

TRANSACTIONS
OF THE
AMERICAN ENTOMOLOGICAL SOCIETY.

VOLUME XVIII.

**A monograph of the species of CRYPTOHYPNUS of
Boreal America.**

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In the printed and other comments which were made on Dr. Hamilton's paper on the distribution of many species in common in the Arctic regions of both continents, my attention happened to be drawn especially to this genus from the fact that several forms had just appeared which seemed to be identical with those of Europe, and which had not, as yet, appeared in our lists. These were made the subject of a short note, in "Entomological News," which closer study has shown me to be inaccurate in many of its statements, due in part to the lack of types, and as much to important omissions of details in the best European descriptions. The subsequent pages will show that several of our forms are parallel with those of Europe, in fact deceptively resembling them, but are readily separated by excellent structural characters hitherto unobserved.

The number of species of Cryptohypnus known being less than one hundred, has not made it unwieldy or difficult to handle, consequently but little attempt has been made to subdivide it. C. G. Thomson, in his Skand. Col. vi, restricts the name Cryptohypnus to those species which have the prosternal sutures straight and Negastrius to those with the sutures arcuate, although he seems to place

greater reliance on other characters which have far less value in a larger number of species. He again subdivides *Negastrius*, separating those species as *Zorochrus* which have the prosternal sutures double and excavate. If any division of *Cryptohypnus* be thought necessary, that based on the form of the prosternal sutures appears to be the only one desirable, from the fact that, between the two forms, the sharpest line of demarcation is observed.

The existence of the double grooved sutures in a group of small species was first observed by Thomson, but cannot be used for generic separation as it would remove certain species from that close approximation in which they should be placed. It has also been observed in our species of that series that the groove is far more distinctly defined in the female than in the male. It is in this group that very notable sexual peculiarities exist in the form of tubercles on the first or first two ventral segments in the males of *Melsheimeri* and *caurinus* respectively, or in a small pubescent spot at the middle of the second ventral in the female of *gradarius*. In *quadriguttatus* (*tetragraphus*) and *dermestoides* of Europe, the anterior tibiae are much broader in the male than in the female. These, too, have an elevation or tubercle on the first ventral segment of the male which seems to have escaped the notice of European students.

Another sexual character has been observed in the two species with non-striate elytra. In the centre of the prosternum of the male is a small, densely punctured spot, bearing, in well-preserved specimens, a short brush of hair.

One species, *littoralis*, is notable in having much shorter legs than normal, the tibiae beset with short, stiff, bristle-like hairs, after the manner of many arenicolous species. The tibial spurs are also better developed. In the species with the curved prosternal sutures the spurs are far less distinct than in those with straight sutures.

It will be observed also that the terminal joint of the maxillary palpus varies in form, but without that degree of difference enabling the character to be used for systematic purposes. Illustrations will be found on the plate, to which the reader is referred.

The species known to me seem to divide very naturally into groups, and it is proposed so to treat them to avoid the use of a long analytical table.

They are, therefore, divided as follows :

- Prosternal sutures straight, parallel, or very little convergent posteriorly.....2.
- Prosternal sutures arcuate and very evidently convergent posteriorly.....3.

- 2.—Tibiæ stouter than usual, the outer side beset with short spinules, the spurs very distinct.....Group **LITTORALIS**.
 Tibiæ slender, not spinulose externally, the spurs usually very small and indistinct.
 Depressed opaque species, thorax coarsely and closely punctate.
 Group **SQUALIDUS**.
 More or less convex and shining, thorax variably punctate, but never opaque, the median line more or less impressed.
 Hind angles of thorax slender and divergent, the basal incisure well marked; surface not distinctly pubescent...Group **HYPERBOREUS**.
 Hind angles of thorax stouter, scarcely at all divergent, basal incisures feeble; surface pubescent..... Group **ABBREVIATUS**.
- 3.—Elytra with the striæ entirely, or in great part obliterated; in the latter case, those near the suture alone evident.....Group **PECTORALIS**.
 Elytra with all the striæ entire.....4.
- 4.—Depressed species, dorsum quite flat, surface opaque, densely punctulate and pubescent; hind angles of thorax with short carina.
 Group **STRIATULUS**.
 Convex species.
 Thorax coarsely granulate, usually with a smooth elevated median line.
 Group **CHORIS**.
 Thorax unequally sculptured, either subasperate or more densely, coarsely punctate near apex, posteriorly smoother, median line usually smooth
 Group **MELSHEIMERI**.
 Thorax equally punctate, either sparsely or moderately closely; elytra ornate..... Group **PERPLEXUS**.

The groups which follow are arranged in a manner to show what seems to be a natural sequence based on facies.

In conclusion, I wish to acknowledge my indebtedness to Dr. Hamilton and Mr. Ulke for the loan and gift of specimens, and to Mr. Blanchard for first having called my attention to the pubescent spot in the abdomen of *gradarius*, thereby suggesting a new line of investigation which has resulted profitably.

Group **LITTORALIS**.

Prosternal sutures straight, very nearly parallel. Maxillary palpi moderate in length, the last joint elongate oval, obliquely truncate at apex. Tibiæ shorter than usual, the outer edge beset with short spinules, the terminal spurs well marked. Form robust, body apterous.

This group contains but one species so unlike those which follow, as to lead to the supposition that it should be more completely separated. There are, however, no differences of sufficient importance to warrant generic separation.

C. littoralis Esch.—Form robust, convex, brownish piceous or darker ferruginous, scarcely shining, sides of thorax (more broadly beneath) and elytra, antennæ and legs yellowish testaceous; antennæ rather stout, joints 6–10 as broad as long, eleventh oval; head sparsely, rather coarsely punctate; thorax broader at middle than long, sides arcuate, sinuate in front of the hind angles, which are acute and feebly divergent, the carina short, but well marked; disc sparsely punctate, basal margin without trace of incisure; elytra oval, humeri obliquely rounded, disc rather deeply striate, striæ not punctate, intervals convex, sparsely punctate near the base, gradually becoming granulate toward the apex; body beneath piceous, except the flanks of the prothorax, these finely punctate externally, more coarsely near the margin; under surface punctate, but not closely, except on the last ventral segment, which is quite rugose. Length 8–11.5 mm.; .32–.46 inch.

In well preserved specimens the surface above and beneath is sparsely fulvo-pubescent. A variety entirely yellowish is mentioned by Mannerheim and Candéze, not the result of immaturity, as might be suspected, but truly varietal, as has been observed in many species living along the sea-coast.

Seems to be abundant on the Alaskan sea-coast.

Group HYPERBOREUS.

Prosternal sutures straight, very slightly convergent posteriorly. Legs slender, tibial spurs small. Maxillary palpi not prominent, the last joint triangular, as in the *squalidus* group. Thorax smooth, sparsely punctate, median line more or less impressed, the basal incisures distinct, hind angles long, slender and divergent. Surface nearly, or quite glabrous, body winged.

This group contains but three species, as far as known to me, especially notable by their oblong, feebly convex form, nearly glabrous surface, subsulcate thorax with slender hind angles.

The species are separated as follows:

Antennæ entirely ferruginous.

Antennæ rather slender, the joints longer than wide.....**grandicollis.**

Antennæ stouter, joints triangular, as wide as long.....**hyperboreus.**

Antennæ piceous, except at base, the joints longer than wide.

Elytral intervals flat.....**Sanborni.**

Elytral intervals convex.....**barbatus.**

These inhabit the more northern or elevated regions of our country, one of them (*hyperboreus*) having a circum-polar distribution in both hemispheres.

C. grandicollis Lec.—Oblong, moderately convex, piceous shining, with faint metallic lustre, elytra paler than the thorax; surface scarcely pubescent; antennæ ferruginous, joints all longer than wide; front flat, coarsely not closely

punctate; thorax distinctly longer than wide. sides scarcely arcuate, hind angles very slightly divergent, distinctly carinate, carina short, disc moderately convex, median line vaguely impressed posteriorly; surface sparsely punctate, a little more closely in front and near the front angles; elytra a little wider than the prothorax at their middle, humeri obtusely rounded; disc moderately convex, rather deeply striate, striæ punctate, intervals slightly convex, sparsely punctate; prosternum moderately coarsely, but sparsely punctate, the lobe moderately prominent, arcuate in front, limited behind by a feeble transverse line, propleuræ moderately closely coarsely punctate, with finer punctures between, not opaque; metasternum moderately closely punctate, punctuation coarse and fine intermixed; abdomen similarly punctate, the last segment more coarsely; legs rufo-testaceous; entire body beneath paler than above. Length 9 mm.; .36 inch.

A much more robust species than any of this group and with the thorax of larger area relative to the elytra.

A specimen in the LeConte cabinet, which I have no doubt is the male, has a rather more slender form, the sides of thorax sinuate in front of the hind angles, which are consequently more slender and divergent. Its color is slightly darker. These differences, in view of the opposite sex of the specimens, seem purely sexual and not specific.

Occurs in Canada and Oregon, ♂.

