

changes. The point to which I would emphatically direct attention is that since radiations are known to be moving in space apart from ponderable bodies and subject to reflections, it is possible so to deal with them as to completely alter their destination and successfully interfere with all results flowing from Prevost's law of exchanges. It also seems to me that the exactness of the second law of thermodynamics depends, as far as radiations are concerned, upon that of this law of exchanges.

Cincinnati, May 18th, 1882.

H. T. E.]

*Revision of the Dermestidæ of the United States. By Horace F. Jayne, M. D.
(With four Plates.)*

(Read before the American Philosophical Society, June 16th, 1882.)

Many years have elapsed since the small family of Dermestidæ, as represented in our fauna, has received careful study. The addition of new genera and species, and the confusion existing among those already well established, have suggested that a review of the entire field, in the light of modern entomological progress, would be useful to the student. In the following pages differences of structure have been recognized, as far as possible, as the only true and constant characters by which to separate species. The arrangement of genera is, substantially, that already well known, save only the necessary alterations incident to the introduction of two new genera. The specific classification is, almost entirely, original. Dr. LeConte, in addition to very many other favors, has kindly offered, in my absence, to read the proof of the following pages.

DERMESTIDÆ.

Head variable in size, deflexed; front variable in width, a single ocellus, or simple lens, at middle, except in *Byturus* and *Dermestes*; epistoma usually very short, coriaceous, on the same plane as the front except in *Axinocerus*, in which it is long and retracted; labrum distinct, mandibles short, simple, except in *Byturus* in which they are dentate, maxillæ with the base exposed, with two lobes of variable form, palpi small, slender, four-jointed; mentum quadrate, usually corneous; ligula simple, palpi three-jointed. Eyes usually prominent—exceedingly in *Byturus*—moderately coarsely granulated, rounded, entire, except in certain species of *Trogoderma*, *Anthrenus* and *Orphilus*, where they are more or less deeply emarginate in front.

Antennæ inserted in front of the eyes, usually eleven-jointed, variable in *Anthrenus*, nine-jointed in *Dearthrus*, ten-jointed in a foreign genus, *Hadrotoma*; terminated by a large club, which is quite strongly serrate

in Acolpus and Trogoderma ; made up, usually, of three joints, of a variable number of joints, however, in Perimegatoma, Acolpus, Trogoderma, and Anthrenus, of two joints in Cryptorhopalum and some foreign genera, and of one, enormous, securiform joint in Axinocerus.

Prothorax short, with side pieces not separate, excavated beneath for the reception of the antennæ, except in Byturus, Attagenus, Dearthrus, Perimegatoma, Acolpus, and one foreign genus—Trinodes. In Anthrenus the antennal fossæ divide the anterior part of the lateral margin ; coxal cavities large, transverse, closed behind by the mesosternum, except in Byturus ; prosternum prolonged behind and usually lobed in front.

Mesosternum narrow and entire in Byturus and Dermestes ; narrow and emarginate in front, or entirely divided, in Dearthrus, Perimegatoma and two foreign genera—Megatoma and Hadrotoma ; wide and entire in Apsectus and Orphilus ; wide and deeply emarginate, or entirely divided in the remaining genera ; metasternum short, rounded or truncate in front or narrowly produced between the mesocoxæ ; side pieces wide, except in Byturus. Elytra covering the abdomen, not striate, except faintly in certain species of Dermestes. Sides more regularly oval in the females ; epipleuræ not extending beyond. Abdomen with five free ventral segments.

Anterior coxæ conical, prominent, with small trochanter ; middle coxæ oval, oblique, excavated externally, with large trochantin—usually distant, approximated in Byturus, Dermestes, Attagenus, Dearthrus, Perimegatoma and two foreign genera—Megatoma and Hadrotoma. Posterior coxæ slightly separated, transverse, not extending to the margins of the body, except in Orphilus, dilated into a plate partly protecting the thighs. This coxal plate shows a beautiful series of variations ; in Byturus it is almost obsolete ; in Dermestes and Attagenus very long, narrow, obliquely truncate externally ; covering only the basal half of the femur ; in genera from Dearthrus to Apsectus, inclusive, it is moderately long and wide, covering more than the basal half of the femur, not obliquely truncate externally, while in Orphilus it is short and wide, covering the anterior part of the femur for its entire length.

Legs short, somewhat contractile, tibiæ with distinct stout spurs ; tarsi five-jointed, pubescent, except in Byturus, where the second and third joints are lobed beneath, first joint either short or long, equaling the fifth, 2-3-4 always short, fifth always long, claws simple, except in Byturus, in which they are dentate.

Two sub-families may be thus separated :

Tarsi with second and third joints lobed beneath,
claws strongly toothed at base, mandibles toothed.

Anterior coxal cavities closed behind by the pro-
sternum.....

BYTURIDÆ.

Tarsi, claws, and mandibles simple. Anterior coxal
cavities completed behind by the mesosternum...

DERMESTIDÆ.

SUB-FAMILY I.—BYTURIDÆ.

BYTURUS, Latr.

