

Revision of the Genus *Odontaeus*
(Coleoptera)

And

Some New Coleoptera

by

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REVISION OF THE GENUS ODONTAEUS, DEJ.
(SCARABAEIDAE, COLEOPTERA).

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This study of the taxonomic units comprising the genus *Odontaeus* Dej. has occupied, for the past three years, by far the greater part of such time as I can devote to entomology, and yet it is with a feeling of dissatisfaction that the following conclusions are offered to coleopterists.

*—Contribution from the Department of Zoology and Entomology, Iowa State College, Ames, Iowa.

Dealing with a genus comprising, in North America, but three recognized species, it seemed reasonable to suppose that, when these three had been definitely placed, such new species as might be found would be easily defined. This view was indeed supported at first by the study of a limited amount of material, but as each fresh consignment came in, difficulty after difficulty arose until I reluctantly concluded that the genus consists of species extraordinarily variable within themselves, often very similar to others, and in most cases determinable with certainty only from comparison of the male genitalia.

Take for instance the species hereinafter described as *simi*. No one seeing extremes of this series could for one second associate them. There is a male 7.49 mm. long and 4.83 mm. wide, with a long horn, profound thoracic foveae and large elevations. There is a male 5.18 mm. long and 3.29 mm. wide, absolutely hornless and with thoracic sculpture as in the female.

Darlingtoni sp. nov. shows even greater extremes from 8.19 mm. x 5.32 mm. to 5.25 mm. x 3.36 mm. and the specimens compared both of *simi* and *darlingtoni* were taken at the same place approximately at the same time.

These "minor" males at their lowest development vary away from even the females in sculpture; the puncturation often becoming much finer, shallower and sparser throughout.

In the paper following, size of type only is given and this is almost certainly—except in the case of *floridensis* sp. nov.—not far from the maximum for the species concerned.

Variations in structural characters common to the sexes; shape and puncturation of clypeus, shape of pronotum, striae of the elytra and their punctures, even the relative lengths of the tarsal joints, are easy to note, but so far I have been unable to correlate these with each other, or with genitalic characters so as to define species within the *liebecki*, *darlingtoni*, etc. complexes.

Especially in the *liebecki* complex, variations may be found in the shape of the middle lobe of the male genitalia. These, however, are so slight and so difficult to correlate with other characters that it has seemed to me safest to disregard them or to assume that they are the result of damage caused by pressure in extraction, or of distortion in drying.

While it is quite possible that later studies, especially of the larvae, pupae and habits of these insects, may show that some of the species listed below are composite, I feel confident that these as given are really distinct. In designating holotypes, therefore, I have preferred to use relatively extreme specimens rather than the mean so that should division become necessary later it will be so much the easier.

The genus *Odontaeus* was first described by Klug in 1843 (Abhandl. d. k. Akad. d. Wiss. z. Berlin pp. 21-57) and in consequence is usually credited to him. Megerle used the name in manuscript long before this and it first appeared in the Dejean Catalogue, Edition 2, 1821, where it was attributed to Megerle. Since Megerle's use of the name was clearly only in manuscript while Dejean listed species under it, the authorship of the genus must be credited to the latter. Apparently no type has been designated for *Odontaeus* but as the literature to make this entirely certain is not available, the matter is left as it is.

In 1823 Say described *Geotrupes filicornis* saying that it belonged to the genus *Odontaeus*. F. E. Melsheimer in 1845 described *Bolbocerus (Scarabaeus) cornigerus*, and in 1859 Dr. J. L. LeConte described *obesus*. The three species were brought together and to some extent compared by Horn in Transactions of the American Entomological Society, Vol. III.

Professor H. F. Wickham (Can. Ent. Vol. XXVI, p. 206) gives *cornigerus* Melsh. and *filicornis* Say, as being representatives of *Odontaeus* in Old Canada. The characters used to separate them are, however, entirely unreliable and it is not possible to say to what species the specimens belonged.

Professor W. S. Blatchley listed and redescribed two Indiana species as *filicornis* and *cornigerus* in his fine work, "The Coleoptera of Indiana."

After a mere glance at a few specimens it was quite obvious that no certainty existed as to the identity of *filicornis* and *cornigerus*. Specimens identified by Dr. Horn himself were clearly incorrectly named, if his own work, cited above, was used. The first thing to do then was to establish the identity of *cornigerus* and of *filicornis*.

Situated as I am hundreds of miles from either a good entomological library or a reference collection this could not have been done but for the generous assistance of entomological friends more fortunately situated. Dr. H. C. Fall and Mr. P. J. Darlington Jr. looked through the collections at Cambridge and found Melsheimer's type of *cornigerus*. Unfortunately, the abdomen of the specimen had disappeared but Mr. Darlington selected a male taken at Highlands, N. C., from the Blanchard collection and both he and Dr. Fall pronounce it to be identical with Melsheimer's specimen. This male is now labelled "Homo-type."

It was more difficult to decide upon *filicornis*, Say. Say's specimens were destroyed long ago and his description would fit several species. Dr. Fall suggested that an examination of the Harris collection be made and this Mr. Darlington very kindly undertook. He wrote to me concerning this as follows:

"There are four specimens under "*Odontaeus*" in the Harris collection; none has been to Say, but all are labelled, or numbered, *filicornis*. Only one is a male, taken Cambridge, (Mass.), July 15th, 1835, according to his notebook. The horn is fixed " (P. J. D. in litt. January 14th, 1926).

In spite of Dr. Horn's statement (Transactions of the American Entomological Society, Volume III) that the horn in *filicornis* is movable, there is nothing in Say's description—quoted later—to this effect. It was conceivable therefore, that Harris might have called his specimen with fixed horn *filicornis* on Say's authority. I finally rejected the possibility of this being *filicornis* on the grounds that its recorded locality was so far away from Say's type locality and that I had nothing from the type region comparable with the Harris specimen, whereas I had a fair series from Medora, Kansas, a locality about directly intermediate between the two localities mentioned by Say, which fitted the description equally well. This species has a movable horn, thus agreeing with Horn's statement, a statement quite likely founded on tradition. The best course, therefore, to me appeared to be the citation of this Kansas species as *filicornis*, Say, and a specimen has been designated as "Neoholotype."

Obesus presented no difficulty. It is the only species of the genus known from the type locality and appears to be fairly common.

But little is known of the life history of these secretive insects. So far as I have been able to ascertain the egg has never been noted, nor has anything as yet been published dealing with the larva or pupa.

Most specimens taken by the ordinary collector appear to be captured at light and this accounts for their apparent rarity for assuredly they are really at least relatively common. From observations of our local species, they do not readily fly to light but when attracted fly *around* it and fall to the ground some feet away, when they are usually difficult to discover.

Mr. R. J. Sim, by far the most successful hunter of these beetles, digs his material out and has made the following observations on his three local species.

"I get the *Odontaeus*, *Eucanthus lazarus*, and *B. farctum*—all rather plentifully from our golf courses; *B. tumefactum* occasionally. All four along one or two old roads—where they burrow into the sides of deep wheel-ruts. *Odontaeus*; a few digging in wood-paths.

"They all work about alike; make a vertical burrow from two to fifteen inches deep, pushing to the surface a pile of sand "sausages," the diameter of the hole. The deeper the hole the bigger the pile—sometimes two or three inches in diameter. *Odontaeus* seems more inclined to branch off laterally and sometimes a pair or three or four are found in the ground under a single 'push-up.' Have occasionally found a *Bolbocerosoma*, a *Eucanthus* and an *Odontaeus* in the ground beneath a single entrance.

"In one yellow-sand road through the edge of the Pine Barrens I saw two little 'push-ups' an inch or so apart. From the ground underneath, in less than a square foot, eight or ten *Odontaeus* were taken.

"Have never seen one in flight or above ground, and have had no luck in finding eggs, larvae or pupae." (R. J. Sim, in litt. IX. 27. 26.).

"Those marked 'Rancocas' are from burrows from the sides of an old sand road in rather open country.

"The ones from 'Rancocas Park' are from the pretty deep shade of old Scrub Pines in a small 'Pine Barren Island' a few miles outside the big, continuous Pine Barrens proper. The ground is an inch or so deep with pine needle humus, but beneath this is pure yellow sand. These fellows have continued work all winter, pushing up fresh sand on each warm day. The female taken yesterday (12.V.27) looks a bit pale and new, but she was in an old burrow that has been kept open for several months!

"Most of those marked Riverton, Merchantville and Pine Valley are from greens and fairways of golf courses right out in the open. No evidences of digging have been seen in the courses in late fall, winter or spring." (R. J. Sim in litt., IV.13.27).

"First let me say that in the mind of your digging *Odontaeus* the prime *intention* is for a vertical burrow. A perfectly vertical burrow. In the pure sand region of Rancocas Park it is usually possible for the beetle to carry out this intention though occasionally a pine root deflects the direction somewhat. In this place the ground is thus: first (on the surface) a carpet of recent red-brown pine needles, then maybe an inch of black humus; below that, from three to ten

inches of firmly packed grayish-white sand; from that on indefinitely a peculiarly loose bright yellow sand. The beetles go down into this yellow sand, with the result that the outside or visible parts of a push-up are quite conspicuous. The beetles seem to work in pairs and when the burrow is a foot or more deep they carry down a mass of the black humus and form a firmly packed elongated mass of it. So far as I have been able to make out, this is simple—not two or three branched as in *Strategus septentrionis* Csy. In this I think the female lays an egg or perhaps more—though I've never found any. In the golf courses there is (Riverton and Merchantville) more clay in the soil and deeper humus, but the beetles' actions are apparently the same.

Now in the *liebecki* localities the soil is pretty purely clay with numerous pebbles and rock fragments. In the ground of Arney Mountain the rocks are fewer or absent, but on the hills at Langhorne, Pa. and the Jenny Jump Mountains in North Jersey the stones are so numerous that a burrow may be very irregular in its downward course. Too, the clay is more firm and difficult to dig though. So as I recall them the beetles were found from one inch to six or eight inches down.

At Arney Mountain the beetles have been discovered working in and near an old road some distance from the top of the hill.