C. hyperboreus Gyll.—Moderately elongate, depressed, piceous brown, moderately shining, antennæ and legs ferruginous; surface very sparsely pubescent; antennæ short, joints 4–10 as wide as long; head slightly convex at middle, sparsely punctate; thorax as broad as long ♀, or a little longer ♂; scarcely narrowed in front, sides regularly arcuate in front of the hind angles which are slender, divergent, and with a short carina; surface shining, sparsely punctate, median line vaguely impressed; elytra wider than the thorax, oblong oval, widest at middle, humeri rounded, disc rather depressed, finely striate, striæ indistinctly punctate at middle, intervals flat, sparsely punctate; prosternum sparsely punctate at middle, densely and finely at the sides, the lobe moderately prominent, arcuate in front, limited behind by a transverse impression, propleuræ densely finely punctate, with coarser punctures intermixed, rather opaque, distinctly pubescent; metasternum sparsely punctate; abdomen closely punctate with coarse and fine punctures intermixed, and with fine brownish pubescence. Length 6.5–8 mm.; .26–.32 inch.

This species is very nearly as depressed as those of the *squalidus* group. It is paler in color than *Sanborni*, and without the faint metallic lustre of that species and differing also in the color of the antennæ.

This species is known from Lapland, Siberia, Kamtschatka, and on our own continent in Alaska.

C. Sanborni Horn.—Oblong, moderately convex, piceous black, moderately shining, sometimes with a faint bronze surface lustre, very slightly pubescent; antennæ slender, feebly serrate, joints all longer than wide, basal joints

rufo-testaceous, the outer joints piceous; head sparsely punctate; thorax longer than wide, not narrowed in front, widest at middle, sides feebly arcuate, sinuate in front of the hind angles, which are slender, acute, distinctly divergent and carinate above, disc moderately curved, the median line vaguely impressed from base to apex, basal incisures distinct; surface sparsely finely punctate; elytra oblong oval, widest behind the middle, humeri oblique, disc striate, striæ distinctly punctured, intervals flat, sparsely punctate, but more coarsely than the thorax; prosternal lobe moderately prominent, the border distinctly beaded, a transverse impression posteriorly, coarsely punctate in front, more finely and sparsely toward apex, punctuation at sides denser and intermixed, propleuræ rather densely punctate and more opaque, with coarser and fine punctures intermixed; epipleuræ pale; metasternum and abdomen rather densely punctulate with coarser punctures intermixed; legs rufo-testaceous, tarsi darker. Length 5.5—7 mm.; .22—.28 inch.

The hind angles of the thorax at tip, the epipleuræ of the elytra and a narrow border of the under side of thorax are usually rufescent. The median line of the thorax, although feeble, is distinctly impressed from base to apex; all the striæ of the elytra are punctate.

Occurs in the White Mountain region of New Hampshire, where it was first collected by Mr. F. G. Sanborn, and since by Blanchard, Henshaw and others.

C. barbatus Sahlb.—Oblong, moderately convex, piceous black, moderately shining, sparsely clothed with short, inconspicuous, brownish pubescence; antennæ slender, feebly serrate, piceous, the two basal joints pale; head rather coarsely punctate, front triangularly flattened, the middle of the triangle elevated in an umbone; thorax longer than wide, very little narrowed in front, sides feebly arcuate, sinuate in front of the hind angles, which are slender and slightly divergent, carina well marked, but short; disc convex, a median impression reaching the base and very nearly the apex; surface moderately coarsely punctate in front and at sides, smoother at middle and near base; elytra oblong-oval, wider slightly behind the middle, humeri rounded, disc convex, deeply striate, striæ punctate, intervals convex, moderately closely punctate; prosternum transversely impressed, rather finely punctate behind the groove, very coarsely in front, the lobe moderately prominent, subtruncate; propleuræ opaque, slightly rugulose, coarsely sparsely punctate; epipleuræ pale; abdomen closely punctate with coarser punctures intermixed, especially near the sides; legs rufo-testaceous, the tarsi piceous. Length 6.5 mm.; .26 inch.

Very close to *Sanborni*, and possibly only an Arctic form of it. The pubescence of the prosternal lobe seems to have been rather exaggerated in importance and extent, as all the species of the present and the *abbreviatus* groups have a slight pilosity in that portion not by any means dense, and often lost by abrasion.

I owe to Dr. Sahlberg the privilege of examining a typical specimen. Occurs in the vicinity of St. Lawrence Bay extending to Port Clarence on the American coast.

Group **ABBREVIATUS**.

Prosternal sutures straight, nearly parallel. Maxillary palpi moderate in length, the last joint triangular, truncate at apex. Legs not long, tibiae not spinulose externally, terminal spurs small. Thorax with median line more or less impressed, the basal incisures feebly distinct, hind angles, at most, but little everted, the carina not long. Surface pubescent. Body winged.

The group here defined is with difficulty separated by description from the one preceding, but the more convex form, pubescent surface and less prominent hind angles seem sufficient.

The species composing the group occur in the Arctic regions of both continents, extending southward in the more northern portions of the temperate region, and along the mountain ranges in the higher altitudes still more to the south.

In consequence of the wide distribution of the species and the varied climatic influences to which they are subjected, a great amount of variation has been produced. This range of distribution is from Labrador on the east to northern California on the west, and in the centre of the continent extending southward along the Rocky Mountains to New Mexico, thence northward in every part of British America to the extreme of the Alaskan peninsula.

In the great quantity of material examined I have not been able to separate more than three species:

Scutellum conspicuously clothed with pale pubescence, that of the elytra somewhat scale like.

Thorax narrowed in front in its apical two-thirds, sides often obtusely subangulate in front of the angular sinuation; elytra with a denser spot of pubescence near the apex **abbreviatus**.

Thorax arcuate near the apex only, the sides thence nearly straight; elytra without spot of denser pubescence near tip **impressicollis**.

Scutellum sparsely punctate and smooth, with scarcely any pubescence; surface simply sparsely pubescent; thorax usually very sparsely punctate, the median impression very indistinct **noeturnus**.

C. abbreviatus Say.—Oblong, moderately convex, piceous, with greenish bronze surface lustre, sparsely clothed with yellowish cinereous pubescence, somewhat scaly in appearance, forming a conspicuous elongate space on the elytral declivity; antennae feebly serrate, either entirely piceous, or with the basal joints paler; head coarsely not closely punctate, the frontal margin scarcely distinct from the clypeal; thorax slightly broader than long, narrowed in front, sides scarcely arcuate, but obtusely subangulate behind the middle, then sinuate in front of the hind angles, these acute but not slender, scarcely divergent, carinate; disc convex, with a median impression usually extending from base to apex and deeper behind, basal incisures feeble, surface shining, moderately

closely, not coarsely punctate, pubescence somewhat brownish; scutellum rather densely clothed with paler yellowish hairs; elytra a little wider than the thorax, widest one-third from base, humeri rounded, sides arcuate, gradually narrowed in apical two-thirds, but obtuse at tip; disc convex, striate; striæ all punctate, intervals flat, moderately closely and finely punctate; body beneath piceous, finely fulvo-pubescent, epipleuræ usually paler; prosternum sparsely punctate at middle, at sides intermixed and finely pubescent, the lobe very coarsely punctate, moderately prominent; propleuræ opaque, finely and closely punctate; metasternum moderately closely punctate with intermixed punctures; abdomen very finely and closely punctulate, the punctures unequal; legs rufo-testaceous, the femora usually darker. Length 5.25—6.5 mm.; .21—.26 inch.

This species varies in color from piceous black to brown, the elytra being often quite pale. It may also vary in the form of the sides of the thorax, the subangulation being scarcely evident in some (*lacustris*), but the thorax is always narrowed in its apical two-thirds. The striæ of the elytra may vary in sharpness, and their punctures are sometimes scarcely evident on the disc.

The spot of pale pubescence near the apex is quite characteristic, and its distinctness is not due to the abrasion of the rest of the surface. In well preserved specimens the greater portion of the elytral pubescence is finer and more brown, consequently less distinct.

No special sexual characters have been observed.

Occurs from Nova Scotia westward through Massachusetts, New York, Canada, Hazleton, Pa. (Dietz), to Oregon and Alaska.

C. impressicollis Mann.—Oblong, moderately convex, piceous or brownish, the elytra paler, surface slightly æneous, the pubescence sparse, pale brownish, rather dense and fulvous on the scutellum; antennæ feebly serrate, piceous, the basal joints paler; head coarsely, moderately closely punctate, the frontal margin scarcely elevated; thorax scarcely wider than long, sides nearly straight, arcuately narrowed near the front, a faint trace of a sinuation near the angles, these acute, scarcely at all divergent; the carina feeble, basal incisures distinct; disc convex, the median channel distinct from base to apex; surface moderately closely punctate and (for this group) rather coarsely, pubescence fulvous; scutellum rather closely pubescent; elytra oblong-oval, widest near the middle, the humeri rounded; disc convex, moderately deeply striate, striæ all punctate, intervals flat, rather closely punctate and posteriorly slightly asperately; body beneath piceous, finely pubescent and subopaque, epipleuræ paler; prosternum sparsely punctate, more coarsely in front and more finely at the sides; propleuræ opaque, with dense fine punctures, with coarser intermixed; metasternum finely indistinctly punctate, punctuation double; abdomen densely finely punctate, with coarser punctures intermixed at the sides; legs rufo-testaceous, femora darker. Length 5—6 mm.; .20—.24 inch.

This species superficially resembles *abbreviatus*, but the form of the thorax and the absence of the spot of pubescence near the apex will

distinguish it. It will be observed in *abbreviatus* that the sides of the prosternum have a well marked, fine silken pubescence, but in this there is no such character.

In one of the specimens before me the elytra are paler at apex.

