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SERAFIN DE VHAGON

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MUR

MONOGRAPH

OF



THE GENUS CATOPS.

BY

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SERAFIN DE UHAGON

[From the ANNALS AND MAGAZINE OF NATURAL HISTORY for
July 1856.]

MONOGRAPH OF THE GENUS CATOPS.

By ANDREW MURRAY, EDINBURGH*.

NOTWITHSTANDING Mr. Spence's able Monograph of the British species of this genus, and the excellent works of Erichson, Sturm, Redtenbacher, Kraatz and others, its study is still attended with so much difficulty, that I imagine the following attempt to clear up the synonymy, and to make the species more easily recognizable, will be welcome, particularly to British entomologists.

When I commenced my examination of the genus, with a view to publishing the results, I applied to my entomological friends for their assistance both in the way of information and communication of specimens, an application which was cordially responded to. I have thus had the advantage of carefully examining Mr. Waterhouse's collection, which I believe to be the best representative of the Spencian species extant;—the determination having been submitted to and approved by Mr. Spence himself, with this qualification, that he (Mr. Spence) had described some of his species from specimens belonging to others, to whom they had been returned, so that the type specimens

* Read before the Royal Physical Society of Edinburgh, Jan. 1856.

were scattered, and the certainty of accuracy derivable from the actual comparison of specimens with the types was in these instances no longer attainable. It is on the faith of Mr. Waterhouse's collection therefore that I principally depend for the identity of the names with the species described by Spence, where the descriptions themselves have failed me.

From Mr. Stephens's collection now in the British Museum I have in like manner endeavoured to identify the species described by him, and as his specimens of Spence's species in a majority of instances correspond with Mr. Waterhouse's, they so far confirm the authority of that gentleman. I have further had the advantage of examining the species in the Jardin des Plantes;—those of M. Lucas and of M. Chevrolat (who left the whole of his large collection of *Catops* for months in my hands), and those of M. Fairmaire, M. Javet, and other French entomologists. To M. Kraatz of Berlin, whose elaborate and admirable revision of the European species of the genus shows the attention he has bestowed upon the subject, I owe especial thanks. Besides favouring me with his opinion upon my ideas, he has furnished me with a nearly complete series of his species, and entrusted those he could not spare to me for examination, so that I have in general the advantage, when speaking of any view entertained by him, of knowing with certainty the identity of the species under discussion. In relation to the North American species I beg particularly to record my obligations to Dr. Leconte of Philadelphia, Dr. Asa Fitch of Salem, and Mr. Calverly of New York. To our British entomologists, Dr. Power, Mr. J. T. Syme, Mr. Hislop, Rev. W. Little, Rev. Hamlet Clark, Mr. Guyon, Mr. Bates, Dr. Lowe and others, I also owe many thanks. They have entrusted to me the whole of their species for as long a period as I chose to retain them, and the whole of the gentlemen I have named have liberally placed their duplicates at my disposal. I take this opportunity to tender to each of them individually my best thanks for their kindness.

With this acknowledgement of my obligations and explanation of the sources of my information, I shall now in the first place cast a rapid glance at what has been done by previous authors, first in the European species and afterwards in the exotic; I shall then give detailed descriptions of all the different species which have been described or have come under my notice (among which will be found one or two new species), and lastly conclude by giving a short dichotomous table of the characters of the European species of the genus.

The species which compose this genus were scattered by ancient authors among several other genera. DeGeer placed one species under *Dermestes*, and Geoffroy another under *Silpha*.

Fourcroy placed the only one he knew under *Peltis*, Panzer under *Helops*, Fröhlich under *Luperus*, Fabricius under *Cistela* and *Hydrophilus*, Marsham under *Mordella*, and Linnæus (possibly) under *Chrysomela*. Latreille was the first who, in his 'Précis des Caractères Génériques des Insectes,' established the genus under the name of *Choleva*. This was in 1802, and about two years after it was also recognized first by Paykull, and afterwards by Knoch, who each gave it another name—Knoch that of *Ptomaphagus* which was adopted by Illiger, and Paykull that of *Catops* which was adopted by Fabricius, and has been retained by most subsequent authors. By the rule of priority therefore the name should be *Choleva*, but I am glad that I have a sufficient apology for not disturbing the almost universally adopted name of *Catops*. Latreille himself appears at first only to have applied his name to one section of the genus. This appears from his 'Histoire Naturelle des Crustacés et des Insectes,' where in speaking of his constituting the genus, he says, "Its appearance, says Geoffroy, resembles that of the *Mordella*, that is to say, it has long legs with which it walks as if it limped. It is from that character that I have taken my generic denomination: *Choleva* in Greek means 'lame.'" The long legs here referred to apply to the first section of the genus, which was subsequently erected into a separate genus by Stephens, and may, I think, be properly maintained as a subgenus, to which Latreille's name may be restricted.

The number of species at first described was small. Latreille in his 'Hist. Nat.' only describes three, and in his 'Genera Crustaceorum et Insectorum,' published in 1807, he describes five. He there breaks the genus into two groups, one corresponding to the subgenus *Choleva*, of which he describes the species *agilis* and *angustatus*, auct., and the other including the rest of the genus.

Gyllenhal in 1808 published six species in the first volume of his 'Insecta Suecica.'

It is unnecessary to enter into any examination of the synonymy of the species described by these authors. Their descriptions are for the most part too vague and applicable to too many species subsequently described to allow us to rely greatly upon them. Gyllenhal in his 4th volume, which was not published till 1827, acknowledges that in his 1st volume he had included five different species under one name.

Mr. Spence was the first author who brought the genus into something like order.

In his Monograph (published in the Linnæan Society's Transactions in 1815) he divided the genus into three main

sections, dependent upon the antennæ being filiform or clavate, the posterior angles of the thorax obtuse or acute, and the elytra striate or not striate; the dilatation or non-dilatation of the first article of the middle tarsi in the males was also made a subordinate character. Of these, the first and last are the only ones which have been adopted as sectional characters by subsequent authors; but the form of the hinder angles of the thorax, although not a good sectional character by itself, will, I think, if taken in conjunction with the base of the elytra, be found to furnish good characters for natural subdivision. Mr. Spence groups his species under the above sectional characters (to each of which I shall attach the synonym now most in use) as follows, viz. :—

* *Antennæ subfiliform; posterior angles of thorax obtuse* (= Subgen. *Choleva*, Steph.).

C. oblonga = *angustata*, Fab., Erich.

C. agilis = *agilis*, Ill., Erich.

** *Antennæ clavate; posterior angles of thorax acute; elytra for the most part striated* (= Subgen. *Catops*, Steph.).

(*Anterior thighs for the most part thickened at the apex in the males, and first article of middle tarsi dilated.*)

a. *Basal margin of thorax excised near the angles.*

C. nigricans = *nigricans*, Erich.

C. sericea = *fuscus*, Panz., Erich.*

* Erichson, and after him Kraatz, give *C. picipes*, Fab., as the synonym of Spence's *sericea*, but I think this is a mistake. The description better accords with *fuscus*, and I believe that *picipes* has not yet been found in Britain. I recorded it in my 'Catalogue of Scottish Coleoptera' as found by myself in Scotland, but I am now satisfied that the specimen on which I relied was only a large variety of *nigricans*. If Erichson formed his opinion of the synonymy from not finding any other probable representative of *picipes* among Spence's species, the circumstance of its not being British explains how this may be. If he judged from Spence's description, he may have been misled by the commencing words used by Spence, "Body broader and more convex than in its congeners," which he might apply to *picipes*, which is the largest species in the genus; and by Spence's next words, "shorter than the preceding," viz. *nigricans*, he might have supposed him to mean less elongate in form, which *picipes* is, although certainly not actually shorter—it being longer. The only other resemblance to *picipes* is the black elytra; but Paykull's description of his *C. sericeus*, to which Spence refers as in all other respects identical with his, corrects this incongruity, for Paykull states the elytra of his species to be obscure testaceous. In Stephens's collection *sericea* is represented by a pale variety of *chrysomeloides*.

*C. tristis** = — ?

C. festinans† = — ? (possibly *grandicollis*, Erich.).

b. *Thorax with the basal margin straight near the angles.*

C. chrysomeloides = *chrysomeloides*, Panz., Lat., Sturm.

C. Leachii‡ = *tristis*, Erich.

C. Kirbii§ = *rotundicollis*, Kellner.

C. Marshami|| = — ? (either *morio*, Erich. or *nigrita*, Erich.)

C. dissimulator¶ = — ? (probably *morio*, Erich.)

*** *Antennæ clavate* ; *posterior angles of thorax acute* ; *elytra not striated.*

(*Anterior thighs alike in both sexes, the middle tarsi with the first joint rarely dilated.*)

C. villosa = *sericeus*, Fab. (*villosa*, Lat.) (*Ptomaphagus truncatus*, Steph.)

C. velox = *velox*, Erich.

*C. fumata*** = — ? (probably *scitulus*, Erich.)

C. Watsoni = *fumatus*, Erich.

C. anisotomoides = *anisotomoides*, Sturm.

C. Wilkinii = *præcox*, Erich.

C. brunneus = *Colon* (*Mylæchus*) *brunneus*, auct.

* No species has puzzled British entomologists more to identify than this. The prominence given by Spence and Stephens to the clavate form of the antennæ, and Spence describing it as bearing a close general resemblance to *chrysomeloides*, has had the effect of making most of them attempt to find a representative for it out of narrow-clubbed and small varieties of *chrysomeloides*—and accordingly it is generally so represented in British collections—an error which I have seen continental entomologists fall into in like manner. I cannot ascertain to my own satisfaction what the species was which Spence had in view in describing this. Mr. Waterhouse had adopted the usual British view, but Stephens has his *tristis* wholly represented by *fuscus*, Erichs.

† This species is stated by Erichson and Kraatz to be a synonym of *fuscus*, but from what I have already said in the note upon *sericea*, it appears to me that that synonym is preoccupied. Mr. Waterhouse has not this name represented in his collection. In Stephens's it is represented by two specimens of *tristis* and one of *grandicollis*. Little can be made out from Spence's description.

‡ Represented wholly by *tristis* in Mr. Waterhouse's collection, and in Stephens's collection by two specimens of *tristis* and two of *grandicollis*.

§ Represented by *rotundicollis* both in Waterhouse's and Stephens's collections.

|| Mr. Waterhouse has this represented by *morio* ; in Stephens's collection it is represented wholly by *chrysomeloides*.

¶ Given as a synonym of *morio* by Erichson. Represented by *tristis* in Waterhouse's collection, and by three specimens of *grandicollis* and one of *nigrita* in Stephens's collection.

** This name (*fumata*) has been universally applied to the species commonly known as the *fumatus* of Erich. and other authors, but a comparison

The next author who went over the genus was Stephens. As he finally left it in his *Manual*, it contains all Spence's species, besides five of his own, and three which had been described by Mr. Newman in the 'Entomological Magazine,' between the commencement of the appearance of his 'Illustrations' and the publication of his 'Manual.'

The following is the result of my examination of the species standing named in his collection in the British Museum, viz. :—

- Ptomaphagus truncatus* = *C. sericeus*, Panz. (*truncatus*, Illig.)
- *velox* = *velox*, Spence.
- *fumatus* = *fumatus*, Erich.
- *Watsoni* = *fumatus*, Erich., and *scitulus*, Erich., mixed.
- *anisotomoides* = *anisotomoides*, Spence.
- *Wilkinii* = *præcox*, Erich.
- Catops nigricans* = *nigricans*, Spence.
- *sericea* = pale variety of *chrysomeloides*, Spence.
- *tristis* = *fusca*, Erich.
- *festinans*, represented by two specimens of *grandicollis*, Erich., and two of *tristis*, Erich.
- *affinis* = *nigrita*, Erich.
- *chrysomeloides* = *chrysomeloides*, Spence.
- *Leachii*, represented by two specimens of *grandicollis*, Erich., and two of *tristis*, Erich.
- *Kirbii* = *rotundicollis*, Kellner.

of Spence's description of it and his next species, *Watsoni*, shows that the latter is what is now known as *fumatus*, and that the former is most probably *scitulus*, Erich. In his description of *Watsoni* Spence says, "In colour this species does not much differ from the preceding, but is furnished with other characters strikingly distinctive. The antennæ are shorter and thicker" (which is the case in the true *fumatus*). He also gives the last joint as pale, while he says nothing of this distinctive character in describing the preceding species. The rest of the description also corresponds with the view I have taken. I am perhaps wrong in using the expression "*true fumatus*." The *true fumatus* should by the rule of priority be what Spence had under his eye when he described it, but I think we are getting out of all bounds in our stickling for priority. If an author describes a species so loosely that it cannot be recognized from his description, so that subsequent authors misapply or ignore his name, while on their part they give a recognizable description, I cannot see on what principle of justice or propriety we are to be called upon to hold by the unrecognizable name instead of the recognizable, nor why an author (be he living or dead, or great or small) should be allowed to supplement his inadequate description by a reference to the typical specimens in his cabinet from which the descriptions were taken,—a practice now in vogue, against which I take this opportunity to enter my protest. Notwithstanding the claims of priority therefore, I do not propose to invert or disturb the generally adopted names of *fumatus* and *scitulus*. I have pointed out how the case obviously stands, and I leave to the advocates of priority the responsibility of introducing the confusion to which I demur.

Ptomaphagus Spencei=*rotundicollis*, Kellner.

— *fulvicollis*=*velox*, Spence.

— *Marshami*=*chrysomeloides*, Spence.

— *dissimulator*, represented by three specimens of *grandicollis* and one of *nigrita*.

Choleva angustata=*angustata*, auct.

— *gomphoita*= ditto.

— *agilis*, represented by three specimens of *agilis* and two of *angustata*.

The other species, or names of species, given in his Manual are not represented in his collection.

I have not had an opportunity of seeing typical specimens of Mr. Newman's three species, *frater*, *soror*, and *nubifer*; but my friend the Rev. Wm. Little has in his collection specimens which had been named by Stephens as being the two latter, and if we may take that as an indication, we find that *soror*=*nigricans* and *nubifer*=*velox*.

Erichson's 'Käfer der Mark Brandenburg' followed in 1837. His division differs from that of Spence. It is as follows, viz. :—

Characters of the first division :—

"*Mesosternum simple (without keel); body oblong; antennæ and legs long and thin, the former scarcely thickened at the point; legs slender; tarsi of fore-feet dilated in the males, tarsi of middle feet simple in both sexes.*"

This division corresponds to Spence's first section (Stephens's *Choleva*); and Erichson only records two species found in Mark Brandenburg as belonging to it, viz. *angustatus* and *agilis*.

The characters of his second division are—

"*Mesosternum simple; tarsi slender, and anterior tarsi and first joint of middle tarsi dilated in the males.*"

These characters place the following species in this section, viz. *C. fuscus*, *umbrinus*, *picipes*, *nigricans*, *grandicollis*, *tristis*, *nigrita*, *fuliginosus*, *morio*, *fumatus*, and *scitulus*, of which *grandicollis*, *fuliginosus*, and *scitulus* are given as new. *Fuliginosus* is said by Kraatz to be a variety of *nigricans* (though, from the description alone, I should not have supposed this), and *scitulus*, as already mentioned, had been described by Spence under the name of *fumatus*. Erichson does not record *chrysomeloides* as found in Mark Brandenburg, but from the differences which he points out between it and *tristis*, I am not sure but some confusion exists even in Erichson relating to *tristis*.

His next division is characterized thus :—

"*Mesosternum simple; body oval; antennæ somewhat thickened at*

the point; tarsi slender; anterior tarsi widened in the males; middle tarsi simple in both sexes."

Velox and *præcox* (Spence's *Wilkinii*) are Erichson's only species falling under this division.

The last division has the

"Mesosternum keeled; tarsi strong; anterior tarsi in the males very broad, widened in the middle in the females; middle tarsi of both sexes equal."

The only species recorded by Erichson is *sericeus* (*truncatus*, Illig. and Steph.).

The above list is instructive both negatively and positively, both for what it does and for what it does not contain. Erichson was celebrated not only for his marvellous acumen in distinguishing species, but also for his success in collecting and for the extent of his collection. Mark Brandenburg too may be taken as fairly representing the rest of Northern Germany; and unless where the species are of a local character, we may pretty safely assume that the same species which occur in Mark Brandenburg will be found in the rest of Northern Germany. These premises should teach us to use great caution in admitting any new species from that district not described by Erichson, as they lead to the probable conclusion, first, that such new species might have been already found in Mark Brandenburg; secondly, that Erichson might have seen them; and lastly, might not have considered them distinct. Of course I do not make any further use of the great weight of his opinion, than to bespeak caution in determining upon such new German species as he has passed over.

Sturm next took up the group in his 'Deutschlands Fauna' in 1839. He added two new species to the first group (*Choleva*)—*spadiceus*, Dahl. *in litt.*, and *castaneus*, Andersch. *in litt.*—both of which have been adopted by subsequent authors, although, for reasons which I shall afterwards give, I think the latter is only a variety of *angustatus*. He also added the *badius* of Meg., the *brunneus* of Knoch, and the *anisotomoides* of Spence to the list of species found in Germany.

In 1841 Prof. Heer (in his 'Fauna Helvetica') described besides most of those already known, two new species, *montivagus* and *ambiguus*, and reproduced the *alpinus*, Gyll. The descriptions of the two former are too short and vague to allow of their being satisfactorily identified from the book, and I have not seen authentic specimens. M. Kraatz in his revision also states, that he has been unable to make them out, but holds that the *alpinus* of Gyllenhal has been rightly revived.

Several detached descriptions of individual species also appeared from time to time.

In 1832 a species from the Morea was described by Brullé in the 'Expédition Scientifique de Morée' under the name of *C. humeralis*, which seems to belong to the subgenus *Choleva*.

Chaudoir (Bulletin de Moscou, 1845, iii.) described two new species as being found in the neighbourhood of Vienna, *longipennis* and *sericatus*. M. Kraatz does not consider these to be distinct species, but joins them respectively to *nigricans* and *sericeus*.

Kellner in 'Stettin Ent. Zeit.' 1846, No. 6, described four new species, *C. longulus*, *rotundicollis*, *coracinus*, and *subfuscus*. As already mentioned, *rotundicollis* is the *Kirbii* of Stephens. Kraatz observes that *subfuscus* is not distinguishable from *alpinus*, Gyll.; and from a specimen of *longulus* submitted to me by M. Kraatz, I am satisfied that it is only a variety of *tristis*.

Rosenhauer (Beiträge zur Insectfauna Europas) in 1847 described *C. abdominalis* (considered by Kraatz to be a variety of *tristis*) and *C. varicornis*, which, although very close to *sericeus*, appears to be a good species.

Redtenbacher in his 'Fauna Austriaca' (1849) gives a synopsis of the species of the genus, but without adding any new species. Dr. Aubé in 1850 added *C. meridionalis* and *quadraticollis*, besides *Catopsimorphus orientalis*, to the list. All three appear to be good species.

The only works remaining to be noticed are M. Kraatz's revision of the genus published in parts in the 'Stettin Ent. Zeitung' in 1852, and the 'Faune Entomologique Française' now in course of publication by MM. Fairmaire and Laboulbène. Although the latter work is subsequent in date, I shall notice it first; partly because none of M. Kraatz's new species are to be found in it, and partly because M. Kraatz's revision contains a full summary of all the European species hitherto described, and is therefore well suited for closing this part of my paper.

The authors of the 'Faune Ent. Franç.' adopt the name *Choleva*, Lat., in deference to priority, instead of *Catops*. They do not introduce any new species. They adopt the four subdivisions laid down by Erichson, and in addition attempt to break up the second subdivision into smaller sections. These subdivisions are—

1. "Posterior angles of corselet obtuse," in which they place *C. picipes*, *grandicollis*, and *alpina*.
2. "Posterior angles of corselet right-angled, more or less pointed," containing *C. fusca*, *morio*, *nigrita*, *quadraticollis*, *tristis*, *chrysomeloides*, *rotundicollis*, and *fumata*.
3. "Posterior angles of corselet pointed, a little produced behind," which contains *umbrina*, *nigricans*, and *scitula*.

These divisions appear to me to group the species in too unnatural a manner to be of service even as an artificial mode of

arrangement in facilitating the determination of species. For instance, *picipes* in the first section has most affinity with *nigricans* in the third, *grandicollis* in the first with *tristis* in the second (indeed I propose to show presently that they are the same species); and *alpina* in the first has very close affinity with *fumata* in the second, and *scitula* in the third should join them. *Umbrina* undoubtedly ought to go beside *velox*, which is not in this section at all;—Erichson's character of the dilatation of the first joint of the middle tarsi in the males separating them. Their affinity otherwise however is so great, that I think that character must be disregarded to allow these species to take their proper place beside each other.

I now come to Kraatz's revision, in favour of which I cannot speak too highly. I differ from him in opinion in one or two instances, but wherever I do so I must beg the reader to take my opinion with caution and examine it with suspicion, as the well-known acumen and accuracy of that gentleman stamp his views with a *primæ facie* authenticity which only very strong evidence can overthrow.

He divides the genus into five sections, the first three and the last of which are Erichson's; the fourth is new.

In the first section he has *spadiceus*, a new species which he calls *intermedius*, *angustatus*, *castaneus* (or *cisteloides*, Fröhl.), and *agilis*. In speaking of Sturm I have already expressed my opinion that *castaneus* and *angustatus* were varieties of the same species, and I cannot come to a different opinion as regards *intermedius*. When I go over the species *seriatim*, I shall give my reasons for this as well as for any similar views I may have adopted regarding other species.

In the second section he includes *acicularis* (a new species, which from the description seems distinct, but which I have not seen in nature), *umbrinus*, *fuscus*, *picipes*, *meridionalis*, *nigricans*, *coracinus*, *morio*, *nigrita*, *grandicollis*, *chrysomeloides*, *longulus*, Kelln. (which, as already mentioned, I think only a variety of *tristis*), *tristis*, *rotundicollis*, *neglectus* (a new species nearly allied to *tristis*), *alpinus*, *fumatus*, *brevicollis* (a new species which I have not seen, but which appears from the description to be good), and *scitulus*.

The third section is confined to *velox*, *badius*, *præcox*, *brunneus*, and *anisotomoides*.

The fourth section is characterized as follows, viz. :—

“*Mesosternum* feebly keeled; body oblong, smooth and shining; antennæ strong, scarcely thickened towards the point; difference of sexes unknown.”

This section is erected by Kraatz to receive a single species

named by him *lucidus*, and described from a single specimen found in Dalmatia.

The fifth section has received the greatest increase. Hitherto it had only contained the two species *sericeus* and *varicornis*, but Kraatz has added three new species, *strigosus*, *validus*, and *colonioides*. I have not seen *validus*, but the others appear to me good and distinct species.

Catopsimorphus orientalis he retains as forming a separate genus.

The number of exotic species which have been described is not great.

M. Motschoulsky described a species from Georgia, *C. pusillus*, in the Bulletins of the Imperial Society of Moscow for 1840.

Kolenati described in the 'Meletemata Ent.' a species, *C. fungicola*, from the Russian Province of Elisabethopoleos.

Menetries described a species (*C. pallidus*) from Bakon in the Caucasus in his 'Catalogue raisonné des Objets de Zoologie recueillis dans un voyage au Caucase,' &c. He also described in the Mem. Acad. Imp. Sciences de St. Pétersbourg, 6 sér. vi. 1849, two species, *C. lateritius* and *C. fuscipes*, found at Novaia Alexandrovskaiia.

Three species from Algeria, *C. marginicollis*, *C. celer* and *C. rufipennis*, have been described in 1849 by M. Lucas in the 'Exploration de l'Algérie.'

One species, *C. australis*, from Van Diemen's Land, has been described by Erichson in Wiegmann's 'Archiv für Naturgeschichte,' 1842.

The North American species hitherto described are *C. basilaris*, *C. opacus* and *C. simplex*, described by Say in the Journal of the Academy of Philadelphia, vols. iii. & v.; *C. Spenciana* described by Kirby in the 'Fauna Bor. Americ.'; *C. cadaverinus*, *C. Frankenhauseri*, *C. cryptophagoides*, *C. brunnipennis*, and *C. luridipennis* described by Mannerheim in the 'Bull. of the Imp. Soc. of Mosc.' in 1843, 1852 & 1853; *C. terminans* described by Leconte in Agassiz's 'Lake Superior,' and *C. clavicornis*, *C. californicus*, *C. strigosus*, *C. consobrinus*, *C. oblitus* and *C. parasitus*, described by the same author in the 'Proceedings of the Academy of Philadelphia,' 1853.

So much for the past history of the genus. We shall now proceed to the examination of the different species *seriatim*.

In doing so I shall first take the European species of each section, and then give the descriptions of the exotic species. I shall not attempt to intercalate the latter among the European species, because there are a number which I have not seen. I shall content myself with classing them according to their geographical distribution.

Genus CATOPS.