At Langhorne they were found among large maples, oaks, etc. on a slope below the top and also among spindling maples and red cedars on a flat area of the top of one hill and along an old road through deciduous forest on the neighboring hill.

At Jenny Jump the burrows were through a dead leaf carpet on a slope (covered with mostly young deciduous trees) not far below top and in an old road through deciduous wood near top of another hill."

Mr. Sim's observations seem to indicate considerable difference in habits; the species from Rancocas Park being adult and active much of the year with probably a period of at least partial disappearance during early or mid-summer; the species from Merchantville appearing only during the summer. As was to be expected this difference in choice of habitat correlated with the difference in period of adult activity, indicated difference in species and the specimens from the shade of the Scrub Pines in Rancocas Park proved to be almost all the species described later herein as "*darlingtoni*" while those coming from Merchantville, Riverton and Pine Valley were the new species "*simi*."

Our local species, described later as "*falli*," inhabits—as one would expect from its black color—somewhat richer land than those taken by Mr. Sim. Mr. Criddle finds them near his home at Aweme, Manitoba, along a road through the aspen poplars, where the soil is a rich, dark sandy loam. They appear never to occur on the more sandy uplands a few yards away or on the bare sand which, too, is quite close.

I have taken "*falli*" from burrows on rather dry ridges of dark sandy clay near Russell, Manitoba and from an old road in a rather damp situation with soil of the same dark sandy clay near Foxwarren, Manitoba. These burrows seem never to be more than a few inches deep.

Falli occasionally comes to light at Winnipeg, or rather flies around light, rarely if ever coming directly to it, but circling it and falling to the ground some

feet away. On one occasion when sugaring for moths in a rich wood, I noticed a small area of the leaf humus undulating in a most vigorous and extraordinary manner. On rolling the piece of mould off like a blanket, a seething mass of *Odontaeus* was found beneath, rolling, crawling, clinging. About seventy specimens were taken in a space not more than eight inches square. They varied much in maturity some being soft and pale, others hard and black, and appeared to have gathered for mating purposes, as many of the males had the genitalia partly exposed.

Professor W. S. Blatchley speaks of *cornigerus* Melsh. as being taken under logs and other cover, and of *filicornis* Say as being found under logs, ("Coleoptera of Indiana"—page 938) while the types of "*liebecki*" were taken by Mr. K. F. Chamberlain at Cornwall Bridge, Connecticut, under "wash-up."

It seems probable that careful search in the early morning for the tell-tale "push-ups"—along sandy or clayey roads, amidst sparse vegetation, in fact almost anywhere where the "push-ups" would be visible—would result in the discovery that most if not all of the species of these interesting and secretive beetles are really rather common.

There seems to be no way of distinguishing with certainty between the sexes except by extraction of the genitalia. In some species the clypeus in the female is usually longer from front to back, less rounded and hence more subangulate at side, than in the male, but this does not hold in all cases even within a species.

The colour may be either black or brown in mature specimens. It should be noted, however, that individuals of the black species may be found of varying shades of yellow or brown depending on their state of maturity.

Frequently, females may be distinguished from hornless and unsculptured males by the fact that in the female the space between the eyes where the horn arises in the male is slightly elevated and bi-tuberculate, slightly elevated but not bi-tuberculate in the hornless males.

The most useful characters for the separation of species are: colour; the angles and situation at apex and base of thorax; shape of sides of thorax; the movability or immovability of the horn; the length and puncturation of the eleventh stria; and, most important, the male genitalia.

The pronotal apical angles may be acute, right or obtuse, the basal may be obtuse or about right, either broadly or rather narrowly rounded. The situation at base of pronotum near the hind angles may be rather sudden and close to the hind angles, or much more gradual and farther away.

The horns may be either apparently fixed or apparently movable. I use the word "apparently" because in some cases only an examination of the insect in life or before drying would show beyond doubt the true character of the horn. In this paper, however, the term "fixed" is used to indicate those cases in which the horn slopes broadly and insensibly laterally and anteriorly into the head; is not excavated at base in front but slopes forward some distance to the suture; and has no deep depression behind. (See Figure 1.)

In those cases in which the horn is said to be "movable," it enters the head much more perpendicularly laterally; is separated laterally and posteriorly from the ordinary substance of the head by an area in which the texture is apparently

less solid, though there is usually a narrow projection formed of the harder material from the anterior basal corners of the horn, joining it to the hard surface of the head; is excavated at base anteriorly as if to permit of a forward movement; and when the horn is pointing backwards there is a depression behind its base which frequently extends laterally of the horn and forms the area of different texture mentioned above. (See Figure 2.).

The species with fixed horns are: *obesus* Lec.; *falli* sp. nov.; *cornigerus* Melsh.; and *liebecki* sp. nov. Those with movable horns are: *mobilicornis* Fab. (European); *thoracicornis* sp. nov.; *filicornis* Say; *simi* sp. nov.; *darlingtoni* sp. nov.; and probably *floridensis* sp. nov.

The male genitalia consist of the usual two lateral and a medial lobe. The lateral lobes show some differences but are so soft and therefore tend so much to distort in drying that I have not attempted to use them. The medial lobe is strongly chitinized and holds its shape better. It is, however, hollow, split for at least part of its length, and filled with a substance that occasionally protrudes, in this way sometimes altering the true outline.

The medial lobe is always strongly curved and "hook" shape, the short or "point" end of the hook being its base.

In order to see the middle lobe clearly it is advisable, after extraction of the genitalia, to slice off with a scalpel one or other of the lateral lobes and glue the part with the medial lobe on a point in such a way that it is turned as nearly as possible 90° from its true position.

The material examined, even though specimens from the district, excepting Kansas, between the Mississippi and the Rocky Mountains, and from the more southerly half of the States east of the Mississippi and west of the Appalachians were largely lacking, is without doubt by far the most extensive ever gathered together. For this state of affairs it is a pleasure to acknowledge the courtesy and generosity with which loans of material were made.

The great Museums which loaned material were:—The U. S. National Museum, through Messrs. P. de B. Ravenel and Fisher; the Canadian National Museum, through Mr. Arthur Gibson, Dominion Entomologist; the American Museum of Natural History through Mr. Andrew Mutchler; the Brooklyn Museum, through Mr. Schaeffer; the Academy of Natural Sciences, Philadelphia, through the kindness of the late Dr. Henry Skinner; the Museum of Comparative Zoology, through Dr. Nathan Banks, and Cornell University through Mr. Frank C. Fletcher.

Nor were private individuals less kind, and the following gentlemen lent me their entire series in the genus:—Messrs. H. C. Fall, of Tyngsboro, Mass.; C. A. Frost of Framingham, Mass.; Chas. Liebeck, Philadelphia; H. F. Wickham, Iowa City; Howard Notman, New York City, Warren Knaus, McPherson, Kansas; F. S. Carr, Medicine Hat, Alta.; W. J. Brown, now of the Dominion Entomological Staff; R. W. Dawson, University of Minnesota, C. Mickle of the University of Minnesota; Normal Criddle, Treesbank, Man.; R. M. Sim, Moorestown, N. J.; Ralph Hopping of the Canadian Entomological Service; Chas. Dury, Cincinnati; the late K. F. Auden, Vancouver, B. C.; K. F. Chamberlain, Cornwall, Conn. To all of these and to others whose help was different only in degree, I extend my sincere thanks.

In addition to thanks for loan of material, I wish to record my indebtedness in especial to Mr. Norman Criddle, for making notes and copying descriptions from sources not available to me; to Mr. W. J. Brown for notes on the authorities for the genus, to Mr. P. J. Darlington for drawings and exhaustive comparative notes on the type and homotype of *cornigerus*, and for an examination of the Harris material; to Dr. H. C. Fall for a critical examination of *cornigerus* type and copious notes on many points; and to Mr. Chas. Liebeck, who has taken a most kindly and enthusiastic interest in my study. In touch as he was with the great Dr. Horn, he has been able to interpret the point of view of the older entomologists. In addition, he delved into old literature, sending me notes of the greatest value and interest, made a close study and reported on the material in the Horn collection; assisted me in securing material from others; and was never too busy to give me a word of encouragement or advice. Mr. R. J. Sim, as will have been evident from the preceding pages, has been most enthusiastic in giving me assistance. Not only has he sent me specimens of the species, *simi*, *darlingtoni*, and *liebecki*, to the number of several hundred, but he has made many interesting notes on the behaviour of these beetles.

KEY TO THE SPECIES OF ODONTAEUS

1. Elytra in both sexes rather densely and very finely punctulate . . . *obesus* Lec.
Elytra in neither sex densely punctulate 2.
2. (a) Colour black, sometimes slightly metallic or pitchy, when mature. (Immature specimens varying from pale testaceous to brownish piceous, are frequently taken, especially by digging.) Margins of elytra subexplanate, wide for the genus. Horn of male fixed. (See Fig. 1). Lateral thoracic elevations compressed longitudinally *falli* sp. nov.
- (b) Colour black. Margins of elytra narrower. Horn of male movable. (See Fig. 2). Lateral thoracic elevations stout reflexed horns. (European) *mobilicornis* Fab.
- Colour never black. Margins of elytra narrower 3.
3. Middle lobe of male genitalia linear, very much longer—twelve or more times—than wide at middle of length. (See Fig. 5). Fully armed males with thoracic horns *thoracicornis* sp. nov.
- Middle lobe of male genitalia linear and evenly "hook" shaped but not more than about ten times as long as wide at middle of length. (See Figs. 6, 7 & 8) 4a, 4b, 4c.
4. a. Front margin of clypeus much emarginate, almost bilobed, the raised edge continued caudad to form a strongly elevated carina. (See Fig. 12) *floridensis* sp. nov.
- Front margin of clypeus as usual in the genus 4b, 4c.
- b. Sinuation of apex of thorax within the anterior angles rather abrupt, making these angles somewhat acute. Width of thorax at apex very nearly the greatest width of head, the apical angles almost meeting the free margin of the head at its termination at the eye. (See Fig. 13a, 13b). Basal angle obtuse and sinuation of base within rather feeble. (See Fig. 15.) Hind tarsal claw and last joint longer than in *simi*. (See Figs. 17a, 17b, 18a 18b) *filicornis* Say.
- c. Sinuation of apex of thorax within the anterior angles less abrupt mak-

- ing these angles right. Width of thorax at apex a little more than the greatest width of head, the apical angles not almost meeting the free margin of the head at its termination at the eye. (See Figs. 14a, 14b). Basal angles about right and sinuation at base within pronounced. (See Fig. 16). Hind tarsal claw and last joint-shorter than in *filicornis*. (See Figs. 17a, 17b, 18a, 18b) *simi* sp. nov.
- Middle lobe of male genitalia not as in 4 5.
5. Middle lobe of male genitalia compressed in the vertical plane, about ten times as long as wide at middle of length, distinctly curved upwards at tip, sigmoid. (See Fig. 9) *cornigerus* Melsh.
- Middle lobe of male genitalia not as above 6.
6. Middle lobe of male genitalia compressed in the vertical plane, not, or very little, curved upwards at tip. Short for the genus, not more than six times as long as wide at middle. (See Fig. 10) *liebecki* sp. nov.
- Middle lobe of male genitalia not as above 7.
7. Middle lobe of male genitalia very abruptly bent at base so that space in the "Hook" is very narrow. (See Fig. 11) *darlingtoni* sp. nov.