Head very large, front as wide as long; no frontal ocellus. Mandibles furnished with several teeth; eyes very prominent, very large, coarsely granulated, round, entire; epistoma very short; antennæ 11-jointed, terminated by a three-jointed club. Thorax nearly as long as wide, anteriorly more than half as wide as at the base, which is somewhat bisinuate, disc convex; sides flattened, especially posteriorly, arcuate; hind angles rounded. Scutellum large, quadrate. Elytra three times as long as wide; sides sub-parallel, apical angles acute. Prosternum very short and wide, not lobed in front, tip narrowly and sharply produced; continuous around and behind anterior coxæ, enclosing them. Anterior coxæ prominent, slightly separated by the top of the prosternum. No antennal fossæ, spaces between prosternum and lateral margins broad, slightly concave. Mesosternum entire, broad and long, prolonged narrowly behind between the middle coxæ which are almost approximated. Metasternum short, side pieces wide (fig. 1).^{*} Legs stout, femora attaining sides, slightly grooved beneath for the reception of the tibiæ, tibiæ stout, terminal spurs strong. First joint of tarsus triangular, 2-3 prolonged beneath into a membranous lobe, 4 small nearly concealed by 3, 5 as long as the four preceding together; the terminal claws are armed with a large basal tooth (fig. 3).

This genus, which is represented by two species—one from the Atlantic district and one from the Pacific—differs greatly from all the rest of genera in the family by the toothed mandibles, the absence of antennal fossæ; the anterior coxal cavities completed behind by the prosternum; the exceedingly large entire mesosternum, the feebly developed posterior coxal plates, the tarsus with second and third joints lobed beneath, and by the strong tooth of the unguis. There can be no doubt as to the position of this genus; its affinities with the rest of the Dermestidæ are marked. Erichson, however, placed it in the Melyridæ, DuVal among his Telmatophilidæ and Crotch in the Nitidulidæ. Redtenbacher and Lacordaire assign it to the present family.

Our two species may be distinguished as follows:—

Elytra uniformly light brown; antennal club compressed, second and third joints much wider than long; eyes very large and prominent; thorax coarsely punctate.....

unicolor.

Elytra marked by three transverse black bands; antennal club elongate, second and third joints fully as long as wide; eyes smaller, less prominent; thorax finely punctate.....

grisescens.

^{*} The posterior coxæ are short and wide, but do not attain the sides, the coxal plates are very feebly developed, not covering the femora (fig. 2).

B. unicolor Say. Elongate, moderately convex, light brown, clothed with moderately long, semi-erect, yellow-cinereous pubescence; elytra uniformly light brown; head coarsely punctate, sparsely pubescent; eyes very large and prominent, black; antennæ nearly as long as the thorax, 11-jointed; first joint, large, round; second smaller; 3-8 decreasing gradually in size, wider than long; 9-10 subequal; 11 longer and rounded at tip; the last three joints forming a somewhat compressed club, which equals one-third the entire length of the antennæ; thorax brown, coarsely and densely punctate, pubescence long, dense at sides; scutellum glabrous; elytra uniformly brown, very coarsely and densely punctate, covered with moderately dense, long, semi-erect, yellow-cinereous hairs; body beneath also brown, pubescence short and recumbent; legs testaceous. (Figs. 1, 4.) Length 18 inches; 4.5mm. Habitat, Atlantic region.

B. grisescens Lec. Elongate, moderately convex, brown, covered with moderately dense, long, recumbent, yellowish-gray pubescence, antennæ, legs, and abdomen rufo-testaceous; elytra light brown marked with three broad transverse bands of black; head finely and sparsely punctate; eyes moderately large and prominent; antennal club elongate, second and third joints as long as wide; thorax finely and densely punctate; elytra moderately coarsely and densely punctate, brown, marked with three equally separated transverse black bands, of which the first is the faintest, and directed obliquely backward and outward, the second wider and darker, also directed backward and outward, but with a large sutural light brown spot; the third or apical band is distinct and directed forward and outward (Figs. 5, 6).

Length 12 inches; 3 mm. Habitat, California.

A smaller and darker species easily recognized by the characters already given.

SUB-FAMILY II.—DERMESTIDÆ (Genuini).

This sub-family, which is distinguished by the characters already given, is represented in our fauna by the following genera:

No frontal ocellus.....	DERMESTES.
Frontal ocellus distinct.	
Mesosternum narrow, middle coxæ not widely separated.	
Prosternum simple in front.	
Antennæ 11-jointed, mesosternum only deeply sulcate anteriorly, posterior coxal plate long, obliquely truncate externally	ATTAGENUS.
Antennæ 9-jointed, mesosternum narrowly divided, posterior coxal plate short, not obliquely truncate externally....	DEARTHUS.
Prosternum lobed in front.....	PERIMEGATOMA.

Mesosternum broad, emarginate in front or entirely divided, receiving the tip of the prosternum, middle coxæ widely separated.

Mandibles and labrum not covered by the prosternum.

No antennal fossæ.....

Antennal fossæ distinct.....

Mandibles covered, labrum not covered by the prosternum.

Antennal fossæ under lateral margin of thorax. Body pubescent.

Front rather flat, clypeus continuous on the same plane. Antennal club of at least two joints.....

Front convex between the eyes, clypeus forming an angle with the front, retracted. Antennal club of one large, broadly securiform joint.....

Antennal fossæ dividing the anterior part of the lateral margin of the thorax.

Body clothed with scales.....

Mesosternum broad, entire. Middle coxæ widely separated. Mouth parts covered by sternum, prosternum truncate behind. Posterior coxæ not prominent, not reaching the sides. Body covered with very long, erect hair.....

Mouth parts covered by anterior legs, prosternum pointed behind. Posterior coxæ attain the sides. Body naked, shining..

ACOLPUS.

