," "Apple-twig Borer," and "Pear-blight."

X. dryographus, Ratz. Oblong, narrow, subcylindrical, shining, clothed with rather long pale pilose pubescence, pitchy-brown, reddish-brown or reddish-testaceous, with the antennæ and legs testaceous; thorax a little longer than broad, scabrous in front, distinctly and rather strongly punctured behind; elytra reflexed but not excavate at apex, with fine punctured striæ, interstices very finely and scarcely visibly punctured. L. 2–3 mm.

Male shorter, with the thorax broadly concave in front and terminated on its anterior margin by a corneous projection; apical declivity of elytra without, or almost without, tubercles.

Female with the thorax simple in front; apical declivity of elytra without, or almost without, tubercles, as in male.

In decaying oak and beech; occasionally captured on the wing; rare, or rather very local; Caterham, Surrey (Champion); Riddlesdown, near Croydon; Abbey Wood, Kent; New Forest; Monmouthshire, extremely local (Chapman); the male is very much rarer than the female; the proportion of the sexes is given by Eichhoff as one to fourteen, but the males in this country appear to be scarcer than this would seem to imply.

X. Saxeseni, Ratz. (♂ *decolor*, Boield., ♂ *subdepressus*, Rey.). Extremely closely allied to the preceding with which it may very easily be confounded, but distinguished by having the hinder part of the thorax almost smooth and scarcely visibly punctured, and, in the female, rather dull, and the apical declivity of the elytra in the latter sex furnished with distinct rows of tubercles arranged in longitudinal rows; in the male, moreover, the anterior portion of the thorax is not excavate and has no corneous projection in front; the colour varies from pitchy-brown to testaceous. L. 2–3 mm.

In decaying oak, beech, apple, hornbeam, and according to Bedel in Rosaceæ and Coniferæ; very local; London district, not uncommon; Wimbledon, Esher, Putney, Peckham, Chatham, Loughton; Upton Bishop, New Forest.

In accordance with their affinities the genera *Trypodendron* and *Xyleborus* are here placed in close connexion with one another; they belong to the section Xylophagi in which the maxillæ are set internally with hairs instead of with a row of spines; the species, moreover, are wood-boring and not bark-feeding, and have the terminal joint of the palpi obscurely striated longitudinally and the elytra without an impressed sutural stria; the other British genera of *Dryocœtina* belong to the section Phlœophagi, which may be distinguished as follows:—maxillary lobe (*lacinia*) set with a radiating series of rigid setæ or compressed spines; terminal joint of palpi simple; elytra with the sutural stria generally deeply impressed; species bark-feeding and never boring into the solid wood.

PLATYPODINÆ.

This sub-family contains the single genus *Platypus*, which is separated from the Scolytinæ by the much longer metatarsus, the emarginate

sides of the thorax and the round subconvex eyes; the head is large, not covered by the thorax, and the labrum is small but distinct; the antennæ are very short and have a large scape and a large compressed solid club, which is pubescent except for a small space at base; the thorax is rather long and the prosternum is moderately long in front of the coxæ which are large, conical-cylindrical and oblique; the metasternum is very long; the ventral segments are five in number and unequal; the elytra are elongate and cylindrical and sloped or subexcavate at apex; the legs are short with the femora dilated, the tarsi long and slender and the claws simple.

The larvæ of the genus *Platypus* differ somewhat from those of the other Scolytidæ, as may be seen by comparing Westwood's figures (Classification I. p. 350, fig. 42, 4, 14, 22); the head is large and the body short and straight and not curved towards the extremity, where it is somewhat obliquely truncate, and the sides of the body are furnished with rows of distinct tubercles; the pupa is elongate with the intermediate coxæ very large, considerably larger than in the ordinary Scolytid pupæ.

The life history of *Platypus cylindrus* has been very fully described by Dr. Algernon Chapman (Ent. Monthly Magazine, viii., pp. 103—132); the following account is abridged from his observations, which are exceedingly valuable; the beetle burrows into solid wood, and, in consequence, is difficult to observe; these burrows, in which both perfect insects and larvæ are found, have always an extremity open on the side of the stump; they are of uniform diameter throughout, viz., that of the full-grown larva and perfect beetle,—presenting no narrow burrows of young larvæ, as observation of most of the other *Xylophaga* would have led us to expect; and the inhabitants are not confined each to its own branch of the burrow, but the larvæ, to the number of from sixty to a hundred, together with the perfect beetles, their parents, run actively backwards and forwards in the burrows, and from one branch to another, getting out of each other's way, backing into a branch to let another pass, just as a train is shunted into a siding. The usual habitat of *Platypus* is in oak stumps, but it also occurs in beech; it only attacks stumps that have entered on their first period of decay, but are to all appearance sound; the chief essential appears to be the presence in the wood of a certain fungus, which probably lives in the fermenting and decomposing sap, and which half fills the galleries in which the eggs are laid, and serves as food for the young larvæ.

During July and August the beetle emerges from the pupal state, the greater number during the last week in July, and at this period they commence their burrows; occasionally an odd burrow is found, but usually the burrows are in colonies, and as many as fifty entrances may be found on the side of a stump scattered over a surface twelve to fifteen inches wide and four or five high; the burrow from its mouth on the surface of the stump is a perfectly clean cut cylinder.

Each burrow is tenanted from its commencement by a pair of beetles; both the beetles and full-grown larvæ feed on the wood, and while doing so they eject little rounded nodules of frass which have obviously passed through their alimentary canals; *Hylesinus fraxini* and other of the *Xylophaga* eat the removed materials while forming their burrows, but this is not the case with *Platypus*; while forming its burrow it throws out the removed wood in very fine splinters which may easily be distinguished from the frass of the wood that has served it for food. Dr. Chapman (l.c. p. 105) gives a very long and interesting account of the process of splintering the wood, and suggests, with much reason, that the usual absence, or rather broken condition of the tarsi in older specimens is due to their method of working; as is well known, the tarsi of fresh specimens are very long and slender, but very soon become much shorter; Dr. Chapman suggests that at first they may be very useful to the beetles to enable them to suspend the body in a proper position at right angles to the surface of the wood or bark in commencing their burrows.

When the burrow is some six or seven inches in depth a rounded extremity is made to it, in which the female deposits her eggs, and it is for the time abandoned, the parent beetles commencing the construction of a branch; eggs appear to be laid as early as the beginning of August, and as late as the end of October, and, as a rule, in recently constructed branches of the burrow; when hatched the young larvæ feed on the fungus above mentioned, and do not begin to eat the wood until almost full grown, when they probably attack it; when newly hatched the larvæ are not straight and cylindrical like the full-grown larvæ, but are rather flattened and disc-shaped, the lateral region being largely developed, and each side carrying two rows of large stiff bristles, each bristle surmounting a lateral tubercle; these bristles are evidently of great use in locomotion; by their means the larva moves with great ease up and down among its fungus food until it has grown large enough to occupy the whole diameter of the burrow; with each change of skin these bristles become smaller, until in the full-grown larva they are only represented by corneous points.