Mentum square, transverse, a little narrowed in front. Ligula of the breadth of the mentum at its base, widened and deeply emarginate in front. *The internal lobe of the maxillæ terminated by a corneous nail or hook. The maxillary palpi* decidedly larger than the labial; *their third article formed like a reversed cone, the fourth much more slender, conic and acuminate.* The third article of the labial palpi oval, a little longer than the second. Mandibles short, furnished with a molar tooth at their base, arched, sharp at the end and unidentate before their summit. Labrum short, rounded, and a little sinuated in the middle in front. Head declining, obtuse in front. Eyes nearly rounded, moderate in size and not prominent. *Antennæ* at least of the length of the thorax; their first six articles of variable length, subcylindric, the last five forming a club, which is sometimes so elongated and slender as to be scarcely observable, and sometimes very distinct; *the eighth joint shorter than the seventh and ninth.* Prothorax of variable form. Elytra oblong or oval, arched above. Legs long and slender, the first four joints (and more especially the first two) of the anterior tarsi, and sometimes the first joint of the intermediate tarsi, dilated in the males and provided with brushes of hair below. Mesosternum sometimes keeled. Body oblong or oval, clothed with a very fine silky pubescence*.

The first division which I shall adopt is the same as Erichson's, and I preserve Latreille's name *Choleva* for it as a subgenus; but I shall drop the dilatation of the anterior tarsi and the first joint of the middle tarsi in the males as a character.

It is a detraction from any character that it requires an examination of both male and female to recognize it; and although the character is perfectly true in this group, it cannot be used in contrast to the subsequent divisions which I am going to propose, as in them exceptions to such a rule occur. I think the following short characters sufficient.

Group I. (Subgenus CHOLEVA.)

Mesosternum not keeled; body oblong; antennæ almost filiform; legs long and thin, posterior trochanters more or less developed in the males.

1. *C. angustatus*, Fab.

Cistela angustata, Fab. Syst. El. ii. 20. 23.

— *agilis*, Fab. Syst. El. ii. 20. 27.

* This description of the characters of the genus is copied with some modifications from that given by Prof. Lacordaire in his admirable work the 'Genera des Coléoptères.'

Catops elongatus, Payk. Faun. Suec. i. 345. 3; Gyll. Ins. i. 281. 6.

Ptomaphagus rufescens, Illig. Käf. Pr. 87. 1.

Catops rufescens, Duft. Faun. Aust. iii. 72. 1?

Choleva oblonga, Lat. Gen. Crust. et Ins. ii. 27. 1; Spence, Linn. Trans. xi. 138. 1.

Catops angustatus, Erich. Käf. d. Mark Brand. i. 233. 1; Sturm, Deutschl.

Faun. xiv. 5. 1. taf. 272. M. m; Heer, Faun. Helv. i. 378. 1; Redtenb.

Faun. Aust. 143. 4; Fairm. & Laboulb. Fn. Ent. Franç. i. 299. 1.

Oblongus, fuscus vel nigro-piceus; *thorace pastice non latiore*; elytris substriatis; antennis pedibusque ferrugineis.

Long. $2\frac{1}{2}$ lin.

A long thin species. The head dark, the parts of the mouth and the antennæ ferruginous; the latter about the length of the elytra, the eighth joint a little smaller than the ninth, the last joint long and acuminate. The thorax is variable in form, sometimes widest at the middle, as in fig. 1, sometimes widest a little before the middle, as in fig. 2, and sometimes widest at the very front, as in fig. 3, but *never widest behind*; sometimes a little

Fig. 1.



Fig. 2.



Fig. 3.



broader than long, and sometimes about equal in length and breadth. The sides are rounded. In some examples they are semitransparent or paler than the centre (and are then known as the var. *angustatus*). In others the edges are firm and concolorous (the variety *castaneus*). The posterior angles are nearly right-angled, more or less obtuse. The upper side is very densely and finely punctate in the males, less so in the females, and in both covered with a thin pubescence. The elytra are feebly striated, finely and densely punctate, with a fine pubescence, sometimes rounded, sometimes acuminate at the apex, sometimes wholly ferruginous, sometimes dark chestnut, paler round the borders. The under side is brown, the edges of the abdominal segments and sometimes the apex of the abdomen reddish. The legs ferruginous.

The trochanters and thighs of the hind legs are liable to considerable variation in form in the males. The following varieties are met with.

1. The trochanters are simple, and the thighs have a fine tooth below.

2. The thighs are simple, and the trochanters are armed with a sharp spike.

3. The thighs are simple, and the trochanters lengthened, formed like a gouge-chisel, convex outwards, concave inwards, but with the edge turned inwards at the point.

4. Both thighs and trochanters simple.

It will be seen from the above that I consider this a variable species, and that the variations I have above indicated are nothing more than different forms of the same species. Erichson was of the same opinion, for it was he who first observed and recorded the variations in the form of the trochanters of the hind legs, and in noticing them he remarks—"Of the males I have the following variations before me. These, one cannot with propriety refer to different species, when in all other respects the perfect examples agree." Other authors however have come to a different opinion, and have made distinct species of these different varieties, and as these authors are of high standing and their species have been very generally adopted, it will be right, I think, to give a copy of their descriptions, so that the reader may have before him the means of judging for himself.

I shall therefore quote the descriptions of them given by Kraatz, as being both the most recent and the most ample; but, in accordance with my own opinion, I shall rank them here only as varieties.

Var. *C. angustatus*, Kraatz.

Catops angustatus, Kraatz, Stett. Ent. Zeit. xiii. 401. .3

"Oblongus, piceus; *thorace minus dense et subtiliter punctato*, ante medium latiore, angulis posticis obtusiusculis, marginibus et angulis posticis dilutioribus; elytris substriatis, rufo-ferrugineis, versus suturam postice interdum infuscatis.

"Long. $2\frac{1}{2}$ lin.

"*Mas*, trochanteribus posticis plerumque scalpiformibus.

"*Fæm.* ? elytris apice acuminatis.

"The longest and narrowest species in this group. The antennæ are very slender, longer than the half of the body, *always entirely of a clear ferruginous colour*. First joint somewhat stronger and as long as the second; third nearly twice as long as the joints on each side of it (second and fourth); eighth only a little shorter than the seventh and ninth, which are equal in length; the last joint longer than the preceding, long, cylindrical, and acuminate. The head is blackish brown; the parts of the mouth ferruginous, abundantly and finely punctate. The thorax is a little broader than long, gently rounded at the sides, broadest before the middle, gradually narrowed towards the base, the posterior angles more or less feebly obtuse-angled; the basal margins are depressed for a moderate breadth, and somewhat bent

up, so that there is the commencement of a deepened line on each side. The upper side is covered with a moderately dense golden-yellow pubescence, and *tolerably abundantly and finely punctured, pitchy black, the outer edges and the posterior angles reddish brown*, with a more or less distinctly marked dorsal line, slightly impressed on both sides near the base. The elytra are only very feebly expanded, sometimes not wider than the base, pressed flat at the suture, slightly striated, finely and densely punctate, with a fine silken pubescence, ferruginous. The darker individuals are somewhat darker towards the apex near the suture. The legs are ferruginous red.

"Note I.—A not unimportant sexual distinction in this and the kindred species is afforded by the formation of the posterior trochanters. I have already (Stett. Ent. Zeit. xii. p. 284 ff.) expressed my opinion upon them, but by persevering investigations I am now able to add something to what has been already said, by way of completion. Male examples both of *C. angustatus*, Fab., and *C. cisteloides*, Fröhl. (*castaneus*, Sturm), occur with slightly developed simple acuminate posterior trochanters, with the difference however, that the trochanters in *C. angustatus* are narrower and longer than in *C. cisteloides*, and their point is far more acuminate. But there are moreover in both species males with very different, strongly developed trochanters. Nevertheless the principle of development is wholly different in the two species. The highest step of the development of the trochanters in the *C. cisteloides*, is that they are armed at the inner side with a projecting tooth more or less curved, and in the *angustatus*, that they are widened and lengthened into a gouge-chisel form; thus it is clear that a male of the *angustatus* can never come before us with a tooth at the inner side of the trochanter, it being impossible to form a transition-step to the gouge-chisel form.

"Note II.—I think I have found a second interesting sexual distinction of the females of the *C. angustatus*, F., in the single sharp acuminate posterior angles of the elytra. The specimens of Erichson (to be found in the Royal collection of this place (Berlin)) are represented as females of *C. angustatus*; in the same way a collection of females here agree perfectly with the males, but the latter have rounded elytra. One female taken at Cassels (alas, somewhat injured), which has been kindly surrendered to me by Herr Richl, has likewise acuminate elytra. A larger series of this generally rare species would be required to allow us to decide without doubt whether perhaps one of the species very similar to *C. angustatus* exists, of which the male likewise may have acuminate elytra. However, I consider this highly improbable.

"Note III.—From the near affinity of this species with the following species more minutely described by Sturm (*castaneus*, St.), is it surprising that I yet refer to this species the greatest part of those placed by Erichson under the *C. angustatus*, of the authors referred to by him, without subjecting to a more particular examination the descriptions given by them, and knowing whether or not they had the work of Sturm on *Catops* before them while engaged on their descriptions? Such an examination has been made as far as possible, and leads to the result that those authors who entered upon a more detailed description, such as Gyllenhal, Latreille, Spence, had mostly both species before them, as Gyllenhal without doubt appears to have had."

Var. *C. intermedius*, Kraatz.

C. intermedius, Kraatz, Stett. Ent. Zeit. xiii. 401. 2.

"Oblongus, fuscus; thorace postice angustiore, ante medium latiore, angulis posticis obtusiusculis; elytris substriatis coloribus; antennis pedibusque ferrugineis.

"Long. $2\frac{1}{2}$ lin.

"Mas, trochanteribus posticis scalpiformibus.

"In form this species occupies the middle place between *C. spadiceus*, Dahl., and *angustatus*, Fab.,—shorter and broader than the latter, less robust than the former; well distinguished however by its breadth. It is distinguished at the first glance from *C. spadiceus*, Dahl., by the thorax not being deeply and strongly punctured, as well as by its lighter colour. From *C. angustatus* it differs in the following points:—

"a. The whole beetle is shorter, more compressed, less equally broad than the *C. angustatus*, Fab.; the elytra in the middle somewhat bellied out.

"b. The antennæ are likewise uniform in colour, clear ferruginous red, but somewhat shorter and stronger, the eighth joint relatively shorter than in *C. angustatus*.

"c. The margin of the thorax is somewhat broader, and more bent upwards than in the *C. angustatus*, Fab.; it is also to be distinguished by the deepened lines on each side of the thorax. *The upper side is moderately finely and densely (coarsely-shagreen) punctured, ferruginous brown, occasionally somewhat darker in the middle.*

"d. The elytra are less equally broad than in the *C. angustatus*, Fab., in the middle somewhat bellied out, entirely of one colour, ferruginous brown.

"I have at least half-a-dozen females, but only one male before me, which with greater probability belongs to this species.

It has gouge-chisel-shaped lengthened trochanters in the hinder legs.

"This species has up to this time been collected in the island of Rugen (Erichson!), Königsberg (Hagen!), Leipzig (v. Kiesenwetter!), S. Wehlen (Märkel!), and Düsseldorf (Hildebrand!). It has also been taken in Austria. For the most part it is found under leaves. *C. angustatus*, Fab., is not rarely found under stones."

Var. *C. cisteloides*, Fröhl.

"*Luperus cisteloides*, Fröhl. Naturf. 28. 25. 3. t. 2. f. 50.

"*Catops castaneus*, Sturm, Ins. xiv. 9. 3. t. 273. a. A; Heer, Fn. Helv. i. 378. 2; Redt. Fn. Aust. 143. 4; Kraatz, Stett. Ent. Zeit. xii. 284. 4.

"— *cisteloides*, Kraatz, Stett. Ent. Zeit. xiii. 404; Fairm. & Laboulb. Faun. Ent. Franç. i. 299.

"Oblongus, nigro-piceus; *thorace nigro-piceo*, ante medium vix latiore, angulis posticis obtusiusculis; elytris substriatis, piceis seu castaneis.

"Long. $2\frac{1}{2}$ lin.

"*Mas*, trochanteribus posticis acuminatis seu latere inferiore dente magis minusve curvato extante.

"This is readily distinguished from the *C. angustatus*, Fab., by the darker colour and the form of the thorax. The antennæ are nearly as long as the body*, reddish brown, always darker towards the point. First joint strong, third distinctly longer than the contiguous joints, the fourth somewhat shorter than the third; fifth, sixth and seventh equal in length, eighth nearly half as long as the seventh, ninth somewhat shorter than the seventh, tenth somewhat shorter than the ninth; the last joint almost twice as long as the preceding, sharply acuminate. The head is black-brown, extremely finely and closely punctate. The thorax is formed like that of *C. angustatus*, Fab., but the sides both before and behind are nearly equally strongly rounded, so that the greatest breadth is not before the middle; the margin is by far less raised up, less broadly spread out, so that the line on each side of the thorax is both shorter and less deeply marked; *the upper side is as a rule entirely pitchy black, extremely deeply and finely (fine-shagreen) punctured*; the deep middle line is frequently wanting. The elytra are moderately arched, lightly striated, *pitchy black, more rarely pitchy brown*. The legs are ferruginous brown.

"It is spread over the whole of middle and southern Europe, and not rare. In France (according to Latreille); in Lombardy

* This is not correctly expressed. The antennæ are longer than the half of the body, but cannot be said to be "nearly as long as the body." They are in no degree longer than the antennæ of the other varieties.

(according to Villa) ; in Italy (according to Sturm) ; in Sardinia (Géné, Berlin Mus.) ; in Sicily (Berlin Mus.)." *

A consideration of the differences here given as characterizing these three species will not, I think, warrant us in looking upon them as more than varieties.

The differences consist in the form and colour of the thorax, the punctuation of the thorax and elytra, the form and colour of the body, the colour of the antennæ, the proportions of the joints of the antennæ, and the form of the posterior trochanters.

Of these, the difference most readily recognizable is that in the form and colour of the thorax ; the form of the thorax in the *typical* specimens of *C. castaneus*, Sturm, being that shown in fig. 1, while *C. angustatus*, Fab., is that shown in fig. 2, and *C. intermedius*, Kr., somewhat between them, but nearest to fig. 2. M. Kraatz's description might lead us to suppose that fig. 3 would best represent *C. angustatus*, F., but having had under my eyes typical examples of all three, sent to me by M. Kraatz, I find that none of them have the thorax widened more in front than fig. 2, which, indeed, fairly represents the thorax of M. Kraatz's specimens of *C. angustatus*, F. But I know that there *are* examples which have their thorax widened as much in front as fig. 3. I possess one myself, and Sturm gives that form in his figure of his *C. angustatus*. We must therefore either make a fourth species to receive fig. 3, or else admit that this subgroup is variable in the form of its thorax ; and there need be no hesitation in adopting the latter course, as, although I have not met with any specimen exactly filling up the gap between fig. 2 and fig. 3, I have seen all grades of transition between fig. 1 and fig. 2. Another point of difference, where we constantly see a gradual passage between the one and the other, is the colour of the thorax. In the typical *C. castaneus*, St., it is dark pitchy black throughout, and the margins are not paler than the centre, nor semitransparent. In both *C. angustatus*, F., and *C. intermedius*, Kr., the margins are paler, or semitransparent ; but I have seen transition specimens where it is almost impossible to say whether the margins are paler or not, in one view looking paler, and in another quite dark and-opake. Again, specimens occur very slightly paler on the margins, and so on. The punctuation and depressions, and the spreading out and raising up of the margins of the thorax also vary. I admit that I have never seen the normal or perfect examples of *C. castaneus*, St., with the spread-out and slightly bent-up edges of the *C. angustatus*, F., or *intermedius*, Kr. ; but if, as I imagine, the latter are less mature individuals, and *castaneus*, St., the more mature fully-

* Kraatz in *loc. cit.*

coloured and more solidified form, such a circumstance will sufficiently account for the differences to which I have been alluding, whether in punctuation, depression, or colour. Indeed, such a supposition accounts for more; for it is not only in the thorax that these differences exist, but also in the whole of the rest of the body. *C. castaneus*, St., is darker and more deeply punctate on the elytra also, and the deeper colour extends to the antennæ, which are slightly darker at the point; and this is only what might be expected: we always find that where a greater infusion of colour has penetrated through an individual, it is not confined to one part, but pervades the whole system. I also look upon the acuminate sutural apex of the elytra (referred to by Kraatz as being possibly a sexual distinction of *C. angustatus*, F.) as another indication of immaturity. I have never seen this in *C. castaneus*, St., but I have found it indifferently both in the males and females of *C. angustatus*, F. As to the differences in the form of the joints of the antennæ of *C. angustatus*, F., and *castaneus*, St., these are too slight, even adopting absolutely M. Kraatz's own description, to allow us to use them as characters for a species; but I cannot entirely adopt his descriptions without reservation, as, notwithstanding a very careful examination of the specimens he sent me, I have scarcely been able to detect the differences he alludes to. Turning back to his description, it will be seen that the only differences given are the following:—In *C. angustatus*, F., he says, the third joint is nearly twice as long as either the second or fourth. In *C. castaneus*, he says, the third is distinctly longer than either the second or fourth. In *angustatus* the seventh and ninth are said to be equal in length. In *castaneus* the ninth is somewhat shorter than the seventh. In *angustatus* the last joint is said to be "longer than the preceding, long cylindric and acuminate." In *castaneus* it is "almost twice as long as the preceding, sharply acuminate." The differences here given are thus exceedingly minute, so much so as to be inappreciable by an ordinary observer. Now I know that in undisputed species in this genus considerable differences are to be perceived in different individuals in the relative thickness, &c. of the joints of the antennæ; so much so as to make the antennæ appear decidedly more clubbed in the one than the other. This minute measuring of the joints appears to me therefore an unsafe character, not to be adopted. There only remains the difference in the form of the posterior trochanters in *C. angustatus*, F., and *castaneus*, St. On this I shall only observe, that M. Kraatz admits that there is great variation in the development of these parts, but seems to think there is an impossibility in a transition taking place between a trochanter having a projecting curved tooth at the

inner side, and a trochanter itself of a gouge-chisel-shaped form without a tooth on the inner side. My readers must judge for themselves as to this; but I agree with Erichson in thinking that the development of that part is variable, and I cannot agree with M. Kraatz in putting bounds to the variation.

The differences we have been considering are almost entirely those between *C. angustatus*, Fab., and *intermedius*, Kr., on the one part, and *C. castaneus*, St., on the other. It is much more difficult to point out those between *C. angustatus*, F., and *intermedius*, Kr.: as to these, I shall confine myself to referring the reader to the distinctions pointed out by M. Kraatz himself in his description of *C. intermedius* above quoted, merely observing that if I am right in joining together the much more dissimilar forms of *C. angustatus*, F., and *castaneus*, St.; we can have no hesitation in refusing to make another species on the strength of the almost imperceptible differences relied on by M. Kraatz, a decision which a careful examination of the specimens of *intermedius* so kindly furnished to me by that gentleman has given me no reason to alter. If any of the varieties are to be exalted into separate species, *castaneus*, St., is obviously the one best entitled to this.

Referring back then to my general comprehensive description of this species above given (p. 13), I have only to add, that the extreme examples of the foregoing varieties may be known without much difficulty by the following characters. The less decided examples form intermediate steps, and it will often be found scarcely possible to say to which of the nearest varieties they belong.

1. *Pale ferruginous varieties.*

Var. A. Thorax widest at front, as shown in fig. 3; margins paler than centre.

Var. B. *C. angustatus*, Kraatz. Thorax widest not at the very front, but a little before the middle, as in fig. 2; margins paler than centre; depressions on thorax not deep. Elytra nearly parallel, darker at suture towards apex.

Var. C. *C. intermedius*, Kraatz. Thorax a little broader than in var. B; margins paler than centre, with deeper depressions on thorax. Elytra slightly widened in middle, entirely red ferruginous.

2. *Dark chestnut variety.*

Var. D. *C. castaneus*, Sturm. Thorax widest in middle, as shown in fig. 1, of a more solid consistence than the pale varieties; margins not paler than centre.

This species is found over the whole of Europe, and Gebler

mentions it as having been taken in the south-west of Siberia. The whole of the above varieties are found in England and Scotland, but var. D is the commonest and var. A the rarest—(of it I have only seen one example).

2. *C. spadiceus*, Sturm.

Catops spadiceus, Dahl. *in lit.*; Sturm, *Ins.* xiv. 11. taf. 273. fig. 6 B; Redt. *Fn. Aust.* 771; Kraatz, *Stett. Ent. Zeit.* xiii. 399.

Oblongus, nigro-piceus; *thorace fortius punctato*, postice angustiore, ante medium latiore, angulis posticis obtusis; elytris castaneis, parum ventricatis, apice obscurioribus, substriatis; antennis ferrugineis, apicem versus obscurioribus. Long. $2\frac{1}{4}$ – $2\frac{1}{2}$ lin.

Mas, trochanteribus posticis scalpiformibus.

Fig. 4.



The most robust species in this group. Head, thorax and under-side in the fully-coloured individuals pitchy black, the elytra fine chestnut-brown. The examples not fully coloured are dirty yellowish brown. The antennæ are tolerably long, scarcely half as long as the body, reddish brown, in the normal state *the last five joints darker*; the first somewhat stronger, third somewhat longer than the adjoining joints; second, fourth and fifth of equal length; sixth somewhat shorter than the fifth, and as long as the seventh and ninth; eighth somewhat shorter than the tenth; tenth somewhat shorter than the ninth; *the last joint is somewhat shorter than the foregoing*, strongly acuminate. The head is pitchy black, the parts of the mouth ferruginous red; the top of the head finely and sparingly, the front more deeply and strongly punctured. The thorax is distinctly narrower than the elytra, a little arched, somewhat broader than long; the sides rounded, and somewhat more so in front than behind, so that the greatest breadth of the thorax is rather before the middle; the posterior angles are obtuse and rounded off, the basal margin straight-truncate; the margin in the posterior half is broadly expanded and a little bent up, so that a somewhat bent and deep line arises on each side, particularly when seen from above. *The upper side is strongly and deeply punctate**, moderately densely covered with a golden-yellow pubescence, with a distinctly impressed line along the middle, about one-third of

* Sturm says, "finely and densely" punctate, but Kraatz properly corrects this; the deep coarse punctuation being one of the most characteristic features of the species.

the thorax in length. The scutellum is triangular, punctate, brown. The elytra are *moderately arched*, chestnut-brown, and a little darker towards the apex; immediately behind the shoulders and a little further back somewhat *bellied out*, but not so that the greatest breadth lies before the middle. The striæ are moderately shallow, but very distinct, and their punctuation is proportionately strong and somewhat wrinkled. *The pubescence on the elytra is long, and not so close or adpressed as in the allied species.* The legs are ferruginous brown.

Kraatz records the male as having chisel-formed posterior trochanters, but in strongly developed specimens there might easily occur gouge-formed trochanters. Sturm only knew the female. I have also only seen the female.

This species is to be distinguished from the preceding by its more robust form, deeper punctuation, more bellied elytra, and by the longer pubescence on the elytra. For a considerable time I was disposed to look upon it as merely another variety of *C. angustatus*, F., but I am now satisfied that it may justly take its place as a distinct species. The stronger punctuation taken by itself might only indicate a variety, but the bellied form of the elytra and the difference in the pubescence are more essential characters; the latter is particularly well seen on the edges of the elytra.

It was first recorded by Sturm as having been found in Austria and Hungary. Chaudoir found it at Kiew. Kraatz records it as having been taken at Halle, Bautzen, Erlangen, Darmstadt, &c. It has been taken by M. Chevrolat in France, and I have one specimen taken in Scotland. Kraatz says, it is generally found under leaves.

3. *C. humeralis*, Brullé.

Choleva humeralis, Br. Exped. Sc. de Morée, iii. p. 162. no. 255.

"Nigricans, punctatus, rufo-villosus; ore, antennis, elytrorum macula humerali, abdominis segmentorum marginibus pedibusque ferrugineis; antennis apice fuscis; elytris profunde punctato-striatis.

"Long. $2\frac{1}{2}$ lin., lat. $1\frac{1}{4}$.

"Head black, finely punctate, with the whole of the mouth and the half of the antennæ ferruginous; the latter slightly pubescent, their five last articles brown. Thorax a little less long than broad, rounded on the sides, raised at the posterior angles, truncate behind, finely punctate, of a blackish brown, lighter on the lateral margins, and covered with a short reddish pubescence. Scutellum triangular, blackish and pubescent like

the thorax. Elytra oval, a little broader than the thorax, marked with deep longitudinal striæ formed by large deep punctures, and tolerably strongly punctate in the intervals between the striæ; their colour is of a deep brown, marked with a large ferruginous blotch at each of the anterior angles; they are covered by a reddish adpressed and tolerably dense pubescence. Under side of the body finely punctate, blackish, with the edges of the abdominal segments ferruginous. Legs of this latter colour; posterior thighs partly brown.

"Upon flowers in the month of June. Arcadia*."

This appears to be the proper place to take in this species. I have not seen it. Brullé did not give a figure of it in his work, and on inquiry at Paris I find that his specimens must have been eaten by the larvæ of the *Anthreni* so destructive to collections on the continent. The only trace or record of the species, therefore, so far as I know, is his description, of which the above is a translation, and which seems to me to show considerable affinity to the preceding species (*spadiceus*, St.).