TROGODERMA.

CRYPTORHOPALUM.

AXINOCERUS.

ANTHRENUS.

APSECTUS.

ORPHILUS.

DERMESTES Linn.

The species grouped together in this genus are the largest and most conspicuous of the entire family. They are all elongate in form, black, more or less pubescent. The head is small and can be retracted within the thorax; the eyes large and, in all our species, entire. No frontal ocellus. The antennæ are 11-jointed, the last three joints being large, prolonged on their outer side, and forming an irregular club (fig. 7), which does not differ either in the species or sexes. The thorax in the first group—including six species—is very convex in front, and the anterior portion of the lateral margin cannot be seen from above, while in the second group—*pulcher*, *lardarius*, *cadaverinus* and *elongatus*—it is less convex, the entire lateral margin being visible. The base is broadly lobed; in the first group, impressed with a median fovea, conspicuous in *marmoratus*, hardly apparent in *fasciatus*; in the second group with two, widely sepa-

rated, basal pits, thus linking this genus, and through it the entire family, with the *Mycetophagidæ*. The thorax is either covered with mixed brown, black and white pubescence, or is uniform in coloring; *mucoreus* and *vulpinus* have a large median triangular naked space on the upper surface. The scutellum is small, but distinctly visible. The elytra are elongate, sides slightly rounded, except in *elongatus*, where they are sub-parallel; pubescence quite dense, except in *pulcher* and *mucoreus*. The prosternum is very short, not lobed in front, prolonged behind into a short, acute point, not reaching beyond the anterior coxæ, which are large and almost contiguous. The antennal fossæ, moderately deep and well defined, are situated transversely in the anterior half of the spaces between the prosternum and lateral margins (fig. 8). The mesosternum is entire, narrow and short, not reaching beyond the middle of the meso-coxæ, which are not widely separated, the metasternum being prolonged anteriorly to meet it. The latter is short, the side pieces wide. The posterior coxæ do not attain the sides of the body, and the coxal plates are long and narrow, covering the basal half of femora, obliquely truncate externally (fig. 9). The abdomen is clothed with dense whitish pubescence (except in *pulcher*, *bicolor* and *cadaverinus*), and then bears a row of black spots on each side, except in *sobrinus*, which has two such series. The males have the third and fourth ventral segments marked by a small median pit, from which arises a bunch of brown, erect hairs. The male of *vulpinus* however, has only the fourth segment so characterized. The legs are stout, the femora, in the species of the first group already referred to, annulated at middle with white pubescence, but *mucoreus* has the basal half of thighs covered with white hairs. The first four joints of the tarsi are equal, the fifth as long as all the preceding taken together.

The species may be separated by means of the following table :

- I. Males with third and fourth ventral segments each marked by a median pit from which arises a bunch of erect brown hairs.
 Anterior portion of lateral margins of thorax not visible from above. Base with median puncture.
 Femora annulated with white pubescence, thorax entirely pubescent.
 Pubescence on upper surface variegated, a single series of lateral black spots on abdomen.
 Elytra with broad basal band of yellowish cinereous pubescence..... **marmoratus.**
 Elytra with broad sub-basal band of yellowish cinereous pubescence..... **fasciatus.**
 Elytra marmorate ;
 With yellowish cinereous and black pubescence.
 Scutellum not conspicuously lighter **murinus.**
 With dark bluish cinereous, ochre and black pubescence. Scutellum conspicuously lighter... **talpinus.**

- Pubescence on upper surface uniform, two series of lateral black spots on abdomen..... **sobrinus.**
- Femora with basal half clothed with white hairs. Elytra with broad basal rufous band, thorax with a large triangular naked spot at middle **mucoreus.**
- Entire lateral margin of thorax visible from above. Base with two punctures. Legs not annulated.
- Thorax and base of elytra red, covered with orange-red pubescence **pulcher.**
- Basal portion of elytra rufous, bearing yellow pubescence, including three black spots..... **lardarius.**
- Thorax and elytra uniform in color, very elongate, striæ on elytra distinct, pubescence on abdomen cinereous, no series of lateral black spots..... **elongatus.**
- Not markedly elongate, striæ on elytra very faint, pubescence on abdomen white, and series of lateral black spots..... **cadaverinus.**
- II. Male with the fourth ventral segment marked by a median pit. Anterior portion of lateral margins of thorax not visible from above. Color above uniform. Thorax with a large triangular naked spot at middle. One series of lateral black spots on abdomen. Legs not distinctly annulated..... **vulpinus.**

D. marmoratus Say. Oblong, convex, black, quite densely pubescent. Elytra black, mottled with ochre, black and cinereous pubescence, and bearing a large sub-quadrate spot just behind the base of cinereous. Head finely but densely punctate, pubescence semi-erect, dense, variegated, brown, black and white. Antennæ piceous, club fulvous. Thorax very convex anteriorly, basal half of lateral margin visible from above, sides suddenly narrowed at middle, finely and densely punctate, a deep fovea in middle of base, pubescence dense, variegated as on head, two lateral and a median small triangular white spots. Scutellum covered with sparse cinereous hairs. Elytra densely and finely punctate, faint striæ near apex, mottled with small transverse spots of fine recumbent brown, black and cinereous pubescence. A large irregularly quadrilateral cinereous spot on outer side just behind the base, the inner anterior angle of which is prolonged inward and forward to the scutellum. Body beneath black, clothed with long dense white recumbent hairs. Abdomen with a row of yellowish-black spots on either side. Last segment black, sparsely covered with fulvo-cinereous pubescence. Legs covered with dull brownish hairs, femora annulated at middle with white. Length .46 inch; 11.5 mm. (Fig. 10).