While I have not seen a type of this species I am quite sure that the forms examined are similar to the unique described by Mannerheim.

Occurs in Alaska, Oregon, Hudson's Bay Territory and Colorado (rare).

C. nocturnus Esch.—Oblong, moderately convex, color variable, surface shining and with slight æneous lustre, sparsely pubescent; antennæ feebly serrate, piceous, the basal joints often paler; head coarsely, not closely punctate, frontal border feebly elevated; thorax as wide as long, slightly narrowed in front, sides arcuate, widest at middle, a slight sinuation in front of the hind angles, these feebly everted, distinctly carinate, disc moderately convex, median impression feeble, rarely visible in front of the middle; surface finely, sparsely punctate; elytra oblong, a little wider at middle than the thorax, humeri obtusely rounded, striate, striæ all punctate, intervals flat, or slightly convex near the base, sparsely finely punctate; scutellum sparsely punctate, scarcely at all pubescent; body beneath paler than above, the epipleuræ especially so; prosternum very sparsely punctate, even on the lobe, sparsely cinereo-pubescent at the sides, the lobe moderately prominent; propleuræ opaque, closely and very finely punctate with coarser punctures intermixed; metasternum and abdomen with fine, indistinct punctures, moderately closely placed, with slightly larger punctures intermixed; legs rufo-testaceous, femora always darker. Length 4—5.5 mm.; .16—.22 inch.

A variable species, widely spread over the northern part of the continent, and with an unnecessary amount of nomenclature, the result of local or climatic variation. A few varieties seem to deserve mention.

Var. *nocturnus* Esch.—Larger in size, piceous black, with æneous surface lustre. The *double* punctuation of the abdomen scarcely evident, except at the sides. The hind angles of the thorax are not paler than the disc. Alaska, Oregon, California, Nevada.

Var. *lucidulus* Mann.—Smaller than *nocturnus*, and with rather paler surface and less distinct æneous surface lustre. The hind angles of the thorax are usually paler. The punctuation of the under side of body is more distinct, and its double character more evident. Of this form *fallax* Mann. and *vestitus* Mann. are merely individual variations. Alaska, Hudson's Bay, New Hampshire.

Var. *bicolor* Esch.—Still smaller, the hind angles of the thorax and the elytra castaneous, with very feeble metallic surface lustre.

Punctuation of under side coarser, its double character very evident. Of this *scarificatus* and *limbatus* Mann. are feeble varieties, and *picescens* Lec. a synonym. Alaska, Oregon, Hudson's Bay, Dacota, Idaho, Utah, Montana, Colorado, New Mexico, Lake Superior, Canada, Labrador, New Hampshire.

On comparing these forms with *abbreviatus* and *impressicollis*, it will be observed that the vestiture is finer and sparser, the scutellum nearly glabrous. The thorax is always more sparsely and finely punctured. The form is also less convex and more elongate.

Candéze states (Mon. iii, p. 68) that *riparius* Fab. occurs in the polar regions of our continent. I have not seen any specimens that I am willing to refer to that species, although some of the forms of *lucidulus* have the dorsal striæ so feebly punctured that they might be considered smooth. The study of the material before me leads to the thought that all the species from the Arctic regions of both continents need a renewed study with a larger number of specimens than seems to have been used.

Group SQUALIDUS.

Prosternal sutures straight and parallel, or very slightly convergent posteriorly. Maxillary palpi not prominent, the terminal joint triangular. Legs slender and moderately long, the tibiæ not spinulose, the terminal spurs small and inconspicuous. Form oblong, much depressed; surface opaque, densely punctured, sparsely pubescent. Body distinctly winged.

This group is represented in our fauna by three species, and a fourth (*depressus*) from Siberia should probably be referred here. The flattened form and opaque surface are repeated in the *striatulus* series, but these have the strongly arcuate prosternal sutures.

The three species are as follows:

- | | |
|--|-------------------|
| Antennæ and legs always pale; under side of body finely pubescent with longer scale-like hairs sparsely scattered..... | squalidus. |
| Antennæ and legs piceous, sometimes the tibiæ are pale; vestiture of under side uniform. | |
| Surface very opaque..... | funebis. |
| Surface slightly æneous..... | planatus. |

C. squalidus Lec.—Oblong, piceous black, opaque, sparsely clothed with very short brownish pubescence, with silken yellow sparsely intermixed: head coarsely, not closely punctate: antennæ not reaching the hind angles of the thorax, feebly serrate, joints all longer than wide, the eleventh but little longer than the tenth; thorax longer than wide, distinctly narrowed in front, sides regularly arcuate, sinuate in front of the hind angles, these slightly divergent,

acute, distinctly carinate; surface moderately closely, but not densely punctate, very evidently longitudinally strigose; disc feebly convex, a distinct basal incisure opposite the fifth stria; elytra slightly wider posteriorly than the thorax, humeri oblique, sides feebly arcuate, more so in the ♀; disc sub-depressed, striate, striæ punctured, more coarsely at sides, especially near the humeri; intervals flat, rather closely punctate; prosternal lobe long, its apex with a feebly beaded edge and without a transverse impressed line posteriorly; surface coarsely, not closely punctured, feebly pubescent, propleuræ opaque, coarsely sparsely punctate and distinctly pubescent; metasternum and abdomen sparsely coarsely punctate, with extremely fine punctuation closely placed between them, the vestiture of pale brown, fine pubescence with intermixed golden scale-like hairs. Length 7.5—8.5 mm.; .30—.34 inch.

The male is more slender and parallel than the female, but shows no other differences.

Occurs in California at San Jose and vicinity.

C. funebris Cand.—Oblong, depressed, black, opaque, finely pubescent; legs piceous, sometimes with the tibiæ paler; head coarsely and moderately closely punctate; antennæ piceous, feebly serrate, the joints all longer than wide; maxillary palpi not prominent, the last joint triangular; thorax a little longer than wide, scarcely narrowed in front, widest at middle, sides regularly feebly arcuate, sinuate in front of the hind angles, which are acute, slightly divergent and with a short carina; disc feebly convex, a distinct incisure each side of base; surface very densely punctured and without strigosity; elytra a little wider than the prothorax, the sides nearly parallel, narrowed at apical third, striate, striæ punctured, intervals flat, closely punctate and quite rugous at base; prosternal lobe moderately prolonged, its edge distinctly beaded, and with a deeply impressed marginal line and another transverse line of variable distinctness posteriorly, coarsely and closely punctate in front of the transverse line, more finely posteriorly; propleuræ very opaque, very scabrous; metasternum and abdomen closely finely punctulate, but not opaque, finely cinereo-pubescent. Length 7.5—8.5 mm.; .30—.34 inch.

This species is more opaque and blacker than either of the other species, while the punctuation of the thorax is dense and simple, not strigose. The sculpture of the metasternum shows but few coarser punctures and these near the middle, while the abdomen is entirely free of them. The legs may be entirely piceous, or have the tibiæ somewhat paler. There is absolutely no surface lustre in this species.

Occurs in California and western Nevada.

C. planatus Lec.—Oblong, nearly parallel, depressed, black, with faint bronze tinge above, beneath opaque; antennæ black, a little longer than the head and thorax, feebly serrate, joints all longer than wide; head coarsely and moderately closely punctate; thorax distinctly longer than wide, widest slightly behind the middle, not narrower in front, sides feebly arcuate, sinuate in front of hind angles, which are slender, acute and slightly divergent, distinctly carinate; disc feebly convex (basal incisures distinct), coarsely, not densely punctate,

except near the front angles, punctures slightly strigose; elytra scarcely wider than the thorax, parallel ♂, or slightly wider behind ♀, humeri rounded; disc striate, striæ punctured, intervals flat, transversely wrinkled, irregularly triseriately, submuricately punctate; prosternal lobe moderately prominent, the edge with distinct bead, a transverse impressed line posteriorly in front of which the lobe is densely coarsely punctate, then for a short distance sparsely punctate, followed by a coarse, denser punctuation, with finer punctures intermixed; metasternum coarsely punctate, closely near middle, more sparsely laterally, the intervals finely closely punctate; abdomen closely, finely punctate, with scattered larger punctures more numerous in front and on the apical segment. Length 7.5—10 mm.; .30—.40 inch.

In well preserved specimens the pubescence of the upper surface is short and inconspicuous; beneath very fine cinereous or fulvous. This is the only species of the group with a faint bronze surface, consequently less opaque than *squalidus* or *funebis*. While closely related to the latter the punctuation of its upper surface is less dense, the antennæ longer, and the punctuation of the under surface more intermixed and coarser.

The name given to this species was previously made use of by Eschscholtz, but that being identical with *hyperboreus*, and the name consequently suppressed, there seems to me no great objection to its use for the present species.

Occurs in western Pennsylvania, New York and Canada, White Mountains (Austin).

Group STRIATULUS.

Prosternal sutures arcuate and convergent behind. Maxillary palpi not prominent, the last joint elongate triangular. Thorax densely punctured and opaque, with, at most, a smooth median line, base without incisures, carina of hind angles short. Elytra striate, equally at the sides. Legs slender, the tibial spurs small. Form depressed. Body winged.

The only species composing this group resembles a diminutive *planatus*, but differs from that group by the form of the prosternal sutures. The peculiar sculpture of the thorax in the *choris* and *Melsheimeri* groups will prevent its being placed with them, the *perplexus* series is convex, shining and ornate, while the *tumescens* group is convex without ornamentation.