4. *C. agilis*, Illig.

Ptomaphagus agilis, Illig. Käf. Pr. 882.

Choleva agilis, Spence, Linn. Trans. xi. 1402.

Catops fuscus, Gyll. Ins. Suec. i. 281. 5.

Choleva testacea, Latr. Gen. Crust. et Ins. xi. 28. 2.

Catops agilis, Erich. Käf. d. Mark Brand. i. 234. 2; Sturm, Ins. xiv. 7. 2. tab. 272. n. N; Heer, Fn. Helv. i. 379. 3; Redt. Fn. Aust. 133. 3; Kraatz, Stett. Ent. Zeit. xiii. 405; Fairm. & Laboulb. Fn. Ent. Franç. i. 300.

Oblongo-ovatus; nigro-piceus, vel testaceo-piceus; thorace transverso, postice latiore; elytris substriatis, antennis pedibusque ferrugineis.

Long. $2\frac{1}{4}$ lin.

Mas, tibiis mediis curvatis; trochanteribus posticis inferiore dente curvato acuminato armatis.

Fig. 5.



Shorter and somewhat broader than *C. angustatus*, Fab., not very constant in colour, the darkest examples ferruginous brown with lighter antennæ. The antennæ are scarcely half so long as the body; the third joint almost twice as long as the second; the fourth, fifth and sixth are nearly equally long, the remainder (seven to eleven) are somewhat stronger than the preceding; the eighth is half as long as the ninth; the ninth equal to the tenth; the last joint is a half longer than the preceding joint,

* Brullé in *loc. cit.*

obtusely acuminate. The head is brown, extremely fine and tolerably sparingly punctured. *The thorax* is almost twice as broad as long, nearly of the breadth of the elytra, *narrower in front than behind, the broadest part being decidedly behind the middle*; the posterior angles are obtuse and rounded, and *the sides are neither spread out nor bent up, so that the moderately dense and very finely punctate upper side is entirely smooth*. The colour of the thorax is dark ferruginous brown, darker in the middle. Individuals with the thorax entirely blackish occur rarely. The elytra are generally ferruginous or testaceous, sometimes chestnut and sometimes pitchy brown; they are finely and densely punctate; at the base very feebly, towards the apex more distinctly finely punctate striate. The legs are ferruginous brown, *the middle tibiae of the males are bent strongly inwards*, the posterior trochanters are not distant at the base, and are armed on the inner side with a short strong pointed tooth.

This species is readily distinguished by the form of the thorax, narrowest in front and widest behind. The other particulars which I have printed in *italics* are characters also easily seized.

It is spread over the most part of Europe, in Prussia, Austria, Saxony, Switzerland, France, Sweden, and Britain, but is everywhere scarce.

The only exotic species belonging to this group which I know of is *C. lateritius*, Menet. *C. Frankenhaueseri*, Mann., would also fall into this group, if it is retained in the genus at all, but its pectinate antennæ seem to me to require us to create a separate genus to receive it.

C. lateritius, Men.

Catops lateritius, Menetries, Mem. Acad. Imp. Sciences, St. Petersburg, 6 sér. vi. (1849), p. 52.

"Oblongo-ovatus, pallide rufo-ferrugineus, breviter griseo-pubescent; antennis tenuibus longitudine dimidii corporis; thorace transverso subdepresso postice latiore angulis obtusis, lateribus subreflexis; elytris creberrime punctulatis, substriatis, stria suturali profunde exarata.

"Long. 2 lin., lat. $\frac{3}{4}$ lin.

"Near *C. agilis*, Illig., but proportionately narrower, the thorax is much less broad and flatter, and the antennæ are much longer.

"Described from two individuals taken at Novaia Alexandrovskaja*."

* Menetries in *loc. cit.*

Group II. (Subgenus CATOPS (true).)

Mesosternum not keeled; body oblong; antennæ more or less club-shaped or thickened towards the apex, eighth joint decidedly smaller than seventh and ninth. The posterior trochanters not more developed in the males.

1st Subdivision. *Base of thorax decidedly narrowed or cut in, so that the thorax and elytra do not form a continuous outline. Middle tarsi widened in the males.*

6. *C. acicularis*, Kraatz.

Catops acicularis, Kraatz, Stett. Ent. Zeit. xiii. 406. 6.

Oblongus, ferrugineus; antennis subfiliformibus; thorace transverso, postice latiore, angulis posticis obtusiusculis; elytris substriatis transversim strigosis.

Long. $1\frac{3}{4}$ lin.

Of the slender form of the species in the foregoing group, but proportionally not so elongate; ferruginous brown; easily distinguished from the remaining species of this group by its transversely strigose elytra. The antennæ are slender, reddish brown, not quite so long as the elytra; first joint somewhat shorter than the second; second equal to the third; third equal to the fifth; fourth somewhat longer and stouter than the sixth; eighth only one-third of the length of the seventh, and somewhat narrower than those on each side of it; ninth somewhat shorter than the seventh, almost somewhat stouter, and equal to the tenth; eleventh of the stoutness of the preceding, about half as long, from the middle forward cone-shaped acuminate. The head is densely and finely punctate, pitchy-black. The thorax is nearly of the breadth of the elytra, wholly light, twice as broad as long, slightly arched, the sides wholly rounded, somewhat more strongly behind than in front, so that the greatest breadth is behind the middle; the anterior angles are somewhat bent down, strongly rounded, the posterior angles are obtuse-angled. The basal margin is extremely lightly sinuated on both sides towards the scutellum; the upper side of the thorax is moderately densely and finely shagreen-punctured. The elytra are uniform oblong, gradually narrowed towards the apex, each being rounded; they have feeble traces of longitudinal striæ, and besides are transversely strigose almost parallel with the base of the thorax. The legs are ferruginous brown and slender.

I have not seen this species in nature, and have merely copied M. Kraatz's description. It appears to be readily recognized

among its neighbours by its transversely strigose elytra. It is found in Sicily, and appears to be rare, M. Kraatz having only seen three specimens.

7. *C. fuscus*, Panz.

Helops fuscus, Panz. Fn. Germ. 18. 1.

Luperus fuscus, Fröhl. Naturf. 28. 24. 2. t. 1. f. 16.

Catops sericeus, Payk. Fn. Suec. i. 342. 1.

Catops rufescens, Fab. Syst. El. ii. 563. 1.

Choleva sericea, Spence, Linn. Trans. xi. 145. 6.

Catops festinans, Gyll. Ins. Suec. iv. 314. 1-2.

Catops fuscus, Erichs. Käf. d. M. Br. i. 235. 3; Sturm, Deutschl. Fn. xiv. 13. 5. t. 274. f. a. A; Heer, Fn. Helv. i. 379. 4; Redt. Fn. Austr. 164. 11; Kraatz, Stett. Ent. Zeit. xiii. 407. 8; Fairm. & Laboulb. Fn. Ent. Fr. i. 101. 7.

Breviter ovatus, *fuscus*; antennis subfiliformibus; thorace transverso, *postice latiore*, angulis posticis rectis; elytris rufo-brunneis, substriatis.

Long. 2 lin.

Dark brown, short oval. Antennæ ferruginous brown, very feebly thickened towards the extremity, not quite so long as the head and thorax; first joint longer than the succeeding joints; second very little shorter than third; third and fourth very nearly equal; fifth and sixth equal, both a little shorter than fourth; seventh not much if at all longer than sixth, but a good deal broader; eighth shorter than those on each side of it, but not greatly narrower; ninth and tenth about same size, and eleventh acuminate and nearly twice as long as the tenth. Head and thorax black, very densely punctate, with a yellowish grizzly adpressed pubescence; mouth reddish; edges of thorax ferruginous brown. *Thorax* rounded on the sides, *broadest behind the middle*, at the base almost twice as broad as long, *very slightly rounded in at the posterior angles*, which are right-angled and have a slight tendency to project behind. *Elytra* reddish brown, covered with a bluish-grey bloom; a little widened in the middle, *apex almost acuminate*; densely punctate, and with striæ visible towards the apex, scarcely perceptible in front. Legs reddish brown.

Fig. 6.



This species is easily distinguished from the rest of the section by the breadth of its thorax behind, which gives its outline at first sight, and before the junction of the thorax and elytra is examined, very much the appearance of being a continuous oval slightly interrupted at the base of the elytra.

It is widely distributed, being found both in England and Scotland, France, Germany, and most of Europe. Kraatz says that it

is seldom or never found under leaves or fungi, but in cellars, stables, potato-heaps, &c. Fairmaire and Laboulbène mention it as having been also taken in moss at the roots of trees. Stephens gives "carcases" as its habitat, and rightly enough so far as regards the species he has under this name (viz. a pale variety of *chrysomeloides*), but incorrectly as regards the true *fuscus*. It is, however, easy to predicate of each species by a simple inspection of its antennæ whether it is a carcase-feeder or not. Those species with filiform or slightly thickened antennæ are found among leaves and moss, &c. Those with heavy, thick, clubbed antennæ are found under dead birds or small mammals. In other words, those which have to seek out putrescent matter for their food, or a nidus for their eggs, are furnished with largely developed antennæ to enable them to smell it out.

8. *C. meridionalis*, Aubé.

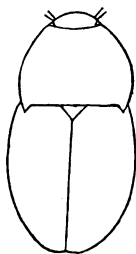
C. meridionalis, Aubé, Ann. Soc. Ent. Fr. viii. 326. 34. t. 11. f. 2; Kraatz, Stett. Ent. Zeit. xiii. 428. 10.

Ovatus, convexiusculus, piceus; antennis pedibusque ferrugineis; thoracis angulis posticis valde productis; elytris oblongiusculis, striatulis.

Long. $2\frac{5}{4}$ lin.

Pitchy-brown; in general appearance occupying the middle between *fuscus*, Panz., and *picipes*, Fab. Head black and finely punctate. Antennæ and palpi ferruginous; antennæ of the length of the head and thorax, only feebly thickened towards the point; first joint equal in length to the third, and nearly twice as long as the second; fourth equal to the fifth, also to the sixth, and somewhat shorter than the third; seventh equal to the second, yet somewhat stronger than those on each side of it; eighth scarcely half so long as the seventh, scarcely more slender, somewhat shorter than the ninth; tenth equal to the ninth; eleventh acuminate. The thorax is pitchy-brown, moderately convex, transverse, of the breadth of the elytra, once and a half as broad as long, emarginate in front, cut almost straight behind, where it is broadest; the sides are broadly rounded; the anterior angles depressed and rounded, *the posterior projecting behind and somewhat acute*. Scutellum tolerably large, finely punctate and reticulate. Elytra brown, oblong oval, nearly twice as long as broad, finely punctate and reticulate, and marked on each side of the suture with a sufficiently distinct stria, and with several others on the disk much less perceptible, particularly in front. Legs ferruginous.

Fig. 7.



This species at first sight looks very like an overgrown *fuscus*, Panz., but closer examination shows that it is a good species,—the proportions of the joints of the antennæ as well as other particulars being wholly different. In a specimen which I owe to the kindness of M. Kraatz, I observe that the development of the posterior angles of the thorax is considerably exaggerated in the outline I have given, which is copied from Aubé's own figure. Aubé also states it is larger than *picipes*, Fab., which had hitherto been considered the largest known *Catops*; but my specimen is scarcely so large as the smaller individuals of *picipes*, from which I should infer that it ought perhaps rather to be stated as being about the same size as *picipes*. Its entirely ferruginous colour and the projecting posterior angles of the thorax furnish a tolerably good *prima-facie* guide to the species.

It is found in Sicily, and is as yet scarce in collections.

9. *C. picipes*, Fab.

Hydrophilus picipes, Fab. Syst. El. i. 251. 10.

Plomaphagus picipes, Illig. Käf. Pr. 893.

Catops striatus, Duft. Fn. Aust. iii. 74. 3.

— *blapsoides*, Germ. Ins. Sp. Nov. 84. 142?

— *picipes*, Erichs. Käf. d. M. Br. i. 236. 5; Sturm, Deutschl. Faun. xiv. 17. 7. t. 274. f. c. C; Heer, Fn. Helv. i. 378. 5; Redt. Fn. Aust. 144. 10; Kraatz, Stett. Ent. Zeit. xiii. 428. 9; Fairm. & Laboulb. Fn. Ent. Franc. i. 300. 4.

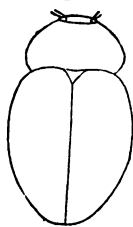
Ovatus, convexus, niger; antennis subfiliformibus pedibusque piceis, apice testaceis; thorace transverso, basi sublatiore, angulis posticis obtusis; elytris apice profunde striatis.

Long. $2\frac{1}{2}$ lin.

This is the largest species of the genus, with the exception of the last. Oval, *convex*, black. Antennæ scarcely thickened at the end, reddish brown at the base, blackish at the extremity, excepting the last joint, which is light yellow. Head very densely and finely punctate, mouth reddish. The thorax is likewise very densely and finely punctate, with a fine silky pubescence, black, strongly rounded on the sides, *narrowed both in front and behind, but most in front*, posterior angles obtuse, posterior margin very slightly sinuated on each side, *the greatest breadth behind the middle*. Elytra oval, very convex, black, with a slight grey hoar-frost bloom upon them, very densely punctate, with striæ faint in front, deeper behind. Under side black, abdomen and legs brown, tibiæ ferruginous brown, tarsi pale ferruginous.

The only species with which there is any risk of this being

Fig. 8.



confounded is *C. nigricans*, Spence. Its large size removes it from all but it and *C. meridionalis*, Aubé, and *C. chrysomeloides*, Spence. Independent of other distinctions, its colour at once distinguishes it from *meridionalis*, which is ferruginous, while this is black. It likewise wants the projecting posterior angles of the thorax. Its subfiliform antennæ distinguish it from *C. chrysomeloides*, which has the heaviest and thickest clubbed antennæ in the genus; and there only remains *C. nigricans*, to which it is much more allied. Both have subfiliform antennæ, pale at the base and apex, and the proportionate length of the joints of the antennæ is much the same; they are both black, with ferruginous legs; and I have specimens of *nigricans* very little inferior in size to *picipes*, but *picipes* is a broader and more robust-looking insect. It has the elytra much more convex and bellied out, and its thorax is differently shaped, being more contracted in front; and very commonly *nigricans* has two or three depressions on the disk of the thorax, which *picipes* has not. The posterior angles of the thorax in *nigricans* have a slight tendency to project behind, which is not the case in *picipes*.

This species is found over the greater part of Europe, but is rare. I have not yet seen a British specimen. Kraatz observes that it is principally found in fungi. Fairmaire and Laboulbène say it is taken in the trunks of trees (I presume decayed).

10. *C. nigricans*, Spence.

Choleva nigricans, Spence, Linn. Trans. xi. 141. 3.

Catops nigricans, Erichs. Käf. d. M. Br. i. 237. 6; Sturm, Deutschl. Fn. xiv. 18. 8. t. 273. f. c. C; Heer, Fn. Helv. i. 380. 6; Redt. Fn. Aust. 144. 11; Kraatz, Stett. Ent. Zeit. xiii. 429. 11; Fairm. & Laboulb. Fn. Ent. Fr. i. 303. 16.

Catops var. *minor*, *C. fuliginosus*, Erichs. Käf. d. M. Br. i. 239. 10; Sturm, Deutschl. Fn. xiv. 28. 13; Redt. Fn. Aust. 771.

C. caliginosus (Mus. Berol.).

Catops var. *major*, *C. longipennis*, Chaud. Bull. de Mosc. 1845, No. 111. 196.

Oblong-ovatus, niger seu piceo-brunneus; antennis longioribus, *obsolete clavatis*, ferrugineis, apice plerumque fuscescentibus; thorace transverso, postice latiore, *angulis posticis acuminatis*; elytris apice substriatis.

Long. $1\frac{1}{2}$ lin.—2 lin.

Oblong-oval, convex. Black or piceous brown. *Antennæ* a little longer than the head and thorax, *very slightly thickened towards the extremity*, sometimes entirely ferruginous, more generally ferruginous at the base and becoming fuscescent towards the point. Head finely punctate, mouth reddish brown. *Thorax* very densely and finely punctate, finely pubescent, *a little narrower than the elytra*,

Fig. 9.



sides rounded, *the greatest width at the middle*; very generally with two or three depressions on the disk; *posterior angles* with a point, *projecting a little behind*, which makes the posterior margin appear to be visibly sinuate on both sides. Elytra blackish brown, sometimes paler, *elongate-oval*, somewhat convex, densely and finely punctate; faintly striate, the striæ perceptible towards the extremity, effaced in front. Under side black; legs reddish brown, thighs blackish.

Kraatz gives the following remarks on the larger and smaller varieties which have been described under the names of *C. longipennis*, Chaud., and *C. fuliginosus*, Erichs.; viz.—

“A. Larger, for the most part female specimens, differ from the smaller males in many particulars, so that one may easily be led to suppose them distinct species. In the first place, the antennæ of these larger examples are somewhat more elongate than those of the smaller specimens, and when they belong to females are also somewhat less stout, which makes them when taken as a whole look much longer than the antennæ of the smaller individuals. Then the elytra are more bellied out, so that the whole animal assumes a more convex appearance; at the same time also the striæ of the elytra are more feebly marked in this than in the other kind. Such examples are generally found along with the rest, but not frequently, and are not of the typical form. If there had not been laid before me by himself one of the original typical examples from Germar's fine collection, it would not have been possible for me, from the short and imperfect description which Chaudoir gives of his *C. longipennis**, to perceive in it the just-described variety of *C. nigricans*, Spence.”

The description by M. Chaudoir to which M. Kraatz refers is as follows, viz.:—

“Near the *umbrinus*, a little larger, form more elongate: thorax broader, more rounded on the sides: elytra less swollen out, flatter, longer: antennæ more slender, last joint of these smaller and more pointed.

“A male, found at Kiew in the garden of the town under dry leaves, in the beginning of September†.”

As to Erichson's *fuliginosus*, M. Kraatz goes on—

“B. The type of *C. nigricans*, sp., is the one described as *C. fuliginosus* by Erichson, according to two specimens left by Dr. Meuer to the Royal Museum (of Berlin). Those specimens which are in the Royal Museum as *C. nigricans* are not fully coloured, and, when we have only a few specimens for comparison, such have altogether a different appearance from the full-coloured specimens. If we compare more minutely Erichson's clear descriptions of both species, we find, besides an agreement

* Kraatz in *loc. cit.*

† Chaudoir in *loc. cit.*

on the most important points, only two differences. One is that the antennæ of *C. fuliginosus* are darker, which proceeds from the perfectly full colouring of the animal. The other again is that the sinuation of the hind margins of the thorax (which particularly characterizes this species) is in *C. nigricans* distinct, in *C. fuliginosus* feeble,—a mark, which in individual cases is not always present in equal force, and which also appears to the eye of the observer in different aspects stronger or weaker than is really the case. There are no specimens named *C. fuliginosus*, Erichs., in the Royal Museum, but instead of it are *C. caliginosus*, Erichs., evidently projected from the description of *C. fuliginosus*. We must suppose that Erichson had originally given his specimens of *C. fuliginosus* the name of *C. caliginosus*, and as such also determined them to his acquaintances, but subsequently allowed it to remain for reasons unknown to me*.”

In dealing with a description emanating from Erichson, it will probably be better that I quote his description of *C. fuliginosus*, leaving the reader to form for himself his opinion of its value as a species. It is in these terms:—

“Oblongo-ovatus, niger; antennis obsolete clavatis, rufo-piceis, apice nigricantibus; thorace basi apiceque latitudine æquali, angulis posticis acuminatis; elytris obsoletissime striatis.

“Long. $1\frac{1}{2}$ lin.

“Very closely allied to the foregoing (*nigrita*, Erichs.). The antennæ have the same form and the same proportions, but are differently coloured; they are brownish red, the last four or five joints including the terminal blackish. The thorax is somewhat shorter than in the foregoing, a little narrower than the elytra, lightly rounded on the sides; the posterior angles pointed; the posterior margin on each side between the edge and the middle twice feebly sinuated. The elytra are oblong oval, very indistinctly striated. The colour of the body is black; the head and thorax have a fine yellow-grey pubescence; the elytra are more brownish black, with a grey hoar-frost rime on them. The legs are ferruginous brown, the thighs blackish†.”

The impression the description rather leaves upon my mind is, that Erichson's intended *fuliginosus* may have been the species subsequently described by Kellner under the name of *coracinus*. The yellow pubescence on the thorax for instance, and the ash-grey rime on the elytra, apply well to it, but not to *nigricans*: on the other hand, the size, $1\frac{1}{2}$ lin., is too much for *coracinus*. Again, it may be that the small examples of *nigricans* standing under the name of *caliginosus* in the Berlin Museum collection, were not published by Erichson from a doubt of their being

* Kraatz in *loc. cit.*

† Erichson in *loc. cit.*

distinct, and that *C. fuliginosus* may have been described from other specimens, although they are not now in the collection in the Berlin Museum.

Still, in the face of M. Kraatz's deliberate opinion, fortified as it is by the specimens in the collection of the Berlin Royal Museum, and also doubtless by the traditions which must remain of Erichson's own views in a place which has only so recently been deprived of him, I have not ventured to carry my difference of opinion further than to submit the above suggestions for the consideration of the reader.

I have only to add with reference to this species (*C. nigricans*, Sp.), that the readiest distinction between it and such others (except *C. picipes*) as are likely to be mistaken for it, is furnished by the longish almost subfiliform ferruginous antennæ. In my observations on *C. picipes* I have already noticed the *primæ-faciæ* differences existing between it and this species.

Widely distributed, being found in Scotland and England, France, Germany, and most of Europe, but nowhere common.

11. *C. coracinus*, Kellner.

Catops coracinus, Kelln. Stett. Ent. Zeit. vii. 177. 3; Redt. Fn. Aust. 771; Kraatz, Stett. Ent. Zeit. xiii. 431. 12.

Ovatus, niger; antennis obsolete clavatis, *rufopiceis*; thorace transverso, basi latiore, *angulis posticis distincte rectis*; elytris obsoletissime striatis. Long. $1\frac{1}{2}$ lin.

Fig. 10.



This has a considerable resemblance to *C. nigricans*, Spence, in the form of the elytra and antennæ, but is smaller, and more continuous in its outline: the hinder angles of the thorax are very slightly acuminate, so slightly as to be scarcely observable except by minute examination: the elytra are indistinctly striated. The antennæ are as long as the head and thorax, slightly thickened towards the point, in some individuals a little thicker than in others, reddish brown; the club usually blackish, but the depth of colour varies. The head and *thorax* are black, densely and finely punctate, with a fine short yellowish pubescence. The thorax is almost as broad as the elytra, broadest in the middle, straight at the base, the anterior angles rounded, and the posterior angles right-angled at the very angle; that is, when looked at superficially the angle would appear obtuse, but when examined more carefully there appears a very short space of right angle before the thorax takes its curved outline: the scutellum is proportionally large, and clothed with the same coloured pubescence as the thorax. The elytra are oval, densely and finely punctate, black, clothed with an ashen-grey pubescence or bloom indistinctly striated: no yel-

low pubescence along the base of the elytra. The legs are reddish brown.

Its small size, shorter and more thickened antennæ, more uniform and less bellied outline distinguish this species from *picipes*, Fab. Its shorter and more thickened antennæ, the yellow pubescence on the thorax and scutellum, want of depressions on the disk of the thorax, and the want of the produced posterior angles of the thorax distinguish it from the smaller specimens of *nigricans*, Spence. Its antennæ only slightly thickened, as well as its smaller size, distinguish it from *chrysomeloides*, Spence. From most of those which have a decided yellow pubescence on the thorax it is distinguished by the want of yellow pubescence along the base of the elytra. This separates it from *tristis*, Panz., including *abdominalis*, Rosenh., *montivagus*, Heer, *longulus*, Kelln., *grandicollis*, Erichs., and *rotundicollis*, Kelln., and from *neglectus*, Kraatz, and *nigrita*, Erichs. Its yellow pubescence also is finer, shorter and more delicate than in any of these. The only remaining species with which it may be confounded is *morio*, Erichs., but the more elongate shape and slenderer form of *morio* and the difference in the posterior angles of the thorax distinguish it. *Morio* has not got the slight acumination which *coracinus* has at these angles, and in it they are gently obtuse instead of being at first right-angled. The thorax in *morio* is also flatter.

It is found in Scotland and England, and in various parts of the Continent.

12. *C. morio*, Fab.

Catops morio, Fab. Syst. El. ii. 564. 4.

Choleva dissimulatrix, Spence, Linn. Trans. xi. 150. 11.

Catops sericeus, Gyll. Ins. Suec. iv. 313. 1-2.

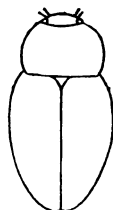
— *morio*, Erichs. Käf. d. M. Br. i. 240. 11; Sturm, Deutschl. Fn. xiv. 29. 14. t. 276. fig. b. B; Heer, Faun. Helv. 382. 14; Redt. Faun. Aust. 144. 13; Kraatz, Stett. Ent. Zeit. xiii. 431. 13; Fairm. & Laboulb. Fn. Ent. Franç. i. 301. 8.