The larvæ feed up rapidly as they are full-grown before the winter; in spring they excavate the pupal galleries on either side of the ordinary burrows; these are close together, the two sides of a burrow often containing several dozen within a few inches, and are always at right angles to the gallery from which they start; the larvæ, after excavating them, must come out and enter backwards, as the head of the pupa is towards the burrow, and the larva is unable to turn round in it; when the perfect beetle emerges, it soon leaves the burrow, and either forms a fresh burrow in the stump, or takes wing to a fresh locality.

The beetles are able to stridulate audibly, by rubbing the abdomen rapidly against the elytra; when a log containing a number of burrows

is shaken, the beetles burrowing within it answer with quite a chorus of squeaking, in order to hear which, the ear must be placed near the wood. The very rare beetle *Colydium elongatum* is parasitic on *Platypus*, but has hitherto been met with in Britain only in the New Forest.

PLATYPUS, Herbst.

This genus is a very large one in point of numbers and contains about one hundred and sixty species, which are chiefly found in North, Central and South America, and in Oceania (New Guinea, Borneo, the Moluccas, the Philippines, New Zealand, &c. ; a few have occurred in India and Ceylon ; only two are found in Europe, one of which, *P. oxyurus*, is confined to the Pyrenees, whereas the other ranges from Norway and Sweden to Northern Africa, and also over Northern Asia and North America.

P. cylindrus, F. Elongate, cylindrical, slightly shining, clothed with sparing yellowish-grey villose pubescence, which is thicker at the apex of the elytra, pitchy-black, or with the head and thorax black or pitchy-black, and the elytra pitchy, reddish-brown, or reddish ; head large, with the forehead broad and depressed, eyes large and moderately prominent ; antennæ very short, six-jointed, with a large scape and club, brownish-red or reddish-testaceous ; thorax longer than broad, finely and obsoletely punctured, with the sides subparallel and compressed in middle, basal portion almost smooth with a central line ; elytra deeply striated, the striæ being scarcely punctured, interstices elevated and subcostate, apex reflexed ; legs red or castaneous, with the femora and tibiæ, especially of the anterior pair, dilated ; anterior tibiæ with transverse elevated lines on their outer margin ; tarsi very long and slender, more than twice as long as tibiæ, with large simple claws. L. 6–7 mm.

Male with the posterior declivity of the elytra furnished with two rather indistinct teeth.

In solid dead and just decaying wood of oak, beech and chestnut ; extremely local, and usually regarded as rare ; Windsor (Stephens) ; Shipley, near Horsham (Gorham) ; New Forest ; Monmouthshire and Herefordshire, locally abundant (Chapman) ; Scarborough (Lawson).

ABNORMAL COLEOPTERA.

STREPSIPTERA or STYLOPIDÆ.

Although the *Strepsiptera* are now usually regarded as belonging to the order Coleoptera, it must be allowed that the question cannot be considered as settled, and Professor Westwood is still of opinion that they ought to be regarded as a distinct order; in a communication I received from him on March 17th, 1889, he says, "My idea is that the Morphology of the different states and the leading organisms warrant the adoption of Mr. Kirby's rules for the establishment of it as a new order of insects"; in the second edition of Professor Rolleston's Forms of Animal Life, p. 511, Mr. W. Hackett Jackson, the editor, after mentioning that the Strepsiptera are included by Brauer and others among the Coleoptera, and after alluding to the fact that Professor Westwood is still of opinion that they should be retained as a separate order, continues as follows: "They are ento-parasitic on various Bees and Wasps. The male is free, has small twisted fore-wings, longitudinally folded hind wings, and a large metathorax. It is metagnathous (that is, it has the mouth adapted for sucking in the imago and for biting in the larva). The mandibles are reduced, the maxillæ connate with the labrum, their palpi two-jointed. The female is blind, vermiform, and never quits the host. There is a dorsal canal by which the male effects impregnation. The ova develop in the cælome (or body cavities); the Campodeiform larvæ escape by the dorsal canal. They are carried by a bee or wasp to its nest, where they bore into a grub, and are transformed into apod vermiform larvæ. The male pupa is coarctate, and perforates one of the abdominal intersegmental membranes of the Bee pupa, protruding only the head, as does also the female." The Strepsiptera are peculiar as being among the few insects that are viviparous and produce living larvæ, the only other instances being the *Tachinæ*, and some *Oestridæ* among the *Diptera*, and some *Staphylinidæ* among the true *Coleoptera*; they are also said, by Von Siebold, to afford an instance of Pædogenesis, or the production of ova by the immature animal, the ova being produced in the pupa at a very early period, and these being laid just before, or as soon as the insects become free; this, of course, is also an instance of Parthenogenesis, or the production of young without the intervention of the male, of which the chief examples are found among insects in the Queen Bees, Humble Bees, Wasps and Aphides.

Dr. Leconte and Dr. Horn place the Stylopidæ at the end of the Heteromera between the Rhipiphoridæ and the Rhinomaceridæ, which they regard as the first of the families of the Rhynchophora; if, however, they are to be regarded as Coleoptera at all, it is much the best plan to place them at the end of the order as abnormal members, although their habits and the fact that the larvæ in their first state are