C. striatulus Lec.—Oblong, subdepressed, piceous black, opaque, finely cinereo-pubescent; legs pale, the femora darker; antennæ slender, black, feebly serrate; head feebly convex, densely rugosely punctate; thorax a little wider than long, narrowed in front, sides arcuate, slightly sinuate in front of the hind

angles, which are stout, slightly everted, and with a short carina; disc feebly convex, densely finely punctate, the median line usually smooth, but not always; elytra as wide as the thorax, humeri obtuse, sides nearly parallel for two-thirds then arcuate to apex; disc rather flat, striate, equally from middle to sides, striæ punctate, intervals feebly convex, densely and finely punctulate, the surface opaque; prosternum moderately closely punctate, more densely and finely at the sides, the lobe short and subtruncate, the transverse impression distinct; propleuræ closely finely punctate, not opaque; metasternum and abdomen densely punctate, a little more closely than the propleuræ. Length 3—4 mm.; .12—.16 inch.

An easily known species by the group characters alone. In some specimens the basal joints of the antennæ are somewhat paler, but these specimens have the under side somewhat paler also, and are probably less mature.

The distribution of this species is rather remarkable. Originally described from the Lake Superior region, it extends westward to Oregon (Wickham) and northern California, eastward to Ohio (Dury) and Allegheny, Pa (Hamilton).

Group CHORIS.

Prosternal sutures arcuate and convergent posteriorly. Maxillary palpi moderately prominent, the last joint elongate triangular. Form convex. Elytra deeply striate, more or less ornate. Thorax roughly granulate, the median line usually finely elevated and smooth; surface more shining.

The species of this group seem naturally to fall together by the very rough sculpture of the entire surface of the thorax. In the *dermestoides* group the thorax is somewhat granulate in front, but comparatively smooth posteriorly. To this group belong *pulchellus* and *sabulicola*, probably also *curtus* and *alysidotus* of the European fauna.

The species known to occur in our fauna may be separated in the following manner:

Apical margin of thorax truncate at middle.

Form gibbous, strongly arched when viewed laterally; carinæ of hind angles short; entirely pale above.....**delumbis.**

Form normal, not very convex; carinæ of hind angles long; color black, ornate with yellow.

Antennæ with three basal joints pale yellowish testaceous; legs always entirely pale.....**choris.**

Antennæ piceous, very little, if at all, paler at base; legs with the femora at least fuscous or piceous.

Elytra gradually attenuate in their posterior third.....**exiguus.**

Elytra not attenuate, apex obtuse.....**ornatus.**

Apical margin of thorax arcuate at middle, slightly prolonged over the head and somewhat elevated.....**cucullatus.**

C. delumbis n. sp.—Oblong, narrowed posteriorly, rather strongly arched, when viewed laterally, convex; color above ochreous, the thorax ferruginous, the head darker, elytra with vague fuscous spaces, often absent, beneath piceous or brown, the last ventral segment and prosternal lobe pale; antennæ entirely pale, the outer joints scarcely longer than wide; head flat, granular; thorax distinctly longer than wide, sides slightly arcuately narrowed from middle to apex, nearly straight posteriorly, angles not divergent, the carina well marked, but short, disc convex, the median line finely elevated and smooth; surface closely granular, not forming strigæ; elytra acutely oval, narrowed almost from the base, humeri obliquely rounded; disc deeply striate, striæ rather wide, coarsely not closely punctate, intervals convex, flatter at apex; surface subinuricately punctate; prosternum closely and rather roughly punctate, distinctly transversely impressed in front, the lobe moderately prominent, but obtuse; propleuræ closely punctate; metasternum rather short, coarsely and closely punctate; abdomen densely submuricately punctate, becoming granulate on the last two segments; legs pale yellowish testaceous. Length 4—5 mm.; .16—.20 inch.

This species is remarkable in its sharply arched form when viewed laterally, as well as by the pale color of the surface. The elytra are usually pale ochreous, but some specimens have a fuscous space on the declivity of broadly crescentic form extending forward by its outer angle parallel with the margin. The carina of the hind angles is short, *i.e.*, extending but little in front of the angles themselves, while in all the other species of the group it extends nearly or quite three-fourths to the apex.

Specimens were sent me many years ago by Mr. F. G. Sanborn, collected by him in some numbers at Truro, Mass., a town on the Cape Cod peninsula. It should occur in other places on the Atlantic coast.

C. choris Say.—Form moderately elongate, distinctly narrowed posteriorly, moderately convex, black, opaque, sparsely clothed with cinereous or golden hairs, each elytron with an angulate sub-basal band, which extends to the humeri, another transverse posteriorly yellow; antennæ slender, feebly serrate, piceous, the three basal joints pale yellowish testaceous; head feebly convex, coarsely and closely granulate; thorax very little longer than wide, sides feebly arcuately narrowed in front, behind the middle nearly straight, or with a very feeble sinuation in front of hind angles, these divergent, the carina long, extending fully three-fourths to apex; disc convex, a smooth, median, elevated line; surface rather coarsely and closely granulate, elytra widest in front of middle, thence gradually narrowed to apex, humeri obtuse; disc deeply striate, striæ punctured, intervals convex, flat near apex, roughly, not closely punctate and somewhat wrinkled; prosternum closely punctate, but smoother in front; two feeble transverse grooves in front, lobe moderately prominent, obtuse; propleuræ more densely punctate, but not opaque; metasternum and abdomen densely and moderately coarsely punctate, but somewhat shining; legs pale rufo-testaceous, the femora rarely slightly darker. Length 3—5 mm.; .12—.20 inch.

The extent of yellow color in the bands is variable so that the elytra may have more of that color than black, or *vice versa*. Specimens of the former were those seen by Say. The normal style of marking consists of a rather broad post-basal band with very sinuous edges, crossing the suture and reaching the lateral margin ending a broad extension to the humeri, behind the middle a transverse band crossing the suture where it is broadest, not reaching the side margin, with a posterior extension along the suture. The style of ornamentation seems intermediate between that of *exiguus* and *ornatus*. The elytra at tip have often a narrow pale border.

Occurs from the Middle States region westward to Indiana, and south to District of Columbia. A specimen collected by myself at Fort Tejon does not appear to differ in any respect from those found in the more eastern regions.

C. exiguus Rand.—Moderately elongate, narrowed posteriorly, convex, black, opaque; elytra ornate with yellow; antennæ slender, piceous, three basal joints fuscous, paler beneath; head flat, densely granulate, sparsely clothed with short whitish pubescence; thorax a little longer than wide ♂, or as wide as long ♀; sides feebly arcuately narrowing to the apex in front, posteriorly parallel with a slight sinuation in front of the angles, which are acute and slightly divergent, the carina long, extending fully three-fourths to apex; disc, convex, closely granulate, the median line smooth and distinctly elevated; surface sparsely pubescent, more conspicuously at the hind angles; elytra widest a little behind the humeri, then gradually narrowed to apex, humeri obtuse; disc rather deeply striate, but less so near the apex, striæ punctate, intervals slightly convex at base only, rather closely submuricately punctate, but smoother at apex, sparsely cinereo-pubescent; prosternum moderately closely punctate, but smoother in front between the two transverse grooves, the lobe moderate, but obtuse; propleuræ subopaque, densely punctate; metasternum densely and rather coarsely punctate; abdomen less closely and less coarsely punctate, last segment rufescent; femora and tarsi piceous, the tibiæ pale. Length 2.5—3 mm.; .10—.12 inch.

This species has been the cause of some confusion, in which every author who has treated of our Elateridæ has had part. Described originally by Randall, in 1838, under the above name it received a second (*guttatulus*) from Mesheimer in 1845.

In 1853, Dr. LeConte, in his "Revision of the Elateridæ," placed *exiguus* and *guttatulus*, in part, in synonymy with *pulchellus*. When the Mesheimer collection became accessible to him it was observed that two species had been confounded, each represented by a single poor specimen, one representing the present species, the other it was thought might prove to be *quadripustulatus* of Europe accidentally introduced in the cabinet. This latter specimen bore the typical

label, and was therefore assumed to be the type, notwithstanding the fact that the very good description given by Melsheimer points clearly to *exiguus*. It is, therefore, without hesitation that I suppress *gut-tatulus*, absolutely, as a synonym, and for the species erroneously so determined by LeConte the name *Melsheimeri* is proposed, and will be found in its proper group.

Dr. Candéze simply followed in the lead of LeConte. A few months ago ("Entomological News," 1890, p. 9) I continued the same error through not having *pulchellus* for comparison. The *sabulicola* which had been sent me instead, serving alone for comparison, led me to believe that our specimens fully met the requirements noted by Fauvel ("Revue Ent." 1889, p. 142).

On comparison of *exiguus* with *pulchellus*, it will be observed that the former is more slender and convex, the elytral striæ more distinct at apex and the elytra at tip piceous without the bifid space seen in the other. The three basal joints of the antennæ are pale rufo-testaceous in *pulchellus*, piceous in *exiguus*, although paler beneath. The femora are also paler in the former species.

There seems to be a closer resemblance between *pulchellus* and *choris*. They have similarly colored antennæ and legs, but the elytra are more roughly sculptured, the striæ deeper at apex, and the bifid spot absent in *choris*.

Occurs in the New England and Middle States; Massachusetts (Blanchard) to District of Columbia (Ulke).