Oblongo-ovalis, niger; antennis obsolete clavatis, articulis duobus primis ultimoque et pedibus ferrugineis; thorace basi apiceque latitudine subæquali, angulis posticis obtusis; elytris obsolete striatis.

Long. $1\frac{3}{4}$ lin.

The antennæ are as long as the head and thorax, imperceptibly but not greatly thickened towards the point; the first two joints are ferruginous yellow, the rest, with the exception of the last, blackish, the last joint yellow: rarely the whole antennæ are ferruginous, which Erichson observes is the case with the examples in Fabricius's collection. The body is black; the

Fig. 11.



c

head densely and distinctly punctate; the parts of the mouth red. The *thorax* is rather *depressed* and is thickly and finely punctured, with a fine yellowish-grey dense pubescence; it is half as broad again as long, lightly rounded on the sides, somewhat narrowed in front, but behind only a very little narrower than in the middle; the posterior angles are nearly obtuse-angled; the posterior margin is truncate and straight. The scutellum has the same pubescence as the thorax. The elytra have an ashy-grey bloom, no yellow pubescence along their base, are densely punctate, nearly without traces of striæ, a little widened in the middle, behind obtusely acuminate. The legs are ferruginous red, the thighs brown.

The same characters which distinguish *coracinus* from the other species in this group apply also to *morio*, and under that species I have already given a comparison of the differences between them. They are however closely allied.

This appears to be a rare species. So far as I know, it has not yet been taken in Scotland. It is found in England, and is widely spread over the Continent. It is included by Gebler in his list of insects found in South-west Siberia. M. Kraatz says it is found under leaves and in the chinks of wood.

13. *C. nigrita*, Erichs.

Catops tristis, Gyll. Ins. Suec. iv. 311. 1.

— *morio*, Payk. Fn. Suec. i. 344. 2.

— *nigrita*, Erichs. Käf. d. M. Br. i. 239. 9.

— *tristis*, Sturm *, Deutschl. Faun. xiv. 24. 11. t. 275. fig. c. C.

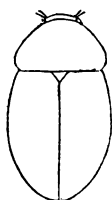
— *nigrita*, Heer, Fn. Helv. 381. 12; Redt. Fn. Aust. 144. 13; Kraatz, Stett. Ent. Zeit. xiii. 432; Fairm. & Laboulb. Fn. Ent. Franç. i. 301.

Oblongo-ovatus, niger; antennis obsolete clavatis
rufo-piceis, clava nigra, apice testacea; thorace
basi apiceque latitudine æquali, *angulis posticis*
fere rectis leviter acuminatis; elytris obsoletis-
sime striatis.

Long. $1\frac{2}{3}$ lin.

Oblong-oval. The antennæ are as long as the head and thorax, imperceptibly thickened towards the point. The first six joints are reddish brown, the remainder brown, the 8th joint not much smaller than the rest, the last joint oval, acuminate, yellow. The thorax is scarcely a half broader than long, rounded on

Fig. 12.

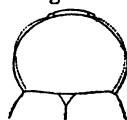


* Both from his figures and descriptions it appears to me evident that Sturm has transposed the names of *nigrita*, Erichs., and *tristis*, Panz. This has not been noticed by Kraatz or subsequent authors, but a very short perusal will I think convince them of it. For instance, of *tristis*, Panz., he says, "the thorax *broad, short*," &c., and of *nigrita*, Erichs., "the thorax *narrower* than the elytra, transverse," which is just reversing the characters of the thorax; and his figures speak for themselves.

the sides, broadest in the middle; nevertheless only a little narrowed in front and behind, in front rather narrower than behind; the posterior angles sometimes a little pointed*, the posterior margin straightly truncate, and only towards the middle very slightly sinuated. It is covered with a yellow silken pubescence. The elytra, as well as the whole body, are black; they have a brownish-blue or purplish peachy bloom, with a yellowish pubescence more conspicuous at their base and basal margins than on the disk. They are finely punctured, very imperceptibly striated, longish oval, in the middle a little widened, behind obtusely acuminate. The legs are ferruginous red, the posterior thighs sometimes brownish.

This is the first of a little group of species, which, with a decided yellow pubescence on the thorax, has a brownish-blue or purplish bloom on the elytra, accompanied with yellow hairs or pubescence conspicuous along the base and basal margins of the elytra,—a character which will limit our comparison to only two or three species. The two species just described, *C. coracinus* and *C. morio*, have also yellow pubescence on the thorax, but their elytra have not a purplish bloom, but a greyish-ash bloom, and want the yellow hairs along the base. The yellow pubescence on the thorax of these two also is feeble both in colour and consistence compared with those which follow. The form of

Fig. 13.



the thorax of this species distinguishes it from all the others. Figure 13 shows the relative form of the thorax of *nigrita* and *tristis*, the plain line being the outline of *nigrita*, and the dotted line that of *tristis*. These two species are in other respects extremely alike. The antennæ however also furnish characters of discrimination—the club of *tristis* being short, heavy and thick, while the antennæ of *nigrita* are long and thin and only obsoletely clubbed. The great breadth of the thorax of *grandicollis*, Erichs., easily distinguishes it; and the form of the thorax of *rotundicollis*, Kelln., which is an exaggerated form of that of *tristis* as above delineated (fig. 13), will prevent *nigrita* being confounded with that species or variety. The elytra in both *nigrita* and *tristis* are elongate, and give them a longer character than *rotundicollis*, which has the elytra short and rapidly acuminate.

* Erichson in his description states that the posterior angles are pointed, but Kraatz says that he cannot agree with him in that respect:—"according to my view," he says, "they are right-angled, in not a few examples passing into obtuse-angled." I have examined a considerable series carefully with a view to determine this point, and find that both are right. I possess specimens which have the posterior angles pointed, and others where there is no appearance of a point, but the line of the base of the thorax perfectly straight. This is another proof of the variable character of the genus. It also shows us how inadequate are Spence's sectional divisions which are founded on this very character.

This species is widely spread, and is found under leaves, and under the carcases of birds and small mammals.

14. *C. tristis*, Panz.

Helops tristis, Panz. Fn. Germ. 8. 1.

*Choleva Leachii**, Spence, Linn. Trans. xi.

Catops tristis, var., Gyll. Ins. Suec. iv. 312. 1.

— *tristis*, Erichs. Käf. d. M. Br. i. 238. 8.

— *nigrita*, Sturm, Deutschl. Faun. xiv. 24. 11. t. 275. f. c. C.

— *tristis*, Heer, Fn. Helv. i. 380. 8; Redt. Fn. Aust. 144. 12; Kraatz, Stett. Ent. Zeit. xiii. 433. 18; Fairm. & Laboulb. Fn. Ent. Fr. i. 302.

Oblongo-ovatus, niger; *antennis abrupte clavatis, clava fusca, articulo ultimo breviori*; thorace transverso basi apiceque latitudine subæquali, angulis posticis rectis; elytris obsoletissime striatis.

Long. $1\frac{3}{4}$ lin.

Of the same size and general form as the last species (*nigrita*, Erichs.); the thorax, however, is not so broad, particularly behind. Perhaps the commonest impression it makes on a first introduction is that of an insect with longish elytra and a disproportionately short, narrow, somewhat square thorax. The antennæ are nearly as long as the head and thorax, strongly thickened towards the point; the first six joints slender, reddish brown, those following brown, broader than long, the eighth not only much shorter but also narrower than the remainder of the club, the last a little larger than the preceding, with a cone-shaped point, generally pale at the tip†. The head and thorax are black, densely punctate, more or less wrinkled transversely, and thickly covered with a close yellow pubescence; the hairs springing from the wrinkled punctuation as shown in the magnified sketch represented in fig. 15.

The thorax one-half broader than long, rounded on the sides, broadest in the middle, or perhaps rather a little before the middle, giving the *primâ-facie* effect of being narrowest behind; but on comparing the narrowness both in front and behind it is found nearly equal, or rather narrower before than behind. The posterior angles are sharply right-angled, the straight edge proceeding a little forward before

Fig. 14.

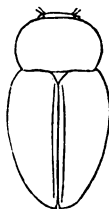
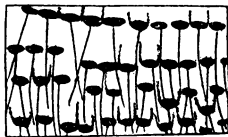


Fig. 15.



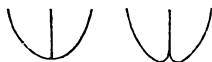
* As already mentioned, I have been unable to make out satisfactorily what the *tristis* of Spence is, and therefore have not added that as a synonym here.

† Erichson says that the last joint is brown like the preceding, but this is only the case sometimes; generally speaking it is paler.

the outward curve commences: the posterior margin is almost straight, only a little sinuate towards the middle. The elytra are covered with a brownish-blue or purplish bloom, and with some yellow pubescence most observable at the base and along the basal margins*. Under the bloom the elytra themselves are brownish, lightest at the base; they are densely punctate, with feeble traces of striæ, in the middle somewhat expanded, behind oval-acuminate. Under side and thighs dark brown, tibiæ ferruginous brown, tarsi ferruginous yellow.

Erichson adds that in the males the extreme termination of each elytron is produced into a single point. In the females the point is commonly rounded. My experience is that it varies indifferently.

Fig. 16.



This is a variable species, and under it, I think, should be comprehended not only the *C. abdominalis* of Rosenhauer, the *longulus* of Kellner, and the *montivagus* of Heer, but also the *grandicollis* of Erichson, and probably the *rotundicollis* of Kellner. These I shall include as varieties under this species, giving however a separate description of each, and where I have not seen the variety in nature, quoting the words of the author who described it.

Var. A. *C. abdominalis*, Rosenh. Beitr. Ins. Fn. Eur. i. p. 22.

"Oblongo-ovatus, niger; antennarum basi, abdominisque segmentis 2 primis ferrugineis; prothorace basi apiceque latitudine æquali, angulis posticis rectis; elytris obsoletissime striatis, antennis abrupte clavatis.

"Long. $1\frac{3}{4}$ lin., lat. 1 lin.

"Very similar to the *C. nigricans*, but smaller and not so convex; particularly like the *C. montivagus*, Heer, Fn. Helv. i. 381. I should consider it perhaps to belong to the latter, were it not that the posterior part of the abdomen of two examples which I possess from different districts of the Tyrol is uniformly of a different colour from that of the rest, a character which is not known to me in any other *Catops*, and which Heer must certainly have observed in describing his species had it existed in it. In the new species also the colour of the base of the antennæ and of the feet is much darker and the thorax is broader.

* It is perhaps scarcely necessary to say, that in speaking of the bloom and the pubescence on these species, I am speaking of perfectly fresh specimens in good condition. When the insect gets greasy and dirty the bloom no longer exists, and the yellow hairs get clogged together so that they look black. The best way in such cases is to turn them about in different directions, till the eye catches the light in which the pubescence or bloom best shows itself.

The head is not large; black, finely and densely punctate, with a yellowish-grey pubescence. The mouth is brownish. The antennæ are somewhat longer than the head and thorax, the first six joints brownish red, slender, the remainder black, broader than long, and thickened into a club towards the outer side; the eighth joint much shorter and more slender than the rest, the last somewhat more slender and about a half longer than the preceding, with an obtuse point. The thorax is densely wrinkled-punctate, and thickly clothed with close-lying yellowish hairs, transverse, about a half broader than long, rounded on the sides, broadest in the middle, narrower in front than behind, the anterior angles obtuse, the posterior straight, the posterior margin scarcely sinuated. The elytra are a little broader than the thorax, somewhat bellied out in the middle, oblong oval, usually attenuated to a point at the apex, densely and finely punctate and transversely wrinkled, covered with a grey pubescence and bluish hoar-frost, the sutural striæ very distinct, and in the middle of the elytra we perceive the trace of several striæ. Under side black, the thighs dark brown, the tibiæ ferruginous brown, the tarsi ferruginous yellow; the first two segments of the abdomen are of a lively ferruginous red, the remainder black, finely and densely punctate, delicately pubescent.

"Found in the Tyrol near Steinach and on the Franzenhöhe, 4000–8000 feet above the level of the sea*."

The reader will see that the above is a pretty accurate description of *C. tristis*, with the exception of the colour of the first two segments of the abdomen. Colour is at all times a character of very doubtful value in Coleoptera, and the constant symptom of immaturity or of not fully developed colour is the substitution for black of a ferruginous brown or red of greater or less intensity, or over a greater or less extent.

I have not seen specimens of this variety in nature, but M. Kraatz, who had authentic specimens through his hands, states that it is a mere variety of *tristis*.

Var. B. *C. longulus*, Kellner.

Catops longulus, Kellner, Stett. Ent. Zeit. vii. 176; Redt. Fn. Aust. 771; Kraatz, Stett. Ent. Zeit. xiii. 433. 17.

Oblongus, niger; antennis obsolete clavatis, basi apiceque testaceis; thorace basi apiceque latitudine æquali, angulis posticis rectis; elytris obsoletissime striatis.

Long. $2\frac{1}{4}$ lin.

According to M. Kellner's description this species is distin-

* Rosenhauer in *loc. cit.*

guished by its long and slender form, and thereby easily separated from the remaining varieties or species in this division.

The antennæ are of the length of the head and thorax, moderately strong, black in the middle, the basal joints reddish, the terminal joint yellowish, the club a little thickened; the head and thorax are densely punctate, clothed with yellowish-grey hairs; the latter is gently rounded on the sides, narrowed in front and behind; the posterior margin is cut straight, and only slightly sinuated on each side of the scutellum. The elytra are long and uniform in their shape, densely and finely punctate, indistinctly striated, lightly covered with yellowish-grey hairs and hoar-frosted. The legs are black-brown, the feet brownish red.

M. Kellner states that he found this kind on high hills near the mountains (of Thuringia) "under moss and on exposed dead birds: very rare."

The only discrepancy which the above description shows between this variety and *tristis* is that the club is but little thickened, and that the elytra are long and uniform in their shape. The degree of thickness of the club of the antennæ varies in all the thick-clubbed species (of course within certain bounds); and the circumstance of its being found under dead birds sufficiently shows that this is one of the thick-clubbed species. Moreover, owing to the kindness of M. Kraatz, I have seen authentic examples of it, and am thus enabled to say that the antennæ are not of less thickness than they are in many other specimens of *C. tristis*. The length of the elytra, which is in point of fact the characteristic mark of this variety, is of no value as a character, scarcely any two examples of *tristis* having the elytra of the same proportions. In some they are more bellied out than in others, which makes them look not so long, and others are longer in point of fact, but they all have the same character which cannot well be mistaken, and this supposed species is only a variety with disproportionately elongate elytra.

I have found this variety in Scotland and England.

Var. C. *C. montivagus*, Heer, Faun. Col. Helv. i. 381.

"Oblongo-ovatus, niger; antennis basi, tibiis tarsisque rufo-testaceis, pronoto subtransverso, basi apiceque latitudine subæquali, angulis posticis rectis, acutis; elytris obsoletissime striatis; antennis abrupte clavatis, articulo ultimo penultimo vix longiore.

"Long. $1\frac{3}{4}$ lin.

"Very similar to *C. tristis*; chiefly to be distinguished by its thorax being a little longer, but narrower. The first five joints of the antennæ are rufo-testaceous, the eighth the smallest, much

shorter and narrower than those that follow, the last shortly ovate, scarcely longer than the preceding; the thorax much narrower than the elytra, a little broader than long, with the sides lightly rounded, behind subsinuate, very densely punctulated, clothed with a dense yellow silky pubescence; elytra oblong ovate, very closely punctate, but evidently impressed with a sutural stria; thighs pitchy black.

"Very rare in the Alps. (At the Gemmi near the Dauenensee*.)"

The above description can I think be referred to nothing but *tristis*; the greater relative length of the thorax, which M. Heer specifies as the chief distinction, being doubtless either the result of variation in the length of the elytra, or one of the variations to which this species is subject. The next variety, which I refer to the same species, shows a much greater variation in the relative dimensions and proportions of the thorax.

Neither M. Kraatz nor myself have seen authentic examples of the above species, but M. Rosenhauer speaks of it (*supra*) as if he was familiar with it, and says that but for the colour of the last segments of the abdomen in his *abdominalis*, he would have referred that species to *montivagus*. M. Kraatz having ascertained *aliunde* that *abdominalis* was an immature specimen of *tristis*, differing only in the colour of these segments, it follows that *montivagus* is what the description would lead us to suppose, viz. a variety or synonym of *tristis*.

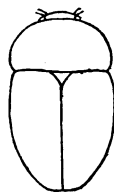
Var. D. *C. grandicollis*, Erichs.

C. grandicollis, Erichs. Käf. d. M. Br. i. 237; Heer, Fn. Col. Helv. i. 380; Redt. Fn. Aust. 144; Kraatz, Stett. Ent. Zeit. xiii. 432. 15; Fairm. & Laboulb. Fn. Ent. Franç. i. 300.

Ovatus, nigro-fuscus; antennis obsolete clavatis pedibusque rufis, illis apice nigricantibus; thorace transverso, coleopteris latiore, angulis posticis obtusis; elytris obsoletissime striatis. Long. $1\frac{3}{4}$ lin.

Somewhat of the form of the *C. nigrita*, but larger, and especially broader. Black-brown. The antennæ are not quite so long as the head and thorax, gradually slightly thickened, towards the point reddish brown, the last joint blackish. The head and thorax are densely punctured and granulated exactly as in *C. tristis*, clothed with close-lying yellow hairs. The latter is considerably broader than the elytra, more than one-half

Fig. 17.



* Heer in *loc. cit.*

broadier than long, strongly rounded on the sides, the anterior angles rounded, the posterior angles obtuse-angled, the posterior margin cut straight, of the breadth of the elytra. These are oblong oval, somewhat convex, densely and finely punctate, indistinctly striated, brownish blue or purplish hoar-frosted, with a yellowish pubescence along the base and basal margins. The legs are brownish red.

This variety stands in a very different position from those which have gone before. They are so near the type, that they might without much harm have been described as synonyms. The present, on the contrary, differs in some respects widely from the type, and it is by no means surprising that it has hitherto been considered one of the best characterized and most distinct species.

The great breadth of the thorax is the prominent distinguishing character; its shape also is somewhat different, being nearer that of *C. nigrita*, Erichs. The grounds on which I have deemed it a variety of *tristis*, are first, that all the specimens of *grandicollis* I have taken have been in company with *tristis*, and they were generally without the admixture of another species except *rotundicollis*, which, as I have already said, I suspect to be another variety of *tristis*. The examples of *grandicollis* were almost invariably males*, and those of *tristis* for the most part females. In my earliest captures it so happened that I found nothing but males of *grandicollis* and females of *tristis*, and naturally came to the conclusion that they were the two sexes of the same thing. Subsequent researches have convinced me to the contrary, as I have now a good many male specimens of *tristis*, and one female of *grandicollis*. Still the great preponderance is as I have stated, and the result to which I have come is, that *grandicollis* is the normal form of the male, and *tristis* of the female; although, as is known sometimes to take place in other orders of animals, the female occasionally assumes the form of the male, or *vice versa*. Another ground for concluding them to be the same species is their great general resemblance to each other, notwithstanding that the one has got such a broad thorax, while in the other it is narrow. This similarity is owing perhaps to the thorax in both being transverse, and the rest of the body of the same figure. The pubescence, colouring, wrinkling and punctuation are identical, and when two fine fresh specimens with their pubescence and bloom untarnished are placed together, I think it is almost impossible to avoid the conclusion that they belong to the same species. The differences that exist other than the broad thorax are very trifling. The antennæ of *grandicollis* are perhaps a trifle thinner and not

* Erichson founded his description on a "single male specimen."

so dark in the middle as in the generality of *tristis*, and the terminal joint is usually not paler than the rest of the club. But these are all variable items in *tristis* itself. I have specimens with their antennæ in every respect to the most minute particular the same in both kinds. The only other discrepancy is, that the slight sinuation on the posterior margin of the thorax of *tristis* seems wanting in *grandicollis*. In a word, the only permanent difference is in the form of the thorax, which, in the face of the circumstances I have adverted to, does not in this instance appear to me a sufficient ground for constituting it a different species.

Another curious confirmation of this view is, that similar variations in the form of the thorax take place in *C. chrysomeloides*. In fact, I possess specimens of the latter having exactly the form of *tristis*; the sole difference being that they are larger; the thorax is more coarsely granulated, its pubescence darker; the elytra more rounded and not so acuminate at the apex, their bloom also is ash-grey instead of purplish, their base is black instead of brownish, and the yellow hairs at the base are wanting. The antennæ are thicker and darker and the last joint is longer. These particulars serve to show that it is not *tristis*; and in addition these varieties are found mixed with large numbers of the normal form of *chrysomeloides*. For instance, among about 200 specimens of *chrysomeloides* which my friend Mr. Bates recently sent me, all taken together at one time, I found three or four with the form of *tristis*; also a specimen or two having in like manner exactly the form of *grandicollis*, but with the elytra not as in the variety of *tristis* bearing that name, but as in *chrysomeloides*; the antennæ are thicker and darker, but there is no other difference in the relative proportions, except in the last joint, which is not long, as it is in *chrysomeloides*. Further, there were a few specimens in the same lot having the shorter form and more acuminate elytra of *rotundicollis*; and lastly, there were examples having the form of the thorax of *nigrita*. The result to which I have come therefore is, that similar variations in form exist both in *C. tristis* and *C. chrysomeloides*; that as we have a variety of the former with a broad thorax (*C. tristis* var. *grandicollis*), we have also a variety of the latter of like form (*C. chrysomeloides* var. *grandicollis*). In like manner of each we have *C. tristis* var. *rotundicollis* and *C. chrysomeloides* var. *rotundicollis*, and *C. tristis* var. *nigrita* and *C. chrysomeloides* var. *nigrita*. We have a var. of *chrysomeloides* like *tristis* (*C. chrysomeloides* var. *tristis*), but I have not found any like resemblance to *C. chrysomeloides* in *tristis*.

In all these varieties, however, there are certain general characters which appear to be constant, and enable us to refer each

variety to its proper species. These are the colour of the elytra and of its bloom, and the colour of the pubescence at the base of the elytra. There are also other characters, which, although they vary in individual species on the one side or other, are on the whole pretty constant. The antennæ of *chrysomeloides* are almost invariably considerably thicker than in *tristis*, and the last joint longer. The pubescence of the thorax (except in the same variety) is browner than in *tristis*, and, except in the var. *rotundicollis* of *tristis*, is more coarsely granulated. The form of the apex of the elytra, except in the same variety, is also rounder in *chrysomeloides* than in *tristis*.

Var. E. *C. rotundicollis*, Kellner.

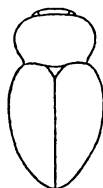
C. rotundicollis, Kellner, Stett. Ent. Zeit. viii. 176. 2; Redt. Fn. Aust. 771; Kraatz, Stett. Ent. Zeit. xiii. 434. 19; Fairm. & Laboulb. Fn. Ent. Fr. i. 302.

Ovatus, nigro-fuscus; antennis obsolete clavatis; pedibus rufo-piceis; thorace transverso subruguloso, lateribus fortiter rotundatis, angulis posticis rectis; elytris apice obsoletissime striatis. Long. $1\frac{1}{2}$ lin.

The antennæ are scarcely so long as the head and thorax, thickened towards the point, reddish brown, lighter at the base. The head and thorax are densely punctate, or rather granulated and densely covered with yellowish grizzly hairs; the latter is strongly rounded on the sides, most so towards the front, narrowed behind, the anterior angles rounded, the posterior angles almost pointed and right-angled, the posterior margin cut straight, and slightly sinuated on both sides near the scutellum. The elytra are oval, a little convex, densely and finely punctate, indistinctly striated, with a bluish or purplish bloom or hoar-frost on them, and also with yellowish hairs particularly at the base, and are narrowed to a point at the apex. The legs are brownish red, the feet lighter.

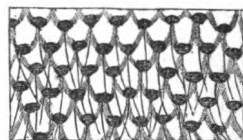
This variety or species is found along with *tristis* and *grandicollis*, but it is not without hesitation that I remove it from the list of distinct species. The characters, however, which distinguish it being all variations in degree, and at times approaching more or less to the type of *tristis*, I have come to look upon it as a variety of that species. It is well known that carcase-feeding beetles are always more subject to variation than others, owing to the chance of the food of the larvæ becoming exhausted before they are full fed. This species may be a starved variety. The particulars however by which it is most readily distinguished

Fig. 18.



are its smaller size, the strongly rounded edges of the thorax inflexed towards the base, and perhaps more than any other, the more strongly marked punctuation or rather granulation on the thorax; but none of these distinctions appear to me sufficient to justify its being kept as a distinct species. As to its size, although it is only about half the size of *grandicollis*, I have undoubted specimens of *tristis* quite as small as it; and even of *grandicollis* I have seen a specimen received by M. Kraatz from Thuringia not much larger. The general cut of the thorax is that of *tristis*, but broader in front. The elytra terminating sharply is a character also shared by *tristis*. The bluish or purplish bloom on the elytra is perhaps not quite so marked a feature as in *tristis*, but it is still well developed, and the yellow pubescence on the thorax and along the base of the elytra is the same. The distinction most appreciable is the punctuation or rather granulations on the thorax. To the naked eye, or under a weak lens, the thorax looks as if it were more coarsely punctate and of a coarser texture than in *tristis*. Under a higher magnifying power it assumes the aspect shown in fig. 19, and a comparison of that with fig. 15 and fig. 20, exhibiting the marks on the thorax of *tristis* and *neglectus* (next species), will show that it occupies a medium place between them. This punctuation in *rotundicollis* however is not always equally coarse, showing gradations to the feebler granulations of *tristis*.