campodeiform and active, certainly seem to show that they are somewhat closely allied to Meloë; the characters of the groups will be found fully discussed in Westwood's Classification, Vol. II. pp. 287, &c., with figures of the species and larvæ and various parts of their bodies; the student of the group is also referred to Kirby's Monographia Apum Angliæ, vol. ii. p. 111, Curtis's Strepsiptera (Brit. Ent. Plates, 226, 385 and 433), and Leconte and Horn's Classification of the Coleoptera of North America, pp. 425, 426; the following are the chief characteristics of the males, but there is considerable doubt as to the true relations of various parts, more especially as regards the mouth organs and the thoracic segments; the body is long and narrow, its great extent being occupied by a very large metathorax; the general character of the body, as remarked by Westwood, indicates great weakness, and we accordingly find that the insects live but a very short time in the imago state; the head and thorax are of a velvety texture; the mouth organs are very abnormal, a character probably due to the fact that the insects in the perfect state, in all probability, take no food, or very little, during the very short time they live, and simply continue the species; it is doubtful, in fact, if there is any true oral aperture; *apparently* mandibles and one pair of palpi are present, and Savigny, Kirby, Leconte and Horn and others state this as a fact; Curtis, however, regards these so-called "mandibles" as maxillæ, and says "Labrum and mandibles wanting?" Westwood regards the mouth organs as analogous to those of certain Lepidoptera, and after remarking that Newman considers the order as not sufficiently separated from the Diptera, proceeds as follows: "I cannot, however, find the least analogy between the oral organization of the Strepsiptera and the tubularly developed elbowed mouth of the Diptera, the labrum of which is greatly elongated; whereas, on the contrary, there seems to me much greater resemblance, in this respect, between the Strepsiptera and Lepidoptera, the labrum in both being soldered flatly to the head, the acute mandibles, as they have been termed in *Stylops*, being exactly represented in some of the Linnæan Bombyces, by the short rudimental maxillæ, and the large articulated appendages being much more analogous to the labial palpi of the Lepidoptera, than to the maxillary palpi of the Diptera;" the head is large and transverse, prolonged at the sides into a stout peduncle at the end of which are situated the eyes, which are large and prominent and strongly granulate, the lenses being large and comparatively few in number; the antennæ are inserted on the front, at the base of the lateral processes of the head, and vary in the different genera; the prothorax is very short, consisting of a simple ring or collar, to which the forelegs are attached on the underside; the mesothorax is scarcely larger and bears on each side a slender coriaceous club-shaped appendage, with the inner margin membranous; these appendages have given rise to much controversy, but apparently are aborted representatives of the elytra; the metathorax is very large, greater in bulk than the rest of the body

with the sutures of the dorsal pieces all distinct; the portion behind these pieces or postscutellum is more or less conical and prolonged considerably over the base of the abdomen; the wings are very large and fan-shaped with a few diverging nervures which are almost wanting in *Elenchus;* they are somewhat opaque and membranous and have the anterior margin incrassated; the abdomen is small and consists of from seven to nine segments; the legs are of moderate length, with the coxæ of the two anterior pairs somewhat elongated; the femora are simple; there are no tibial spurs; and the tarsi have the underside of the joints strongly lobed beneath and are not furnished with terminal claws.

Four genera appear to be known, all of which are found in Europe; *Xenos* and *Stylops* also occur in North America; a species of the former genus has also been found in a Brazilian species of *Sphex;* *Elenchus* is represented in Mauritius, and a Stylopised bee has been observed in Tasmania; our knowledge of the group, however, is exceedingly limited, and many more species and genera will probably be discovered; in North America Stylopised individuals of *Odynerus quadricornis* and of a large species of *Sphex* have been observed, and as *Xenos* is apparently attached to the genus *Polistes* and *Stylops* to *Andrœna,* the parasites of these species must probably be referred to new genera.

Xenos, which inhabits the middle and south of Europe and North America, does not occur in Britain; it may be distinguished by its five-jointed antennæ; as in *Stylops,* the tarsi are four-jointed, but the last joint is entire, whereas in *Stylops* it is deeply emarginate; the wings, moreover, in the latter genus, are much less rounded; the three genera found in Britain may be distinguished as follows: it must be remembered that the characteristics apply to the males only.

I. **Antennæ bifurcate.**
  i. **Antennæ shorter than thorax, six-jointed; tarsi four-jointed** . . . . . STYLOPS, *Kirby*
  ii. **Antennæ longer than thorax, five-jointed; tarsi two-jointed** . . . . . ELENCHUS, *Curtis.*
II. **Antennæ branched, flabellate, shorter than thorax, seven-jointed; tarsi three-jointed** . . . . . HALICTOPHAGUS, *Curtis.*

STYLOPS, Kirby.

The members of this genus may be known by the formation of the antennæ which most closely resemble those of *Xenos* but are six-jointed; the basal joint is somewhat cup-shaped, the second very short and transverse, and the third is produced on its internal side into a dilated hollow lobe extending beyond the fifth joint; the fourth, fifth and sixth are comparatively long, the fourth being the longest; the eyes are very prominent; the rudimentary elytra are not clavate; the wings are very large and have the sides straighter than in the other genera and produced in front into a round blunt angle; the nervures are very fine but distinct; the post-scutellum is elongate and rounded at apex; the posterior tro-

chanters are elongate and the tarsi are four-jointed with the last joint emarginate at apex; the female is larviform.

The full-grown larvæ of *Stylops* are nearly cylindrical fleshy grubs, about a quarter of an inch long, of a white colour, with the head distinct and flattened, and attached to the body by a neck; the head is not at this time furnished with distinct mandibles, but appears only to be provided with several small elevated tubercles, behind which is a transverse impression: Professor Westwood, who points out these facts, is inclined to agree with Mr. Kirby that the larva feeds by absorption.

Mr. Dale, who has been by far the most fortunate Entomologist as far as this group is concerned, thus relates his observations regarding *Stylops;* they have already been quoted by Curtis and Westwood but may with advantage be repeated: "Every specimen of *Andrena barbilabris* I have seen this year (1827), from the 27th April to the 4th June, has contained larvæ, pupæ, or exuviæ of *Stylops*, from one to three in each. On the 5th May I picked out one with a pin, on the 7th another rather immature, and caught one flying in the hot sunshine over a quick-set hedge in the garden; it looked milk-white on the wing, with a jet black body, and totally unlike anything else; it flew with an undulating or vacillating motion amongst the young shoots, and I could not catch it till it settled on one, when it ran up and down, its wings in motion, and making a considerable buzz or hum nearly as loud as a *Sesia:* it twisted about its rather long tail, and turned it up like a *Staphylinus*. I put it under a glass and placed it in the sun; it became quite furious in its confinement, and never ceased running about for two hours. The elytra or processes were kept in quick vibration as well as the wings; it buzzed about the sides of the glass, with its head touching it, and tumbled about on its back. By putting two bees (*A. labialis*) under a glass in the sun, two Stylops were produced; the bees seemed uneasy and went up towards them, but evidently with caution, as if to fight, and moving their antennæ towards them, retreated. I once thought the bee attempted to seize one, but the oddest thing was to see the Stylops get on the body of the bee and ride about, the latter using every effort to throw his rider. A large hole is left in the tail of the bee when Stylops escapes, which closes up after a time. I have found five species of Andrenæ infested."

Professor Westwood (l.c. p. 299) adds that the bees were quite mad immediately before the Stylops came out, and that when on the body of the bee the Stylops kept its wings still and half erect; the males of the species of *Xenos* and *Elenchus* appear to be equally active and rapid in their movements; this property would appear to be very necessary for the union of the male and female on the body of a rapidly moving bee or wasp; as remarked by Mr. Dale, the bees seem unable to shake off the parasite when it has obtained a firm footing; this it is probably enabled to do by means of the membranous lobes of the tarsi, although the absence of tarsal claws would seem to be a disadvantage.