C. ornatus Lec.—Oblong, moderately convex, not attenuate posteriorly, black, opaque; surface finely cinereo-pubescent; elytra either ornate, as in *pulchellus*, or with merely two small spots posteriorly or entirely black; antennæ slender, feebly serrate, entirely piceous; front flat, densely granulately punctate; thorax a little variable in form, as wide as long ♀, or a little longer than wide ♂, narrowed in front, widest usually at or near the base, sides feebly arcuate in front, behind the middle nearly straight and parallel, or with a faint sinuation in some males, the angles not divergent, the carina extending nearly three-fourths to apex, disc convex, the median line finely elevated and smooth; surface opaque granulate, the granules elongate and forming short strigæ posteriorly; elytra parallel, arcuately narrowed at apical third, humeri obtuse; disc moderately deeply striate, striæ punctured, intervals flat, slightly convex at base in male, roughly punctate, more or less transversely wrinkled and rugulose, especially near the base; prosternum rather coarsely and closely punctate, especially in front, two transverse impressions anteriorly, the lobe moderately prominent, but obtuse; propleuræ closely punctate, but not opaque; metasternum densely and rather roughly punctate; abdomen densely punctate, less coarsely than the metasternum. Length 3--5 mm.; .12--.20 inch.

The males are more slender and rather more coarser than the females, the thorax a little longer than wide and with a faint sinuation in front of the hind angles, which are, however, not divergent.

There is considerable variation in color in the specimens before me, and three varieties may be indicated.

Var. *ornatus* Lec.—The elytra have two yellow spaces. The anterior is transverse, post-basal, of irregular form, widest externally, but not extending to the humerus nor margin. The posterior is behind the middle, transversely oval, not reaching the side nor the suture. The femora are piceous, the tibiæ and tarsi usually paler.

Var. *colon* Horn.—Here the elytral markings are reduced to a small round spot on each side in the position of the posterior spot of the preceding variety. The legs may be as in *ornatus*, or entirely piceous.

Var. *mærens*.—Entirely black, without elytral markings. The legs are nearly always piceous.

Occurs in California from San Diego northward in the central valley, as well as along the coast region to Oregon (Blanchard).

C. encullatus n. sp.—Elongate oval, rather broader in proportion to its length than usual in the genus, moderately convex, black; elytra with faint bronze lustre; thorax cinereo-pubescent near the hind angles; elytra with extremely fine and short flavo-cinereous pubescence; antennæ slender, feebly serrate, entirely piceous; head flat, closely punctate; thorax scarcely longer than wide, sides straight posteriorly, gradually arcuately narrowed from middle to apex, hind angles not divergent, the carina extending in front of middle, apical margin arcuate and prolonged over the head, deeply sinuate near the front angles; disc convex, without smooth median line; surface very coarsely granulate, but somewhat smoother on the declivity and near the hind angles; elytra with sides parallel, arcuately narrowed at apical third; apex obtuse, humeri obtuse; disc moderately convex, striate, striæ punctate, intervals slightly convex in their entire extent and closely punctulate; prosternum granulate in front, rather finely punctate posteriorly, a faint transverse impression in front, the lobe short and obtuse; propleuræ more finely and closely punctate than the sternum; metasternum a little more coarsely punctate; abdomen rather more finely and densely; legs piceous, the tibiæ and tarsi paler. Length 3.5 mm.; .14 inch.

This species is easily known by the form of the apical border of the thorax of which the middle forms a short lobe partly concealing the head from above. On each side of this lobe is a rather deep sinuation causing the front angles to be more acute and prominent than usual.

Specimens have been examined from the Indian Territory; Columbus, Texas (Schwarz), Utah (Ulke). A specimen has been seen labeled Ohio, but the locality seems doubtful.

Group **MELSHEIMERI**.

Prosternal sutures arcuate and convergent posteriorly. Maxillary palpi not prominent, the last joint elongate triangular, the apex rounded. Thorax asperate, or subgranulate in front, becoming gradually quite smooth posteriorly, the base without incisures. Elytra striate; tibiæ slender, spurs small; surface usually shining, elytra often ornate. Body winged.

A group of small species standing naturally between the *choris* and *perplexus* series. Its essential character is in the sculpture of the thorax, the anterior portion being quite roughly or more densely sculptured, and the basal portion quite smooth. Some curious sexual peculiarities have been observed in some of them, of rare occurrence in Elateridæ, but by no means rare in Eucnemidæ, consisting of tubercles or pubescent spots on the first two ventral segments.

The elements composing the group are by no means homogeneous, and might be again divided as the last three species have not that very marked difference in sculpture of the thorax so well shown in the others. As a whole, the group is known from the *striatulus* series by its more convex form and the evident inequality of the thoracic punctuation; from the *choris* series by the opaque, granular thorax of these; the *perplexus* series has usually a sparsely punctate thorax, and in any event the punctures are equal and equally disposed.

The following species are known to occur in our fauna:

- Prosternal sutures widely double, smooth and grooved in nearly their entire length; thorax simply emarginate at apex when seen from above.
- Antennæ and legs pale; anterior tibiæ of male not broader than in female, the first ventral ♂ with a flattened space at middle enclosing a tubercle.....**Melsheimeri**.
- Antennæ piceous, tip of first and the second and third joints paler; legs pale, femora darker; anterior tibiæ of male nearly twice as broad as in the female, the first ventral ♂ scarcely flattened, but with an oval hairy spot.....*quadriguttatus*.
- Antennæ piceous, paler at base; legs pale, femora piceous; anterior tibiæ of male not broader, the first and second ventrals of male with a tubercle near the posterior border.....**caurinus**.
- Antennæ as in *quadriguttatus*, legs similar; anterior tibiæ of male broader than in female, but less marked; first ventral of male gibbous between the coxæ, rather suddenly declivous posteriorly and fringed with longer hair.....*dermestoides*.
- Prosternal sutures very narrowly double, not grooved.
- Carina of the hind angles of thorax extending to or beyond the middle of the thorax.

Form subdepressed; thorax distinctly rugulose in front; posterior coxal plates obliterated externally.

Thorax simply emarginate in front; no ventral sexual characters in either sex..... **dispersus.**

Thorax sinuate each side at apex, the middle somewhat elevated and prolonged over the head; second ventral of ♀ with oval pubescent spot..... **gradarius.**

Form convex; thorax simply a little more coarsely punctate in front; posterior coxal plates not obliterated externally; sides of thorax sinuate in front of hind angles..... **tumescens.**

Carina of hind angles of thorax very short, not extending beyond the angles.

Piceous, faintly bronzed; sides of thorax sinuate in front of hind angles, these distinctly divergent..... **musculus.**

Brownish opaque; sides of thorax straight posteriorly, the hind angles not divergent..... **dubius.**

It will be observed that two European species are introduced in the table, the names in italics. These have been the cause of much of the trouble experienced in identifying our species. On several occasions specimens have come to me labeled *dermestoides* with *quadriguttatus* as a variety. Whether that is the view generally held in Europe is hardly my province to investigate, but there is no question in my mind that they are two well defined species easily separated by the sexual characters of the male. I find no mention made of the latter in any literature examined, they have even escaped the acute observation of C. G. Thomson.

C. Melsheimeri n. sp.—Oblong, moderately convex, piceous black shining, sparsely finely pubescent, each elytron with a humeral and subapical yellow spot; antennæ slender, feebly serrate, joints all longer than wide, ferruginous, joints 2-3 paler, basal joint darker; head slightly convex, punctate, somewhat asperate; thorax wider than long, narrowed in front, sides arcuate, straight for a short distance near base, hind angles broad, but acute at tip, the carina extending finely three-fourths to apex; disc convex, shining, asperately punctate in front, gradually evanescent behind and quite smooth near the base, median line distinctly smoother in front; elytra as wide at base as the thorax, humeri obtuse, sides nearly parallel, arcuately narrowed at apical third, apices obtuse, disc striate, striæ extremely finely punctate, intervals slightly convex, sparsely minutely punctulate, the humeral spot small, rhomboidal, the subapical round; prosternum sparsely punctate, more coarsely and closely in front, the lobe moderately prominent, rather obtuse, prosternal sutures widely double, smooth, grooved nearly their entire length, propleuræ feebly shining, punctures fine and close; metasternum moderately closely punctate, the last segment more densely and opaque; legs pale rufo-testaceous, the femora slightly darker. Length 2—2.25 mm.; .08—.09 inch.

The first ventral segment of the male has a flattened space at middle, in the centre of which is a slightly elevated broad tubercle.

The female has simple ventral segments, the antennæ a little shorter, and the joints, consequently, relatively broader.

Superficially this species closely resembles *quadriguttatus* (*tetragraphus*), but the thorax is smoother, *i. e.*, the roughness does not extend so far posteriorly, and the median smooth line is shorter.

Thomsom states (Skand. Col. vi, p. 116) that in the male of *tetragraphus* the anterior tibiæ are inwardly dilated near the apex. No such structure is seen in our species.

This species is the form for which Dr. LeConte retained the Melsheimer name *guttatulus*, but I have elsewhere shown that the description applies accurately to that described previously as *exiguus* Rand.

Occurs in the District of Columbia (Ulke); northern Illinois.