Fig. 19.



It is not a rare variety, and is found under dead birds, &c. both in England and Scotland and all over the Continent.

15. *C. neglectus*, Kraatz.

Catops neglectus, Kraatz, Stett. Ent. Zeit. xiii. 434. 20.

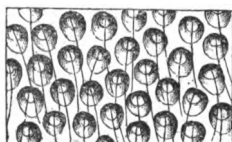
Ovatus, nigro-fuscus; antennis obsolete clavatis pedibusque rufopiceis; thorace transverso, postice angustiore, *variolariter punctato*; elytris apice substriatis.

Long. $1\frac{1}{2}$ lin.

Shape entirely that of *tristis*. Antennæ obsoletely clavate, reddish brown. The head is black, deeply, densely and distinctly punctate. The thorax is in the middle almost of the breadth of the elytra, nearly half as broad as long, somewhat convex, the sides moderately strongly rounded (exactly as in *tristis*), more narrowed behind than in front, so that the greatest breadth is before the middle. The posterior angles are right-angled, the posterior margin feebly sinuated on each side in

front of the scutellum. It is covered with a dense yellow pubescence as in *tristis*, but is not granulated like it, but covered with shallow punctures, so that under a strong lens it looks exactly as if pitted with the small-pox, and out of each shallow flat pit issues a yellow hair (sometimes two, springing from the same centre); these pits are arranged in a sort of irregular transverse order (see fig. 20), which gives

Fig. 20.



the thorax to the naked eye the appearance of being strongly transversely wrinkled. The elytra are densely and finely punctate, with indistinct, very evanescent traces (when highly magnified) of similar depressions being scattered over them, and with indistinct traces of

striae at the apex; they are clothed with a purplish brownish bloom similar to that of *tristis*, and with yellowish hairs principally seen at the base. The legs are brownish red, feet lighter.

Till this species was made known by M. Kraatz, it had been always overlooked. On a hasty glance it looks exactly like *tristis*; a little better inspection, particularly of the apparent granulations on the thorax, leads one to suppose it is *rotundicollis*, but a careful examination brings out the much deeper and differently formed punctuation of the thorax. This is the only character to be relied on to separate it from *tristis*; for although the antennæ are not so abruptly or heavily clavate as in that species, and are entirely of a reddish brown instead of having a blackish club, still in neither particular are they so different as to be beyond similar variations to be found in the true *tristis*. I therefore felt great difficulty in making up my mind whether they were distinct species or not. Thanks to the liberality of M. Kraatz, who supplied me with specimens of his *neglectus*, I was enabled to examine them all very carefully, which I did under high powers of the compound microscope, and although there is in one sense undoubtedly a transition between *tristis* and *neglectus* through *rotundicollis*, inasmuch as while the sculpture of the thorax in *tristis* is slightly wrinkled, that of *rotundicollis* is granulated, and that of *neglectus* variolose, still there did appear a greater difference between *neglectus* and *rotundicollis* than between the latter and *tristis*. It is not easy to embody the difference in words, but I am enabled by the kind assistance of Dr. Greville, whose qualifications as a microscopic observer and microscopic draughtsman are unsurpassed, to submit the differences to the reader, in the woodcuts, figs. 15, 19 and 20, drawn by him, which show the sculpture of the thorax of the three kinds as seen under a magnifying power of 280 diameters. These I think prove the close relationship of *rotundicollis*, fig. 19, with

tristis and *grandicollis* (both of which are exactly the same), fig. 15: the punctures from which the hairs issue are only a little larger and deeper in the former than in the latter, which also shows the first faint traces of the circular depressions between these punctures in the former. In *neglectus* however, although there are deep circular depressions, these are on a totally different arrangement from those in the other species. Here they surround the puncture from which the hairs spring, while in *rotundicollis* they are placed between the hairs. In *neglectus* the concave curve of the depression is turned towards the hair, in *rotundicollis* it is the convex curve which is turned to it.

Although the character is narrow, I incline to think that this is a good species, more especially as M. Kraatz mentions that nothing approaching to a transition between it and *rotundicollis* has been found.

This interesting species was taken by M. Kraatz in Hussia, but I have not yet observed it in any collection made in this country.

16. *C. quadraticollis*, Aubé.

Catops quadraticollis, Aubé, Ann. de la Soc. Ent. de Fr. 1850, viii. 326. 35. t. 11. f. 3; Fairm. & Laboulb. Fn. Ent. Fr. i. 302.

Oblongo-ovalis, convexiusculus, niger; antennarum articulis primis et ultimo, tibiisque ferrugineis; *thorace quadrato*, vix postice angustiore, angulis posticis rectis.

Long. $1\frac{3}{4}$ lin.

Oblong-oval, convex. Brownish black, covered with a sparing yellowish-grey pubescence; mouth and base of the antennæ obscure ferruginous. Antennæ gradually clavate, a little longer than the head and thorax. Thorax almost as broad as long; sides feebly arched, almost straight, except in front, where they are pretty strongly rounded; posterior angles right-angled, a little sharply pointed; very finely and densely punctate. Elytra with a more marked punctuation, very dense; sutural stria deep, disappearing on the anterior third. With a strong lens some traces of striæ are perceptible. Thighs brownish black, tibiæ and tarsi obscure ferruginous.

This species is almost of the size of *tristis*, which it comes very near in form and colour. It is however a little more elongated and generally deeper in colour, and the antennæ are less clavate; but the principal difference is in the form of the thorax, which is nearly as long as broad and rectilinear on the sides, in fact nearly square; the posterior angles also are straighter. The

Fig. 21.



lateral margins are a little more rounded in the males than in the females, reminding us of what we have already surmised in speaking of *tristis* and *grandicollis*, but they are always less so than in *tristis*.

At first I was disposed to consider this a variety of *tristis*, but on closer examination I became satisfied that it is a distinct species; at least, that we must hold it so until a closer study of its affinities and alliances shall teach us otherwise.

17. *C. chrysomeloides*, Panz.

Helops chrysomeloides, Panz. Fn. Ger. 57. 1.

Choleva chrysomeloides, Latr. Gen. Crust. et Ins. 29. 4; Spence, Linn. Trans. xi. 146. 7.

Catops chrysomeloides, Erichs. Käf. d. M. Br. i. 697. 7 a; Sturm, Deutschl. Fn. xiv. 22. 10. t. 275. f. b. B; Heer, Fn. Helv. 380. 9; Redt. Fn. Aust. 144. 10; Kraatz, Stett. Ent. Zeit. xiii. 432. 16; Fairm. & Laboulb. Fn. Ent. Fr. i. 302.

Ovatus, nigro-piceus; antennis *abrupte clavatis*, *clava nigra nitidula*, *articulo ultimo oblongo*; thorace transverso, basi latiore, *angulis posticis rectis*; elytris obsolete striatis.

Long. 2 lin.

Ovate, convex; deep brown or black, with a pretty dense pubescence. Antennæ shorter than head and thorax, strongly and abruptly clavate, the base (first six joints or so) red, the club black or deep brown, the fourth, fifth and sixth joints not longer than thick, also not thicker than those preceding, those following considerably thicker, the seventh, ninth and tenth somewhat thicker than long, brown; the eleventh oblong oval; the eighth narrower than the other joints of the club, very short. Thorax one-half broader than long, rounded on the sides, narrowed a little more in front than behind; at the posterior margin a little narrower than the base of the elytra; the posterior angles right-angled, pointed; the posterior margin lightly sinuated on each side, covered with a coarse yellowish grizzly pubescence. Elytra like the thorax, very finely and densely punctate, very indistinctly striated, with an ashy grey bloom; no yellow pubescence. Legs ferruginous red, often brown on the thighs.

This very distinct species is distinguished at once by the large black club of its antennæ. When seen along with other species, its gloomy black opaque appearance, combined with a larger club of the antennæ than any other species, at once point it out. The only other large black species in this group are *picipes* and *nigricans*, and neither of these has heavy thick-clubbed antennæ. From the other thick-clubbed species (none of which however have antennæ equal to it in thickness), it may be quickly distin-

Fig. 22.



guished by its gloomy black colour, and by the dull ash-grey bloom on the elytra. The pubescence on the thorax is dull grizzly yellow, a good deal coarser than the strong rich russet yellow of *tristis* and the other thick-clubbed species; and the bloom on the elytra wants the purplish tinge observable in these species; and there are no yellow hairs along the base or margins of the elytra, which are not lighter in colour themselves than the thorax. Immature specimens wholly ferruginous brown are occasionally met with. The thickness of the club of the antennæ is also not always equally great, but always greater than in any other species.

As I have already mentioned in speaking of the varieties of *tristis*, similar varieties occur of this species, viz. :—

Var. *grandicollis*, with larger broad thorax.

Var. *tristis*, with narrow short thorax and broad elytra.

Var. *rotundicollis*, of the shape of *rotundicollis*, but larger.

Var. *nigrita*, of the shape of *nigrita*.

For the differences between these varieties and the similarly named varieties of *tristis*, see the remarks on page 42.

As I have already mentioned, this species used very generally to be made to represent both *tristis* and *chrysoloides* by British and even foreign entomologists.

It is found under small dead birds and mammals. Mr. Bates of Leicester has taken hundreds (and supplied me largely) by a simple trap which is very useful for taking some of our rarest *Clavicornes*. He puts three or four rabbits' feet into a soda-water bottle, buries it in a favourable locality, so that the mouth of the bottle is level with the ground, and in a week or ten days the interior of the bottle is swarming with insects, among which great rarities occasionally occur.

Exotic Species.

18. *C. celer*, Lucas.

Catops celer, Lucas, Explor. de l'Algérie, Anim. Art. ii. p. 225.

Oblongo-ovatus, fulvo-pubescent; capite subtilissime granario; antennis ferrugineis, ultimis articulis fuscis; thorace granario, angulis posticis acuminatis; elytris granariis; corpore infra granario; pedibus ferrugineis femoribusque nigricantibus.

Long. $1\frac{1}{2}$ lin., lat. $\frac{3}{4}$ lin.

Very closely allied to the *C. nigrita*; black, covered with a yellow, silky, very dense pubescence. The head is very finely shagreened and scarcely pubescent. The labial as well as the maxillary palpi are of a clear ferruginous colour. The antennæ are ferruginous, with the four last joints of a deep brown. The

thorax is very finely shagreened, much more pubescent than the head; it is very slightly convex, rounded on the sides, with the posterior angles projecting and pretty strongly acuminate. The scutellum is very finely granulated and scarcely pubescent. The elytra are a little more strongly granulated than the head and thorax, and are very pubescent. All the body below is granulated, scarcely pubescent, and of the same colour as above. The legs are ferruginous, very lightly pubescent, with the thighs blackish.

Found by M. Lucas in Algeria under stones in the month of June. He mentions Oran and the Bondjaréa as localities where he took it, and he observes that it is very agile.

The above description is reproduced from that of M. Lucas. I have seen specimens in his possession, but not having had an opportunity of comparing them with the specimens in my own cabinet, I am not able to pronounce positively upon them. The same remark applies to the other two species from Algeria described by him (*marginicollis* and *rufipennis*).

19. *C. fuscipes*, Menetr.

Catops fuscipes, Menetries, Mém. Acad. Imp. Sciences St. Pétersb. 6 sér. vi. (1849) p. 53.

"Oblongo-ovatus, convexus, posterius valde angustatus pallide rufo-ferrugineus; capite, thoracis dorso, pectore abdomineque nigro-fuscis; antennis tenuibus longitudine dimidii corporis; thorace antrosum angustato, lateribus deflexo, angulis posticis productis acutis; elytris stria tantum suturali exarata*."

Long. $1\frac{3}{4}$ lin., lat. $\frac{3}{4}$ lin.

Menetries says that this species somewhat resembles his *C. lateritius* (already described (No. 5) in the first group), but that it is much more convex and *narrower behind, with the posterior angles of the thorax pointed and prolonged backwards*; he adds that moreover it has no perceptible striæ on the elytra, except one along the suture, but that it is particularly the colour which distinguishes it at the first glance.

I have not seen this species, but the above description, particularly the portion which I have printed in italics, would seem to indicate an affinity to *C. nigricans*, and the pale colour has probably arisen from immaturity. I have therefore, in the absence of any more precise information, placed it in this group.

Menetries does not mention its locality, but as it comes immediately after *C. lateritius*, and he institutes comparisons between them, it is probable that they were found not far from each other. In that case the locality of this species would be Novaia Alexandrovskaiia.

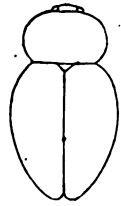
* Menetries in *loc. cit.*

20. *C. vestitus*, mihi.

Oblongo-ovatus, fuscus, dense griseo-pubescentis; antennis clavatis, nigris, basi ferrugineis; thorace transverso, granulato, angulis posticis obtusis; elytris stria suturali.

Long. 2 lin.

Fig. 23.



Oblong-oval, blackish-brown; mouth and legs ferruginous; clothed with a thick, coarse, griseous pubescence, of a more lively fulvous colour on the thorax. The antennæ are clavate, black, except at the base, which is ferruginous; they are not so slender at the base as is usually the case, making the club look less thickened than it is in reality. The first joint is large, the second shorter and narrower; the rest are nearly all of equal length, with the exception of the seventh and ninth, which are a little longer, and the eighth, which is shorter. They gradually increase in thickness up to the seventh, which is the broadest and largest of them all; the eighth joint is smaller and thinner than the seventh and ninth, but not very minute; the terminal joint is suddenly acuminate at the tip, looking as if truncate at the end, with a short spike projecting from the centre. The thorax is transverse, broadest a little behind the middle. The posterior angles are obtuse, except at the very angle, where there is an exceedingly minute rectangular starting-point. The surface is coarsely granular. The scutellum is small. The elytra are granulated and have a distinct sutural stria, but apparently no others—at least the traces, if any, are exceedingly indistinct. The anterior tarsi and first joint of the middle tarsi are dilated in the male.

This species has some resemblance to *C. chrysomeloides*, but it is smaller, the thorax is narrower and more transverse, the antennæ are not so heavily clubbed, and the joints are differently proportioned. It has also some resemblance to *C. tristis*, but the form of the thorax as well as a difference in the pubescence distinguish it. The pubescence is coarser and more dense than in most other species.

From the East Indies (Boys' collection). The above description is taken from a unique (male) example kindly presented to me by my friend Mr. Westwood.

21. *C. Spencianus*, Kirby.

Choleva Spenciana, Kirby, Fn. Bor. Amer. p. 108 (1837).

Catops cadaverinus, (Esch.) Mannerh. Beitr. zur Käf. Faun. der Aleutischen Inseln, Sitka, und Calif., aus d. Bull. Naturforsch. Moscow, xvi. (1843) p. 82. no. 173.

— *fuscus*, Hoff. var. Dej. Cat. 3rd ed. 133.

"Oblongo-ovatus, fusco-piceus, tenue-pubescent; antennis mediocribus, clavatis, basi ferrugineis; thorace brevi transverso, basi parum latiore, angulis posticis obtusis; elytris rufescentibus punctatis, stria suturali impressa; pedibus ferrugineis piceis; femoribus infuscatis.

"Long. $1\frac{1}{2}$ lin., lat. 1 lin.*"

Fig. 24.



Body black, covered with decumbent pale hairs. Head minutely punctured; antennæ shorter than the prothorax, the two first joints ferruginous, the eighth shorter and smaller than the rest; mouth and palpi ferruginous; prothorax not visibly punctured, with all the angles rounded; base with a slight sinus on each side; elytra acute, very minutely punctured, with a hair emerging from each puncture, without furrows, except a single one parallel with the suture, ferruginous, black at the tip; abdomen piceous, rufous at the base; legs ferruginous.

Found in the Sitka Islands by Eschscholtz and Kuprianoff.

A comparison of the authentic unique specimen of Kirby's *Choleva Spenciana* preserved in the British Museum, with specimens of Mannerheim's *Catops cadaverinus*, shows that they are the same species.

Mr. Kirby remarks regarding it, that "This species appears to present the type of a new family of *Choleva*, not noticed in Mr. Spence's 'Synopsis Sectionum' in his admirable Monograph of that genus. From his first section (*Choleva*, Steph.) it borrows the rounded posterior angles of the prothorax; from his second (*Catops*, Steph.) its clavated antennæ; and from his third (*Ptomaphagus*, Steph.) its unfurrowed elytra: it seems properly included in the second, with which it most agrees in habit†."

Var. *b*. Mann. Bull. de la Soc. Mosc. 1843, pp. 173, 254.

Ferrugineo-testacea; capite fusco; thoracis disco antennisque infuscatis; elytris pallide livido-testaceis, postice nonnihil obscurioribus.

As Count Mannerheim observes, this species is somewhat allied to *C. morio*, Erichs. (*fuscus*, Gyll.), but distinguished from it by the thorax being smaller and narrower and the elytra longer. The colour both of the pubescence and body is paler.

In carcasses in the island of Afognak; taken sparingly in the month of August by M. Holmberg, who also took it in California. It was likewise brought by M. Frankenhäuser from the interior of the Peninsula of Kenai.

For the figure of this and the other American species I am indebted to my friend Dr. Leconte of Philadelphia, who has kindly

* Mannerheim in *loc. cit.*

† Kirby in *loc. cit.*

furnished me with drawings of them made expressly for my use in this paper. They are in half outline, and all his figures are four times enlarged. The head is brought up simply to show proportions.

22. *C. brunnipennis*, Mann.

Catops brunnipennis, Mann. Nachtrag zur Käfer-Fauna der Nord-Amerikanischen Länder der Russischen Reiches, Mosc. 1853, p. 14.

"Oblongo-ovatus, convexus, crebre subtilissime reticulato-strigulosus, nigro-piceus, griseo-pubescens; antennis thorace vix brevioribus, ferrugineo-testaceis, clava parum incrassata fusca, articulo octavo minutissimo; thorace longitudine sesqui latiore lateribus modice rotundatis, antice latitudine basis haud angustiore, angulis omnibus subrotundatis; elytris obscure castaneis, apice subacuminatis, stria suturali leviter exarata; pedibus piceo-testaceis.



"Long. $1\frac{3}{4}$ lin., lat. $\frac{3}{4}$ lin.

"Longer than *C. cadaverinus*, Esch., more narrowed behind, besides differing from it in having the antennæ more slender, the thorax much broader, shorter, and not narrowed in front.

"Found tolerably frequently near the river Tschunuktnu in the Peninsula of Kenai, in carcasses at the end of June, M. Frankenhäuser*."

The reader owes the figure of this species to Dr. Leconte.

23. *C. luridipennis*, Mann.

Catops luridipennis, Mann. dritten Nachtrag zur Käfer-Fauna der Nord-Amerikanischen Länder des Russischen Reiches, Mosc. 1853, p. 84.

"Ovatus, convexus, crebre subtilissime reticulato-strigulosus, nigro-piceus, griseo-pubescens; antennis thorace nonnihil longioribus, crassiusculis nigris, articulo octavo minuto; thorace longitudine fere duplo latiore, lateribus rotundato, antice latitudine basis haud angustiore, angulis omnibus rotundatis; elytris obscure castaneis, apice obtusis rotundatis, stria suturali leviter exarata; tarsis rufis.



"Long. $1\frac{1}{2}$ lin., lat. $\frac{5}{8}$ lin.†"

Mannerheim says that this species is allied to his *C. brunnipennis*, but is shorter, and is besides distinguished by having the antennæ thicker, the thorax shorter, its sides more rounded, and the elytra rounded at the apex.

Collected in carcasses in the months of July and August by M. Frankenhäuser on the banks of the Tschunuktnu in the Peninsula of Kenai: not frequent.

* Mannerheim in *loc. cit.*

† *Ibid.*

24. *C. simplex*, Say? Lec.

Catops simplex, Say? Journ. Acad. Nat. Sc. Philad. v. 184; Leconte, Synopsis of the Silphales of America in Proceedings of Acad. Philad. 1853, 281.

Fig. 27.

"Piceus, fulvo-sericeus, dense punctulatus; thorace antrorsum subangustato, lateribus rotundatis, basi late rotundato; elytris obsoletissime striatis, stria suturali profundiore; antennis basi testaceis; tibiis calcaribus mediocribus armatis.

"Long. $1\frac{3}{4}$ lin.

"The anterior tarsi and first joint of the middle tarsi of the male are moderately dilated; the antennæ are as long as the head and thorax, moderately thickened; the seventh joint is a little larger than the sixth, and equal to the ninth; the eighth is about one-half smaller*."

The above is Dr. Leconte's description; the following is Say's:

"Pale brownish, sericeous; terminal and five basal joints of the antennæ rufous. Inhabits Arkansas. Head dark ferruginous; antennæ dark ferruginous, the five basal joints and terminal joint rufous; palpi and mandibles ferruginous; thorax rather paler than the head, quadrate, a little transverse, sides regularly arcuated; posterior margin not wider than the anterior; posterior edge rectilinear; angles rounded; elytra paler than the thorax, light brownish, with obsolete striæ, more obvious towards the tip; very numerous minute punctures furnishing minute hairs; beneath piceous; feet rufous; thighs yellowish beneath. Length nearly $\frac{5}{16}$ ths of an inch. This species occurred on dung†."

Dr. Leconte in speaking of his species remarks, that he is not positively certain that it is Say's species, which was found in Arkansas, while his was from New York. He adds, "The thorax is more narrowed in front than described by him; although the legs are in reality black, the lustre of the fulvous hair is such, that one might readily be tempted to describe them as testaceous at base."

25. *C. clavicornis*, Lec.

Catops clavicornis, Lec. Synopsis of Silphales of America in Proceed. Acad. Philad. 1853, 281.

Fig. 28.

"Oblongo-ovatus, ater, subtiliter pubescens, dense punctulatus; thorace antrorsum valde angustato, lateribus rotundatis, basi late rotundato; elytris versus apicem obsolete striatis, stria suturali profunda; antennis thorace brevioribus, magis clavatis.

"Long. $1\frac{3}{4}$ lin.

* Leconte in *loc. cit.*

† Say in *loc. cit.*

"One female: New York. This species is readily distinguished from the preceding (*C. simplex*) by the shorter, more clavate antennæ, which are only indistinctly testaceous at the base; the seventh joint is about twice as large as the sixth; the eighth is smaller than the sixth, and appears only about one-third as large as its neighbours. The spines of the tibiæ are somewhat smaller than in the preceding species (*simplex*)*."

2nd Subdivision. *Thorax forming a continuous or nearly continuous line with the elytra; middle tarsi of the males widened in some species, in others not.*

In the last subdivision our arrangement led us gradually from the species with slender antennæ to those with the heaviest and thickest-clubbed antennæ. The affinity to these leads us now to reverse this order, and to commence this subdivision with those having similar thick antennæ.

A. *Antennæ heavily clubbed and middle tarsi widened in the males.*

26. *C. fumatus*, Erichs.

Choleva Watsoni, Spence, Linn. Trans. xi. 156.

Catops agilis, Fab. Syst. Elæuth. ii. 565. 6; Gyll. Ins. Suec. i. 277. 2; Panz. Faun. Germ. 95. 10; Duft. Fn. Aust. iii. 75. 4.

Catops fumatus, Erichs. Käf. d. M. Br. i. 240. 12; Sturm, Dent. Fn. xiv. 31. 15. t. 176. f. c. C; Heer, Fn. Helv. i. 382. 15; Redt. Fn. Aust. 144. 7; Kraatz, Stett. Ent. Zeit. xiii. 436. 22; Fairm. & Laboulb. Fn. Ent. Fr. i. 303. 14.

Oblongo-ovalis, fusco-piceus; *antennis brevibus, clavatis, basi apiceque ferrugineis*; thorace brevi, basi latiore, *angulis posticis rectis*; elytris pedibusque testaceis.

Long. $1\frac{1}{2}$ lin.

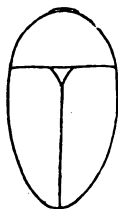
One of the smaller species. Oblong oval. Deep brown. Antennæ short and thick, a little longer than the thorax, brown; last joint broader than long, both it and the three first joints ferruginous.

Head black, densely punctate. Thorax with reddish transparent margins, slightly arched; densely and finely punctate, almost twice as broad as long, as broad at the base as the elytra, or very nearly so, narrowed in front; posterior angles right-angled, pointed; posterior margin almost straight. Elytra oval, acuminate, densely punctate, without traces of striæ, except the sutural; reddish-brown, often brownish at the extremity. Under side blackish-brown. Legs ferruginous.