With regard to the number of British species of Stylops at present known there is considerable doubt ; the type of the genus is regarded as *Stylops melittæ*, Kirby ; Westwood figures a species (Classification, Frontispiece, fig. 6) as *Stylops Spencii*, Pck. ; while Curtis (Brit. Ent., fig. 225) describes and figures a species as *Stylops Dalii*, Curt. ; Mr. C. W. Dale (History of Glanvilles Wootton, p. 117) mentions two species with their localities as follows :

1. *Stylops Dalii*, Curt. Very rare. Taken by my father, flying over the garden hedge, May 3rd and 23rd, 1827, and May 10th, 1829. The females are only to be found inside the tails of *Andrena labialis*.
2. *S. Kirbii*, Leach, rare. Taken by my father, May 7th, 1827, May, 10th, 12th, and 14th, 1828, May 9th, 10th and 23rd, 1829, May 12th, 1836, and May 12th, 1840. The females are only to be found inside the tails of *Andrena barbilabris*.

The figure of *S. Dalii* given by Curtis (fig. 226) differs from that of *S. Spencii* given by Westwood (Classification, Frontispiece, fig. 6) in having the wings considerably more narrowed behind, the base of the antennæ shorter, and the post-scutellum more produced over the abdomen, but these differences may be more or less accidental ; in a communication I received from Professor Westwood (March 29th, 1889) he says: "As to the species of Stylops, I believe there has never been an opportunity of comparing the type specimens, so you must rely on your own judgment, founded upon the only materials which now exist for identification," and he further refers to one of the existing figures as probably not very accurate ; under the circumstances I prefer to consider that we have only one British species.

S. melittæ, Kirby (? *Dalii*, Curt., *Spencii*, Pck., *Kirbii*, Leach). Male of a deep velvety black colour, with the base of the scutellum and the sides of the abdomen yellowish or yellowish-brown ; legs and pseudelytra fuscous ; wings ample, milky white and iridescent, with the sides comparatively straight and produced in front into a broad blunt rounded angle, nervures rather well marked, black or blackish, anterior edge dark and thickened ; female larviform. L. 3 mm.

Parasitic on species of *Andrena ;* male rare ; female not uncommon in some districts ; the male flies with an undulatory motion very early on hot summer mornings ; London district, Reigate and Shirley (Champion) ; Woking (E. Saunders) ; bred from *Andrenæ* taken at Hammersmith (S. Stevens) ; near London (Enock) ; Hastings ; Glanvilles Wootton ; Oxfordshire ; it probably occurs in many other localities.

ELENCHUS, Curtis.

This species differs from *Stylops* in having the antennæ in the male much longer and five-jointed ; they are inserted in a cavity on each side of the front of the head and are slender and pubescent, with the first and second joints short and the third produced on the side and forming a long lanceolate appendage ; the eyes are almost sessile and composed of only about twenty lenses ; the pseudelytra are clavate and longer than in *Stylops;* the postscutellum is scarcely produced over the abdomen which is

very narrow; the wings are broader than their length measured from the pseudelytra to apex of abdomen, and have scarcely any visible nervures; the posterior trochanters are short and the tarsi are two-jointed; two species are known, one from Mauritius and one which has occurred in Britain.

E. tenuicornis, Kirby (*Walkeri,* Curt.). Dull ochreous-fuscous; eyes black and shining scarcely pedunculate; wings iridescent, pale fuscous, with the anterior margin considerably thickened and darker fuscous; the few nervures are also fuscous; abdomen more or less spotted above and beneath; legs and antennæ pubescent; thorax shorter and more gibbose than in *Stylops,* as well as the postscutellum; tarsi two-jointed (at all events apparently) much more slender in the first pair than in the others. L. 1 mm.

By sweeping herbage; parasitic on *Bombus* and perhaps on *Andrena* and *Halictus;* extremely rare; Southgate, near London (Walker); Glanvilles Wootton (very rare; a couple only taken by Mr. Dale, on Whitedown, June 11th, 1830, and in Aldermead, June 27th, 1839); Ireland, Belfast (Templeton); the latter specimen is now in the University Museum, Oxford.

HALICTOPHAGUS, Dale.

In this very curious genus the antennæ are short and seven-jointed and flabellate, the tarsal and second joint being stout, and each of the remainder being produced into a lobe on the outer side, the lobes gradually decreasing in length to the apical joint, which is inserted at the base of the lobe of the penultimate joint; the lobes are submembranous and are ornamented with semitransparent punctures; the eyes are prominent and strongly granulate; the pseudelytra are strongly clavate and very slender at base; the abdomen is rather short and is in great measure concealed by the postscutellum, which has a long deep furrow at base; the wings are broad with rather strong nervures; the anterior coxæ are long, the femora rather short, the tibiæ short and compressed, and the tarsi three-jointed; one species only appears to be known.

H. Curtisii, Dale. Black and slightly glossy, clothed with a brown velvety pubescence; antennæ and legs dull brownish ochre; wings slightly tinged with brownish ochre and obscurely iridescent; nervures brown, broad and strongly marked; wings less rounded than in *Elenchus,* broader in front and narrowed behind; tips of the joints of the tarsi and apex of abdomen ochreous. L. 1 mm.

Parasitic on species of *Halictus;* very rare; taken by Mr. Dale in August in company with the male of *Halictus æratus* (?) by brushing some long coarse grass and thistles close to the sea, on a rock called Durdle Door at Lulworth Cove; Mr. Dale also recorded the fact of his having found a larva in *Halictus?* 4 *guttatus* taken in the New Forest in April; a number of *Halicti* infested with apterous Strepsipterous females were once found by Sir S. S. Saunders near Folkestone; these very likely belonged to the present species, but no male was discovered.

APPENDIX.

NOTES ON THE GENUS **HETEROCERUS**, F.

(Vide Vol. III. p. 384.)

Since the publication of Volume III. two important papers have been published on this much-neglected and very obscure genus: "The Species of *Heterocerus* of Boreal America," by Dr. Horn (Trans. Amer. Ent. Soc. xvii. Jan. 1890), and the "Bestimmungstabelle der Heteroceren Europas und der angrenzenden Gebiete," by Herr A. Kuwert (Verhandlungen der Kaiserlich-königlichen zoologisch-botanischen Gesellschaft in Wien, 1890, p. 517 *et seqq*). I have had some correspondence with Herr Kuwert, who has kindly looked over and determined for me a number of British specimens, and has sent me specimens of some of the species: in his last letter he expresses great regret that he had not had more British specimens before him when he wrote his paper. I have already published the results of these investigations in the Entomologist's Monthly Magazine (Vol. ii. (Second Series), 1891, pp. 132 and 202); I have not had time to work the species thoroughly, nor have I had sufficient material: before arriving at definite conclusions it will be necessary to work at large series from various localities, with the males and females distinguished as taken from the same burrows. I am by no means sure that Herr Kuwert is right in several instances, and he himself, in certain cases, seems doubtful as to Kiesenwetter's determinations: there is only one other small genus of British Coleoptera that presents anything like the same difficulties as *Heterocerus*, and that is *Haltica*: in both cases I believe that a thorough revision is required, from large series, of all the European species.