The largest species of the genus, and indeed of the entire family, which is found in our fauna. The large distinct basal, and the faint general cinereous spots on the elytra, the convex thorax, annulated femora, black

spots on abdomen are the characters upon which to rely for a correct diagnosis. *Dermestes mannerheimi* Lec., appears to be only a variety in which the basal elytral spots are shorter and more confluent, while the transverse spots at middle and apex are wider and more distinct.

Occurs in the Western and Pacific States.

D. fasciatus Lec. Elongate, black, convex, quite densely clothed with black and cinereous pubescence. Elytra with a moderately broad sub-basal band, fine transverse mottlings of cinereous pubescence. Head moderately coarsely, densely punctate, pubescence semi-erect, dense, variegated fulvous and black. Antennæ piceous, club fuscous. Thorax very convex, lateral margins not visible from above, sides arcuate, densely and finely punctate, only a very slight depression at the middle of the base; pubescence dense, variegated, brown, black and cinereous. Scutellum covered with long, fulvo-cinereous, recumbent hairs. Elytra finely and densely punctate, striæ hardly apparent, pubescence black, marmorated with small, cinereous, transverse spots; a broad transverse band which does not reach the base also cinereous. Body beneath clothed with dense yellowish-white, recumbent pubescence, a single series of lateral black spots on abdomen, last segment black, except three white spots at base. Legs covered with dense brown hairs, femora annulated at middle. Length .32 inch; 8 mm. (Fig. 11.)

No difficulty will be encountered in recognizing this species; the broad, distinctly limited, transverse elytral cinereous band, which never attains the base, is characteristic.

Occurs in Colorado.

D. murinus Linn. Elongate, black, clothed with fine black and cinereous pubescence. Elytra black, covered with marmorate black and cinereous hairs. Head densely and moderately coarsely punctate, clothed with dense variegated hairs. Antennæ piceous, club fuscous. Thorax very convex in front, lateral margins not visible from above, sides arcuate; finely but densely punctate, a faint median basal depression, pubescence dense, variegated, a small white spot at middle. Scutellum clothed with cinereous hairs. Elytra black, densely and finely punctate, striæ indistinct, marmorate with fine sparse black, and coarser cinereous pubescence, the latter more dense at base. Body beneath black, clothed with long, dense, whitish yellow pubescence, abdomen with a row of black spots on each side, last segment black, marked with two white spots at base. Legs brown, femora annulated at middle with white. Length .22 inch; 8 mm. (Figs. 12, 13.)

This species is to be distinguished from the preceding by the irregularly mottled cinereous and black pubescence on the elytra, there being no distinct basal or sub-basal band. Two varieties can be recognized.

Variety a. In this the cinereous spots at the sides of the base of the elytra are confluent, the entire basal half appearing yellowish-white, except some black marking near the suture. (*Caninus* Germ.)

Variety b. The pubescence on the elytra is cinereous, faintly mottled with black. This form is smaller and more slender than the preceding, and was described by Dr. LeConte under the name *rattus*. I cannot, however, see anatomical characters by which it can be distinguished, the color of the pubescence not being sufficient, as all gradations through the first variety, up to a typical *murinus* are to be found.

Occurs in the Middle and Western States.

D. talpinus Mann. Elongate, convex, black, clothed with fine black recumbent hairs. Elytra black, covered with black pubescence, which is mottled with coarser ochre and gray. Head coarsely punctate, pubescence long, semi-erect, variegated. Antennæ fuscous. Thorax convex, anterior part of lateral margin not visible from above, sides arcuate; a not very distinct depression on base, finely and densely punctate, covered with bunches of variegated hairs. Scutellum clothed with coarse, recumbent, golden-yellow pubescence. Elytra black, densely and finely punctate, marked by a few faint striæ, pubescence black, marmorate with very small, transverse spots of ochre and gray. Body beneath clothed with long, recumbent, grayish-white pubescence, and a single series of lateral black spots on abdomen. Last segment entirely black, except two faint white spots, at base, on each side of median line. Legs clothed with brown pubescence; femora annulated at middle with white. Length .26 inch; 6.5 mm.

This species is to be distinguished from the foregoing mottled forms, by the almost black color of the pubescence on the elytra, and by the conspicuously yellow scutellum.

Occurs in the Pacific States.

D. sobrinus Lec. Elongate, convex, black, covered with short, sparse, fuscous pubescence. Elytra uniformly black, pubescent. Head moderately coarsely and densely punctate. Antennæ testaceous. Thorax convex, anterior part of lateral margin not visible from above, sides suddenly narrowed at middle, a very faint depression at middle of base, hind angles prominent, faintly and densely punctate, entirely pubescent. Scutellum densely punctate. Elytra finely and densely punctate, faint striæ just apparent, pubescence sparse and unicolored. Body beneath covered with long, dense, white, recumbent pubescence. Abdomen marked by two lateral and two sub-median longitudinal rows of spots of black pubescence. Legs clothed with dense brown hairs; femora annulated at middle with white. Length .32 inch; 8 mm.

The distinguishing characters of this species are found in the convex thorax, the uniform color of the pubescence on the upper surface, the four rows of abdominal spots and the annulated femora. Occurs in Texas—one specimen in Dr. LeConte's cabinet.