Distinguished from the other European species of this sub-

* Leconte in *loc. cit.*

Fig. 29.



division, except *alpinus* and *scitulus*, by its short, thick, heavily-clubbed antennæ.

The *alpinus* is clearer in colour, is longer, and has the thorax usually narrower than the elytra. *Scitulus* differs from *fumatus* in having the antennæ longer, the elytra broader, the posterior angles of the thorax projecting, and the colour somewhat different, the elytra being brown, without the reddish tint which is characteristic of *fumatus*, particularly at the base of the elytra, and having a marked sericeous lustre.

One of the commonest species. It is found in Scotland and England, and all over Europe, under detritus, in decaying fungi and under leaves.

27. *C. alpinus*, Gyll.

Catops alpinus, Gyll. Ins. iv. 3121. 2; Heer, Fn. Helv. i. 318. 11; Kraatz, Stett. Ent. Zeit. xiii. 435. 21.

Catops subfuscus, Kellner, Stett. Ent. Zeit. viii. 177. 4; Redt. Fn. Aust. 771.

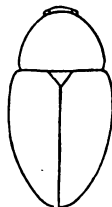
Oblongo-ovalis, fusco-piceus; *antennis abrupte clavatis*, Fig. 30.*
basi ferrugineis; thorace brevi, *angulis posticis obtusiusculis*; elytris pedibusque rufo-brunneis.

Long. $1\frac{1}{2}$ – $1\frac{3}{4}$ lin.

Very like *C. fumatus*, but usually somewhat larger, with a narrower thorax, the posterior angles of which are obtuse, and the basal margin not so broad as the elytra. The antennæ are as long as the head and thorax, with the basal joints reddish and thick; club blackish; the last joint is usually black, but sometimes yellowish at the tip. The head is black, densely and finely punctate, with a yellowish pubescence. The thorax is blackish-brown, densely punctate, densely clothed with yellow hairs, at the basal margin not so broad as the elytra, cut straight, and slightly sinuate on both sides of the scutellum, the anterior angles obtuse and the posterior angles slightly rounded. The elytra are oval, densely punctate, lightly clothed with yellow pubescence, clear reddish-brown, generally blackish at the tip and towards the suture. The legs are brownish-red.

The normal specimens are readily distinguished from *fumatus* by their larger size and more elongate form, and by the thorax being narrower than the elytra; but these characters are sometimes wanting, and in form the smaller specimens do not differ from *C. fumatus*; the clearer colour, the particularly strong dark club of the antennæ with its eighth joint proportionately smaller, then serve to distinguish it; but on the whole I am very doubtful of its being more than a variety of *fumatus*, and it is with hesitation I have placed it as a distinct species.

* The comparative breadth of the elytra is rather exaggerated in this figure.



Generally distributed over the north of Europe; but I have not yet seen British specimens.

28. *C. brevicollis*, Kraatz.

Catops brevicollis, Kraatz, Stett. Ent. Zeit. xiii. 436. 23.

"Ovatus, fusco-piceus; *antennis ferrugineis obsoletissime clavatis, articulo ultimo duobus præcedentibus longitudine æquali, acuminato*; thorace fusco, transverso, basi latiore, *angulis posticis rotundatis*; elytris substriatis pedibusque rufo-testaceis.

"Long. $1\frac{1}{2}$ lin."

I have not seen this species. The following is M. Kraatz's description:—

"Nearly in the middle between *C. fumatus* and *C. scitulus*. Easily distinguished from both by the wholly different thorax and form of the antennæ. Pitchy-brown; elytra and legs brownish-yellow. The antennæ are somewhat longer than the head and thorax, reddish-brown throughout; the club scarcely perceptibly thickened; the five last joints are only a little stouter than those preceding, and are of equal breadth; the first joint is somewhat longer and a little stouter than the second; the third somewhat shorter than the second, distinctly larger than the fourth, almost equal to the sixth; fifth scarcely larger than those on each side of it; seventh half as long again and somewhat stouter than the sixth, equal to the ninth; eighth scarcely slenderer, and half as long as those on each side of it; tenth a little shorter than ninth; eleventh as long as ninth and tenth together, from the middle outwards sharply acuminate. The head is pitchy-black, very finely moderately densely punctate; the mouth brownish-yellow. The thorax of the breadth of the elytra, broadest at the base, more than twice as broad as long, tolerably strongly and symmetrically narrowed from the base towards the front. The anterior angles are rounded, somewhat depressed; the obtusely rounded hinder angles project a little beyond the anterior margin of the elytra; the posterior margin is very feebly sinuated on both sides near the middle; the upper side is moderately, densely, finely shagreen-punctate, pitchy-black; the sides and posterior margin brownish, tolerably closely covered with a long yellowish-grey pubescence. The elytra are uniform, only slightly narrowed behind, densely and finely punctate, with a slight bloom or hoar-frost on them, sparingly and finely pubescent, brownish-yellow. The under side of the body is pitchy-black. The legs are reddish-yellow*."

M. Kraatz has established this species upon one example from Sicily, communicated by Zeller to the Royal Museum of Berlin.

* Kraatz in *loc. cit.*

29. *C. scitulus*, Erichs.*Choleva fumata*, Spence, Linn. Trans. xl. 155. 4.*Catops scitulus*, Erichs. Käf. d. M. Brand. i. 241. 13; Sturm, Deutschl. Faun. xiv. 33. 16; Redt. Faun. Aust. 772; Kraatz, Stett. Ent. Zeit. xiii. 437. 24; Fairm. & Laboulb. Fn. Ent. Fr. i. 304. 17.

Ovatus, fuscus; antennis leviter clavatis, ferrugineis; thorace postice latiore, *angulis posticis productis, rectis*; elytris pedibusque obscure fusco-testaceis.

Long. $1\frac{1}{2}$ lin.

Oval, brown. Antennæ as long as head and thorax, ferruginous, a little deeper before the extremity. Head brownish-black, densely punctate. Thorax large, deep brown, densely punctate, only one-third broader than long, as broad at the base as the elytra, narrowed in front from the middle, rounded on the sides; posterior angles pointed, a little projecting behind, which makes the posterior margin visibly sinuated on each side. Elytra oval, slightly acuminate; densely punctate, without vestiges of striæ, except the sutural; testaceous-brown, extremity blackish. Legs ferruginous.

Resembles *C. fumatus*, but differs by having the antennæ longer, the elytra broader, and the posterior angles of the thorax projecting a little behind, and its colour darker and concolorous; and covered with a fine silky pubescence, so that when looked at from behind, a paler sericeous band appears to stretch across the elytra.

Not common. Has been taken near Berlin, in Thuringia, Erlangen, Switzerland, near Paris, near London, and in the south of England. I have not seen any examples taken in Scotland.

B. *Antennæ not heavily clubbed; middle tarsi of males rarely widened.*

30. *C. depressus*, mihi.

Breviter ovatus, postice attenuatus, ferrugineus; antennis subfiliformibus; thorace transverso, subdepresso, postice latiore, *lateribus postice leviter inflexis*; angulis posticis fere acutis; elytris pallidioribus, substriatis.

Long. $1\frac{7}{8}$ lin.

Entirely of a pale ferruginous colour; the elytra paler, and the legs testaceous. The antennæ are slender, pale ferruginous; first joint stouter and longer than the second; third joint nearly twice as long as the

Fig. 31.

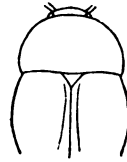


Fig. 32.*



* The sinuations of the thorax and prominence of the shoulders are rather exaggerated in this figure.

second; fourth nearly as long as the third; fifth and sixth joints nearly equal in length—if there is any difference, the fifth is longer than the sixth, but this is scarcely perceptible; they are also all of the same breadth, and each is shorter than the third; the seventh is a little longer than the sixth, and broader; the eighth is only half as long as the seventh, but scarcely narrower; the ninth and tenth are nearly equal in length, rather broader than the seventh; the eleventh is nearly round, but with a slight obtuse point at the tip. Head brown, pretty closely and distinctly punctate, most deeply in front, and with a shallow frontal depression; clothed with a yellowish pubescence. Thorax transverse, subdepressed, narrowest in front; the posterior angles meeting, and as broad (or nearly so) as the base of the elytra, the lateral margins with a slight appearance of inflexion just before the posterior angles; the anterior angles rounded; the posterior angles somewhat acute; posterior margin broadly sinuate towards the sides; shagreen-punctured, clothed with a yellowish pubescence. Elytra $2\frac{1}{2}$ times as long as the thorax, ferruginous-red; shoulders prominent, and tapering from them towards the apex; turned rapidly in at the apex, so as to make it appear almost slightly truncate; a depression surrounds the scutellum (which is large and triangular) and extends along on each side of the suture for more than half the length of the elytra, the back of each elytron rising in a somewhat humped manner from the depression; there is a deep sutural line running up the middle of this depression; it touches the suture at the apex, expands as it goes along, and contracts almost to the suture again when it reaches the scutellum; the elytra are tolerably distinctly striated, the striae deepest at the apex; shagreen-punctured, and clothed with a close testaceous yellow pubescence. Legs and under side of same colour as upper side, but rather paler, clothed with a similar pubescence.

At first sight this species is very like *fuscus*, many specimens of which have the same depression on the back of the elytra; but it is distinguished at once by the different form of the posterior part of the thorax, which in *fuscus* turns in to meet the base of the elytra, while in this species it does not. The joints of the antennæ are also somewhat different in their proportions, and the elytra taper more rapidly to the apex, and the apex itself at its extremity has a tendency to become semi-truncate for a short space, while in *fuscus* the apex is rounded off to the suture. There is, however, no doubt that this is very much akin to *fuscus*, and, in a strictly natural arrangement, should come next to it; but no arrangement will provide for all the aberrant forms which occur, and an occasional separation of nearly allied species must be submitted to, for the

sake of the greater facility of determination afforded by artificial divisions.

The above description is taken from a single female specimen which I found in M. Chevrolat's collection, and which, although unique, he has kindly ceded to me. It stood among his European species, but the exact locality was not mentioned.

31. *C. umbrinus*, Erichs.

Catops umbrinus, Erichs. Käf. d. M. Brand. i. 235. 4; Redt. Fn. Aust. 771; Kraatz, Stett. Ent. Zeit. xiii. 407. 7; Fairm. & Laboulb. i. 303. 15.

Ovatus, brunneus; antennis subfiliformibus; thorace transverso, postice latiore, angulis posticis elongatis, *acutis*; elytris substriatis.

Long. $1\frac{3}{4}$ lin.

Short oval, brown. Antennæ scarcely thickened at the extremity, ferruginous, lighter at the base, clear yellow at the apex. Head almost black; mouth reddish. Thorax densely and finely punctate, broadest behind, posterior margin sinuate, and the posterior angles pointed, projecting, embracing the base of the elytra. Elytra very slightly widened in the middle, obtusely rounded at the apex, finely and densely punctate with indistinct striae, scarcely more visible behind. Legs reddish. Middle tarsi of males widened.

Fig. 33.



The completely oval shape of this species, the outline of the thorax fitting exactly to the elytra, distinguishes it from all but a few. Its slender antennæ distinguish it from those in the preceding section of this subdivision. It is the largest species of this section, and comes nearest to *C. velox*. Its larger size, darker colour, the posterior angles of the thorax more projected behind, and the middle tarsi widened in the males, distinguish it from that species.

Widely distributed over the Continent, but I am not aware of its having been taken in Britain*. It has been taken near Stettin, Berlin, in Austria, near Kiew, Paris, Fontainebleau, &c., on trees and under leaves.

32. *C. velox*, Spence.

Choleva velox, Spence, Linn. Trans. xi. 154. 13.

Catops velox, Erichs. Käf. d. M. Brand. i. 241. 14; Sturm, Deutschl. Faun. xiv. 3. 5. 17. t. 277. f. b. B; Heer, Fn. Helv. i. 383. 17; Redt. Fn. Aust. 144. 15; Kraatz, Stett. Ent. Zeit. xiii. 437. 25; Fairm. & Laboulb. Fn. Ent. Fr. i. 304. 18.

* I recorded this in my 'Catalogue of Scottish Coleoptera' as having been taken by Mr. Morris Young near Paisley, but I am now satisfied that this was a mistake.

Ovatus, ferrugineus; capite fusco; antennis longioribus, obsolete clavatis, ferrugineis; thorace transverso, basi latiore, *marginē postico leviter sinuato*, angulis posticis rectis; elytris obsoletissime striatis, *subtilissime transversim rugulosis*.

Fig. 34.



Oval, ferruginous-red; head brown, reddish in front, extremely finely punctate. Antennæ as long as the head and thorax, slender, very feebly thickened towards the extremity, ferruginous, the last joint not more slender than the preceding, excised at the extremity. Thorax densely and finely punctate, as broad behind as the elytra, one half broader than long, rounded on the sides, narrowed in front; posterior angles right-angled, pointed a little inwards; posterior margin lightly but visibly sinuate on each side; ferruginous, with the disk darker, and the margins semi-transparent. Elytra scarcely widened in the middle, obtusely rounded at the extremity, with very indistinct striæ; surface densely punctate, finely wrinkled across. Anterior legs slightly widened at the extremity; middle tarsi not widened in the males.

Distinguished from *C. scitulus*, to which it has considerable outward resemblance, by its more slender antennæ, its paler colour, the margins of the thorax lighter-coloured than the disk, its transversely wrinkled elytra, and its middle tarsi not widened in the males.

Differs from *C. umbrinus* by its smaller size, its lighter colour, the posterior angles of the thorax not produced behind, the elytra transversely wrinkled, and the middle tarsi not widened in the males.

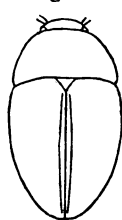
Found throughout Britain and over the Continent not unfrequently. It has also been taken by Chaudoir at Kiew, and by Wollaston at Madeira, where, however, it appears to be excessively rare.

33. *C. badius*, Dahl., Sturm.

Catops badius, Meg. Dahl. Col. et Lepid. 30; Sturm, Deutschl. Fn. xiv. 40. 20. t. 278. b. B; Heer, Faun. Helv. i. 383. 19; Redt. Fn. Aust. 145. 15; Kraatz, Stett. Ent. Zeit. xiii. 437. 26.

Ovatus, piceo-brunneus; antennis longioribus, obsolete clavatis, ferrugineis; thorace transverso, basi latiore, *marginē postico recto*, angulis posticis rectis, *prominulis*; elytris obsoletissime striatis.

Fig. 35.



Long. $1-1\frac{3}{4}$ lin.

Perfectly egg-shaped, the sharper end behind, gently convex, clear pitchy-brown, the whole upper side clothed with a fine, adpressed, yellow-

ish-grey pubescence. The antennæ are a little longer than the head and thorax, ferruginous-yellow, somewhat thickened towards the point; the seventh joint longish, the eighth shorter, but as broad as the last, the terminal joint obtuse roundish. The head is very finely punctate, the eyes black. The thorax is finely and densely punctate, short, behind exactly as broad as the base of the elytra, strongly narrowed in front, the anterior and posterior margins not sinuate, the sides lightly rounded, the posterior angles right-angled, somewhat projecting over the shoulders of the elytra. The scutellum large, triangular, finely punctate. The elytra are oblong-oval, widest in the middle, behind acuminate-oval, finely shagreened, with a deeply impressed sutural stria, but without traces of other striae. The under side of the body and the legs are of the same colour as the upper, only somewhat lighter.

Distinguished from *C. velox* by its decidedly more slender form, by its colour always pitchy-brown and not reddish-brown, and by the posterior angles of the thorax somewhat projecting over the margins of the elytra.

Differs from *C. præcox* by its thorax not being wider than the elytra, and from *C. brunneus* by its larger size, and the posterior angles of the thorax not being obtuse.

This species seems rare. Sturm simply says it is found in Austria. Kraatz says he has only seen two specimens, which came from Vienna. I have not seen it.

34. *C. præcox*, Erichs.

Choleva Wilkinii, Spence, Linn. Trans. xi. 157.

Catops præcox, Erichs. Käf. d. M. Br. i. 242. 15; Sturm, Deutschl. Fn. xiv. 37. 18. t. 277. f. c. C; Heer, Fn. Helv. i. 318. 18; Redt. Fn. Aust. 145. 16; Kraatz, Stett. Ent. Zeit. xiii. 438. 27; Fairm. & Laboulb. Fn. Ent. Fr. i. 304. 19.

Oblongo-ovatus, ferrugineus; antennis longioribus, obsolete clavatis, ferrugineis; thorace brevi, basiliore, *marginè postico recto, angulis posticis obtusis*; elytris obsoletissime striatis, *paulo angustioribus quam thorace*.

Fig. 36.



One of the smallest species, of a peculiar shape, oblong-oval, gradually narrowed behind, with the apex somewhat truncate, brownish ferruginous, clothed with a very fine and thin yellowish pubescence. The antennæ are ferruginous-red, almost longer than the head and thorax; only the three last joints are perceptibly thicker than those preceding, and the eighth joint decidedly shorter, but not more slender than the seventh. The head is frequently brownish or blackish on the front. The thorax is large, transverse, very

slightly, but still perceptibly, broader than the elytra; the sides are rounded, more narrowed in front than behind; the posterior angles obtuse; the posterior margin straight, very finely and densely punctate. The scutellum is of the form of an equilateral triangle. The elytra are oblong, straight, perceptibly narrowed behind, with the apex truncate, somewhat flat, more distinctly punctate than the thorax, and very feebly and indistinctly striated, with the exception of the sutural stria, which is deeply impressed. The anterior tibiae are slightly widened towards the extremity.

Where the characteristic breadth of the thorax is well marked, this species can be recognized by the base of the thorax being a little wider than the base of the elytra, and by the elytra narrowing backwards and becoming truncate: where this is less conspicuous, the smaller size, narrower shape, the straight margins of the elytra, and their narrowing behind, distinguish it from *C. velox*. From *C. badius*, its smaller size, much lighter colour, straight posterior margin of thorax not projecting backwards at the posterior angles, separate it; and it is distinguished from *C. brunneus* by the finer punctuation of the elytra.

Spread over all Europe, including Scotland and England, but everywhere scarce.

35. *C. transverso-striatus*, Dej. Cat.

Catops transverso-striatus, Dej. Cat. 3rd ed. p. 133.

Angustatus, elongatus; antennis longioribus quam capite et thorace; elytris postice attenuatis, striatis et fortiter elongatis, transversim strigosis. Fig. 36a.

Mas, elytris longissimis. Long. $1\frac{1}{4}$ lin.

Fœm., elytris minus elongatis. Lat. 1 lin.

This species bears considerable resemblance to *C. præcox*, is of the same colour, but is larger, and in the male especially has the elytra much more elongate.

It has also the elytra very deeply transversely strigose, and has seven distinctly impressed irregular striae, besides a deep sutural stria.

Male. Pubescent, of a yellowish testaceous or pale brown colour. The antennæ are testaceous, slender, longer than the head and thorax. The first and second joints are long, the first a little shorter and thicker than the second; the second, third and fourth are about equal in length; the fifth, sixth and seventh are all nearly of the same breadth and thickness, but each a little shorter than the one preceding it; the eighth is slightly shorter than those on each side of it. The last three are thick-



ened; the last is short and a little acuminate. The head is a little darker than the rest of the body, and the mouth somewhat lighter. The thorax is pubescent, smooth, not punctate, but feebly granulose, broader than long, rounded on the sides, broadest a little behind the middle, bisinuate at the base, with the posterior angles projecting slightly backwards. The scutellum is large and acutely triangular. The elytra are very long, being five times the length of the thorax, and taper towards the apex in a wedge-shape. They are very deeply transversely wrinkled, with a profound sutural stria, and seven other striae less deeply impressed but still quite distinct. The apex of each elytron is somewhat rounded. The margins of the elytra are broadly inflexed, leaving a prominent lateral ridge.

Female. The above description will apply also to the female, with the following alterations:—She is much shorter and comparatively broader, and the elytra are not so disproportioned in their length. The antennae are shorter and thicker, the base and apex much paler than the middle. The impressed striae on the elytra are much less evident, but the transverse strigations are equally distinct.

No species that I have seen has the transverse strigations so strongly marked. It may at first sight be mistaken for a very large *præcox*, but these strigations and the almost disproportionate length and wedge-shape of the elytra in the male distinguish it readily.

I found three males and one female under this name, marked as coming from Portugal, in the collection of the Count Dejean; the kindness of M. le Marquis de Laferté Senectère having placed that collection in my hands for examination.

36. *C. brunneus*, Dahl., Sturm.

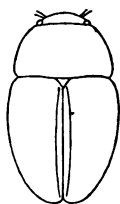
Catops brunneus, Knoch, Dahl. Col. et Lepid. 30; Sturm, Deutschl. Fn. xiv. 38. 19. t. 278. f. a. A; Redt. Fn. Aust. 145. 16; Kraatz, Stett. Ent. Zeit. xiii. 439. 28.

Ovatus, piceo-brunneus, *fumatus*; capite fusco; antennis longioribus, obsolete clavatis, ferrugineis; thorace transverso, basi latiore, *marginè postico recto, angulis posticis obtusis*; elytris brunneis.

Long. 1 lin.

As large as *C. præcox*, but of a wholly different shape. It is broad-oval, moderately flat, behind broadly truncate, ferruginous-brown and shining. The antennae are as long as the head and thorax, thin, gradually somewhat thickened towards the apex, the terminal joint roundish, pubescent, the eighth joint short. The head

Fig. 37.



broad, pitchy-black, finely punctate; the parts of the mouth ferruginous-red. The thorax is large, broad, as broad at the base as the elytra, only slightly narrowed in front; the sides lightly rounded; the posterior angles obtuse; the basal margin straight; it is moreover slightly convex, somewhat darker on the back, very finely and densely punctate, and thinly clothed with a fine yellowish-grey pubescence. The scutellum is obtusely triangular, densely punctate. The elytra are of a short and broad oval form, broadly truncate at the apex, finely shagreen-punctured, thinly clothed with a yellowish-grey pubescence, deeply impressed with a sutural stria, and without any traces of other striæ. The abdomen is pitchy-black; the legs are ferruginous-yellow.

The salient points in which it differs from *C. præcox* have been already noticed. It is larger, more densely pubescent, more thickly punctate and less shining than the following species (*C. anisotomoides*).

The above description is reproduced from Sturm, as I have not seen the species. It has been taken in Hungary and Austria.

37. *C. anisotomoides*, Spence.

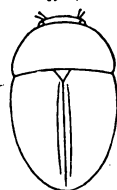
Choleva anisotomoides, Spence, Linn. Trans. xi. 156. 16.

Catops anisotomoides, Sturm, Deutschl. Fn. xiv. 42. 21. t. 278. f. c. C; Heer, Fn. Helv. i. 384. 20; Redt. Fn. Aust. 145. 16; Kraatz, Stett. Ent. Zeit. xiii. 439. 29; Fairm. & Laboulb. Fn. Ent. Fr. i. 304. 20.

Ovatus, piceus, nitidulus; antennis longioribus, obsolete clavatis; thorace transverso, basi latiore, margine postico recto, angulis posticis obtusis; elytris piceis seu rufo-piceis.

Long. $\frac{3}{4}$ lin.

.Fig. 38.



Oval, very convex. Pale ferruginous-brown, somewhat shining, variable in depth of colour, deeper on the disk of the thorax and of the elytra, with a fine brown pubescence. Antennæ tolerably long, scarcely thickened at the extremity. Thorax transverse, as broad at the base as the base of the elytra, narrowed a little in front, very densely but finely punctate; posterior margin straight, posterior angles obtuse. Elytra elongate-oval, scarcely widening behind the base, then gradually becoming narrower; densely punctate, but not so finely as the thorax; suture raised; sutural stria deep, almost reaching the scutellum; no traces of other striæ to be seen. Legs and antennæ of the same colour as the body.

The smallness of its size, and its short and more convex form, distinguish it from *C. velox*. It is nearer in point of size to *C. præcox*, but the more elongate form of the latter and its dif-

ferently shaped thorax distinguish it; and a tendency which it has to curl itself up like an *Agathidium* will suggest what it is.

Distributed over all Europe, and generally common. In Scotland and England it is scarcer; but in France and Germany it is very common. Fairmaire says it is found almost all the year round in vegetable detritus, principally on the banks of lakes and marshes.

Exotic species.

38. *C. marginicollis*, Lucas.

Catops marginicollis, Lucas, Expl. de l'Algérie, Anim. Art. ii. p. 224. pl. 21. fig. 4.

"Capite nigro, granario; thorace subgranario, nigro, ferrugineo marginato, angulis posticis subacuminatis; elytris nigris striatis subtilissimis confertissime punctulatis; corpore infra nigro, subtiliter granario; pedibus antennisque ferrugineis. "Long. $2\frac{1}{2}$ lin., lat. $1\frac{1}{2}$ lin.

Fig. 39.



"The head is black, granulated, and scarcely pubescent. The maxillary and labial palpi, as well as the antennæ, are entirely ferruginous. The thorax pubescent, very lightly granulated, black, with the lateral margins ferruginous; it is very gently convex, rounded on the lateral parts, with the angles on each side of the base less projecting, and a little less acuminate than in *C. celer*, Luc. The scutellum is black, granulated. The elytra, of the same colour as the scutellum, pubescent, have a very fine and very dense punctuation; they are striated, and the striæ are sufficiently well marked. All the body below is of a deep brown, and is very finely granulated. The legs are entirely ferruginous*."