SPECIES OF ODONTAEUS, DEJ.

Odontaeus obesus Lec.

Odontaeus obesus Lec., Proceedings of the Academy of Natural Sciences, Philadelphia, p. 282-283, - 1859 - Vol. XI.

Odontaeus obesus Lec. (Horn, Transactions American Entomological Society, Vol. III.).

(Original description).

"Rotundato-ovatus, valde convexus, piceo-niger, nitidus, thorace basi rotundata versi angulos, vix sinuata, angulis postices rectis, elytris striis fortiter crenatis, antennis piceis. Long 45.

Femina capite dense rugose punctato, tuberculo paras frontali, plicaque verticali signato; thorace punctato, tuberculis duobus anticis plicaque transversa munito, Mas latet."

Table Mountain below San Francisco: Mr. Davidson.

"Very much larger than any of the other species of the Genus. The male is one of the finest entomological prizes which will reward the collector in Western America. Differs from our other two species by the colour and by the base of the thorax being less sinuate, whereby the posterior angles become more rectangular."

Dr. Horn, in the paper cited above, points out that the lateral thoracic elevations are acute, and that the horn is fixed.

There is a considerable range of variation shown in the long series examined, but I am unable to define geographical races though specimens from the more northern part of its range usually have the lateral thoracic elevations less prominent. Shape is more variable in this than in the other species, the strongly developed males being usually broader than is the case in the males lacking in the secondary sexual characters.

This species, so far as is now known, can always be told from the other species of the genus by its minutely and quite densely punctulate elytra. The medial lobe of the genitalia is of the linear type. (See Fig. 3.).

The type is in the museum of Comparative Zoology at Cambridge, Mass.

Obesus has a range extending from British Columbia to New Mexico. Apparently it occurs most frequently nearer the Coast, but has turned up most unexpectedly in Utah, and at Buena Vista, Colorado, this latter locality being on the eastern slope of the divide.

Material Examined: 120 specimens.

Localities: British Columbia, California, Oregon, Washington, Idaho, Utah, New Mexico, Colorado. The largest number of specimens, fifty-nine, is from British Columbia. California is well represented by twenty-nine, but Utah and Colorado have but three, New Mexico (Mescalera Res.) two, and Idaho (Coeur d'Alene, June H. F. Wickham) but one.

(To be continued)

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REVISION OF THE GENUS ODONTAEUS, DEJ.
(SCARABAEIDAE, COLEOPTERA).

BY J. B. WALLIS,

Winnipeg, Man.

(Continued from page 128).

Odontaeus falli sp. nov.

Holotype: Shape and Size: Broadly oval, elytra somewhat inflated so that the maximum width is in front of middle. Length: 9.59 mm.; width: 6.3 mm.

Color: Black above, piceous brown below, the posterior tibiae and femora darker; antennae brown, the basal joint of club dark. Shining.

Clypeus: Evenly rounded, acutely margined, densely rugose with moderate punctures in the wrinkles, longitudinally tuberculate at middle but not carinate. Horn fixed, rather coarsely punctate at base, finely and moderately closely punctate on front face.

Thorax: Anterior angle slightly less than right, roundly blunt, apex rather deeply sinuate. Sides obliquely divergent from apex for about half length, thence about parallel to basal angles. Basal angles a trifle more than right, rounded, base of thorax only moderately sinuate. Punctate, as usual, coarsely in anterior half—except on medial elevation—and in the depressions, with scattered coarse punctures elsewhere, these sometimes in groups, the whole surface finely and rather evenly punctulate. Medial elevation wide, feebly grooved, the tubercles just behind middle. Lateral foveae round, moderately deep, bounded externally by an acute ridge nearly plane at top but rounding both apically and basally.

Elytra: Striae deep, especially the discal; moderately and rather closely punctured, the punctures mostly separated by less than or about their own diameters. Eleventh stria well developed and punctured much as the others. Fourteenth but little curved away from margin towards base. Intervals more convex than usual in the group, with sparse scattered punctules and a secondary system, visible only under high power, of more plentiful though still sparse very minute punctules. Margin rather wide for group, almost sub-explanate.

Genitalia: Outer lobes pale, darker below. Medial lobe dark brown, linear, regularly curved. (See Fig. 4.).

Allotype: *Shape and Size*: As in holotype but a little less broad. Length 9.52 mm. Width 5.88 mm.

Colour: As in holotype, except that appendages and under side are darker, club of antenna concolorous, dark.

Clypeus: Less evenly rounded, almost sub-truncate in front, otherwise much as in holotype.

Thorax: Outline much as in holotype but narrower. The surface somewhat dulled. Three tubercles, the middle one, transverse, at about apical third, the outer rounded at about apical fourth, in a transverse row; a slight depression behind medial tubercle and a swelling at middle of basal third. Surface coarsely, irregularly and rather densely punctured except on tubercles and on post-medial elevation a fine secondary system of minute punctules visible throughout.

Elytra: As in holotype.

Holotype: Foxwarren, Manitoba. 14.VII.27.

Allotype: Winnipeg, Manitoba. 1. VII.11. Both taken by myself and in my collection.

Specimens examined: 100.

Localities: Saskatchewan, Manitoba, South Dakota, Minnesota, Michigan, Wisconsin, Ontario, Quebec.

As the above indicates *falli* is a widespread northern species with a known range extending from Regina, Saskatchewan, to Quinze Lake, Quebec and south to South Dakota and Wisconsin.

It is a species to be looked for in moderately heavy, dark soil and probably ranges in suitable situations well towards the Rocky Mountains. The few specimens from the U. S. were taken at Volga, S.D., Taylor's Falls, Minn., Marquette and Hrn. Mt. Club, Michigan. The Wisconsin specimen has no other locality. It appears to be rather common near Ottawa, Canada.

Falli is quite closely related to *obesus* Lec. It is, however, smaller, with wider elytral margins and lacks the dense minute elytral sculpture characteristic of *obesus*. These two are our only black species. Immature specimens of each species of varying shades of testaceous may be found. The punctulate elytra of *obesus*, the wide elytral margins of *falli* and the genitalia of each, will readily separate such immature specimens from the normally reddish-brown species.

***Odontaeus mobilicornis* Fab.**

This European species is mentioned merely to complete the survey of the genus.

The colour when mature is black as in the two preceding species, and it further resembles them in the strongly striate elytra with well punctured striae.

The thoracic sides appear normally somewhat sinuate before the hind angles which are therefore more than usually pronounced though bluntly rounded, and the thoracic apex is narrower than in our species.

The horn, however, is movable, more evidently so than in any of our species and the thoracic horns when present are much as in our *thoracicornis* hereinafter described. The genitalia, on the other hand, are more of the *filicornis* type. (See Figs. 6, 7 and 8.)

***Odontaeus thoracicornis* sp. nov.**

Odontaeus cornigerus, Blatchley, nec. Melsh. (Coleoptera of Indiana, p. 938.).

Holotype: Shape and Size: Moderately broadly oval. Length: 7.84 mm. Width 5.60 mm. (The head and thorax are much depressed in mounting so that the specimen appears shorter than in its natural position. It is probably really from .75 mm. to 1.00 mm. longer than is given above.)

Colour: Dark brown, the under side, femora and antennae a little lighter. Shining.

Clypeus: Sub-truncate in front, oblique at sides, the front angles broadly rounded, margin poorly defined probably owing to wear, coarsely rugose and punctured, a low medial carina reaching about midway to horn. Horn movable, slightly widening and distinctly flattening apically; finely, evenly and sparsely punctate on front face.

Thorax: Anterior angles slightly less than right, somewhat sharp, apex rather deeply sinuate, sides feebly curved to middle, thence still more feebly curved to hind angles which are nearly right, though bluntly rounded, and prominent; base of thorax quite strongly sinuate; coarsely punctate in the depressions, the usual fine punctules throughout. Medial elevation wide, grooved, open in front, its sides terminating in two tubercles at about middle of thorax. Two subapical shallow depressions separated by a swelling, two larger and deeper post-medial depressions in front of each of which is a stout, reflexed horn pointing obliquely backward towards the scutellum.

Elytra: Striae deep, less so laterally. Strial punctures moderately coarse, deep and close, with a tendency to be closer on the alternate striae. Eleventh stria well developed, strongly and closely punctured. Intervals, especially on disk, convex. Secondary system of fine punctules not observable.

Genitalia: Outer lobes pale brown, medial lobe darker especially basally. Linear, regularly curved as in *obesus* and *falli* but not so long. (See Fig. 5.).

Allotype: Shape and Size: Moderately broadly oval. Length: 8.80 mm. Width: 5.60 mm.

Colour: As in holotype but more nearly concolorous.

Clypeus: As in holotype but a little longer (from front to back) and with the carina a little longer.

Thorax: Outline as in holotype except that there is a faint sinuation at about basal fourth of side. The usual transverse row of three tubercles at a little more than apical third, the middle one transversely longitudinal, the exterior rounded and narrowly separated from the medial.