D. mucoreus Lec. Elongate, moderately convex, black, clothed with sparse black and cinereous pubescence. Elytra black, with a broad irregular

basal band rufous, which bears sparse reddish-yellow hairs. Head moderately coarsely and densely punctate, pubescence cinereous and dense. Antennæ piceous; thorax very convex anteriorly, anterior two-thirds of lateral margin invisible from above, sides arcuate, basal fovea indistinct; finely and densely punctate, covered at sides, base and front with cinereous pubescence, leaving a large triangular spot at middle naked. Scutellum black, sparsely pubescent.

Elytra black, basal third rufous, bearing an irregular transverse band of yellowish hairs; pubescence black, with a transverse spot on each side of suture, at middle, and some faint mottlings; cinereous, under surface clothed with dense, white hairs. Lateral spots on abdomen distinct; last segment white, legs sparsely pubescent, except the basal half of femora which is covered with dense white hairs. Length .28 inch; 7 mm.

A number of specimens received by Dr. Horn from Texas, on comparison with the type in Dr. LeConte's cabinet, prove to be of this species. The original description was of an immature form from an uncertain locality. The characters to be relied upon are the convex, naked at middle, thorax, with uniformly cinereous pubescence, faint basal puncture; the elytral rufous band; and the femora white at base.

D. pulcher Lec. Elongate, moderately convex, red, covered with sparse, short, recumbent, golden pubescence. Elytra black, except a narrow basal band, which is red. Head finely and moderately densely punctate. Thorax only moderately convex, lateral margins entirely visible from above, gently arcuate, base broadly lobed, two distinct basal foveæ on each side of lobe, hind angles prominent; finely and densely punctate. Elytra densely, moderately coarsely punctate; a few faint striæ indicated near apex, black, covered with very sparse, fine, black pubescence, except the base which is red, clothed with golden hairs. Scutellum punctate. Entire under surface (also antennæ and legs) red, finely punctate, pubescence fine. Length 25 inch; 6.2 mm. (Fig. 16.)

No trouble will be found in distinguishing this species; the general red color, with the almost entirely black elytra, the flattened thorax, with two basal foveæ; the absence of abdominal spots and white rings on femora, furnish conclusive characters.

Occurs in the Southern, Middle and Western States.

D. lardarius Linn. Elongate, moderately convex, black or piceous, clothed with short black sparse recumbent pubescence. Elytra marked at base with a broad rufous space which is covered with cinereous yellow and three spots of black pubescence. Under surface and legs black with yellowish pubescence, without spots or rings. Head moderately coarsely but very densely punctate, antennæ rufous. Thorax moderately convex, lateral margins entirely visible from above, basal fovea not very deep; finely, but very densely punctate, pubescence black, scutellum covered with black pubescence. Elytra finely, but very densely, punctate, indistinct striæ near apex, black with a space at base rufous which bears yellow

hairs and a transverse row of three black spots at the basal third. Length .24-.30 inch ; 6-15 mm. (Figs. 14, 15.)

The most common of all the species ; to be recognized by its more elongate form, basal band of cinereous pubescence on elytra, and the uniform color of the hair on the under surface. A rubbed specimen bears some resemblance to *mucoreus*, but the important characters on the thorax and under surface of the latter, already given, would separate it at once.

Dermestes signatus Lec. is a variety in which the thorax is covered with denser cinereous pubescence, marked by three small black spots on disc, and the elytra almost entirely piceous, the cinereous pubescence extending nearly to the apex. A well furnished cabinet exhibits a complete series of gradations from the typical *lardarius* down to the variety under consideration.

Occurs everywhere.

D. elongatus Lec. Elongate, cylindrical, black or piceous, covered with moderately long, dark brown, recumbent pubescence. Elytra uniform in color, arcuate, marked by striæ. Antennæ, legs and under surface piceous. Head moderately coarsely punctate. Thorax only moderately convex, sides gently arcuate, slightly margined, finely and densely punctate, two not very distinct basal foveæ. Elytra black, finely and densely punctate, eight or ten distinct striæ from base to apex, under surface and legs covered with uniform dark cinereous pubescence. Length .36 inch ; 9 mm. (Fig. 17.)

The most elongated of all the forms under consideration, with the striæ on the elytra more apparent. The uniform pubescence and absence of markings on legs and abdomen are important additional characters. This species may be identical with *bicolor*, but from the description the form seems less elongated and the striæ deeper in the latter. A comparison of types would alone settle the matter. I have preferred to keep them, temporarily, at least, separate.

Occurs in the Southern and Western States.

D. cadaverinus Fabr. Elongate, moderately convex, black or piceous, clothed with sparse, short, recumbent, cinereous pubescence. Elytra black. Under side, legs and antennæ piceous. Head black, densely and moderately coarsely punctate. Thorax black, lateral margins arcuate, entirely visible from above ; base lobed, with two very distinct basal foveæ, densely, moderately coarsely punctate, with faint striæ on apical portion. Body beneath more densely pubescent. Abdomen without black spots at sides ; legs not annulated. Length .27 inch ; 6.7 mm.

This species is to be distinguished by the uniform color of thorax and elytra and of their pubescence, by the deep thoracic foveæ and only faint apical striæ on elytra.

Occurs in Florida.