This species was taken by M. Lucas at Oran, in the west of Algeria, under stones, in the end of February.

The outlines of this and the following species are taken from the figures given in M. Lucas' work.

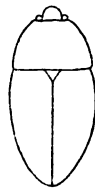
39. *C. rufipennis*, Lucas.

Catops rufipennis, Luc. Expl. d'Algérie, Anim. Art. ii. p. 224. pl. 21. fig. 3.

"Capite nigro, granario; thorace subtilissime granario, nigro, ad latera posticeque rufescente marginato; elytris granariis rufis, ad suturam utrinque unistriatis; corpore infra nigro; pedibus rufis tibiisque fusco-maculatis.

Fig. 40.

"Long. $2\frac{1}{4}$ lin., lat. 1 lin.



"This is smaller than *C. celer*, from the same country (Algeria), and cannot be confounded with it,

* Lucas in *loc. cit.*

on account of the colour of its elytra, which are entirely ferruginous. The head is black, granulated. The maxillary palpi, as well as the labial palpi, are reddish. The antennæ are ferruginous, with the last joints a little brownish. The thorax slightly pubescent, very finely granulated, and tolerably convex; black, margined with ferruginous on the sides and behind; the sides are rounded, as are also the angles on each side of the base. The scutellum is black, pubescent, and very finely granulated. The elytra very pubescent, ferruginous; they are finely granulated, striated, and a sutural stria appears pretty deeply impressed on each side of the suture. The whole body below is black. The legs are of the same colour as the elytra, with the thighs marked with brown, and the tibiæ finely denticulated*."

Met with by M. Lucas on a single occasion, under stones, in the month of January, in the ravines of Djebel Santon, in the neighbourhood of Oran.

40. *C. fungicola*, Kolen.

Catops fungicola, Kolenati, Meletemata Ent. fasc. v. 51.

"Castaneus, nitidus, pubescens, punctulatus; capite brunneo, antennis pedibusque testaceis.

"Long. 0.0025, lat. 0.00133.

"Head blackish-brown, shining, scarcely punctulated; thorax testaceous or chestnut, pubescent, very finely punctulate; elytra convex, chestnut, shining, narrowed behind, rounded, punctulate. Scutellum brown, punctulate.

"Lives in fungi in the woods of Mount Ssarijal, in the province of Elisabethopolis†."

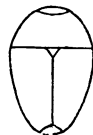
This species is unknown to me, and I place it in this group merely from the colour, none of the characters on which I have rested my subdivisions of the genus being mentioned by M. Kolenati.

41. *C. pusillus*, Motsch.

Catops pusillus, Victor Motschoulsky, Bull. Soc. Imp. Mosc. 1840, p. 175.

"Ovalis, cinnamomeus, sericeo-pubescent; thorace transverso, angulis posticis subproductis, lateribus rotundatis; antennis pedibusque dilutioribus pubescentibus.

"Long. $\frac{1}{2}$ lin., lat. $\frac{1}{3}$ lin.



"One of the smallest species of *Catops*, and covered with a close golden pubescence. The antennæ are a little pilose,

* Lucas in *loc. cit.*

† Kolenati in *loc. cit.*

of the length of the head and thorax together, the eighth joint much smaller and shorter than the seventh. The thorax is transverse, rounded on the sides, and when looked at from in front, it appears even a little broader than the elytra; it is cut straight at the base, and has the posterior angles a little projecting backwards. The scutellum is triangular. The elytra are oval, *obliquely emarginate at the extremity towards the suture, with the exterior angle projecting in a point*. On each side of the suture there is an impressed line which reaches a little beyond the half of the elytra. The anterior tibiæ are a very little dilated*."

The emargination of the elytra at the apex of the suture furnishes an easy character for distinguishing this species.

M. Motschoulsky mentions that he took it in spring at Ananur, on the great military route of Georgia, and in the month of August, near Davial, on the same route. It was found under stones, and in the earth, among roots, in obscure places. The specimens which have been recently excluded are often of a testaceous colour.

42. *C. pallidus*, Menetries.

Catops pallidus, Menetr. Cat. rais. des Obj. de Zool. rec. dans un Voyage au Caucase, &c., p. 169.

"Oblongo-ovatus, subdepressus, ferrugineus, breviter griseo-pubescent; elytris obsolete punctulatis, apice subacuminatis. Long. 2 lin., lat. $1\frac{1}{2}$ lin.

"Found at Bakon†."

The above meagre description is all that we know of this species; it would, however, rather appear to belong to this group.

43. *C. Dauricus*, Motsch.

Catops Dauricus, Motsch. Remarques sur la Collection de Col. Russ. de V. de Motschoulsky in Bulletin de Moscou, vol. xviii. 1845.

"Testaceo-ferrugineus; thorax angustior quam elytra.

"A species remarkable on account of its thorax being much narrower than the elytra, which are of a tolerably broad oval, and acuminate at the extremity. The *facies* approaches nearly the genus *Pteroloma*, but the body wholly removes it. It is of a ferruginous-yellow colour, and is found on the summits of the alps of Hamar-Daban in Mongolia‡."

* Motschoulsky in *loc. cit.*

† Menetries in *loc. cit.*

‡ Motschoulsky in *loc. cit.*

I have not seen this species in nature, and the above description is too short to enable us to form an accurate idea of its form or affinities.

44. *C. basilaris*, Say.

Catops basilaris, Say, Journ. Acad. Philadelphia, iii. 194.

"Niger, brevissima flavescens pubescentia vestitus; elytris brunneis, pallidioribus ad basin.

"Long. $1\frac{1}{2}$ lin.

"Body black, covered with numerous short yellowish hairs; eyes fuscous; antennæ blackish, two basal joints yellowish-white; eighth joint very small, transverse, shortest; the seventh and three terminal joints largest, the latter somewhat piceous; thorax transverse, quadrate, convex, rather narrower before; lateral edge regularly arcuated, basal and anterior edge subrectilinear; angles rounded; scutellum triangular; elytra brownish, paler at base; a distinct subsutural impressed line; labrum and palpi pale piceous, beneath blackish piceous; feet dark piceous.

"Found under wood at Engineer Cantonment, on the Missouri*."

I believe it is not known what species Say had in view in describing this. Dr. Leconte, whose knowledge of American entomology is perhaps greater than that possessed by any other naturalist, includes it, in his 'Synopsis of the *Silphales* of America,' among those which were unknown to him. Say's description, I think, seems to point either to an affinity with *C. tristis* or *C. fumatus*, and I place it in this group with doubt.

45. *C. opacus*, Say.

Catops opacus, Say, Journ. Acad. Nat. Sc. Philad. v. 184; Leconte, Syn. Silph. Amer. in Proceedings of Acad. Philad. (1853) 280.

"Ater, punctulatus, subtiliter pubescens; thorace semi-elliptico, basi late rotundato; elytris obsolete striatis; tibiis calcaribus magnis armatis.

"Long. 2 lin.

"New York and Ohio: rare.

"The male has three joints of the anterior tarsi strongly dilated; the middle tarsi are not dilated. The sutural stria of the elytra is deeper than the others†."



* Say in *loc. cit.*

† Leconte in *loc. cit.*

46. *C. terminans*, Leconte.

Catops terminans, Lec., Agassiz, Lake Superior, 218; Lec. Synops. Silph. N. Amer. Proc. Acad. Philad. vi. 1853, 282.

"Oblongo-ovalis minus convexus, nigro-piceus, subtiliter pubescens; elytris distinctius rugose punctulatis, stria suturali profunda; thorace brevior, antrorsum valde angustato, angulis posticis vix productis; pedibus fuscis; antennis apice flavis, basi testaceis. Fig. 43.



"Long. 1 lin.

"Very abundant at the mouth of the Pic river, on the north side of Lake Superior, under dried animal matter. This species is broader and less convex than *C. consobrinus*, and is easily known by the more distinct punctuation, and by the absence of the transverse lines. The thorax is densely and finely punctulate; it is about twice as wide as its length, strongly narrowed in front, rounded on the sides, especially anteriorly, slightly emarginate at apex, truncate at base, and very slightly sinuate at the posterior angles, which are scarcely perceptibly acute. The anterior tarsi of the male, and the first joint of the middle tarsi, are dilated*."

47. *C. monilis*, mihi.

Oblongo-ovalis, fuscus; antennis capite et thorace longioribus, articulo octavo minutissimo, articulis ante sextum non gradatim crescentibus magnitudine, fuscis, articulo ultimo et articulis ad basin ferrugineis; thorace leviter, elytris fortiter transversostrigosis, his stria suturali impressis; pedibus spinosis.

Fig. 44.



Long. $1\frac{1}{2}$ lin., lat. $\frac{5}{8}$ lin.

Oblong-oval, nearly of the same size and form as *C. alpinus*, brown, a little darker behind and on the middle of the thorax. The antennæ are longer than the head and thorax; the basal joints (first, second, third, fourth and fifth) and the last joint are ferruginous-yellow; the seventh, eighth, ninth and tenth joints blackish-brown; first joint large, and longer than second; second thin and slender, a little longer than third; third, fourth and fifth thin and slender and very short, nearly all of equal length; sixth shorter than these, but rather broader; seventh largest and broadest of the whole; eighth excessively minute; ninth and tenth of equal length and thickness, rather narrower than the seventh, their sides more parallel than is the case in other species; eleventh of the same breadth as the two preceding. Head broad, rugosely punctate; mouth broad, concolorous. Thorax

* Leconte in *loc. cit.*

pale on the margins, lightly transversely strigose. Elytra more decidedly transversely strigose, with the suture and a sutural stria somewhat depressed, and indistinct traces of striae towards the apex. Scutellum equilaterally triangular, somewhat depressed, clothed all over with a concolorous fuscous pubescence; beneath the pubescence the surface is somewhat shining; under side and legs fuscous-brown, paler than above; tibiae slightly and delicately spinous, middle tibiae slightly bent.

This species has very much the appearance of *alpinus*, but the structure of the antennae is different. They are longer than in that species. The club also does not gradually increase in thickness from the first joint onwards till it reaches its greatest breadth at the seventh, and then taper away again, as in *alpinus*; the club from the eighth joint to the middle of the last joint is of equal thickness, giving a somewhat moniliform appearance to the club, from which character I have given its name. In *alpinus* the third joint is thicker and longer than the second, while here it is smaller and slenderer. In *alpinus* the fourth, fifth, sixth and seventh joints go on increasing in thickness, while here the third, fourth and fifth form a narrow slender peduncle, all being of nearly equal size; the sixth and eighth joints here are much smaller than in *alpinus*. The pubescence in this species is also darker and duller and more sparing than in *alpinus*.

It was found at Caraccas by M. Sallé, and presented to me by his relative M. Chevrolat.

48. *C. spinipes*, mihi.

Elongato-ovalis, fuscus; antennis capite et thorace vix longioribus, articulis ante sextum gradatim crescentibus magnitudine, fuscis, articulis ultimis et primis pallidioribus; thorace leviter et elytris fortiter transversostrigosis, his stria suturali impressis; pedibus spinosis. Long. 1 lin., lat. $\frac{1}{2}$ lin.



A good deal smaller than the preceding (*C. monilis*), to which it has considerable resemblance, but is more elongate in form. The antennae are not quite so thick; the joints do not continue thin, short and slender from the second to the sixth, but go on increasing in breadth from the second to the seventh; the second and third are nearly of equal length; the fourth and fifth are each shorter than the third, and gradually but slightly increase in breadth; they are all of nearly the same length; the sixth is shorter than the fifth, but not very minute; the seventh is the largest joint in the antenna; the eighth is minute, but not nearly so much so as in *monilis*; the ninth is as broad but

shorter than the seventh ; the tenth is a little narrower than the ninth, and the eleventh a little narrower than the tenth, otherwise they are nearly of the same size. The antennæ are brown, with the exception of the two first joints which are clear ferruginous, and the three last which become gradually paler to the tip. The head and mouth are broad ; the former is rugosely punctate and darker than the rest of the body. The thorax is short, darkest in the middle, transversely rugose. The elytra are very distinctly transversely strigose ; there is a sutural stria impressed on them. The scutellum is small, elongate triangular, depressed, and darker than the elytra. The whole body is covered with a dense fuscous pubescence of the same colour throughout, but throwing a reflexion like a lighter band across the elytra towards the apex when viewed in certain lights. The under side is of the same colour as the upper. The legs are paler ; they are very distinctly spinose, a character which is found in other species, but which, from being very marked here, I have taken to furnish a suitable name to the species. The middle tibiæ are a little bent. In the males the anterior tarsi are widened, but the middle tarsi are not.

Found at Caraccas by M. Sallé, and presented to me by M. Chevrolat.

Group III.

Mesosternum keeled ; middle tarsi alike in both sexes.

1st Subdivision. *Body polished and shining ; the elytra not transversely strigose.*

49. *C. lucidus*, Kraatz.

Catops lucidus, Kraatz, Stett. Ent. Zeit. xiii. 439. 30.

"Oblongo-ovatus, nigro-piceus, *nitidus* ; *antennis pedibusque ferrugineis* ; thorace transverso, basi latiore lævi *ad angulos obtusos utrinque distincte sinuato* ; elytris flavo-testaceis, apice piceis, passim minus profunde punctatis.

"Long. $1\frac{3}{4}$ lin."

Not having seen this species, I can only reproduce M. Kraatz's description, which is as follows :—

"A new species differing so much from all the species of *Catops* known to me, by its shining glittering upper side and clear yellow elytra, that I cannot class it under any one of Erichson's groups : not only so, but I was not wholly averse to have based a new genus upon it, if in spite of the many differences there was not a form of transition to that of the perfect *Catops* in a species which I possess (the only one hitherto accessible), and a species from Mesopotamia in the Royal Mu-

seum (of Berlin) (though in other respects differing little from the *C. lucidus* of this country). The antennæ are nearly of the length of the elytra, entirely of a lively reddish-brown, stout; first joint distinctly longer than the second, and as well as it a little more slender than the remaining joints; third a little stouter than the fourth, nearly as long as the first; fourth, fifth and sixth are reverse cone-shaped, the following joint always somewhat shorter than the preceding; the seventh is equal to the ninth and to the tenth in length, which is the same as the length of the fourth joint, but somewhat stouter; the eighth is somewhat shorter but scarcely more slender than the joints which encompass it; the eleventh is almost of the length of both the preceding, from its base to its last third growing gradually broader, from thence cone-shaped acuminate. The head is black, shining, not punctate; the mouth yellowish-red. The thorax at the base is more than double as broad as long, gradually narrowed from the base towards the front, so that the greatest breadth is before the middle*, gently rounded on the sides; the anterior angles are obtuse, somewhat sloping downwards, the posterior angles likewise obtuse and rounded off; the posterior margin is distinctly sinuate and depressed over the moderately densely finely punctate scutellum, and on each side towards the posterior angles, so that the posterior angles project slightly and are a little reflexed; the upper side is dark pitchy-brown, clearer on the sides and posterior angles, flatly arched, bright shining. The elytra are symmetrical oblong, only feebly narrowed behind, shining pale yellow, brownish towards the scutellum, dark pitchy-brown at the apex, disappearing at some distance, with punctures irregularly arranged in rows and clothed with solitary yellowish hairs; the under side is shining black, not punctured, the last abdominal segment yellow. The legs are lively reddish-brown.

“One example from Kuhr, probably found in Dalmatia†.”

I am unable to give any description of the species from Mesopotamia above referred to by M. Kraatz.

50. *C. cryptophagoides*, Mannerheim.

Catops cryptophagoides, Mann. Bull. Soc. Imp. Mosc. 1852, pt. 2. p. 333.

“Oblongo-ovatus, convexus, rufo-ferrugineus, nitidus, glaber-rimus; antennis extrorsum valde incrassatis pilosis, articulo

* *Sic in orig.*, viz. “von der Basis an nach vorn allmählig verengt, wodurch die grösste Breite vor der Mitte.” It should probably have been, “greatest breadth behind the middle.”

† Kraatz in *loc. cit.*

octavo præcedente multo minore; thorace lævi, antrorsum rotundato, angulis posticis supra elytra rotundato-productis; elytris disperse punctatis, subrugulosis.

"Long. $\frac{2}{3}$ lin., lat. $\frac{1}{3}$ lin.*"

I have not seen this species. M. Pippingsköld collected it in the island of Sitka under a stone.

Mannerheim states that in form it comes very near the genus *Colon*, but he rather referred it to *Catops* from the structure of the antennæ, although at the same time differing from both by the polished smoothness of its body. From this indication it should probably rank beside *lucidus*, Kraatz, and I have accordingly placed it in this subdivision.

2nd Subdivision. *Body not polished and shining; elytra transversely strigose.*

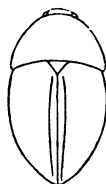
51. *C. strigosus*, Kraatz.

Catops strigosus, Kraatz, Stett. Ent. Zeit. xiii. p. 441. 31.

Fig. 46.

Ovatus, rufo-ferrugineus; antennis longioribus, obsolete clavatis, ferrugineis; thorace transverso, angulis posticis fere acuminatis; elytris substriatis, evidenter transversim strigosis, apice acuminatis.

Long. $1\frac{1}{2}$ lin.



The antennæ are slender, entirely reddish-brown; first, second and third equal in length; fifth scarcely longer than those on each side of it, half as large as the first joint; seventh somewhat longer and stouter than the foregoing, equal to the ninth and tenth; eighth scarcely half as long and a little thinner than the seventh; eleventh somewhat longer than the tenth, moderately sharply acuminate. The head is red-brown, densely and finely punctate. The thorax is nearly $2\frac{1}{2}$ times as long as broad; at the base it is of the same breadth as the elytra; it is gradually narrowed towards the front, gently rounded on the sides; the upper side is moderately densely clothed with golden-yellow pubescence, coarsely granulated; the anterior angles are obtuse, sloping downwards; the almost pointed posterior angles project pretty strongly backwards embracing the elytra, so that the posterior margin appears to be strongly sinuated on both sides near the elytra. The elytra are oval, strongly narrowed from the middle towards the apex, each tolerably sharply acuminate, moderately densely and finely pubescent, and deeply transversely

* Mannerheim in *loc. cit.*

strigose, with distinct traces of longitudinal striæ. Under side and legs reddish-brown.

Kraatz says it is of a reddish colour, but the only specimen I have seen was black.

Of the form of the *C. velox*, Spence, approaching most to it, but a little smaller, more acuminate behind, and easily recognizable by its keeled mesosternum; distinguished from the following species by its different form and longer antennæ; and from *C. acicularis*, Kraatz, the only other species of the preceding groups which has transversely wrinkled elytra, by its smaller size and shorter and broader form.

Found in Austria: extremely rare.

52. *C. validus*, Kraatz.

Catops validus, Kraatz, Stett. Ent. Zeit. xiii. 441. 32.

"Oblongo-ovatus, niger, fusco-sericeus; *antennis rufo-piceis, clavatis*; thorace, elytrisque transversim strigosis, apice truncatis. Long. $2\frac{1}{2}$ lin.

"This distinct species comes near the following in the form of the body, and only deviates from them by its greater size and the different structure of the antennæ. I confine myself therefore to describing the latter more strictly.

"Antennæ reddish-brown; first joint at least twice as long and half as strong again as the second, somewhat more slender at the base; second very small, at the end nearly as broad as long, somewhat more slender at the base; *third at least three times as long as second*, for the last third part becoming gradually somewhat broader; *fourth equal in length to second*, but somewhat broader; fifth equal to fourth; *sixth somewhat shorter and broader than the eighth*; *seventh somewhat shorter, but just as broad as the ninth*; eleventh distinctly more slender and half as long again as tenth; from the base to the apex conical acuminate, somewhat paler at the tip. Agreeing in other respects with the following species.

"Two examples from Stentz in Hungary are in the Royal Museum, under the name of *C. validus**."

Not having seen this species in nature, I have merely copied the description of Kraatz. In size it is a third larger than the following species; but although that of itself would not be sufficient to constitute it a distinct species, the differences in the structure and proportion of the joints of the antennæ are too

* Kraatz in *loc. cit.*

great to allow us to hesitate in according it a place as such. The principal differences in these proportions have been printed in italics in the respective descriptions of the antennæ of these species.

53. *C. sericeus*, Fabr.

Catops sericeus, Fabr. Syst. El. ii. 564. 2; Erichs. Käf. d. M. Br. i. 243. 16; Sturm, Deutschl. Fn. xiv. 43. 22. t. 278. f. d. D; Heer, Fn. Helv. i. 384. 21; Redt. Fn. Aust. 143. 1; Kraatz, Stett. Ent. Zeit. xiii. 442. 34; Fairm. & Laboulb. Fn. Ent. Fr. i. 305. 21.

Helops sericeus, Panz. Fn. Germ. 73. 10.

Ptomaphagus truncatus, Illig. Mag. i. 42. 4.

Catops truncatus, Gyll. Ins. Suec. i. 279. 3.

Choleva villosa, Latr. Gen. Crust. et Ins. ii. 29. 5; Spence, Linn. Trans. xi. 152. 12.

Mycetophagus picipes, Kug. Schneid. Mag. 558. 9.

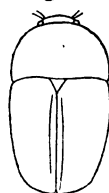
Mordella silphoides, Marsh. Ent. Brit. i. 493. 19.

Var. minor. *Catops sericatus*, Chaud. Bull. de Mosc. 1845, no. 3. 199.

Oblongo-ovatus, niger, fusco-sericeus; antennis brevioribus, nigro-piceis, *ad basin ferrugineis*; thorace elytrisque transversim strigosis, his apice truncatis.

Long. $1-1\frac{1}{2}$ lin.

Fig. 47.



Oval, a little depressed above, of a deep blackish-brown, very silky. Antennæ about as long as the thorax, perceptibly thickened towards the extremity; first joint twice as long as the second; *second and third nearly equal in length and thickness; fourth and fifth nearly equal in length, each shorter than second or third; sixth about the same length as fifth, but decidedly broader, twice as long as eighth, and not so broad; seventh a very little longer and much broader than sixth; eighth less than half as long as seventh, and scarcely less broad; ninth and tenth each about the same length as seventh, but broader; eleventh more slender and half as long again as tenth, and only commencing to be acuminate past its middle; the apex obtuse, reddish-brown, lighter at the base, deeper at the apex.* Head black, large, finely punctate. Thorax shining black, finely transversely wrinkled, a little broader than long, somewhat narrowed in front; posterior angles pointed, projecting backwards, which makes the posterior margin broadly arched. Elytra of a brown, more or less dark, finely transversely strigose, becoming narrower from the base to the extremity, which is obliquely truncate. Legs brown; thighs often blackish. Size very variable.

Distinguished at first sight from all the allied species, except

varicornis and *validus*, by its truncate elytra. From *C. varicornis* it is distinguished by the apex of the antennæ not being light-coloured, and from *C. validus* by its smaller size and by the different proportions of the joints of the antennæ.

Common in Britain, and generally distributed all over Europe.

54. *C. varicornis*, Rosenhauer.

Catops varicornis, Rosenh. Beitr. zur Ins. Fn. Eur. i. 23; Kraatz, Stett. Ent. Zeit. xiii. 442. 33.

Oblongo-ovatus, niger, fusco-sericeus; antennis brevioribus, basi apiceque ferrugineis; thorace elytrisque transversim strigosis, his apice truncatis.

Long. $1\frac{1}{2}$ lin.

Closely allied to *C. sericeus*, and principally distinguished by the form and colour of the antennæ, which are shorter and ferruginous both at the base and the apex, and the beetle is usually somewhat darker. The head is broad, finely punctate, shining black with a grey pubescence; the mouth ferruginous-red. The antennæ scarcely reach beyond the half of the thorax, and are thickened on the outer side so as to be distinctly club-shaped. The individual joints are as in the *C. sericeus*, but form a rounder oblong and thicker club. The first five joints are ferruginous-red, those following brownish; the eighth shorter but not more slender than the remainder; the last transverse, short, and very obtuse, much shorter than in the *C. sericeus*, and reddish-yellow. The thorax is large, black, shining, clothed with a silky pubescence, almost square, a little broader than long, of the breadth of the elytra, somewhat narrowed in front, gently rounded on the sides; the posterior angles pointed, projecting slightly backwards, the posterior margin rounded. The scutellum is large, triangular, transversely strigose. The elytra are dark brown, finely transversely strigose, a little arched, somewhat rounded on the sides, moderately narrowed towards the extremity, not so strongly truncate at the apex as in *C. sericeus*, and more rounded, with a fine brownish pubescence. The under side is black; the legs are brown, the tarsi paler.

The pale terminal joint of the antennæ, combined with the general appearance of *C. sericeus*, at once indicates this species. It is also a deeper insect than *sericeus*, and the sides more nearly approach the perpendicular.

Described by Rosenhauer from three specimens found at Stettin. It has since been found in other parts of Germany, and no doubt is scattered all over the continent. I have not found it

in Scotland, but it has been taken by Mr. Guyon near Richmond, and by Dr. Power near London.