The whole surface except basally and on the medial elevation coarsely punctured, the usual fine punctules throughout.

Elytra: As in holotype except that the strial punctures are more widely separated and that sparse punctules are visible.

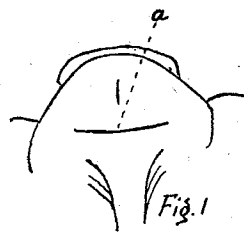


Fig. 1

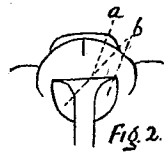


Fig. 2

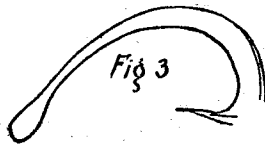


Fig. 3

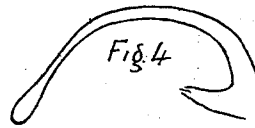


Fig. 4

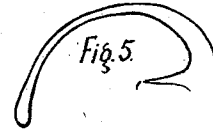


Fig. 5

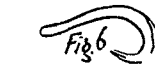


Fig. 6

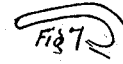


Fig. 7



Fig. 8



Fig. 9



Fig. 10



Fig. 11

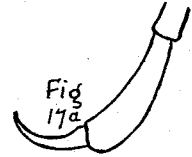


Fig. 17a

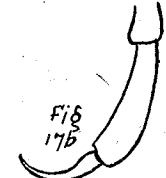


Fig. 17b

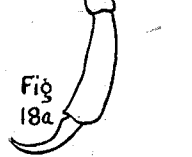


Fig. 18a

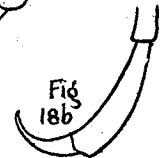


Fig. 18b

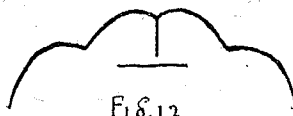


Fig. 12
Clypeal margin of
Ogleridensis spnax
Holotype

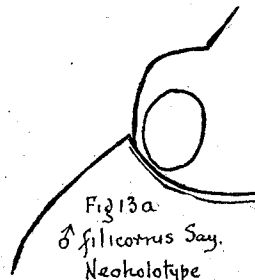


Fig. 13a
filicornis Say,
Neoholotype

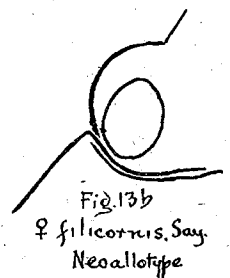


Fig. 13b
filicornis Say,
Neoholotype

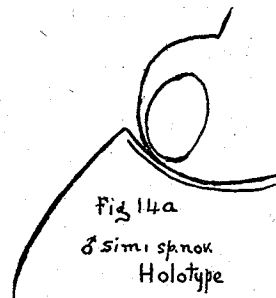


Fig. 14a
Simi spnax
Holotype

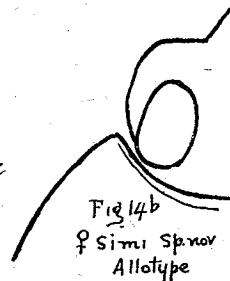


Fig. 14b
Simi spnax
Allotype

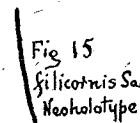


Fig. 15
filicornis Say
Neoholotype

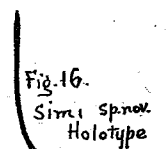


Fig. 16
Simi spnax
Holotype

Holotype and Allotype: Cincinnati, Ohio, Chas. Dury, who has kindly permitted me to retain them.

These two specimens were determined by Dr. Horn as *cornigerus*, and it appears to be the species recorded as *cornigerus* by Dr. W. S. Blatchley on page 938, "Coleoptera of Indiana," although that author speaks of the horn as being fixed. As already pointed out none of our species has its horn as obviously movable as the European *mobilicornis* Fab., and there is room for a difference of opinion as to just where the line between the fixed and the movable horn species should be drawn. Certainly, however, *thoracicornis* is much nearer the *filicornis* type in this respect than it is to such obviously fixed forms as appear in *cornigerus* as defined in this paper, *obesus* and *falli*.

Specimens examined: 25.

Localities: Pennsylvania, Iowa, Illinois, Indiana (?), Missouri, Kentucky, Tennessee, Ohio, Oklahoma, Kansas, Texas.

The above, if correct, indicates a rather remarkable distribution and it is possible that larger series from different States will permit the describing of other species within this complex. In fact, early in the preparation of this paper I described in manuscript a single male specimen from Baton Rouge, Louisiana, 3.IX.1897., which differs strikingly from typical *thoracicornis*. As more material came to hand, however, it seemed advisable to consider this specimen for the present as an unarmed *thoracicornis*, the male genitalia being practically identical.

***Odontaeus floridensis* sp. nov.**

Holotype: *Shape and Size*: Oblong-oval. Small for the genus. Length: 6.02 mm. Width: 3.64 mm.

Colour: Dark red-brown above, abdomen and antennal club pale yellowish brown, remainder of under surface, and femora a little lighter than upper side, tibiae and tarsi scarcely so. Shining.

Clypeus: Rounded at sides, distinctly emarginate at middle, the strongly elevated margin meeting in the middle at a very obvious angle, giving the clypeus almost the appearance of being bilobed. Surface with large punctures rather more widely spaced than usual in the genus, and with a few scattered small ones, the whole with a feeble tendency to rugosity. Medial carina strongly elevated especially anteriorly where it continues the anterior margin backwards; about two-thirds depth of clypeus. Horn represented only by a swelling very feeble tuberculate each side.

Thorax: Anterior angles acute, feebly blunt, apex rather deeply emarginate and feebly bi-sinuate, the sinuation within the angles moderate. Sides nearly evenly rounding from apex to base, the point of maximum width a little behind middle. Posterior angles obtuse, broadly rounded, the sinuation at base slight. Secondary sexual characters wanting. Transverse ridge well forward nearly at apical fourth, feeble though broad, the usual tubercles rather widely separated, large and very feebly elevated. Medial groove wide and very shallow though suddenly considerably depressed on middle line. Punctures large and moderately sparse, in the usual positions, with an evident secondary system of minute scattered punctules.

Elytra: Striae scarcely impressed except the sutural which is particularly deep, almost grooved, as it approaches the scutellum. Strial punctures large, rather deep and widely separated, usually by at least two, frequently by three or more times their own diameters, a little smaller apically. Intervals scarcely convex. Minute punctules extremely sparse and fine, eleventh stria represented only by a few irregularly spaced punctures, fourteenth stria marginal apically, but leaving margin widely and becoming almost coalescent with thirteenth basally.

Genitalia: Outer lobes pale yellow. Medial lobe pale brownish yellow, a little darker within the "hook," moderately long and linear, almost evenly rounded though feebly sinuate above near tip. (See Fig. 6.).

Allotype: *Shape and Size*: As in Holotype. Length: 6.09 mm. Width: 3.62 mm.

Colour: As in Holotype.

Clypeus: Deeper from front to back than in holotype, the finer punctules and rugosities somewhat more evident, swelling on head a little less with the tubercles a little more evident. The emargination of the front edge and the medial carina even more evident than in the holotype.

Thorax: Almost exactly as in holotype but the transverse ridge and tubercle are a trifle less apical.

Elytra: Very nearly as in holotype, but the sutural striae not quite so deep, the groove continued further apically. Eleventh stria almost completely obsolete.

Holotype: Lake Worth, Fla., Coll. of Mrs. A. T. Slosson (In American Museum of Natural History).

Allotype: Tampa, Fla., Coll. Hubbard and Schwarz (No. 40871 in United States Natural Museum).

The Holotype and Allotype are almost identical, the most important observable difference being in the greater length of the clypeus and the slighter grooving of the sutural stria in the female.

The Holotype was under the name *cornigerus* Melsh. The Allotype is quite probably a specimen recorded as *filicornis* Say from Tampa, Florida, by Dr. Schwarz in his MSS. notes. Dr. Schwarz recorded *filicornis* from Enterprise, and Prof. W. S. Blatchley, (Can. Ent. LII, 263, 1920) from Dunedin, Florida. It may be that these specimens belong here.

I have before me a much larger female, length 7.35 mm., width 4.90 mm., from Kissimmee, Fla., which I tentatively assign here. It has the elytral strial punctures smaller and the thirteenth and fourteenth striae distinct.

Horned specimens are almost certain to occur and if so, judging from the shape of the male genitalia, the horns will probably be movable.

(To be continued)

Excerpts from Canadian Entomologist, July, 1928

REVISION OF THE GENUS ODONTAEUS, DEJ.
(SCARABAEIDAE, COLEOPTERA).

BY J. B. WALLIS,
Winnipeg, Man.

(Continued from page 156)

Odontaeus filicornis Say.

Jour. Acad. Nat. Sci., Philadelphia, Vol. 3, 1823.

Original Description.

"*Geotrupes filicornis*. Rufous; thorax tridentate; clypeus with an elongate horn. Inhabits Upper Missouri.

Body pale brownish-rufous; clypeus, anterior and lateral margins punctured, entire; horn elongated, linear, slightly curved and compressed, longer than the greatest width of the head; thorax unequal; three tubercles, placed in a transverse series, the exterior ones compressed and longitudinal, intermediate transverse submarginate; an indented line behind the middle tubercle, and a concavity each side; scutell triangular; elytra with punctured striae. Length one fourth of an inch.

I obtained it near the Council Bluff on the Missouri. Mr. T. Nuttall obtained specimens on the Arkansas. Belongs to the Genus *Odontaeus* Megerle."