D. vulpinus. Elongate, black, convex, clothed with sparse cinereous pubescence. Elytra uniform in color. Head densely, moderately coarse-

ly punctate. Antennæ rufous. Thorax very convex in front, lateral margin not visible from above, finely and densely punctate, no distinct basal foveæ, pubescent only at sides and front, leaving a large triangular median space, naked. Scutellum clothed with orange-yellow hairs. Elytra black, finely and densely punctate, hardly any appearance of striæ, covered with sparse, cinereous, semi-erect pubescence. Body beneath clothed with long dense white hairs, a row of black spots on each side of abdomen, the fourth segment alone marked by a median pit, which bears a bunch of brown hairs; last segment brown, except two white spots on either side of median line. Legs covered with brown hair. Femora not distinctly annulated. Basal half almost entirely yellowish-white. Length .36 inch; 9 mm.

The male of this species can be recognized at once by the single abdominal pit on the fourth segment; the female by the convex, naked at disc, thorax; the uniform color of the upper surface, and the abdominal spots and indistinct markings on femora, which are important characters, common to both sexes.

ATTAGENUS Latr.

Head small, front wide and flat, ocellus distinct. Epistoma short. Eyes round, entire, moderately prominent. Antennæ eleven-jointed, terminated by a three-jointed club, which varies greatly in the different species. Mouth parts not protected by prosternum, thorax convex, at base not quite twice as wide as long, apex half as wide as base, which is strongly bisinuate, sides arcuate, hind angles prominent. Scutellum small but distinct. Elytra elongate, moderately convex, apices hardly separately rounded. No antennal fossæ, prosternum not lobed in front, broad and moderately long, except in *varicolor*, in which it is narrow and short, prolonged behind into a tip which is acute, and extends slightly beyond the anterior coxæ. Mesosternum narrow, moderately long (very long in *Hornii*), sulcate anteriorly, mesocoxæ not widely separated. Posterior coxal plate very long, prominent, narrow, obliquely truncate externally. Legs stout, femora channeled beneath for tibiæ; first joint of tarsi very short, 2-5 successively larger.

The distinguishing characters of this genus are the narrow, emarginate mesosternum, prosternum simple in front, the 11-jointed antennæ and absence of antennal fossæ, and the long prominent hind coxal plate.

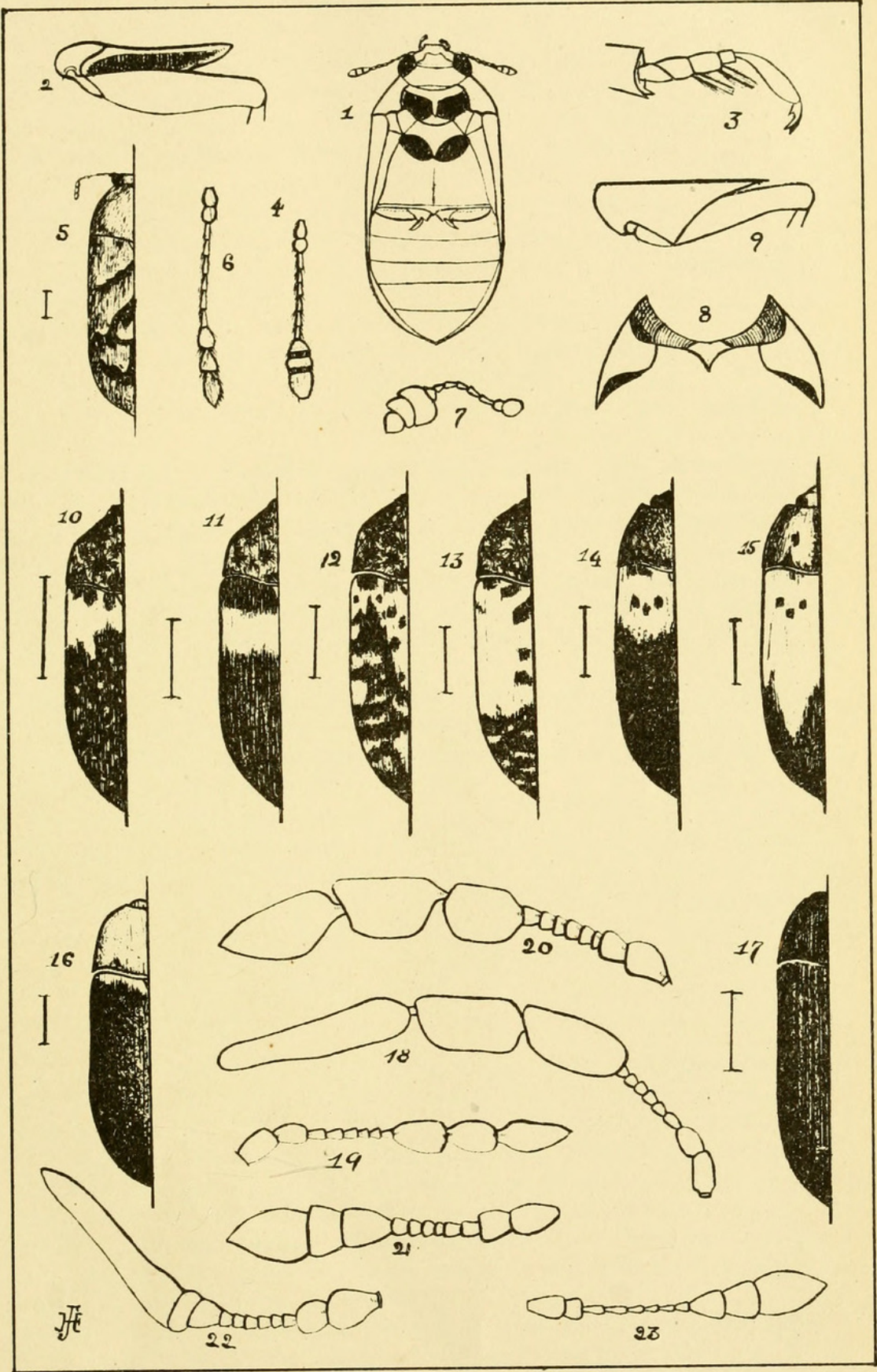
The following table is put forth to aid in separating our species:

Prosternum broad, moderately long.