C. caurinus n. sp.—Oblong, moderately convex, piceous, slightly shining, surface finely cinereo-pubescent, each elytron with a small yellow spot at humerus, a second subapical, both indistinct; antennæ slender, feebly serrate, entirely piceous; head convex, a slight median impression posteriorly, surface opaque, finely asperate; thorax a little broader than long, narrowed in front, apex emarginate, sides parallel posteriorly, then gradually arcuately narrowed to the front, hind angles stout but acute, the carina extended two-thirds to apex, disc convex, median line somewhat smooth in front, surface asperately punctate in front, finely and closely posteriorly; elytra as wide as the thorax, humeri obtuse, sides scarcely arcuate, apical third arcuately narrowed, apex obtuse, disc striate, striæ faintly punctured at the sides, intervals feebly convex, minutely and moderately closely punctate; prosternum finely not closely punctulate; a distinct transverse impression, anterior to which the punctuation is rather coarse and rugose; lobe prominent, obtusely rounded in front, sutures widely double, smooth and grooved, propleuræ opaque, densely and very minutely punctulate; metasternum and abdomen densely finely punctulate; femora piceous, tibiæ and tarsi testaceous. Length 2—2.5 mm.; .08—.09 inch.

The males have an oval flattened space in the middle of the first ventral segment enclosing a small tubercle, a second tubercle near the margin of the second segment. Females are not known to me.

In a superficial comparison this species might be supposed to be merely a *Melsheimeri* with spots less distinctly marked, but here the antennæ are quite black and the male sexual characters different.

Occurs in the State of Washington.

C. dispersus n. sp.—Oblong, moderately convex, piceous black, feebly shining, sparsely and finely cinereo-pubescent, each elytron with a faint humeral and subapical yellow spot, or without any; antennæ slender, feebly serrate, entirely piceous, or with joints 2-3 pale; head convex, sparsely asperately punctate; thorax a little wider than long, apex emarginate, sides parallel for a short distance posteriorly, thence arcuately narrowed to the front, the hind angles

broad, but acute; the carina extending two-thirds to apex, disc convex, median line smooth in front, surface asperately punctate in front, sparsely punctate posteriorly; elytra as wide at base as the thorax, but evidently narrowed from the obtuse humeri, disc striate, striæ finely punctate, intervals slightly convex, finely moderately closely punctulate; prosternum not closely punctate, a feeble transverse impression in front, lobe obtusely prominent, coarsely and closely punctate, the sutures very narrowly double, but not at all excavate, propleuræ less shining, very minutely and densely punctulate; metasternum and abdomen densely and finely punctulate; legs testaceous, the femora darker. Length 2.25 mm.; .09 inch.

The two specimens before me, which seem to be male and female, exhibit no ventral sexual characters. One ♂ from Washington has entirely piceous antennæ, a very faint humeral spot, the subapical more distinct; that from Nevada has no elytral spots, and the second and third joints of the antennæ pale. A third from Nova Scotia, probably representing a distinct species, has the elytral spots well marked as in *Melsheimeri*, and the three basal joints of the antennæ pale. In the absence of a male it is for the present placed with this species.

Occurs in Nevada, Washington (and Nova Scotia?).

C. gradarius n. sp.—Oblong, feebly convex, piceous-black, subopaque, faintly bronzed, surface finely cinereo-pubescent, more evidently in the depression near the hind angles; antennæ black, slender, feebly serrate; front slightly impressed, rather coarsely and roughly punctured; thorax very little wider than long, narrowed in front, sides posteriorly straight, in front gradually arcuate to apex, apical border sinuate, slightly elevated at middle and prolonged over the head, hind angles broad, but acute, the carina extending two-thirds to apex, disc convex, asperately punctate in front, more finely and smoother posteriorly; elytra as wide at base as the thorax, humeri obtuse, sides feebly arcuate, apex obtusely rounded, disc striate, striæ punctulate, intervals feebly convex, punctulate; prosternum sparsely punctate, shining, a feeble transverse impression in front, lobe not prominent, obtusely rounded, coarsely punctate, prosternal sutures simple, without trace of excavation, propleuræ subopaque, densely finely punctulate; metasternum and abdomen closely finely punctate; legs rufo-testaceous, femora darker. Length 2 mm.; .08 inch.

The male shows no sexual characters on the ventral segments, the female, however, has a finely pubescent, oval spot at the middle of the second segment.

This species is the one I had thought identical with *dermestoides*, but a closer examination shows it to be our equivalent, on this continent, of *curtus* of Europe. The sinuation of the apical border of the thorax, although sufficiently well marked in comparison with the others of the group, is less distinct than in *cucullatus*. The denser silken pubescence of the hind angles of the thorax is rather a con-

spicuous feature of this species. The two specimens before me are precisely alike above and show no traces of pale spots.

Collected by Mr. D. W. Coquillett at Los Angeles.

C. tumescens Lec.—Oblong, convex, facies robust, piceous-black, with slight æneous surface lustre, sparsely cinereo-pubescent; antennæ either entirely piceous, or with joints 2-3 paler; joints subtriangular from 4-10; head convex, closely punctate; thorax as wide as long, narrowed in front, sides rather strongly arcuate, sinuate in front of the hind angles, which are acute, slightly divergent, with the carina extending nearly half to apex, disc convex, the median line smooth, surface moderately closely punctate, a little roughened near the apex only, gradually more finely posteriorly; elytra oval, widest a little behind the middle, humeri obtuse, disc convex, striate, striæ punctate, intervals slightly convex near the base, sparsely punctate, more coarsely in front, the lobe obtuse, propleuræ more closely punctate; metasternum more coarsely punctate; abdomen more finely and closely punctate; legs rufo-testaceous, the femora piceous. Length 3-4 mm.; .12-.16 inch.

The prosternal sutures, while doubled as usual in the group, are very narrow, although in the female they are distinctly wider than in the male.

The form of this species is quite that of a diminutive *Cardiophorus*. The sculpture of the thorax does not have that marked roughness seen in the preceding species. The posterior coxal plates are not obliterated externally.

Occurs on the north shore of Lake Superior (LeConte), upper Canada (Pettit) and New Mexico (Fuller); White Mountains (Blanchard).

C. musculus Esch.—Oblong, convex, facies robust, black, shining, surface distinctly æneous, sparsely pubescent; antennæ piceous, slightly serrate; head convex, closely, subasperately punctate; thorax broader than long, very little narrowed in front, sides strongly arcuate, sinuate near the hind angles, which are acute, slightly divergent, and with a very short carina, disc convex, median line smooth, surface closely and slightly asperate in front, gradually more finely and sparsely behind; elytra oval, widest at middle, humeri rounded, disc convex, striate, less deeply at sides, striæ punctate, intervals slightly convex near the base, moderately closely, but finely submuricately punctate, forming transverse ridges near the base; prosternum sparsely punctate, a distinct transverse groove in front, the lobe rather obtuse, propleuræ similarly punctate; metasternum a little more coarsely punctate; abdomen punctate similarly to the propleuræ, but more densely; legs piceous, the tibiæ and tarsi paler. Length 2.5-3 mm.; .10-.12 inch.

The prosternal sutures are not at all doubled in this species. The carina of the hind angles of the thorax is here very short and inconspicuous, and might readily be passed unobserved. The posterior

coxal plates are obliterated externally, the posterior edge being confluent with the anterior.

Occurs in Alaska.

C. dubius Horn.—Oblong, moderately convex, fuscous, feebly shining, sparsely pubescent, hind angles of thorax paler; antennæ slender, scarcely serrate, fuscous, the three basal joints paler; head slightly flat, closely subasperately punctate; thorax a little wider than long, narrowed in front, sides parallel behind, arcuate anteriorly, the hind angles nearly rectangular, the carina moderate in length, disc convex, the median line smoother, surface closely punctate and somewhat scabrous in front, gradually more smooth posteriorly; elytra oblong, sides parallel, arcuate at apical third, humeri obtuse, disc striate, a little less at the sides, striæ relatively coarsely punctate, intervals flat, finely and moderately closely punctate; prosternum sparsely punctate, transversely impressed in front, the lobe short and obtuse, propleuræ finely and indistinctly punctate; metasternum more coarsely punctate; abdomen very finely and moderately closely punctate; legs pale. Length 2—2.5 mm.; .08—.10 inch.

The under side of body is notably paler than the upper, especially on the sternal members and the epipleuræ. The posterior coxal plates are obliterated externally.

This species has the same general outline of body as in the *Mel-sheimeri* series, but is more convex.

Occurs in Nebraska and Dakota (Ulke).

Group PERPLEXUS.

Prosternal sutures arcuate and rather strongly convergent posteriorly. Maxillary palpi moderately prominent, the last joint elongate triangular. Elytra moderately deeply striate, ornate with yellowish spaces. Form rather slender, convex. Thorax simply punctate, not rugose, the median line not elevated nor smooth, without basal incisures. Legs slender, tibial spurs very small.

Among the species with arcuate prosternal sutures, those of this group are known by the striate and ornate elytra, with comparatively smooth thorax. The only exotic species known to me as belonging here is *quadripustulatus* Fab.

The species are separated as follows:

Thorax distinctly narrowed in front, at base as wide, or wider than at middle.

Antennæ and legs entirely piceous.....**gentilis.**

Thorax coarctate at base and apex nearly equally, widest at middle, hind angles slender, slightly divergent. Legs and three basal joints of the antennæ yellowish testaceous.