It is impossible from the above description to know what species Say had before him, but the description of the exterior thoracic tubercles as being "compressed and longitudinal" seems at least to eliminate the species in which these "tubercles" are conical horns. It may be noted that Say does not mention the horn as being movable. This character is attributed to it by Dr. Horn—(Trans. Am. Ent. Soc. Vol. III) and, in addition, he raises the length of the insect to .34 inch. *Falli* is the only other species except *thoracicornis* which comes very

near the territory assigned to *filicornis* by Say, but *falli* is black when mature and the probability that Say would be so unfortunate as to take all immature specimens is extremely small. Further, the most southerly locality so far known for *falli* is Volga, S.D., considerably further north than Council Bluffs. Eliminating *falli* and *thoracicornis* the only species from Say's locality is one chiefly represented by material from Medora, Kansas, almost exactly midway between Say's stations. As a specimen of this species is known from Minnesota, and Say's description, even as to size fits the Kansas species it has been determined as *filicornis* Say and a specimen labelled as *neoholotype*.

As *filicornis* is very close in all respects to an eastern species next to be considered, a detailed description of the neoholotype is given.

Neoholotype: Shape and Size: Oblong-oval. Length: 7.14 mm. Width: 4.76 mm. *Colour:* Moderately dark red-brown above, below a little lighter, the legs approximately the same colour throughout. Antennal club the same colour as the front femora.

Clypeus: Rounded at sides, feebly emarginate at middle, the angle formed by the meeting of the two halves of the strong acute clypeal margin very obtuse. Surface not punctured but broken up into large, rather deep depressions by irregularly intersecting rugosities. Medial carina does not continue anterior margin backwards but is considerably lower than it at the anterior margin, much stronger and acute medially, three-quarters depth of clypeus.

Thorax: Anterior angles less than right—scarcely rounded. Apex rather abruptly and deeply sinuate within. Apical width very nearly the greatest width of head, the apical angles almost meeting the free margin of the head at its termination at the eye. Sides moderately rapidly diverging anteriorly, less rapidly converging from about middle of length to base. Basal angles obtuse, not widely rounded. Sinuation of base within the basal angles quite moderate. Punctured anteriorly, laterally and in the depressions rather closely with large, rather evenly placed, coarse shallow punctures in the exact centre of the bottom of most of which is a punctule. A sparse micro-punctulation visible throughout. Medial elevation moderately well forward, the tubercles at about apical five-eighths partly closed in front by an emarginate ridge joining the darker tubercles, wide, the groove rather deep and wide, convex longitudinally and laterally, somewhat densely but irregularly punctured. Lateral foveae deep, especially near lateral ridge, well separated from the base but in great part caudad of the medial tubercle. Lateral ridges strong, acute, rounded, highest at about middle of length, but sloping more gradually basally and running well forward of the medial tubercle.

Elytra: Striae feebly impressed, sutural a little more so basally. Strial punctures large, round, moderately deep, separated by from a little less to a little more than their own diameters, minute punctules rather evident, eleventh striae poorly developed, fourteenth but little curved, its basal punctures coalescent with the supernumerary punctures in the gutter.

Legs: The hind tarsal ultimate joint and its claws are respectively longer than those in the next species. (See Fig. 17a, 17b, 18a, 18b.).

Genitalia: Outer lobes pale yellow, medial lobe slightly more reddish, most distinctly so on inner side of hook at base; moderately long, and linear, evenly curved. (See Fig. 7.).

Neallotype: Shape and Size: Oblong-oval, a little narrower than the male. Length: 7.21 mm. Width: 4.62 mm.

Colour: As in Neoholotype.

Clypeus: As in Neoholotype except that as usual in the females the depth is somewhat greater, the anterior margin, probably owing to wear, less pronounced, with the medial carina consequently more nearly continuing the margin backward, still, however, somewhat lower; a number of scattered small punctules on the rugosities and in the interstices.

Thorax: Anterior angles acute, apex not quite so suddenly or deeply sinuate as in the Neoholotype. Sides almost straight anteriorly, divergent, more rounding posteriorly, the basal angles strongly obtuse and broadly rounded. Sinuation at base within the angles very feeble. Coarsely and irregularly punctured in the usual positions, with minute punctules at the bottom of most of large punctures, the minute punctules sparse but evident. Transverse tubercles far forward, at about apical two-sevenths, medial rather long, low, acute each side of middle, feebly grooved behind this acute part. Medial groove sub-triangular rather than convex in cross section, moderately deep, not attaining base.

Elytra: As in Neoholotype, except that the minute punctules are scarcely discernible.

Neoholotype and Neallotype: Medora, Kansas, 14.VII.23. Collected by Mr. Warren Knaus, and through his generosity in my collection.

Material examined: 15 specimens.

Localities: Kansas, Minnesota (Le Sueur Co., Fish Hatchery, At Light, R. W. Dawson, 15.VII.23), Louisiana (Winnfield, 2.V.18) ex collection H. C. Fall.

The Louisiana specimen is an unarmed male and I am not absolutely sure that it is this species, but it is nearer to it than to any other.

***Odontaeus simi* sp. nov.**

Odontaeus filicornis Blatchley nec. Say. (Coleoptera of Indiana, P. 938.)

Holotype: Shape and Size: Oblong-oval. Length: 7.49 mm. Width: 4.83 mm.

Colour: Dark yellowish brown above, antennae, femora and under side a little lighter, tibiae and tarsi about the colour of upper side.

Clypeus: Rounded at sides, feebly emarginate at middle, the angle formed by the meeting of the two halves of the clypeal margin very obtuse. Margin acute but scarcely as strong as in *filicornis*. Surface broken up into large moderately shallow depressions by irregularly intersecting rugosities; a few scattered fine punctules on rugosities. Medial carina more nearly continuous with the anterior margin as in *floridensis*, stronger throughout than in *filicornis*, rather markedly elevated at about middle of clypeus; not as long as in *filicornis*, about two-thirds clypeal depth. Horn movable, sparsely and finely punctate anteriorly and laterally.

Thorax: Anterior angles a little less than right, scarcely rounded. Apical width obviously a little more than greatest width of head, the apical angles well outside the free margin of the head at its termination at the eye. Apex less abruptly sinuate within than in *filicornis*. Sides moderately diverging anteriorly (though less so than in *filicornis*) less rapidly converging from about middle to base. Basal angles nearly right, moderately rounded. Sinuation of base within the basal angles more pronounced than in *filicornis*. Large punctures much as in *filicornis* but decidedly sparser—especially laterally—throughout.

Medial elevation moderately well forward, the tubercles at about apical five-eighths, deeply emarginate between them, tubercles a little more widely apart than in *filicornis*, groove wide and deep, extending further basally than in *filicornis*, sides of medial elevation much narrower and more acute than in *filicornis*, the punctures mostly crowded on the medial line. Lateral foveae deep, the greatest depth not so near the lateral ridges as in *filicornis*, moderately separated from base, and their anterior transverse bounding elevation less pronounced than in *filicornis*. Lateral ridges strong, thicker (transversely) than in *filicornis*, rounded, highest basally of the middle, sloping more steeply basally, and running well forward of the medial tubercle.

Elytra: Striae feebly impressed, a little more so basally. Strial punctures smaller than in *filicornis*, rounded, moderately deep, a little more widely spaced especially laterally than in *filicornis*. Minute punctules evident, eleventh stria fairly well developed, fourteenth moderately curved basally, its punctures smaller and shallower than in *filicornis*, the extra punctures in or near the gutter, fewer, smaller and more shallow.

Legs: Last joint and its claws of the hind tarsus are respectively a little shorter than those in *filicornis*. (See Figs. 17a, 17b, 18a, 18b.).

Genitalia: Outer lobes pale. Medial lobe a little darker especially basally in the "hook," nearly evenly curved though feebly sinuate above towards tip. A little longer than in *filicornis*. (See Fig. 8.).

Allotype: *Shape and Size*: Oblong-oval. Length 7.91 mm. Width: 4.90 mm. (The head is a little more exerted than usual, giving a somewhat greater length.).

Colour: As in holotype.

Clypeus: Depth from front to back as usual greater than in male but also proportionally deeper than in female *filicornis*. Anterior margin not very strong, acute. The shallow depressions among the rugosities larger than in female *filicornis* and with punctures. Medial carina longer, more pronounced throughout, more nearly continuing anterior margin caudad and more definitely elevated in the middle of clypeus than in female *filicornis*.

Thorax: Apex wider in proportion to head, basal angles less obtuse and less rounded, sinuation within the basal angles stronger, transverse ante-medial carina longer, stronger, more acute throughout, medial groove deeper and narrower with punctures more confined to medial line than in female *filicornis*.

Elytra: Striae and intervals much as in holotype, the punctures more widely spaced and the fourteenth stria a little more curved, and basally with less impressed, considerably smaller punctures than in female *filicornis*.

Legs: Claws of hind tarsi very evidently, last joint of hind tarsi a little shorter than in female *filicornis*.

Holotype: Merchantville, N. J. 27.VII.26.

Allotype: Merchantville, N. J., 2.VII.26.

Both collected by Mr. R. J. Sim, who has presented them to me and to whom as an acknowledgment of his great success in finding these elusive beetles, the species is dedicated.

Material examined: 146.

Localities: Indiana, New York, New Hampshire, Connecticut, Massachusetts, New Jersey, Michigan.

This species is very close to *filicornis* Say and I have therefore made the description more or less of a comparative one with that species.

Floridensis, *simi*, and *filicornis*, from the close similarity of the genitalia of the males, form a natural group.

Floridensis should be recognized from its richer red-brown colour, its small size, peculiar clypeus, more widely spaced striae punctures of elytra, and other characters as given. The middle lobe of the genitalia is proportionally longer than in either of its two closely allied species. (See Figs. 6, 7, 8.).

The descriptions of *simi* were purposely drawn from specimens as nearly like *filicornis* as were among the magnificent series sent by Mr. Sim. The direction of variation, therefore, is away from each other as described. Thus the anterior thoracic angles in *simi* vary towards right, while *filicornis* varies towards acute. Similarly, the basal thoracic angles in *simi* vary towards right, with the basal sinuation of thorax deeper and even a faint sinuation of the posterior half of the thoracic sides, while in *filicornis* the tendency is towards more obtuse basal angles, less deep sinuation within these angles and a greater rounding of the thoracic sides. The greater width of the thoracic apex in proportion to the head, the finer and more widely spaced punctures of the elytral striae and the shorter hind tarsal claws and claw joints in *simi* appear to give characters which suffice to distinguish the two species.