Elytra uniformly black or piceous. Last joint of male club four or five times as long as the preceding two united, which are very small.

Pubescence on elytra uniformly dark and sparse..... piceus.

Pubescence on elytra dense and white on a smooth spot at middle, on each side of suture..... pellio.



DERMESTIDÆ.

Elytra fulvous, with a black sub-basal spot and longitudinal broad band on either side of suture extending almost to the apex, pubescence uniformly cinereous. Last joint of male club as long as the preceding two united, which are very large and equal. **Hornii.**

Elytra black with a sub-basal sinuous transverse piceous band, which bears dense whitish pubescence, all three joints of male club very large and equal. **perplexus.**

Prosternum narrow and short.

Elytra black, with three, more or less confluent, broad piceous spots on either side of suture; whitish pubescence arranged in three distinct transverse fasciæ, all three joints of male antennæ club very large and equal. **varicolor.**

A. piceus Oliv. Elongate, convex, black, clothed with short, semi-erect, yellow pubescence. Head coarsely punctate, sparsely pubescent. Antennæ rufo-testaceous. Thorax black, coarsely punctate, pubescent at sides and base. Scutellum pubescent. Elytra black, or rufous, coarsely punctured, clothed with very sparse, brownish pubescence. Body beneath black, coarsely and densely punctate, clothed with semi-erect, yellow hairs. Prosternum long and wide. Legs rufous. Length .14-.20 inch; $3\frac{1}{2}$ -5 mm. (Fig. 26.)

Male. Antennæ with first joint large, suboval; second smaller; joints 3-8 small; 9-11 forming the club, of which the first two joints are wide but very short, the last wide, extremely long, pointed at end—equaling all the preceding part of the organ. (Fig. 22.)

Female. Antennal club compact, not quite equal to all the preceding joints, made up of three joints of which 9-10 are equal; while the last equals the two united. (Fig. 23.)

Under this name I have included *rufipennis*, *dichrous*, *spureus*, *megatoma*, as I can see no characters by which they can be separated. The sparsely pubescent uniformly colored elytra, the broad prosternum and the structure of the male antennæ are diagnostic.

Occurs everywhere.

A. pellio Linn. Elongate, convex, black, clothed with short, semi-erect, brown hairs; head coarsely punctate, pubescence sparse, brown and erect, antennæ rufo-testaceous, club cinereous. Thorax coarsely punctate, base and angles clothed with white pubescence; scutellum pubescent. Elytra black, sparsely pubescent, a small smooth spot on either side of suture is clothed with dense white hairs. Body beneath black, coarsely punctate, pubescence yellow, semi-erect. Prosternum wide, moderately long; abdominal segments rufous, margined with black, pubescent. Length .21 inch; 5.5 mm. (Figs. 29, 30.)

Male. Antennal club with joints 9-10 very small—last joint very large, as long as all the remaining portion of the antennæ.

Female. Antennal club compact, joints 9-10 wide, together equaling the last segment.

Distinguished by the elytral spots, uniform color, and the structure of the prosternum and male antennal club.

Occurs in New England.

A. Hornii, n.sp. Elongate, convex, black, clothed with dense, cinereous, semi-erect pubescence. Elytra fulvous with a broad longitudinal black band, interrupted obliquely at basal third, of black; head coarsely punctate, pubescent, antennæ testaceous; thorax coarsely punctate, densely pubescent. Elytra coarsely punctate, fulvous with a basal spot and longitudinal band rufous; entirely clothed with dense, cinereous recumbent pubescence. Body beneath rufo-piceous, moderately coarsely punctate, clothed with short cinereous hairs, prosternum moderately long, wide. Mesosternum twice as wide as long, sulcate in front, very prominent. Abdominal segments black with short cinereous hairs. Legs testaceous. Length .14 inch; 3.5 mm. (Figs. 24, 25.)

Male. Antennal club elongate, with joints 9-10 very large, equal, together as long as all the preceding joints, 11 elongate almost equal to 9 and 10 united. (Fig. 18.)

Female. Antennal club elongate, joints 9-10-11 equal. (Fig. 19.)

This species is easily separated from the rest, by the markings, and dense cinereous pubescence of the elytra and by the structure of the male antennal club. The mesosternum is long, less deeply sulcate and more prominent than in the other species.

It was recognized by Crotch as a new form and labeled in the collections with the above name, although no description has ever been published.