The table given in Vol. III. p. 384, will serve roughly to distinguish the species which were known as British when I wrote it, but the character of the presence or absence of margins on the posterior angles of the thorax is often a very obscure one; occasionally, as in the continental species *H. obliteratus*, Kies, they are present in one sex only; on this character, however, Kuwert forms two of his principal subgenera, *Heterocerus* i. sp., in which the hind angles of the thorax are not margined, and *Tænhetocerus*, Kuw., in which they are margined or at least show a trace of margins (Hinterecken des Halsschildes gerandet oder mindestens mit Spuren von Randung). Dr. Horn says, with regard

to the American species : "Considerable stress has been laid on the fact as to whether the base of the thorax has a marginal line, but as far as our species are known it exists in all, but varies in the sharpness of its definition."

The first two sub-genera, mentioned in Kuwert's paper, are not represented in Britain : these are *Micilus*, Schiödte (containing a single species, *M. murinus*, Kies.) and *Phyrites*, Schiödte (containing a single species, *P. aureolus*, Schiödte) ; the former is distinguished by the shape of the scutellum (which is punctiform and subtransverse) and the latter by having the third joint of the antennæ small and the fourth forming with the following a uniform club, whereas in *Heterocerus* and *Tænhetocerus* the third and fourth joints are both small.

Kiesenwetter appears to have been the first who attempted to monograph the species, and he divided them chiefly on colour and sculpture, both of which are very misleading characters, as both vary considerably in different specimens of the same species ; Schiödte in 1866 attempted a division on obscure antennal characters ; in 1872, however, Mulsant and Rey observed that in certain species the elevated curved line on the first ventral segment extended from the front angle by a broad curve towards the middle of the posterior edge of the segment and there terminated, while in others the line continued the curve forward towards the inner edge of the coxæ ; these lines are apparently stridulating organs, and the genus is divided by Dr. Horn on this character as follows :—

Stridulating ridge of first ventral segment incomplete, i.e. extending from the front angle in a curved line merely to the posterior border of the segment . .	**Heterocerus, i. sp.**
Stridulating ridge of first ventral segment complete, i.e. forming nearly a semicircle from the front angle to the posterior border, then recurving to the inner coxal border	**Littorimus, *Des Gozis.***

The latter division was originally wrongly named *Augyles*, which was the name applied by Schiödte to quite a different division, founded, as above-mentioned, on obscure antennal characters.

As far as our fauna is concerned the characters depending on these stridulating organs are not of much practical use, as the sub-genus *Littorimus* only contains two species, *H. britannicus* and *H. sericans*, and it is doubtful whether the latter species can really be regarded as indigenous ; it seems, therefore, that we must to a certain extent fall back upon the character presented by the margination of the posterior angles of the thorax, in spite of its being often so unsatisfactory ; *H. flexuosus*, *femoralis*, *salinus v. rectus* and *arenarius* will be found to present scarcely a trace of margins, whereas in the other species they are more or less distinctly visible. Dr. Sharp (Biol. Cent. Am. vol. i. pt. 2, p. 116) makes use of a character, which he has recently observed, and which may prove to be of considerable importance ; in several of the American species there is an elevated line on the metasternum, which begins at the middle of the posterior border of the middle coxa, extending

obliquely backward and joining the suture between the metasternum and its episternum; it is possible that this may prove a good character with regard to some of our species. The males are, as Dr. Horn observes, in most cases easy to distinguish from the females; the head is larger and more prominent, the mandibles more slender and projecting, the labrum longer, and the clypeus retuse to a varying degree; the thorax is at least as broad as the elytra, sometimes slightly broader, and not gradually narrowed to the front as in the female; at the same time it must be remembered that it is easy to regard the male as a separate species, an error which can only be avoided by capturing the species in the burrows, two, a male and a female, usually occupying one burrow.

The British species have usually been considered to be eight in number; of these *H. fossor*, Kies. (*rectus*, Wat.) and *H. arenarius*, Kies., have been regarded as doubtful, and the generally recognized species, six in number, are *H. femoralis*, Kies., *H. obsoletus*, Curt., *H. marginatus*, F., *H. lævigatus*, Panz., *H. fusculus*, Kies., and *H. sericans*, Panz.; as far as I have been able to make out *H. rectus*, Wat., is an intermediate variety or species between *H. salinus* and *H. fossor*; *H. arenarius* must be regarded as a very doubtful species; *H. femoralis* and *H. flexuosus*, which have usually been regarded as synonymous, must now be considered as distinct; a new species, *H. pulchellus*, Kies., must be added doubtfully before *H. fusculus*, and for *H. sericans* a newly described species, *H. britannicus*, Kuw., must be substituted; apparently we do not possess the true *H. sericans*, but the specimens which have been named for me by Herr Kuwert as *H. britannicus* appear to differ considerably, and I was at first inclined to think that part of them should be referred to an allied species, if not to *H. sericans*, which may perhaps be found in our collections. The following then may be regarded as a provisional list of our species, as far as is at present known; they are given in the order in which they come in Herr Kuwert's monograph :—

Sub-gen. *Heterocerus*, i. sp.
flexuosus, Steph. (*femoralis*, Kies., *pars*).
salinus, Kies., var. *rectus*, Wat.
(*arenarius*, Kies. ? ?)
femoralis, Kies.
Sub-gen. *Tænhetocerus*, Kuwert.
marginatus, F.
(*sericans*, Kies. ? ?) } s.g. *Littorimus*, Des Gozis.
britannicus, Kuw. }
obsoletus, Curt.
pulchellus, Kies. ?
fusculus, Kies.
lævigatus, Panz.