Odontaeus cornigerus Melsh.

Bolbocerus cornigerus Melsh. Proceedings of the Academy of Natural Sciences of Philadelphia, Vol. II, 1844 and 1845.

Red-brown; head armed with a long filiform horn; thorax greatly unequal; elytra crenate-striate—5L, long, 3L. wide. Pennsylvania ? (1 sp.).

Scarabaeus cornigerus Melsh. M.S. Reddish-brown; head blackish, scabrous; clypeus rounded, marginate, with a short longitudinal raised line at tip, base armed with a filiform smooth curved horn; thorax very unequal, strongly carinate in the middle, the carina grooved towards the base for the occasional reception of the apical portion of the horn; each side of the carina with a wide and profound concavity, having its outer elevated narrow edge abbreviate a little behind the anterior margin; lateral edges reflexed; posterior angles obtusely rounded— anterior ones sub-acute; lateral margins and concavities sparsely and profoundly punctured; scutel sub-cordate, concave at base; obsolete punctured; elytra crenate-striate, interstices convex, anterior tibiae quadri-dentate with the apical tooth widely crenate.

In Vol. III, Transactions American Entomological Society, in his resume of the Genus, Horn says of this species, "Similar in colour to the preceding (i.e. pale castaneous or ferruginous) but occasionally black. The horn is less slender than in *filicornis* and fixed. This species attains a somewhat larger size than the preceding and is usually more robust. Middle and Central States."

It appears certain that Dr. Horn was not familiar with the Melsheimer species. In the Academy of Natural Sciences at Philadelphia, eight specimens stood as *cornigerus* three of which were Dr. Horn's. The first of these three is a male of the species described hereinafter as *liebecki*. The second a female from New York probably *liebecki*. The third is a male with thoracic horns and

belongs to the species described above as *thoracicornis*. On the whole Dr. Horn seems to have considered the species with thoracic horns as *cornigerus*, for as stated previously, Mr. Charles Dury of Cincinnati, Ohio, sent me such a specimen so identified by Dr. Horn. From Dr. Horn's use of the words "occasionally black" in his comments quoted above, it seems probable that he mixed with the two species already mentioned a third, probably *falli*, as, so far as the material examined shows, no specimens of *liebecki*, *thoracicornis* or *cornigerus* are ever black.

That *cornigerus* is not the species with thoracic horns is at once evident from Melsheimer's words relating to the lateral edge of the "profound concavities" which he speaks of as "its outer elevated narrow edge." By no stretch of the imagination could this phrase be used to describe the conical thoracic horn of *thoracicornis*, and the thoracic concavities of that species do not have "outer elevated narrow edges."

It seemed very probable, however, that the species was the one relatively common in the East and East Central States, represented in Dr. Horn's material by the first specimen in his series. That fine coleopterist, Mr. Charles Liebeck of Philadelphia was strongly of this opinion. Fortunately, the type of *cornigerus* was found by Dr. H. C. Fall and Mr. P. J. Darlington, Jr. in the M.C.Z. at Cambridge, and I was much surprised on receiving a specimen compared with the type by Mr. Darlington to find that this homotype was not the species of the Horn collection. As the abdomen of the type had disappeared and consequently no genitalic comparison was possible, I sent specimens of the two species to Dr. Fall and he kindly again went to Cambridge and compared these with the type. He reported as follows: "Such small superficial differences as I detected in your two specimens appear very trifling—but I am able to declare with a good deal of positiveness that the Melsheimer type—if we may so call it—agrees in these respects with the Highlands N. C. example which Darlington selected to represent the species, and I haven't the slightest doubt it is specifically the same." (H. C. Fall in litt. 10.X.26).

Mr. Darlington, who made a very careful comparison between Melsheimer's specimen and the Highlands N. C. specimen mentioned above, and marked the latter "homotype," says that the "blackish-scabrous" head of the Melsheimer specimen is due to discolouration and dirt. So far as I know the head in *Odon-taeus* is always practically concolorous with the rest of the upper surface.

Cornigerus Melsh. is one of our finest species, and the males can as a rule, apart from their size, be told from all our other species by their more parallel form. The more fully armed males and the females are less parallel resembling in shape several other species. The middle lobe of the male genitalia is apparently unique. (See Fig. 9.).

The species has not been taken commonly, the following localities being represented by ten specimens: North Carolina, Virginia, Maryland, New Jersey, Georgia, New York.

***Odontaeus liebecki* sp. nov.**

Holotype: Shape and Size: Oblong-oval, somewhat more parallel than usual in the genus. Convex as usual. Length: 9.31 mm. Width: 6.16 mm.

Colour: Dark red-brown above, somewhat lighter below, femora colour of under side, tibiae and tarsi, of upper; Antennal club, especially outer joints, yellowish brown, basal joints of antennae dark. Shining.

Clypeus: Almost evenly rounded though very slightly sub-angulate at sides; acutely margined, quite densely and coarsely punctured, slightly rugose with very fine punctules on spaces between large punctures. Slightly swollen a little anteriorly of middle on median line, very feebly carinate or elevated along this swelling. Horn fixed, rather finely and sparsely punctate.

Thorax: Anterior angles about right, slightly rounded, apex rather deeply sinuate. Sides rapidly divergent from apical angles and nearly straight for about half depth of thorax, thence almost parallel though feebly sinuate to posterior angles, which are rounded and about right. Base distinctly sinuate. Not densely punctured though moderately so on sides. Minute punctules visible only on close examination with high power. Medial elevation short, at about basal three-eighths, rather narrow anteriorly rapidly widening basally, triangularly open at front with the tubercles prominent and obliquely longitudinal, the groove moderately deep in front, very shallow behind. Lateral foveae deep and large, deepest well within basal third, separated quite narrowly from basal margin by the inwardly inflexed edge of the lateral ridges. Lateral ridges prominent, rounded throughout but more gradually in front, the highest point being behind the medial tubercles.

Elytra: Striae moderately deep, as usual less so externally. Punctures round and moderately deep, slightly larger externally, smaller apically, separated throughout by about their own diameters. Intervals moderately convex, with extremely fine and very sparsely distributed punctules. Eleventh stria well developed. Fourteenth curving well away from margin basally.

Genitalia: Outer lobes pale yellow, middle lobe very little darker, flattened in the vertical plane, short for the group, very little upturned at tip. (See Fig. 10).

Allotype: Shape and Size: Almost exactly as in holotype. Length: 9.80 mm. Width: 6.16 mm. the difference in length apparently being due to the more extended position of the head of the allotype.

Colour: As in holotype.

Clypeus: As in holotype except that the faint medial elevation does not reach quite so far back.

Thorax: Anterior angles a little less than right. Anterior half of sides not quite so divergent from apical angles and posterior half a trifle more convergent towards basal angles than in holotype, with the sinuation even less evident. Basal angles rounded and right. Base obviously sinuate. A moderately short transverse ridge at about apical third with a slight tubercle at each end narrowly and shallowly separated, and a little more anteriorly placed. A slight depression posterior to the transverse ridge and a medial narrow shallow groove. Puncturation moderately coarse and close, the elevations as usual impunctate except for the minute sparse punctules visible throughout.

Elytra: As in holotype.

Holotype and Allotype: Cornwall, Ct., 30.V.21. Taken under wash-up by Mr. K. F. Chamberlain, who has kindly permitted me to retain the specimens.

Specimens examined: 96.

Localities: Ontario, New York, New Jersey, New Hampshire, Massachusetts, Maryland, Michigan, North Carolina, Long Island, Maine, Vermont, Delaware, Virginia, Indiana, Connecticut, Missouri.

The great majority of the specimens come from the Eastern States.

This is the species that frequently appears in collections as *cornigerus* and indeed it is very much like that species. The medial thoracic elevation is usually narrower and its groove deeper in *cornigerus*. The apical thoracic angle in *cornigerus* is more obtuse and the apex of the thorax less sinuate than in *liebecki*. Well developed males of *cornigerus* are distinctly narrower and more parallel in proportion to their size though obviously larger than in *liebecki*. The colour when mature is prevalently darker in *liebecki*. The middle lobe of the male genitalia is quite distinctive.

Mr. R. J. Sim records taking *liebecki* in burrows under a layer of humus in yellow clay containing pebbles and rocks.

This species is named in honour of the well-known coleopterist Mr. Chas. Liebeck.

***Odontaeus darlingtoni* sp. nov.**

Holotype: Shape and Size: Oblong-oval. Maximum width a little in front of middle. Length: 8.19 mm. Width: 5.32 mm.

Colour: Dark red-brown above, a little lighter below. Antennae, tibiae and tarsi about concolorous with the upper, femora with the under side. Moderately shining.

Clypeus: Rather narrow from back to front, broadly rounded, acutely and strongly margined, strongly rugose rather than punctured. Finely but distinctly carinate for three-quarters of depth, the carina being elevated at middle of clypeus. Horn movable, sub-parallel for most of its length, slightly swollen towards apex; apex distinctly excavated below, front face finely and sparsely punctate.

Thorax: Anterior angles about right, scarcely rounded, apex not very abruptly sinuate. Sides rapidly divergent for about two-fifths of length, thence almost parallel though very slightly convergent to posterior angles. Posterior angle a little more than right, base of thorax not deeply sinuate within. Not closely or densely punctured, the elevations smooth except for an exceedingly minute system of scattered punctules. Medial elevation well forward at about apical third, rather narrow, closed in front and not tuberculate, its sides diverging only a little basally, central groove broad and shallow. Lateral foveae deep and large, somewhat transverse so that they are well separated from the thoracic base, and their greatest depth is not much posterior to the middle of thorax. Lateral ridges prominent, rounded from back to front though more gradually in front, the highest point being at about opposite the middle of the medial elevation.

Elytra: Striae not deep, the sutural the most so, the outer ones scarcely at all impressed. Strial punctures rounded, deep, well separated—on most of the striae by more than their own diameters—not much different in size apically or laterally. Intervals but very slightly convex, the minute punctules scarcely distinguishable. Eleventh stria considerably abbreviated in front, fourteenth well curved away from margin basally.