Elytral humeri obtuse, body with well developed wings, striæ scarcely more punctate than the intervals; each elytron with two yellow spaces, humeral and subapical.....**æstivus.**

Elytral humeri rounded, body very feebly winged, striæ more coarsely punctate than the intervals.

Each elytron with two yellow spots; thorax wider than long.

Each elytron with a humeral spot only; thorax distinctly longer than wide*quadripustulatus.*
perplexus.

The European species is introduced in the table for the comparison of its characters with the two in our fauna most closely allied to it.

C. gentilis Lec.—Moderately convex, piceous, feebly shining, clothed with fine flavo-cinereous silken pubescence, each elytron with an arcuate humeral oblique yellow stripe and a short transverse one behind the middle; antennæ slender, piceous, feebly serrate, joints all longer than wide; head vaguely longitudinally impressed, finely and moderately punctate, slightly scabrous; thorax as broad as long, narrowed in front, sides anteriorly feebly arcuate, nearly straight at basal fourth, the hind angles stout not divergent, tipped with yellow, the carina extending nearly to middle, but very feeble in front, disc moderately closely finely punctate, the median smooth line very feeble, the pubescence irregularly arranged, giving a holosericeous appearance; elytra as wide at base as the thorax, humeri obtusely rounded, disc feebly arcuate, gradually narrowed from base, disc deeply striate, striæ closely punctate, intervals convex, densely punctulate, somewhat scabrous near the base; prosternum sparsely punctate, a little more coarsely in front, with two vague transverse impressions, the lobe obtusely rounded with narrowly beaded margin, propleuræ a little more closely punctate than the sternum, shining; metasternum and abdomen a little more coarsely punctate than the prosternum, the apical segment somewhat roughened. Length 3—4 mm.; .12—.16 inch.

In the male the form is more slender, and, contrary to what has been noticed elsewhere in Elateridæ, the elytral intervals are less convex. The hind angles are also very slightly divergent. The frontal impression may be vaguely triangular.

The yellow humeral lunule of the elytra is, in form, very like the same mark in *Cicindela*. The legs are piceous, but sometimes the tibiæ and tarsi are paler.

From either of the species of this group this differs in having the thorax broadest at base, the antennæ and legs piceous.

Occurs in Nebraska (Ulke), Wyoming and Washington (Morrison)

C. æstivus Horn.—Oblong, moderately elongate and convex, piceous, basal joints of antennæ, hind angles of thorax, legs, a humeral and subapical spot on each elytron yellowish testaceous, surface moderately shining, sparsely pubescent; antennæ feebly serrate, joints slender; front rather flat, head vaguely punctate and slightly rugulose; thorax not longer than wide, slightly narrowed in front, widest slightly in front of middle, sides arcuate, distinctly sinuate in front of the hind angles, which are slender, acute and distinctly divergent, the carina not prolonged, disc moderately convex, not closely punctate, the median smooth line feebly evident posteriorly; elytra as wide at base as the thorax, humeri obtuse, sides feebly arcuate, disc striate, striæ punctate, intervals slightly convex, not closely punctulate; prosternum sparsely finely punctate, vaguely transversely impressed, the lobe short and truncate, propleuræ more coarsely and punctate than the prosternum at middle, shining; mesosternum punctured similarly to the propleuræ, the abdomen a little more finely. Length 4—5 mm.; .16—.20 inch.

In this species the elytra are colored very like *gentilis*. The more striking differences between it and the others of the group are sufficiently detailed in the table.

Occurs in Missouri; collected by Dr. S. V. Summers, Ohio (Blanchard).

C. perplexus Horn.—Moderately elongate and convex, piceous-black, shining, sparsely pubescent, three basal joints of the antennæ, legs and a humeral spot reddish yellow; antennæ slender, feebly serrate; front rather flat, sparsely punctate; thorax distinctly longer than wide, nearly equally narrowed at base and apex, widest a little in front of middle, sides arcuate, distinctly sinuate in front of the hind angles, which are small, acute and distinctly divergent, the carina distinct, disc convex, sparsely but equally punctate, median smooth line distinct; elytra elongate oval, widest at middle, humeri rounded, the disc striate, striæ rather deep and coarsely punctate, the intervals convex, shining and very sparsely punctulate; prosternum transversely impressed in front, the lobe short and obtuse, surface sparsely finely punctate at middle, more distinctly at the sides, propleuræ shining, a little more coarsely and less closely punctate than the sternum; metasternum a little more coarsely and closely punctate; abdomen more finely than this. Length 2.75—3.5 mm.; .11—.14 inch.

This species resembles that variety of *quadripustulatus* in which the humeral spot alone is present, but it differs in having the thorax very obviously longer than wide, the elytral striæ more coarsely punctate, and the intervals smoother. The hind angles of the thorax are sometimes tipped with yellow, but this is by no means frequent. The body is very feebly winged.

Occurs in the District of Columbia, where it has been collected abundantly, at times, by Mr. Ulke.

Group PECTORALIS.

Prosternal sutures arcuate, convergent posteriorly, nearly twice as widely separated at the apical angles as at the coxæ. Maxillary palpi not prominent, the last joint triangularly oval. Legs slender, the tibial spurs minute. Form at least moderately convex, body winged. Elytra either not at all striate, or those near the suture alone indicated faintly. Thorax without basal incisures, a smooth median line variably present.

This group is equivalent to the second division, AA, indicated in the Monograph of Candéze. Those occurring in our fauna separate very naturally from the exotic forms by having the carina of the hind angles of the thorax short, while in those the carina is prolonged nearly or quite to the anterior angles.

The species known to inhabit our fauna may be separated by the following table.

Elytra faintly striate at middle, the striæ distinctly impressed in the basal declivity; antennæ and legs piceous; surface shining, faintly æneous.

restrictulus.

Elytra absolutely without striæ; antennæ and legs pale.

Surface moderately shining, the punctuation extremely indistinct; each elytron with an oblique yellow band at middle, not reaching the suture and an oval apical spot. **obliquatulus.**

Surface subopaque, the punctuation very distinct, especially on the thorax; color very variable, from yellowish testaceous to piceous, with intermediate maculate forms **pectoralis.**

The species of this group are small, some of the forms of *pectoralis* being the smallest Elaterides in our fauna.

C. restrictulus Mann.—Oblong, moderately elongate and convex, piceous, shining, very sparsely pubescent; antennæ piceous, longer than the head and thorax, slender feebly serrate, joints all longer than wide; head slightly concave, not closely punctate; thorax slightly longer than wide, widest at middle, slightly narrowed in front, sides arcuate, sinuate in front of the hind angles, which are slender, acute, divergent and carinate, disc convex, finely not closely punctate, the median line faintly smoother; elytra oblong oval, widest at middle, humeri rounded, disc moderately convex, very faintly striate near the middle, the striæ impressed in the basal declivity, at the sides entirely obliterated, surface moderately closely punctate, except near the apex; prosternal lobe short, mouth exposed, the sternum moderately convex, sparsely punctate at middle, more closely near the sides, propleuræ shining, moderately closely punctate; metasternum and abdomen similarly punctate, not closely nor coarsely; legs piceous, the tibiæ and tarsi sometimes paler. Length 3.5 mm.; .14 inch.

In the male the last ventral segment is bisinuate truncate with a median tooth, the same segment of the female is similarly truncate, but in a less pronounced manner.

This species is described in the Monograph of Candéze as *musculus* Mann., but a comparison of the original descriptions will show that Dr. Candéze had *restrictulus* and not the other before him. Besides, a type of *musculus* is in the LeConte collection from Mannerheim. The measurement given by Candéze is also incorrect for either species, while its position among the striate species is certainly misleading. The form of the last ventral segment is not found in any other species in our fauna. In habitus the species resembles *Oedostethus femoralis*, but in the latter the striæ are more distinctly impressed, although obliterated at the side, and the claws have the basal half dilated.

Occurs in Alaska (Mannerheim, Ulke) and in the White Mountain region of New Hampshire (Blanchard).

C. obliquatulus Mels.—Oblong, moderately convex, piceous, thorax somewhat paler in color, very sparsely pubescent, antennæ and legs testaceous; antennæ slender, feebly serrate, joints all longer than wide; head sparsely punctate; thorax a little wider than long, slightly narrowed in front, widest at middle, sides regularly arcuate, sinuate in front of the hind angles, which are small, acute, and very slightly divergent, the carina fine, and, when seen from above, directed nearly straight to the front, disc moderately convex, sparsely equally punctate, the median smooth line very faint; elytra slightly wider than the thorax, humeri very little oblique, sides regularly arcuate, widest at middle, disc entirely without striæ, more sparsely and finely punctured than the thorax, color piceous, on each elytron an oblique yellowish band reaching the margin, but not the suture, an oval apical spot of variable size also yellow; prosternum sparsely punctate, and with two transverse impressions, the lobe moderately prominent, but obtusely rounded in front, the border finely beaded, propleuræ shining, more sparsely and finely punctate than the sternum; metasternum minutely and indistinctly punctate, abdomen more densely and coarsely. Length 2.25—2.75 mm.; .09—.11 inch.

Usually the underside of the body is much paler than the upper, especially in the prothorax and the elytral epipleuræ. The color and markings seem to be very constant, and vary but little beyond that caused by varying degrees of maturity.

The males have a small, densely punctured space at the middle of the prosternum, usually more pubescent, but never as distinct as in *pectoralis*.