H. flexuosus, Steph., and *H. femoralis*, K., are considered synonymous in our catalogues; the latter insect is, however, smaller with the elytra rather shorter and the hinder indented cross markings situated a

little nearer the middle; the markings, according to Kuwert, are reddish in *H. flexuosus* and yellow in *H. femoralis*, but this is not worth much as a character. I have only seen one specimen of the true *H. femoralis*, which was sent me by Mr. E. Waterhouse (without locality) and named by Herr Kuwert; it certainly looks very different from *H. flexuosus*, being shorter, smaller and duller, with the general colour dark and the markings hardly visible; *H. flexuosus* is apparently a rather common British species, but it appears to be rarer on the continent, and Herr Kuwert says that he only possesses one specimen of it, from Morlaix; *H. femoralis* would seem to be rare in Britain, but there still appears to be considerable confusion with regard to it, and considerable doubt as to what really is the *true H. femoralis* of Kiesenwetter; Herr Kuwert a short while ago sent me a specimen named *H. femoralis* from Pomerania, and now writes concerning it that he is inclined to believe "that the *femoralis* from Pomerania, which has the legs paler and is larger, may perhaps be the *arenarius* of Kiesenwetter." With regard to *H. arenarius*, I cannot discover an authentic British specimen; I believe that light examples of *flexuosus* and *lævigatus* are made to do duty for it; the following is Kuwert's account of the species: "A little larger than *femoralis*. According to Kiesenwetter (I have no examples to refer to) in colour, markings and pubescence it comes half way between *salinus* and *femoralis*, but the colouring is brighter and the legs are entirely yellow;" the only locality he gives is Ireland; as, however, I have pointed out (Vol. III. p. 386), Mr. Crotch came to the conclusion that the Irish specimens did not differ materially from *femoralis*; I believe, therefore, that *H. arenarius* should be regarded merely as a synonym of the last named species.

Among the insects which I sent to Herr Kuwert are specimens named *H. rectus*, Wat., from Mr. Waterhouse's and Mr. Champion's collections; these he is inclined to regard as a new variety or species, and proposes that they should be described by me as *intermedius*, n. sp., as being intermediate between *H. salinus* and *H. fossor*; I prefer to consider them as a variety of *H. salinus*; Kuwert was not, apparently, aware that the insect had been described, but, apart from this, there is a species of Kiesenwetter's already in existence, named *intermedius*, which comes near *hispidulus*, Kies.*

H. salinus is a rather large species (6-7 mm.), parallel, with bright yellow markings and legs entirely yellow; the elytra are twice as long as together broad; the thorax is short, with the sides strongly rounded and the margins more or less broadly yellow; the club of the antennæ is somewhat long; the colouring is variable, and the pubescence thick: the variety *rectus* differs in being smaller, with the antennæ darker, and the legs dark instead of light; it also has, in the male, two small,

* Since I wrote the above I have received a letter from Herr Kuwert in which he says that he meant to propose "*intermissus*" as the name, but wrote "*intermedius*" in error.

but distinct, prominences on the head behind the clypeus, which are scarcely visible in the type form ; *H. fossor* has lighter legs than the *var. rectus*, and only one small prominence on the head behind the clypeus.

H. marginatus and *H. lævigatus* are often confused ; the latter is a little larger on an average and is duller and more plainly pubescent, with the markings longer (and more colon-like (colon-artigen) according to Kuwert) on the disc ; in *marginatus* they are smaller and more often form spots ; the scutellary region appears to be usually dark in *marginatus*, whereas in *lævigatus* it is often occupied by more or less long yellow markings ; in the latter species the second joint of the antennæ ends in a whitish tuft of hairs, of which the longest reach the apex of the club ; both these species have the hinder angles of the thorax rather distinctly margined.

The following is Kuwert's description of *H. britannicus* :—

H. britannicus, n. sp. : Thorax plainly broader than the elytra, the latter with obscure red spots, and with thick yellowish pubescence ; thorax black with shorter and less thick pubescence, with a distinct red central line and badly defined reddish sides, very strongly rounded and widened in the middle and a little narrowed in front. Male with the clypeus raised into a prominence on its anterior margin, and with the intermediate tibiæ strongly widened beneath. Legs and apex of abdomen reddish. L. 2 mm.

Described by Herr Kuwert on a single male obtained through M. Bellier de la Chavignerie, labelled "Anglia, Reiche ;" apparently, however, locally common in Britain ; it has been taken in numbers by Mr. Lennon near Dumfries, and I have received specimens from Mr. Bennett of Hastings ; the latter are considerably darker, and I am not sure that they ought not to be referred to another species ; Herr Kuwert, however, has named the specimens from both localities as his *britannicus* ; in both cases the specimens have been described as *H. sericans* ; I have not seen a British specimen answering to the description of the last named insect, although it very probably occurs ; it is larger than *H. britannicus* (being $2\frac{1}{2}$ mm. in length) and is somewhat differently marked, the markings being yellow instead of red.

H. obsoletus, Curt., is one of our most distinct species by reason of its rather large size (usually about 5 mm.) and coarse punctuation, and small, but plain, lighter markings.

H. fusculus, Kies., is an extremely local species, but occurs abundantly at Luccombe Chine, Isle of Wight, on wet and muddy places at the foot of the cliffs about thirty feet above high water mark ; I sent a specimen to Herr Kuwert taken by myself at this locality and he named it *pulchellus*, Kies. ; a specimen, however, taken by Mr. Champion at Sandown, a few miles from Luccombe, is returned as *fusculus*, and I believe that both insects belong to the same species ; another specimen of Mr. Champion's, from Dr. Power's collection, without locality, is returned as *pulchellus* and another (rather larger) from the London

district as *fusculus;* the former is described in Kuwert's monograph as smaller than *H. fusculus* and always with plainer and brighter markings, but the differences seem very slight, and I cannot decide, without further material, whether we have both species in Britain: the characters drawn from the colour of the sides of the thorax and of the legs are plainly untrustworthy in these closely allied species: if these two species are really distinct, I am inclined to think that all the Isle of Wight specimens must be referred to *pulchellus,* and that the single specimen above referred to from the London district may prove to be *fusculus;* our knowledge of the group is evidently by no means exhausted, and it is very probable that several more of the continental species may be eventually found in Britain.

Cryptohypnus dermestoides, Herbst.,and **C. quadriguttatus,** Lap. (*tetragraphus,* Germ.). On page 88, Vol. IV. the latter of these species is regarded as a variety of the former: in a short paper, however, in the Entomologist's Monthly Magazine, Vol. ii. (New Series) p. 72, Dr. Horn points out the specific differences as follows:—

First ventral segment with a small tubercle between the coxæ, and the anterior tibiæ dilated, in the male . .	C. QUADRIGUTTATUS.
First ventral segment convex between the coxæ and fimbriate posteriorly, and the anterior tibiæ dilated, in the male	C. DERMESTOIDES.

The first ventral segment of *C. dermestoides* (male) is somewhat gibbous between the coxæ and raised to a level with them, and the fimbriæ are directed backwards; while in *C. quadriguttatus* (male) the first ventral segment is rather flat between the coxæ, and has a round pubescent spot.