Genitalia: Outer lobes pale yellow, middle lobe pale brown, "hook" very short and narrow, "shank" gradually narrowed, feebly sinuate above, more strongly bisinuate beneath. (See Fig. 11).

Allotype: *Shape and Size*: Almost exactly as in holotype.

Colour: Red-brown—a little paler than the holotype, distribution of colour the same.

Clypeus: Deeper than in holotype, sculpture the same, except that medial carina is shorter and less elevated at middle of clypeus.

Thorax: Allowing for sexual differences shape as in holotype. The transverse ridge rather short, at about apical third, the lateral tubercles well separated from ridge but rather poorly developed. The medial depression narrow, deep, and coarsely and confluent punctured. The usual puncturation rather coarse, deep and close. The elevations with an obvious system of finer punctules which are larger anteriorly.

Elytra: Striae deeper and intervals more convex, strial punctures closer than in holotype.

Holotype and Allotype: Rancocas Park, N.J., 27.X.26, both taken by Mr. R. J. Sim, who has presented them to me.

Specimens examined: 125.

Localities: Virginia, New Jersey, North Carolina, D. C., Massachusetts, New York.

Found commonly by Mr. R. J. Sim in Pine Barrens in New Jersey working in yellow sand beneath a layer of humus. The species must be fairly common at Southern Pines, N.C. as a number were collected there by the Rev. A. H. Manee.

Dedicated to Mr. P. J. Darlington in recognition of his assistance in the preparation of this paper.

EXPLANATION OF PLATE.

(All figures greatly enlarged).

- Figure 1. Fixed horn type in *Odontaeus*. (a. Suture):
 Figure 2. Movable horn type in *Odontaeus*. (a. Suture. b. Depressed area behind attachment of the horn.).
 Figure 3. Middle lobe of genitalia of *O. obesus* Lec.
 Figure 4. Middle lobe of genitalia of *O. falli* sp. nov.
 Figure 5. Middle lobe of genitalia of *O. thoracicornis* sp. nov.
 Figure 6. Middle lobe of genitalia of *O. floridensis* sp. nov.
 Figure 7. Middle lobe of genitalia of *O. filicornis* Say.
 Figure 8. Middle lobe of genitalia of *O. simi* sp. nov.
 Figure 9. Middle lobe of genitalia of *O. cornigerus* Melsh.
 Figure 10. Middle lobe of genitalia of *O. hebecki* sp. nov.
 Figure 11. Middle lobe of genitalia of *O. darlingtoni* sp. nov.
 Figure 12. Margin of clypeus of *O. floridensis* sp. nov. showing the deep emargination.
 Figure 13a, 13b. Part of head and thorax of *O. filicornis* Say. (a) ♂, (b) ♀ showing close approximation of anterior thoracic angle to margin of head.
 Figure 14a, 14b. Part of head and thorax of *O. simi* sp. nov. (a) ♂, (b) ♀, showing the separation between the anterior thoracic angle and the margin of the head.
 Figure 15. Base of thorax of *O. filicornis* Say showing basal angle and the situation within.
 Figure 16. Base of thorax of *O. simi* sp. nov. showing basal angle and the situation within.
 Figure 17a, 17b. Last posterior tarsal joint and claw of *O. filicornis* Say (a) ♂, (b) ♀.
 Figure 18a, 18b. Last posterior tarsal joint and claw of *O. simi* sp. nov. (a) ♂, (b) ♀.

With the compliments
of J. B. Wallis.

Excerpt from Canadian Entomologist, April, 1926.

SOME NEW COLEOPTERA

BY J. B. WALLIS,

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There could be no more fitting introduction to this paper than an expression of appreciation of the work done by Dr. H. C. Fall of Tyngsboro, Massachusetts, in the study of our North American Coleoptera. It is his remarkable ability to select and to point out the salient characters of species in difficult groups as displayed in his revision of the genera *Coelambus* and *Agabus* in *Dytiscidae* and of *Gyrinus* in *Gyrinidae* that makes possible the description of five out of six of the following beetles.

In reference to the measurements given below, it should be noted that a

micrometer scale in the eye piece of a binocular microscope was used, the magnification varying from x 17 to x 49 with the size of the insect or part measured. The measurements may therefore be considered as exact with but a very small allowance for probable error.

Coelambus acaroides race **winnipeg** new race.

Shape: Rotundate oval as in *acaroides*.

Head: Shining reddish-yellow, pale, with a large oval or oblong rufopiceous spot adjacent to each eye; uniformly and moderately punctate; antennae pale at base, outer joints darker. Clypeus very finely margined.

Thorax: Dark rufopiceous, slightly paler towards sides; moderately, evenly and rather closely punctate, shining between punctures.

Elytra: Pale testaceous, with dark markings as in *acaroides*, very evenly and uniformly punctate with rather large shallow punctures separated by about or somewhat less than their own diameters; the whole surface, including the punctures, covered with a very minute reticulation; the sub-marginal carina distinct and nearly attaining the base.

Under side: Of head and thorax pale; epipleura pale but usually infuscate; abdominal apex pale, tibiae pale, fore and middle tarsi always, hind tarsi usually, darker; femora pale, the hind and sometimes the others clouded with darker, metasternum and the coxal plates very coarsely and the latter closely punctate; epimera, epipleura and abdomen very densely and minutely punctulate, the epipleura and the first two abdominal segments at the sides with a few large, shallow scattered punctures. ♂ fore and middle tarsi moderately dilated, the first fore-tarsal joint widest.

Size: Type, 2.38 mm. long, 1.56 wide.

Type: ♂ Winnipeg, Manitoba, 10, vii, 24, in my collection.

Paratypes: 9 ♂ ♂'s Winnipeg, 5-17, vii, 24, 1 ♂ Thornhill, Manitoba, 14, vii, 24, 2 ♂ ♂'s Stonewall, Manitoba, 20, vii, 25. 6 ♀ ♀'s Winnipeg, 3-10, vii, 24; 1 ♀ Thornhill, Manitoba, 14, vii, 24, 1 ♀ Stonewall, 20, vii, 25; 1 ♀ Thornhill, 27, vii, 25. Some of these No. 1969 in the Canadian National Collection.

This interesting race appears to be worthy of a name, as the 22 specimens before me show little variation, what there is being a tendency towards a lighter color beneath—possibly due to immaturity—and a finer, less even punctation of the thorax. Apparently this race may be known from typical *acaroides* by the dark markings on the head—always present though occasionally faint—the infuscate antennae, and the dark thorax.

In addition to the two porrect spines mentioned by Dr. Fall (N. A. species of *Coelambus*, 1919, page 5) there are, in *acaroides* and in *winnipeg*, caudal and external to them, two minute, erect denticles.

Acaroides is not known from Manitoba.

Agabus pseudoconfertus sp. nov.

Holotype: ♂; oblong-oval, the sides slightly more parallel than in *confertus* Lec., the point of maximum width at or a trifle behind the middle of the elytra. Black. Labrum, two posterior spots on head, the lateral margins of thorax and the posterior portion of the lateral elytral margin, reddish. No yellow spots on elytra. Antennae, palpi, and legs rufous, the femora in great

part piceous, and the hind tibiae darker rufous. Reticulation of thorax and elytra slightly more pronounced than in *confertus*. The secondary minute micro-reticulate sculpture present on the elytra but not on the thorax and the three series of coarser punctures on the elytra are also a little more evident than in *confertus*. Minute punctules a little coarser than in *confertus*, within the thoracic meshes, but both within the reticulation and on the reticulating lines of the elytra. Prosternum angularly convex in cross section, the process somewhat deflexed with the metasternal sulcus rudimentary and not continued backward on to the plane of the metasternum, (very slightly so in *confertus*). The pro- and mesotarsi are a little more strongly incrassate than in *confertus*, the claws a little stouter with the anterior one less sinuate than in that species. The posterior claw is evidently though slightly longer than the anterior. A few punctures on the inner margin of posterior tibiae.

The coxal plates approach the meso-coxae more closely than in *confertus*. In the holotype the relative width of the coxal plate to the metasternal wing is very close to as 1.48 mm. is to 6 mm. while in *confertus* the metasternal wing is a little more than half the width of the coxal plate. The posterior abdominal segment is rather widely flattened in the middle and this space is reticulate. Exteriorly at the apical end of the segment are a few longitudinal strigosities, the longest extending not more than half way to the base. In *confertus* these strigosities are longer, usually more pronounced and frequently converging with the enclosed space not or feebly flattened, and smaller.

Allotype—♀, as in the ♂ with the exception of the sexual characters.

Morphotype—♀. Shape as in holotype but slightly smaller. Head with not very evident secondary micro-reticulation. Micro-reticulation distinct on the thorax causing the lustre to become somewhat sericeous.

Reticulation of basal two thirds of elytra longitudinal and fine and dense, approaching the normal for the species only as it nears the posterior end. The secondary system of micro-reticulation is so fine and dense that it gives a distinctly sericeous appearance to the elytra, particularly in the anterior two thirds. The minute punctules are discernible anteriorly only with difficulty. Beneath less shining than in holo- or allotype, otherwise the same.

Holotype—♂, Winnipeg, Man., 11, VI, 24 (Wallis); in my collection.

Allotype—♀, Mile 17, Hudson's Bay Ry., 2, VII, 17 (Wallis); in my collection.

Morphotype—♀, Winnipeg, Man., 10, IV, 25, (L. H. Roberts); in my collection.

Paratypes—1 ♂, Winnipeg, 12, IV, 25; 2 ♀, Winnipeg, 10, IV, 25 (Roberts & Wallis).

The average length and width for the species seems to be about 8 mm. x 4 mm. This species is very close to *confertus* to which it would run in Dr. Fall's key, (A Review of the North American species of *Agabus*, H. C. Fall, 1922) and the absence of the elytral spot in the six specimens known, though this spot seems always present in *confertus*, would perhaps be poor evidence of a species. The even more rudimentary metasternal sulcus, the slight differences in sculpture, ♂ tarsi and claws, but particularly the evidently much narrower

metasternal wings in proportion to the coxal plates and the difference in sculpture of the posterior abdominal segment give a combination of characters sufficient to differentiate it from Leconte's species.