Chaudoir's *C. sericatus* is said by Kraatz to be only a small variety of this species. I have not seen it, but I have no doubt he is correct. Chaudoir's description contains no character sufficient in my view to support the establishment of a new species. His description is as follows:—" *C. sericatus*, hitherto confounded with *C. sericeus*. It is constantly three times smaller, more narrowed behind; the elytra narrower; the wrinkles above less marked; the antennæ less enlarged towards the extremity, the last joints more elongate, the eighth a little narrower, the last less obtuse, and of the colour of the preceding. The breast is less convex; the colour of the elytra is lighter towards the extremity, which is almost ferruginous.

"Found at Kiew in spring, under dry leaves at the foot of trees*."

55. *C. colonoides*, Kraatz.

Catops colonoides, Kraatz, Stett. Ent. Zeit. xii. 169. 35.

Oblongo-ovatus, fusco-sericeus; antennis obsolete clavatis, ferrugineis; thorace elytrisque transversim strigosis, *his non truncatis*.

Long. $\frac{7}{8}$ lin.



Fig. 48.

The antennæ are about the length of the head and thorax, imperceptibly thickened towards the point, ferruginous-red; the seventh joint scarcely broader, but at least twice as long as the preceding, always darker-coloured than the remaining joints; the eighth joint somewhat smaller than the sixth; the ninth, tenth, and the acuminate eleventh tolerably equal in size. The head is blackish-brown, finely punctate, with a grey pubescence. The thorax is blackish-brown, somewhat lighter on the extreme posterior margin, extremely densely and finely granulated, about a fourth broader than long, narrowed in front, moderately rounded on the sides; the posterior angles are sharp, projecting backwards. The elytra are dark brownish, towards the apex lighter, finely transversely strigose, covered with a fine silky brown down, gradually narrowed towards the apex. The under side is blackish-brown, the margins of the individual abdominal segments lighter; the legs are ferruginous-brown. Nearly constant in size.

A very distinct species, similar to *C. sericeus*, and, like it, with transversely wrinkled elytra, but smaller than the smallest

* Chaudoir in *loc. cit.*

individuals of that species, and easily distinguished by the wholly different form of the antennæ, by the gradually narrowed and not truncate elytra, and the stronger more distant transverse wrinkling. The club of the antennæ is as a rule somewhat darker, the last joint somewhat larger than the preceding, cone-shaped, acuminate.

Kraatz says that it is taken near Berlin in loose sand at the foot of old oak-trees, and that it is frequent in moors.

Exotic species.

56. *C. suturalis* (Motsch.) mihi.

Affinis *C. sericeo*, sed elongatior, lateribus minus rectis, et thorace forma brevior; elytris longioribus. Long. $1\frac{1}{8}$ lin.

Fig. 49.



Fuscous; head and thorax with fulvous sericeous pubescence; elytra ferruginous-brown, with the anterior half of the sutural margin and the margins of the elytra darker; inflexed margins of elytra and margins of under side of thorax clear ferruginous, remainder of under side pitchy-black; legs ferruginous. Antennæ with base ferruginous, club and apex dark; first joint large and long; second not so long; third and fourth of nearly the same length; fifth shorter than fourth; sixth shorter than seventh; seventh large and broad; eighth very small; three last nearly of the same size. Thorax faintly transversely strigose, posterior angles obtuse. Elytra deeply transversely strigose. Scutellum elongate. Sutural stria shortened, joining the suture at about one-third from the apex. Elytra truncate at the apex; pubescence on elytra darker than on thorax.

This species has a great resemblance to *C. sericeus*, but differs from it in the following particulars. In general outline it is scarcely broader in front than behind, while *sericeus* is usually markedly so. The thorax begins to round-in towards the head almost immediately from the base forward, while in *sericeus* it does not begin to turn inwards till about the middle of the thorax. Scutellum more elongate than in *sericeus*. The length of the elytra is $2\frac{1}{2}$ times that of the thorax, while in *sericeus* it is not so much as twice that length. The elytra also are not so broadly truncate at the apex.

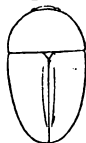
Described from a specimen in M. Chevrolat's collection received under this name from M. Motschoulsky. Locality not mentioned; supposed to be from Mongolia.

57. *C. californicus*, Leconte.

Catops californicus, Lec. Synopsis of Silphales of N. America, Proc. Acad. Philadelphia, vol. vi. 1853, p. 281.

Oblongus, subovalis, piceus, sericeus, subtilissime punctulatus et transversim strigosus; antennarum basi, pedibus, elytrisque pallidioribus, his stria suturali profunda; thorace antrorsum valde angustato, angulis posticis paulo productis subacutis.

Long. 1 lin.



The antennæ are slightly clavate and as long as the head and thorax; the thorax is strongly narrowed in front, truncate at base, and slightly sinuate near the posterior angles, which are subacute; the sides are broadly rounded; the disk is sometimes blackish, and the sides dark rufous. The punctures of the upper surface in this species are very indistinct, and the transverse striæ very fine; the pubescence is sericeous, but not dense; the anterior tarsi of the male are strongly dilated, the intermediate pair simple, the posterior pair longer than the tibæ.

Dr. Leconte mentions that it is abundant at San Jose and San Diego, California. He also observes that one female specimen which he had from San Diego appeared more elongated than the others and much more narrowed posteriorly. He could not, however, find any other difference.

58. *C. consobrinus*, Leconte.

Catops consobrinus, Lec. Syn. Silph. N. Amer. Proc. Acad. Philad. vi. 1853, p. 281.

"Oblongo-ovalis, subelongatus, ater, subsericeus, vix punctulatus, subtiliter transversim strigosus; antennis basi rufo-piceis; elytris stria suturali profunda; thorace antrorsum modice angustato, angulis posticis leviter productis.

"Long. 1 lin.




"Georgia. This species resembles the two preceding, but is a little more elongated and more oval; it is entirely black, excepting the base of the antennæ and the tarsi, which are rufo-piceous. The thorax is more than one-half wider than long, moderately narrowed in front, broadly truncate at apex, very slightly rounded on the sides, truncate at base, and faintly sinuate at the posterior angles, which are slightly acute. The punctures are very indistinct. The transverse scratches are as fine as in *C. californicus**."

* Leconte in *loc. cit.*

59. *C. Lecontei*, mihi.

Catops strigosus, Lec. Syn. Silph. N. America, Proc. Acad. Philad. vol. vi. 1853, p. 281.

"Oblongo-ovalis, subelongatus, piceo-rufus, sericeus, Fig. 52. distinctius strigosus; thorace latitudine sesqui brevior, antrorsum modice angustato, angulis posticis vix productis, subacutis; elytris stria suturali profunda; antennis magis incrassatis, piceis, basi testaceis. 


"Long. 1 lin.

"One female, South Carolina, Dr. Zimmerman. This species resembles the preceding, but the thorax is less narrowed in front and less rounded on the sides; the transverse lines on the thorax and elytra are more distinct; the punctures are very indistinct; the first four or five joints of the antennæ are testaceous, the rest are piceous; the apex is indistinctly paler*."

The "Synopsis of the Silphales of America north of Mexico," in which this species was described by Dr. Leconte under the name of *strigosus*, was published in February 1853, while M. Kraatz's description of the European species so named by him was published in the 'Stettin Ent. Zeitung' in 1852. By the rule of priority therefore, the name *strigosus* must be retained for Kraatz's species, and another name given to this. It appears to me that it is an appropriate homage to name it after the eminent naturalist who first described it.

60. *C. oblitus*, Leconte.

Catops oblitus, Lec. Syn. Silph. N. Amer. Proc. Acad. Philad. vi. 1853, 282.

"Subellipticus minus convexus, rufo-fuscus, pubescens; Fig. 53. thorace punctulato antrorsum subangustato basi truncato, angulis posticis fere obtusis; elytris transversim minus dense strigosis, stria suturali distincta; antennis flavis, art. 4-10 fuscis. 

"Long. 1½ lin.

"Three specimens, Georgia. Easily distinguished by its subelliptical and less convex form. I cannot discover any punctures on the elytra; if they exist they are concealed by the dense pubescence, which is however scarcely sericeous. The male has three joints of the anterior tarsi dilated; the middle tarsi are simple in both sexes†."

The mesosternal keel is less elevated in this and the next than in the other species.

* Leconte in *loc. cit.*

† Leconte in *loc. cit.*

61. *C. parasitus*, Leconte.

Catops parasitus, Lec. Syn. Silph. N. Amer. Proc. Acad. Philad. vi. 1853, p. 282.

"Breviter ovatus, piceo-rufus, sericeus; thorace disco Fig. 54.
obscuriore, brevi, antrosum valde angustato, angulis
posticis non productis; elytris transversim strigosis,
stria suturali profunda; antennis basi apiceque flavis.
"Long. $\frac{3}{4}$ lin.



"New York, in ants' nests, with *Haterius brunnipennis*, March and April. This species is much broader and more suddenly narrowed posteriorly than the others. The thorax is fully twice as wide as its length, punctulate, not strigose, strongly narrowed in front, broadly rounded on the sides, truncate at base, with the posterior angles simply rectangular and not produced. The elytra are punctulate and distinctly striate transversely. The antennæ are as long as the head and thorax, very slightly incrassated, rufo-piceous, with the first four joints and the apical one yellowish; the seventh joint is more than twice the length of the sixth; the eighth joint is much shorter, but scarcely thinner than the following ones. The anterior tarsi of the male are broadly dilated; the first joint of the middle tarsi is less dilated than in *C. terminans**,."

The mesosternal keel is finer and less raised in this and *C. oblitus* than in the other species.

62. *C. a-scutellaris*, mihi.

Oblongo-ovatus, fusco-sericeus; antennis vix ad apicem Fig. 55.
incrassatis, fuscis, basi apiceque ferrugineis; thorace
elytrisque leviter transversim strigosis, his stria
suturali impressis; *scutello in viso*.
Long. $\frac{7}{8}$ lin.



Fuscous-brown. The antennæ are scarcely so long as the head and thorax, so slightly clavate as to be almost filiform, fuscous, the basal joints ferruginous, the two apical joints pale; first and second joints long and slender, those following short, gradually though very slightly increasing in breadth up to the seventh; the seventh is rather shorter than the ninth, and of about the same thickness; the eighth is not narrower than those on each side of it, but shorter, being about half the length of the ninth; the ninth and tenth are equal in length and thickness; the eleventh is larger than the tenth, and becomes acuminate towards the point. The head is darker than the rest of

* Leconte in *loc. cit.*

the body. The thorax forms a continuous or nearly continuous line with the elytra; its posterior angles do not project behind; both thorax and elytra are seen under a powerful lens to be very finely though distinctly transversely strigose. The elytra are not truncate, although they are rounded rather rapidly at the apex. The scutellum is not visible. The sutural stria is distinct at the base, but it draws closer to the suture as it proceeds to the apex, and is lost before it reaches it. Under side and legs ferruginous-brown.

From Caraccas. I received this species from M. Deyrolle, under the manuscript name of *æquinotialis*; but the advantage of having a name bearing reference to some particular character, when that can be had, is so obvious, that I am sure that that excellent entomologist will excuse my not adopting the name he had destined for it.

63. *C. australis*, Erichs.

Catops australis, Erichson, Wieg. Arch. (1842) p. 243.

Mesosterno carinato, niger, nigro-pubescent; thorace elytrisque transversim strigosus.

Long. $1\frac{1}{2}$ lin.

Oval, lightly convex, black, with black pubescence. Antennæ of the length of the head and thorax, the apex slightly thickened, the eighth joint narrower than those next it, black, piceous at the base. Thorax about the same breadth as the elytra, with the sides lightly rounded, the posterior angles slightly projecting obliquely behind, nearly right-angled; the base subsinuate on each side, finely transversely strigose. Elytra transversely feebly strigose, the strigations rather widely separated, impressed with a sutural stria, rounded at the apex. Legs concolorous, tarsi piceous, the anterior lightly dilated at the base in the males. Mesosternum slightly keeled.

This species seems to come between *strigosus*, Kraatz, and *sericeus*.

It is found in Tasmania, and is the only species yet recorded from the southern part of the hemisphere.

Genus CATOPTRICHUS, mihi.

Antennæ of eleven joints, the last eight of which are strongly serrated in the males, somewhat less so in the females; the three first are slender; the eighth joint is very slightly, if at all, narrower or shorter than those on each side of it. In other respects the characters do not differ from those of *Catops*.



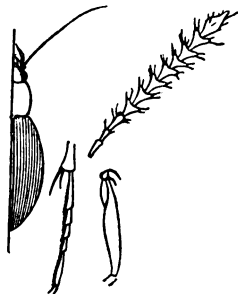
Fig. 56.

1. *C. Frankenhäuseri*, Mann.*Catops Frankenhäuseri*, Mann. Bull. Soc. Imp. Mosc. 1852, pt. 2. p. 332.

Elongatus, fusco-piceus, griseo-pubes-cens; antennis pectinatis, basi ferru-gineis, articulo ultimo pyriformi apice acuminato; thorace quadrato, angulis rotundatis, obsolete canaliculato, pos-tice in medio impresso; elytris ob-longo-ellipticis, subtilissime punctu-latis, tenue striatis, stria suturali pro-fundiore, rufo-testaceis, cinereo-holo-sericeis, pilis longis fuscis præsertim in margine obsitis; pedibus ferru-gineo-piceis.

Long. $2\frac{1}{2}$ –3 lin., lat. $1\frac{1}{4}$ – $1\frac{1}{2}$ lin.

Fig. 57.



Elongate, having a good deal the form of the first group (subg. *Choleva*) of the genus *Catops*: fuscous, clothed with a griseous pubescence. Antennæ pectinated, black, ferruginous at the base; the first three joints slender; third longer than second; fourth to tenth each of nearly equal length, globose, with a long spine proceeding outwards. Thorax quadrate, angles rounded, obsoletely canaliculated, impressed behind in the middle. Elytra oblong-elliptic, very finely punctulated, feebly striated, the sutural stria deeper, rufo-testaceous, with a cinereous bloom and clothed with long brown hairs, especially on the margin; legs dark ferruginous.

Inhabits the island of Sitka. Several specimens were taken by M. Frankenhäuser in a human body lying in a wood, and in putrid fungi.

I owe the above figure to Dr. Leconte.

Genus CATOPSIMORPHUS, Aubé.

Catopsimorphus, Aubé, Ann. Soc. Ent. France, 2 sér. vol. viii. p. 324.

"Antennæ with eleven joints, very much flattened; the eighth not narrower and scarcely shorter than the seventh and ninth. Epistome cut almost straight. Labrum broadly and deeply emarginate, and provided in front with a small very slender membrane, strongly emarginate in the middle and ciliated in the emargination. Mandibles denticulated at the extremity and furnished within with a ciliated membrane. Maxillæ with the internal lobe terminated by a small hook; the external lobe obtuse and hairy at the extremity. Maxillary palpi with four joints, the first very small, the second slightly clavate, the third obconic, the last conical, a half smaller than the third. Labium

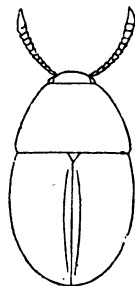
membranous, pretty deeply emarginate. Labial palpi with three cylindrical joints, the last smallest. Tarsi with five joints, the anterior and middle probably dilated in the male. The facies of this genus is completely analogous to that of *Catops*. It differs from it principally in the form of the antennæ. We know nothing of its mode of life*."

1. *C. orientalis*, Aubé.

Catopsimorphus orientalis, Aubé, Ann. Soc. Ent. Fr. 2 sér. viii. 325.

"Ovalis, convexiusculus, niger, griseo-pubescent; antennis, ore, elytris pedibusque ferrugineis; thorace antice angustato, angulis omnibus rotundatis.— $3\frac{1}{2}$ mill.

Fig. 58.



"Head black, somewhat brilliant, tolerably broad, very finely punctate and slightly pubescent. Labrum, palpi and antennæ testaceous; the latter with the first joint longish, cylindrical; the second almost globular; the remainder transverse, flattened and gradually increasing in size to the last, which terminates in a point; the eighth scarcely shorter than the seventh and ninth. Thorax black, pubescent and finely punctate and reticulated, more than one and a half times broader than long, much narrower in front than behind, cut almost straight at the apex and the base, very broadly rounded at the sides; the anterior and posterior angles obtuse and rounded. Elytra as broad as the thorax at the base, about one and a half times longer than broad; broadly rounded behind; ferruginous, less finely punctate and reticulated than the thorax; pubescent and marked with a deeply impressed stria on each side of the suture. Under side of body black, with the extremity of the abdomen somewhat ferruginous. Legs ferruginous; thighs slightly brown†."

Dr. Aubé mentions that he had two individuals of this species, both taken in the neighbourhood of Constantinople. He supposes them to be both females from their having all their tarsi simple.

Since the first part of this paper was in print, I have had an opportunity of carefully examining the specimens in the collection of the Count Dejean, now belonging to the Marquis de Laferté Senectère, who kindly placed them in my hands for that purpose; and it may be desirable that I should state the result of my examination in reference to the names used by

* Aubé in *loc. cit.*

† Aubé in *loc. cit.*

Count Dejean and published in his Catalogue. The specimens are for the most part in good order and preservation. A few, however, were in a less satisfactory state, and of course I give my opinion of these with doubt. As might be expected in such a difficult genus, there were sometimes more than one species placed under the same name, so that it is a matter of opinion which was the typical species he intended to designate.

The names in the collection correspond with those published in the 3rd edition of his Catalogue, 1837. His

Catops rufescens = *C. angustatus*, Erichs.

— *oblongus* = *cisteloides*, Fröehl. (*castaneus*, Sturm).

— *ovatus*, Dej. = *agilis*, Erichs.

— *major*, Dej. = *picipes* Erichs.

— *Americanus* was in too bad a state to determine.

— *morio* = *nigrita*, Erichs.

Under this name were found specimens of *nigrita*, *fuscus*, and *umbrinus*, but the preponderance in point of number was decidedly in favour of *nigrita*.

Catops tibialis, Dej. = *coracinus*?, Kelln.

This species and a portion of those standing under the next name, *fuscus*, but which were the same, were marked as coming from Portugal. I thought they came nearer to *coracinus* than any other, but am not satisfied that they were not perhaps an undescribed species.

Catops fuscus = *tristis*, Erichs.

I have no doubt that Dejean meant *tristis* to be the type of his *fuscus*. He had a number of *tristis*, and one of *grandicollis* under it, and none of these under any other name. At the same time he had among them several of the above Portuguese species, and some of *alpinus*, Gyll., as well as *Spencianus*, Kirby (*cadaverinus*, Mann.).

Catops chrysomeloides = *chrysomeloides*, Sp.

— *australis* = *australis*, Erichs.

— *agilis* = *fumatus*, Erichs.

Some of *C. alpinus*, Gyll., were mixed with *fumatus* under this name, but the great majority were the latter.

Catops truncatus = *sericeus*, Erichs.

A single *fumatus* and a single *velox* have found their way into the mass of *sericeus*, but this is obviously by inadvertence.

Catops transverso-striatus = a new species described by me under this name in the foregoing pages.

Catops pallidus = *velox*, Spence. Represented by a single bad specimen.

Catops luridus = *scitulus*, Erichs.

The first specimens are *scitulus*, then follow some of *velox*, and lastly what may be *brunneus*, Sturm.

— *flavescens* = *præcox*, Erichs.

— *minutus* = *anisotomoides*, Spence.

The remainder of his species are different species of *Colon*, and do not fall within this Monograph.

I have only now to add the Dichotomous Table of the European species which I promised at the commencement of this paper. It is not to be understood as a substitute for the descriptions, but merely as a slight aid in turning to the quarter where the species are likely to be found.

Dichotomous Table of Characters of European Species of CATOPS.

{ Mesosternum simple		1
{ Mesosternum keeled		30
1.	{ Antennæ nearly filiform and decidedly longer than thorax	2
	{ Antennæ more or less clavate, and not longer or very slightly longer than thorax	5
2.	{ Thorax broader towards base than in front	<i>agilis.</i>
	{ Thorax not broader towards base than in front ...	3
3.	{ Punctuation coarse, pubescence long and sparse, and elytra bellied out	<i>spadiceus.</i>
	{ Punctuation fine, pubescence dense and short, and elytra elongate and narrow	4
4.	{ Margins of thorax paler than middle	<i>angustatus.</i>
	{ Margins of thorax not paler than middle ...	<i>do. var. cisteloides.</i>
5.	{ Base of thorax cut in, so as not to form a continuous outline with elytra	6
	{ Base of thorax forming a continuous outline with elytra or nearly so	19
6.	{ Colour of pubescence grey and brown or dull yellow on thorax, yellowish hairs on base and margins of elytra wanting or scarcely perceptible, and either no bloom or grey bloom on elytra	7
	{ Colour of pubescence clear yellow on thorax, a brownish-blue or purplish bloom on the elytra, and yellowish hairs on base and sides of elytra ...	14
7.	{ Antennæ longish and subfiliform, not heavily clubbed	8
	{ Antennæ shorter and more clavate	12
8.	{ Elytra transversely strigose	<i>acicularis.</i>
	{ Elytra not transversely strigose	9
9.	{ Antennæ with apex pale	<i>picipes.</i>
	{ Antennæ with apex not paler than rest	10

10. { Posterior angles of thorax acuminate behind 11
 { Posterior angles of thorax not acuminate behind... *fuscus**.
11. { Posterior angles much produced, antennæ wholly
 ferruginous *meridionalis*.
 { Posterior angles only slightly produced, antennæ
 more dusky towards apex *nigricans*.
12. { Antennæ very heavily clavate *chrysmeloides*.
 { Antennæ only moderately clavate 13
13. { Insect thin and narrow *morio*.
 { Insect shorter and more compact *coracinus*.
14. { Antennæ comparatively long and subclavate *nigrita*.
 { Antennæ heavily clavate 15
15. { Thorax deeply punctured *neglectus*.
 { Thorax more or less transversely granulose or
 wrinkled 16
16. { Thorax nearly parallel on the sides *quadraticollis*.
 { Thorax not parallel on the sides 17
17. { Thorax faintly transversely wrinkled 18
 { Thorax granulose *tristis*, var. *rotundicollis*.
18. { Thorax short, transverse, and not broad; elytra
 usually very long *tristis* (type).
 { Thorax broad, elytra moderate in length ... *tristis*, var. *grandicollis*.
19. { Middle tarsi widened in males 20
 { Middle tarsi not widened in males 25
20. { Antennæ heavily clavate 21
 { Antennæ subclavate 22
21. { Thorax not narrower at base than elytra *fumatus*.
 { Thorax slightly narrower at base than elytra *alpinus*.
22. { Thorax with posterior angles rounded *brevicollis*†.
 { Thorax with posterior angles not rounded 23
23. { Thorax with lateral margins reflexly sinuated *depressus*‡.
 { Thorax with lateral margins rounded 24
24. { Thorax with posterior angles projecting strongly
 backwards, forming an acute angle; elytra not
 distinguished by sericeous pubescence *umbrinus*.
 { Thorax with posterior angles projecting slightly
 backwards, the angle not acute but right-angled;
 elytra distinguished by a silky pubescence which
 in different lights shows like a light band across
 them *scitulus*.

* *Fuscus* is one of those species, which, from their transitional characters, nearly put dichotomy at defiance. It might almost be placed under No. 19 instead of No. 6, as the base of the thorax has only a slight interruption in its continuity; and again, its brown or purplish elytra are not unlikely to induce one to place it under No. 14 instead of No. 7.

† Not having seen this species, I only place it under No. 19 provisionally, the description given by M. Kraatz being scarcely sufficient to satisfy me as to its place.

‡ Not having seen the male of this species, it is only from supposition that I have placed it under No. 20.

25.	{ Thorax not wider at base than elytra	26
	{ Thorax slightly wider at base than elytra	<i>præcox.</i>
26.	{ Elytra more than three times the length of thorax....	<i>transverso-striatus.</i>
	{ Elytra not more than three times the length of thorax	27
27.	{ Basal margin of thorax sinuated	<i>velox.</i>
	{ Basal margin of thorax straight	28
28.	{ Posterior angles of thorax right-angled	<i>badius*.</i>
	{ Posterior angles of thorax obtuse	29
29.	{ Insect roundish	<i>anisotomoides.</i>
	{ Insect more elongate	<i>brunneus*.</i>
30.	{ Body polished and shining	<i>lucidus.</i>
	{ Body not polished	31
31.	{ Elytra not truncate	32
	{ Elytra truncate	33
32.	{ Elytra acuminate	<i>strigosus.</i>
	{ Elytra not acuminate	<i>Colon.</i>
33.	{ Antennæ with apical joint pale	<i>varicornis.</i>
	{ Antennæ with apical joint not pale	34
34.	{ Antennæ heavily clubbed, with base not paler than rest	<i>validus.</i>
	{ Antennæ moderately clubbed, and base paler than club	<i>sericeus.</i>

* Not having seen *badius* nor *brunneus*, their place is marked provisionally and with hesitation.

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