Dr. Horn further remarks that in none of the North American *Cryptohypni* are the male front tibiæ dilated, as they are in these two European species.

Mr. Champion adds the following note to Dr. Horn's article:—

"*C. dermestoides*, Herbst.,and *C. quadriguttatus*, Lap. (=*tetragraphus*, Germ.), considered by most recent authors as varieties of one species, thus prove to be distinct. They occur together in various northern localities in Britain, as Rannoch, Braemar, Scarborough, etc.; in Scotland *C. dermestoides* is, perhaps, the commoner of the two, while at Scarborough, *C. quadriguttatus* is much more abundant than *C. dermestoides*. A large number of specimens collected by Mr. J. J. Walker in Italy, at Civita Vecchia, all belong to *C. quadriguttatus*, none of these showing the slightest variation in the elytral spots. It may be safely assumed that all British specimens with *distinct* spots are *quadriguttatus;* while those which are unspotted or merely have the shoulders and an indeterminate patch near the apex of each elytron a little lighter are, with rare exceptions, *dermestoides*. In some examples of *C. quadriguttatus* the basal or the apical spot is obsolete. Many of

the Scarborough specimens of *C. quadriguttatus* have the spots large and sharply defined, these examples resembling the normal continental form; Scotch examples are rarely so well marked."

The following new species of **Anaspis** (*vide* Vol. V. p. 74) has been described by Mr. Champion in the Entomologist's Monthly Magazine, Vol. ii. (New Series) p. 104 :—

Anaspis septentrionalis, n. sp. Elongate, black, the front of the head and the palpi flavo-testaceous, thickly and finely pubescent, the prothorax and the elytra very finely transversely strigose. Antennæ black, the three or four basal joints flavo-testaceous, filiform, in the male very elongate and slender, in the female considerably shorter, the penultimate joints in both sexes longer than broad, but much more elongate in the male than in the female; prothorax about one-third broader than long, bisinuate at the base, the hind angles rectangular; elytra with the transverse strigæ more distinct than on the prothorax; beneath black; legs comparatively slender—the anterior pair, including the coxæ, flavo-testaceous, with the tarsi slightly darker—the middle pair fusco-testaceous, with the tibiæ, except at the base, piceous or fuscous, and the tarsi, except at the base of the first and second joints, infuscate—the hind pair piceous, the extreme base of the tibiæ excepted—the tibial spurs testaceous, the anterior and middle tarsi slender in both sexes.

Male with the anterior tarsi very feebly dilated; anterior and intermediate tibiæ sinuate within, the anterior pair slightly curved inwards towards the apex. Third ventral segment elongated, produced in the middle behind, and furnished at the apex with two long laciniæ or appendages, these latter narrowly separated at base, almost straight, extending to the middle of the fifth segment, and becoming slightly divergent posteriorly, the space enclosed by them unimpressed; fifth ventral segment very deeply and abruptly emarginate at the apex, but not at all depressed in the middle in front of the emargination. Length (with the head extended) $3\frac{1}{2}$–$3\frac{3}{4}$ mm.

Two examples of this species were captured by Mr. Champion at Aviemore, Inverness-shire, in July, 1876.

Mr. Champion remarks that *A. septentrionalis* is closely allied to *A. frontalis*, L., but may easily be known from it by the more slender legs and antennæ and by the well marked male characters. The male of *A. frontalis* has the fifth ventral segment broadly excavate in the middle from the apex nearly to the base (this part being quite unimpressed in *A. septentrionalis*) and the apex much less deeply emarginate; the laciniæ very distinctly curved inwards at the apex; and the anterior tarsi strongly dilated (very feebly so in *A. septentrionalis*). The antennæ in the male of *A. septentrionalis* are very elongate and slender, the insect thus resembling *A. Garneysi*, Fowler, but this latter has the laciniæ strongly divergent and curved and enclosing a large broad space;

the anterior tarsi are equally slender in these two species, and only very feebly dilated in the male; in the female of *A. septentrionalis* the intermediate legs are a little darker than in the male. The different male characters, &c., distinguish it from *A. pulicaria*, Costa, and *A. nigripes*, Bris., and the non-moniliform antennæ from *A. rufilabris*, Gyll, and *A. melanostoma*, Costa (for these species, see Vol. V. p. 75–77.)

Oviposition of **Metœcus** (Rhipiphorus) **paradoxus**, L.—On page 82 of Vol. V. will be found an account by Dr. Algernon Chapman of the life history, as far as known, of *M. paradoxus;* the questions, however, of oviposition, of the hatching of the young larva, and its means of reaching the wasps' nest, are left undetermined; in the Entomologist's Monthly Magazine, however, for January, 1891, Vol. ii. (New Series) p. 18, Dr. Chapman again takes up these questions, concerning which he has during the past year made several important discoveries. I may add that Dr. Chapman sent to me, together with the article, several valuable drawings of the eggs as laid, &c.; his observations are so interesting that it is best to quote them at length:—

"Failures are often as instructive as successes, and have, in this case, led up to the trifling successes I have at length reached, so that I am sorry to have kept no record of what I did in the matter at various times in recent years. I did, however, obtain examples of the beetle in greater or less numbers, and treated them in various ways, placing them with earth, sand, various plants, flowers, etc., but always with the result that in a few weeks at furthest they died, without either ovipositing or showing any desire to hibernate. I, however, came to, or was confirmed in, the conclusion that the eggs were laid in autumn, and that the beetles did not hibernate, partly from the death of the beetles, partly from the females always being full of eggs fully matured. I have never succeeded in finding a free larva in the wasp's nest, whence I conclude that they are introduced one by one, and very quickly bury themselves in a wasp grub; whereas, did the beetle hibernate, the female would lay many eggs in a nest, and the young larvæ would certainly be often met with. The female contains so many ova (though not so many as *Meloë*) that it is obvious that the great mortality of the species occurs between oviposition and the safe arrival of the larva into the interior of the wasp grub, especially as after that date the mortality is *nil*. If the egg were laid in the nest, this would not be so.

"Thinking out these matters, I this year (1890) enclosed a number of freshly disclosed beetles in a sunny place, with portions of dead and rotten wood, as well as some flowers. I was lucky enough on two occasions to see the beetles *in cop.*, proving certainly that pairing occurs in autumn, and afterwards I observed several females, fertile or otherwise, searching the crevices of the wood with their extensive ovipositors, and at times quietly resting with the ovipositor nearly out of sight,

buried in the cracks of the wood. This clearly proves that the eggs are laid in autumn.