The dimorphism in the ♀ is remarkable.

Four of the six specimens at hand were taken in a ditch of water running to the Assiniboine River. This ditch simply carries off the water from the melting snow and soon dries up. *Pseudoconfertus* should be looked for, therefore, in spring, in ditches or rivulets having connection with a river.

***Agabus palustris* sp. nov.**

Length 6.09 mm., width 3.20 mm. Oblong-oval, the sides almost parallel.

Black. Labrum, base of head, antennae, reflexed edges of elytra and thorax, palpi and legs reddish, femora scarcely darker, under side black.

Head and thorax obviously reticulate, the meshes larger on the latter. Secondary system of micro-sculpture detectable under high power on head and at sides of thorax, disk of thorax shining, minute punctules observable only at sides of thorax.

Elytral reticulation moderate, smaller and less impressed than in *strigulosus* but much as in *confertus*, the micro-sculpture evident throughout, the minute punctules plentiful, occurring chiefly on the reticulating lines, the two discal series of coarse punctures evident, the submarginal less so especially anteriorly.

Prosternum angularly convex in cross section, somewhat deflexed. The metasternal sulcus is rudimentary, not extending on to the plane of the metasternum, though fairly deep and wide between the coxae.

The pro- and mesotarsi are quite narrowly dilated, the proportion of the first to the fourth pro-tarsal joint being only about $3\frac{1}{2} : 2\frac{1}{2}$. There are no obvious palettes on the rather sparse glandular hairs. The protarsal claws are small and but little sinuate, the posterior one a little the more so.

In the type there are two large punctures about the middle of the hind tibiae. These are probably variable.

The last ventral segment is somewhat flattened medially, with a few short strigositys externally.

Metasternal wing about one-third the width of the coxal plate, the proportion being nearly .37 mm. : 1.05 mm.

Type—♂, Onah, Manitoba, 13, vii, 18, taken by myself in a marshy stream running out of Douglas Lake. In my collection.

This little species, unfortunately represented by a unique, is quite clearly different from any of our recognized species. The two peculiarly placed punctures of the hind tibiae make its position in Fall's table (A Review of the North American species of *Agabus*, 1922, p. 6) uncertain. If, as appears possible, specimens are found having no punctures on the inner side of the posterior tibiae, they will then run to couplet 19 in Dr. Fall's paper. The species is not likely to be mistaken for *strigulosus* however, though about the same size, the entirely different type of pro-tarsal pads and even more particularly the characters of the prosternal process and metasternal sulcus immediately forbidding such reference. On the other hand, if it be considered as falling under Dr. Fall's section 33, it would then run directly to *confertus*. Indeed it is very much like

a small *confertus* Lec. or *pseudoconfertus* Wallis, and from its prosternal, abdominal and sculptural characters should probably be put next them. The metasternal sulcus is, however, proportionately wider than in those species as the coxae are less approximate. The tarsi are less dilated, the protarsal claws proportionally weaker even than in *confertus*, and the rugosities of the last ventral much less pronounced even than in *pseudoconfertus*, though of the same type; and the relative widths of the metasternal wing and coxal plate different from either. It is, of course, very much smaller.

***Gyrinus hatchi* sp. nov.**

Form rather broad and not very convex, black with some bluish reflections, bronzed, quite brilliantly so on clypeus, and on the thoracic and elytral sides. Elytral surface moderately polished and with a fine alutaceous sculpture visible most clearly posteriorly and laterally, obviously micro-punctulate. Side margins of thorax and elytra moderate, about intermediate between the *ventralis* and the *aeneolus* groups; stria punctures moderate, stronger laterally. Eleventh stria distinct but not very distant from margin, somewhat nearer than in *ventralis* and considerably nearer than in *marginellus*. Beneath, including hypomera and epipleura, rufo-testaceous, the middle and hind legs slightly lighter.

Male genitalia. Testaceous, middle lobe broad, between one-half and two-thirds as wide again as lateral lobes, scarcely noticeably widened apically, tip bisubtruncate, very broadly angulate, upper surface flatly carinate, the carina becoming obsolete some distance from tip which is flat.

Length 4.69 mm. width 2.51 mm.

Holotype ♂. Crooked Lake, Washtenaw Co., Michigan, 18 iv, 20, bearing the serial number 655 k. Collected by Mr. Melville H. Hatch in whose honor the species is named. Type at present in my collection.

This species would appear to fall between couplets 6 and 7 in Dr. H. C. Fall's table (The North American Species of *Gyrinus*, 1922. Transactions of the American Entomological Society, XLVII, P. 276), its size forbidding reference to 6, and its relatively wider lateral margins to 7. It may be distinguished from *ventralis* by its smaller size, more obvious micro-punctulation, and the genitalic characters; from *fraternus* by the size and the genitalia; from *marginellus* by the distinctly bronzed, punctulate, and alutaceous elytra, the closer approximation of the eleventh stria to the margin, the paler color beneath, and the genitalia; from *aeneolus* by the difference in elytral sculpture and the genitalia; from *woodruffi* by the genitalia as well as minor characters.

***Gyrinus dubius* sp. nov.**

Holotype. ♂, Rather broadly oval, not very convex, black with sides moderately bronzed, bluish reflections not very noticeable, moderately polished, very finely alutaceous most evident laterally and posteriorly, distinctly and fairly densely micro-punctulate.

Stria punctures fine, not much coarser externally, outer row close to but distinct from margin.

Under side. Hypomera, epipleura and mesosternum reddish brown, the latter darkest; metasternum and abdomen black with a reddish tinge; fore and

middle legs and hind femora almost concolorous with mesosternum, hind tibiae and tarsi lighter.

Male Genitalia. The outer lobe piceous brown, the median lobe rufo-testaceous, darker along the median carina, especially where it broadens near tip, the color there being piceous brown. The median lobe resembles the median lobe in *picipes* to some extent. It is strongly roofshaped, its sides converging apically for about two-thirds of its length, when a slight constriction is visible, it then again converges evenly to the tip which is almost exactly one-third the greatest width of a lateral lobe. The superior edge of the median lobe is narrowly flat for about half its length, it then becomes rounded for a very short distance, but about one-third from the tip it flattens and expands into a parallel sided ridge about one-third the width of a lateral lobe. The extreme tip of the median lobe is very slightly upturned and prominent. Length 4.94 mm., width 2.70 mm.

The *holotype* is a male taken at St. Anthony, Newfoundland, and is No. 1970 in the Canadian National Collection.

A *paratype* ♂ from the same locality remains in my collection through the kindness of Mr. Gibson, Dominion Entomologist.

With these specimens I associate somewhat doubtfully three females from the type locality. They are rather larger, more bronzed especially along the suture and in the strial punctures, the latter being bluish in the holotype, and more decidedly alutaceous; otherwise they match the males.

This species is very close to *picipes*, but appears to be obviously more alutaceous and micro-punctulate above, with the outer strial punctures less evidently larger than those near the suture. Before the color is more reddish and the legs are darker. Superficially the genitalia are much alike, but apparently the color of the apical portion of the median lobe together with the peculiarities noted above will be sufficient to separate them. To this, however, may be added that the depth in a vertical plane of the tip of the middle lobe of the ♂ genitalia of *dubius* is considerably more than in the case of *picipes*.

***Oberea brooksi* sp. nov.**

Length 12.74 mm., width immediately behind humeri 2.73.

Black above and below excepting the clypeus which is yellowish brown, the tarsal claws, reddish, and the palpi tinged with reddish.

Antennae beneath especially basal joints, the head, thorax, elytra and underside, moderately thickly clad with ash-grey vestiture, obscuring the ground color except under fairly high magnification. Erect hairs short, rather sparse and pale except posteriorly where they are darker.

Head rather coarsely punctate, the punctures separated as a rule by less than their own diameter, the lines between the antennal bases less punctate and more shining. A secondary system of minute punctules occupies the interstices among the coarse punctures. Antennae longer than elytra.

Thorax coarsely and evenly punctate on disk and flanks, the punctation becoming crowded anteriorly and basally. A secondary system of minute punctules evident. A shining anterior submarginal groove almost encircles the thorax, and a similarly shining basal submarginal groove terminates near the lateral extension of the coxae. The two moderate sized callosities are, under high magni-

fication, seen to be very finely micro-alutaceous. There is an irregularly narrow, shining, slightly elevated area on the middle line from between the callosities to near the base, where it disappears in a sudden depression which basally becomes transversely rugose. The thorax is slightly constricted midway between the callosities and the anterior margin, and again near the posterior margin. Length of thorax 1.97 mm., width 2.17 mm.

Elytra.—Length 9.45 mm. feebly inflated apically. Coarsely and deeply punctate in series, the rows somewhat confused apically; the punctures subquadrate basally, rounded apically, the secondary system of punctures less evident than on the head and thorax as the hairs of the elytral vestiture are coarser on the elytra than elsewhere; vaguely bi-costate in about basal half; the apices obliquely truncate, scarcely sinuate, the sutural denticle small but distinct, the exterior obsolescent.

Under side rather densely granulate-punctate with irregularly arranged and somewhat scattered larger punctures, coarser at sides than on middle of abdomen, all distinctly smaller as a rule than those on upper side. Last segment of abdomen (♀) truncate and feebly emarginate, triangularly impressed for a little over half its length, a median line evident in basal portion.

Type. ♀, Transcona, Manitoba, 10, vii, 24. In my collection.

Paratype. ♀, Transcona, Manitoba, 10, vii, 24. In collection of Mr. G. S. Brooks, who took both specimens and to whose generosity I am indebted for the type.

O. brooksi does not fit in anywhere very well in Casey's table (Mem. on the Col. iv, 1913, p. 364) but may be placed as a fourth subsection under section 9.

This fine species was taken by Mr. Brooks when sweeping low willows at night. Unfortunately there is no certainty as to what the specimens were swept from as numerous herbaceous plants were among the willows and were swept at the same time. Mr. Brooks and I made a conscientious attempt to secure more this season but without success.

It is a pleasure to dedicate the species to Mr. Brooks as a slight recognition of his enthusiasm and careful collecting.