Distributed from Canada and the New England States southward to Virginia and westward to Iowa.

C. pectoralis Say.—Oblong, feebly convex, subopaque, sparsely finely pubescent, color variable from entirely yellow to entirely piceous; antennæ slender, feebly serrate, joints all longer than wide, yellowish testaceous; head moderately closely punctate, front flat; thorax usually as wide as long, sometimes slightly longer, slightly narrowed in front, widest at middle, sides arcuate, scarcely sinuate in front of the hind angles, which are small, acute, but not divergent, the carina, when viewed from above, turned externally, disc very distinctly and rather closely punctate, the median smooth line usually evident; elytra slightly wider than the thorax, humeri slightly oblique, sides arcuate, disc without striæ, surface less distinctly punctate than the thorax; prosternum moderately closely punctate, transverse impression not well marked, the lobe moderately prominent, subtruncate in front, propleuræ punctate similarly to the sternum; metasternum punctate similarly to the prosternum, the abdomen much more finely and densely. Length 1.5—3 mm.; .06—.12 inch.

The males of this species have a small, but densely punctured spot at the middle of prosternum from which arises a bunch of longer pubescence. The pubescence is often absent, except in well preserved specimens.

This species varies greatly in color, and has been given three names in consequence. These varieties may be described as follows:

Var. *pectoralis* Say.—Entirely yellowish testaceous above and beneath. Specimens often occur with a transverse fuscous fascia behind the middle of the elytra, which extends narrowly along the suture to the apex.

This form occurs from Massachusetts to California and Texas.

Var. *futilis* Lec.—This does not differ from the preceding variety, except in its smaller size and with apparently a slightly more rugose thoracic sculpture. A subvariety occurs in Arizona entirely piceous. These latter are the smallest specimens seen (.06 inch).

Occurs at San Diego and Owen's Valley in California, and also in Arizona.

Var. *inops* Lec.—Piceous, elytra with an indefinite humeral yellow spot, a short transverse band at middle adjacent to the lateral margin, these two sometimes united along the margin, a subapical yellow space. Specimens often occur with a median discal space of the thorax yellowish.

Occurs in California and Washington.

Var. ———.—Entirely piceous, and occasionally with the legs darker than normal.

This is known to me from the extreme northwest, Washington, although one from Iowa has merely slightly paler humeri.

From the localities given this seems to be the most widely distributed of our species.

Synonymy and Bibliography.

CRYPTOHYPNUS Esch.

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C. Sanborni Horn, Trans. Am. Ent. Soc. 1871, p. 303.

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‡‡‡

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lacustris Lec., Trans. Amer. Philos. Soc. x, 1853, p. 486.

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C. exiguus Rand., Bost. Journ. ii, p. 35.
 guttatulus Mels., Proc. Acad. ii, p. 214 (nec Lec.).
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C. dispersus n. sp.
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C. tumescens Lec., Trans. Amer. Philos. Soc. x, 1853, p. 486.
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 v. *futilis* Lec., Trans. Amer. Philos. Soc. x, 1853, p. 488; Cand., Mon. iii, p. 91.
 v. *inops* Lec., Trans. Amer. Philos. Soc. x, 1853, p. 488; Cand., Mon. iii, p. 91.

APPENDIX.

ÆDOSTETHUS Lec.

This genus does not seem to be generally known to collectors, so that but few specimens have ever been sent me for determination. It differs from *Cryptohypnus* in having the claws abruptly dilated at basal half as shown in fig. 8, pl. 1. The prosternal sutures are arcuate, but in a less degree than in the species of *Cryptohypnus* with sutures.

Oe. femoralis Lec., Revis. Elat. p. 489.

This is the only species known. It greatly resembles *C. restrictulus*, having the striæ of elytra feebly distinct on the disc and obliterated at the sides, the color and form being also quite similar. The maxillary palpi are rather slender and similar to *restrictulus*.

It is known to me from Canada, western Pennsylvania and Colorado.

ANTHRACOPTERYX n. g.

Frontal margin not elevated, confluent with the edge of the clypeus. Antennæ a little longer than the head and thorax, joints 3–10 feebly serrate, nearly equal in length, eleventh longer, second shorter, first joint stout, nearly as long as the next two. Maxillary palpi long, the last joint (of both palpi) cultriform, longer than the two preceding joints together. Thoracic margin acute, when seen laterally nearly straight, terminating opposite the middle of the eye; scutellum oval, slightly transverse. Elytra oblong, humeri obliquely rounded, body apterous. Prosternal lobe rather short, the mouth exposed beneath, the sutures straight, slightly convergent posteriorly, tip of prosternum acute, flexed upward toward the body. Posterior coxal plates abruptly dilated at inner third. Tarsi as long as the tibiæ, the first four joints decreasing gradually in length and not lobed, claws simple.

The above description briefly defines a form which it is by no means easy to place. From the method of classification adopted by Dr. Candéze, which assumes the form of the front as the character of greatest primary moment, the genus should be referred to the division *Corymbitites* and to the group *Dimites*. From Dr. Candéze I have received the following note: "For me there remains no doubt, after a mature examination, that it can be placed in the *Dimites*, where it will form a new genus related to *Diadysis* (of Australia) and *Asorno* (of Patagonia) which I will hereafter place in the *Dimites*."

In a sentence immediately preceding he writes: "Its head is the head of a *Corymbitite*, but the coxæ!" Here is the point at issue. The form of the posterior coxal plates, whether abruptly or gradually dilated internally seems to me a character of greater stability, and therefore more reliable as a character than the form of the head. Therefore, I must at this time differ from that learned entomologist, and place it among the *Cryptohypnites*.

In the latter group we find species with the frontal margin scarcely distinct from the clypeal and the labial palpi exhibiting a tendency to elongate, especially in the last joint.

From *Cryptohypnus* the genus may be said to differ by the form of the long maxillary palpi terminated by a cultriform joint.

Science owes to Mr. T. D. A. Cockerell the discovery of the species on which the genus is founded, and both the generic and specific names are due to his suggestion. Had it not been for the necessity of quoting the letter of Dr. Candéze in order to explain why I differed from him, I would have preferred to have elaborated the notes sent me by Mr. Cockerell to publish them under his name.

A. hiemalis n. sp.—Oblong, parallel, moderately convex, piceous, slightly shining, sparsely pubescent; antennæ a little longer than the head and thorax, piceous, feebly serrate, joints all longer than wide; head sparsely punctate, front rather flat, the frontal ridge not continuous across the front; thorax longer than wide, apex feebly emarginate, widest one-third from apex, sides moderately arcuate, slightly convergent posteriorly, feebly sinuate before the hind angles, which are acute, not long nor divergent, distinctly carinate, disc moderately convex, median line feebly impressed posteriorly, without basal incisures, surface equally punctate, moderately coarsely, but not closely; elytra not wider than the thorax in front, oblong oval, humeri very oblique, disc striate, striæ punctured, intervals flat, irregularly biserially punctate and somewhat wrinkled, especially at base; prosternal lobe not prominent, irregularly arcuate in front, the edge not beaded, surface coarsely not closely punctate, apical mucro very oblique, propleuræ less coarsely and less closely punctate; metasternum and abdomen still less closely punctate and more shining, the last segment more coarsely and closely; legs piceous, tarsi usually paler. Length 6.5 mm.; .26 inch. Pl. 1, figs. 6, 7.

Collected by Mr. T. D. A. Cockerell at West Cliffe, Custer County, Colorado, at an elevation of 7000 feet and over.

In the Mexican fauna the species of the family Throscidæ show nothing in common. In our fauna *Throscus sens. lat.* is represented by thirteen species, and in Mexico by five, while *Drapetes* contains twenty-six in Mexico and but four with us, in addition to which *Lissomus* has twelve Mexican species, and is totally unknown in our fauna. *Pactopus* makes a closer approach to the *Eucnemidæ* without having any parallel in Mexico.

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There has recently appeared from the able hands of Dr. Candéze a work entitled, "Catalogue Méthodique des Elaterides connus en 1890," which will have great value to those interested in the study of that family. In it all impertinent synonymy has been omitted, only such being given as has not already obtained sufficiently wide circulation. But little has been observed worthy of correction in reference to our species, except that *Megapenthes granulatus* Mels. is on p. 98, while its male is found on p. 190 as *Ludius limbatus* Hbst. Our *Betarmon bigeminatus* Rand. has been omitted. The results of my studies of *Cryptohypnus* are included in the list, although I have slightly modified the arrangement of the species since my communication to him.

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EXPLANATION OF PLATE I.

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- Fig. 1.—Maxillary palpus of *Cryptohypnus littoralis*.
 " 2.—Maxillary palpus of *C. planatus*.
 " 3.—Maxillary palpus of *C. restrictulus*.
 " 4.—Last ventral segment ♂ of *C. restrictulus*.
 " 5.—Last ventral segment ♀ of *C. restrictulus*.
 " 6.—*Anthracoptyx hiemalis*.
 " 7.—Maxillary palpus of *Anthracoptyx hiemalis*.
 " 8. Claw of *Oedostethus femoralis*.
 " 9.—Antenna and maxillary palpus ♂ of *Pyrota Akhurstiana*.
 " 10.—Head of *Epicauta straba*.
 " 11.—Head of *Epicauta* of usual form.
 " 12. *Eleodes Wickhami*.
 " 13.—*Eleodes longipilosa*.