"That a cavity in dead or rotten wood is the natural place of oviposition is not proved, but is rendered in the highest degree probable, when it is remembered that no other arrangement that I previously tried had any success in inducing oviposition. It becomes further, therefore, probable that the mite-like young larvæ are met with by the wasps in collecting the wood shavings for nest building, probably usually one at a time, and a nest contains a succession of *paradoxus*, because the same post or stick over which the beetle larvæ are wandering, is constantly frequented by the wasps of that nest, whilst those of other nests, free from *Rhipiphorus*, do not happen to have visited such a post. Though my observations will well bear refutation or confirmation, there remains really only one matter still unknown, and that is;—When do the eggs hatch? From the delicate nature of the eggs I incline to believe that the young larva is developed in the autumn, but hibernates unhatched within the egg-shell. Those eggs that I found laid in the wood cavities were either infertile or injured by my examination, or they went mouldy instead of developing. Whether any I did not disturb may have been more lucky will not appear till next spring, but I much doubt it.

"The eggs are spindle-shaped, 0.47 mm. long and 0.2 mm. in diameter, of a pure milk-white, and are laid somewhat irregularly, but with a tendency to be packed closely side by side. Mr. Fowler appears to entertain the idea that the egg is laid in the wasp cell; this may justify my stating two reasons why this would be extremely improbable, even if I had not otherwise rendered it practically certain that the actual habit is very different. First, a personal reason; I have met with hundreds of *Rhipiphorus* in all stages, only once as a free larva, but abundantly within the wasp larva, and at all stages forward to the perfect beetle, but have never seen any indication of an egg within the cell. Secondly, the wasp develops with extreme rapidity, yet the *Rhipiphorus* keeps up with it, or, indeed, overtakes it; there would thus be really no time for the development of the young larva within the egg, even were it as rapid as is at times the case in *Chrysis*. The nature of the ovipositor, egg, and young larva, nevertheless, plainly indicates that the larva must take some time to mature in the egg, and that the species is not viviparous."

The characters given for the family *Anthicidæ* on pages 3 and 83 of Vol. V. apply to the British species only: in *Mecynotarsus*, Laf., the penultimate joints of the tarsi are not bilobed, and the eyes are larger in proportion than in *Notoxus* and *Anthicus*. I am indebted to Mr. Champion for kindly sending me a specimen of *M. serricornis*, Panz. (*rhinoceros*, F.) taken by Mr. J. J. Walker at Besika Bay: it is about $1\frac{1}{3}$ mm. in length and resembles a minute *Notoxus*.

Phlœophthorus rhododactylus, Brit. Cat. Vol. v. p. 423.—Just after the last sheets of the *Scolytidæ* had gone to press I received the following communication from Mr. W. F. Blandford, and am glad to have the opportunity of inserting it:—

"I find that in the two European species of *Phlœophthorus,* Woll., namely *P. rhodolactylus,* Marsh., and *P. spartii,* Nörd., there has been confusion of nomenclature. The insect called abroad *P. spartii* is our v. Marsham's *P. rhodolactylus* (its proper and prior name); while the *P. rhodolactylus* of the Continent is unknown here and does not really possess any separate name at all.

"The proper synonymy will be as follows:—

"*Phlœophthorus rhododactylus.—Ips rhododactylus,* Marsham, Ent. Brit. Col. p. 58.

"*H. rhododactylus,* Gyll. Ins. Suec. iv. 619 *nec.* Ratzeb; Chapuis; Eichhoff.

"*Phlœophthorus perfoliatus,* Woll. Ins. Mader. p. 301. Pl. 6, Fig. 1.

"*Hylesinus spartii,* Nörd. Stett. Ent. Zeit. 1848, p. 250.

"*Hylesinus tarsalis,* Foerst. Verhandl. Nat. Ver. Rheinl. 1849, 383.

"*Phlœophthorus spartii,* Chapuis, Eichhoff, etc.

"*Phlœophthorus Chapuisii,* mihi.

"*H. rhododactylus,* Ratz., Forstius. I. p. 178. Pl. 7, Fig. 13.

"*P. rhododactylus,* Chapuis, Synopsis, p. 43. 2. v. Thomson, v. Eichhoff, v. Lowendal.

"I hope to publish a note of this in one of the foreign papers. If you have time to get in the synonymy at all into your book it would be convenient.

"I may add that I have seen the original specimens in Kirby's collection from which Marsham described his."

It is evident that a considerable amount of work yet remains to be done among the Scolytidæ, and we may hope that Mr. Blandford will be enabled to clear up many more doubtful points regarding them.

In the Biologia Centrali-Americana, Coleopt. Vol. iv. Dr. Sharp is doing work on the Rhynchophora of Central America which will help to clear up several unsatisfactory points in our present classification of the group: I have only had the opportunity of seeing a small portion of this work (Pt. 3, March 1891, pp. 81, *et seqq.*); the following remarks regarding the sub-fam. Otiorrhynchinæ are of general interest:—

"The family is defined in a satisfactory manner by the existence of a scar on each of the mandibles, due to the detachment of a peculiar pair of cutting instruments, supposed to be used by the insect for freeing itself when emerging from the pupal stage (*vide* Vol. V. p. 170). I propose to divide the family into two divisions, consisting (I.) of the apterous, (II.) of the winged Otiorrhynchinæ.

"Series *Otiorrhynchinæ apterœ*.—Alæ rudimentariæ.—Metanotum membraneum.

"These important characters divide the Otiorrhynchinæ in a natural manner, and though they cannot be directly observed without breaking up the specimen, as the elytra are frequently more or less soldered together in the apterous forms, yet it is very easy to distinguish the members of the two groups by external minor characters. In the *Otiorrhynchinæ apterœ* there are no prominent shoulders to the elytra, the exposed portion of the scutellum is usually very minute, and scarcely penetrates at all between the exposed parts of the wing-cases: the metasternum is always short, and the part of the mesothoracic episterna left uncovered by the elytra is small or moderate in size; although this latter point is very variable it is of great assistance in separating the insects of the two groups, and indeed was made use of by Horn as a means of dividing the family.

"In the *Otiorrhynchinæ alatæ* the shoulders of the elytra are distinct and stand out more or less laterally, the tip of the scutellum separates the exposed bases of the elytra, the metasternum is either elongate or short, and the uncovered part of the mesothoracic episterna either moderate in size or large."

The results of Dr. Sharp's work on the Rhynchitidæ and Attelabidæ have already been referred to (p. 102), and we may be certain that great light will be thrown upon the Rhynchophora generally by his present researches; as far, however, as our fauna is concerned the Classification adopted in the present volume will be found to be of use for all practical purposes, except, perhaps, in the case of one or two obscure families or genera for which it is hard to find characters at once distinctive and obvious.

INDEX TO VOL. V.

GENERAL INDEX
TO FAMILIES, GENERA, ETC.

THE END.

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