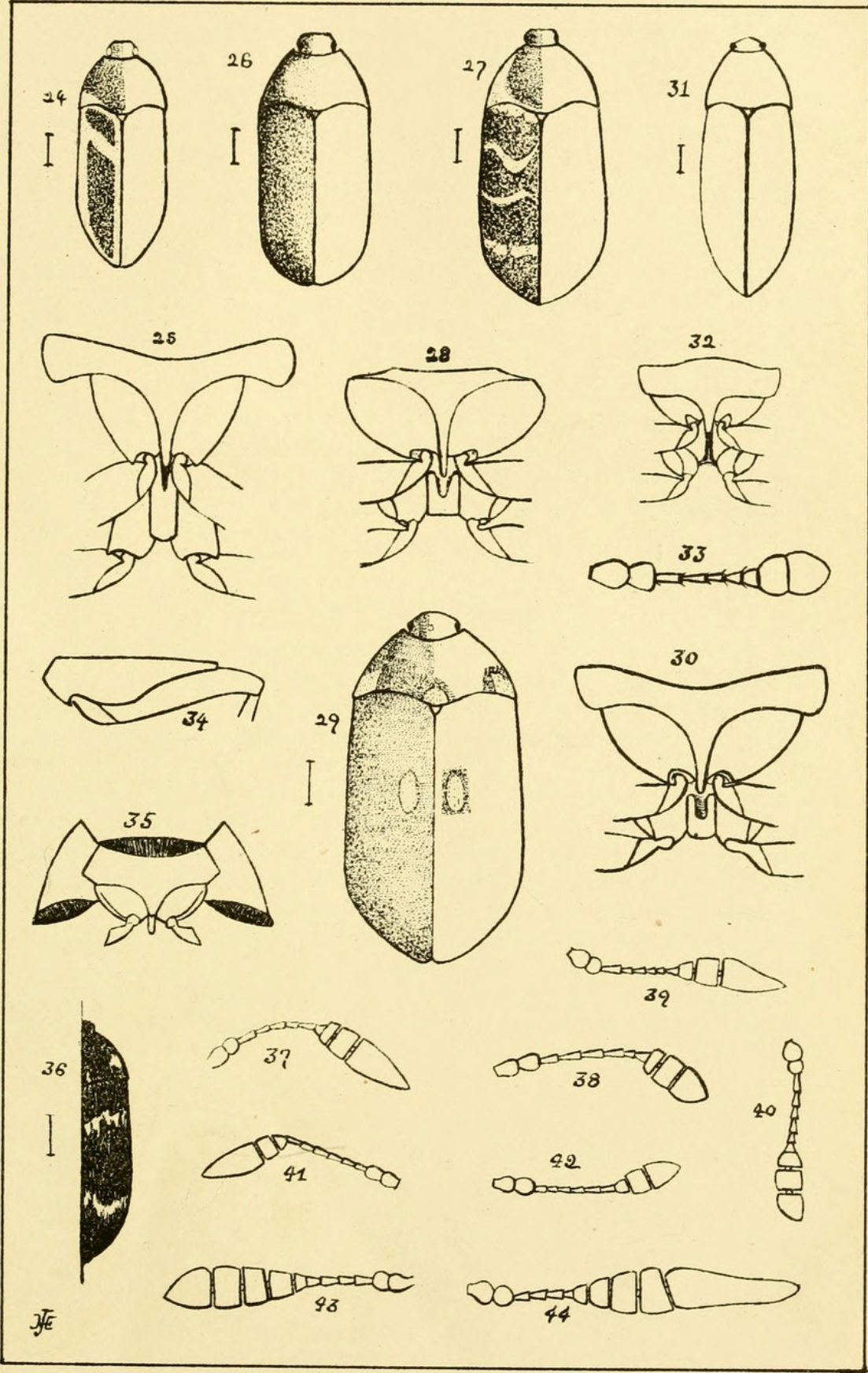
A. byturodes Cr. of the Check List is the female of this species. Occurs in the Pacific States.

A. perplexus n.sp. Elongate, convex, black, clothed with short, black, semi-erect pubescence. Elytra with broad sinuous basal and a few spots at middle and apex, of whitish pubescence. Head coarsely punctate, pubescence black and cinereous. Antennæ rufous. Thorax densely and coarsely punctate, disc sparsely, sides and base more densely clothed with long semi-erect yellow pubescence. Elytra black, with a piceous sinuous sub-basal band which bears whitish-yellow hairs. Body beneath black, coarsely punctate, pubescence short, semi-erect, yellowish-white. Prosternum wide, moderately long, abdominal segments black, finely punctate, pubescent, legs rufous. Length .16 inch; 4 mm.

Male. Antennal club with joints 9-10 equal; 11 slightly longer not equal to both the preceding united.

Female. Antennal club with the last joint equal to two preceding united.

This species is entirely different in appearance and in the structure of the male antennal club from all others in our fauna except *varicolor*, from



which it can be easily distinguished by the narrow short prosternum and broad confluent piceous spots on the elytra of the latter.

Occurs in Nevada.

A. varicolor, n. sp. Elongate, convex, black, covered with whitish-yellow, semi-erect pubescence. Head and thorax coarsely punctate, pubescent. Antennæ rufous. Scutellum pubescent. Elytra black, clothed with black, semi-erect pubescence, marked by three irregular transverse confluent rufous spots, with three sinous transverse bands of white semi-erect pubescence. Body beneath black, punctate, covered with short, cinereous hairs. Prosternum very short and narrow. Legs rufo-testaceous. Length .16 inch ; 4 mm. (Figs. 20, 21, 27, 28.)

Male. Antennal club not quite twice as long as all the preceding portion, with joints 9-11 very large ; last joint only slightly longer.

Female. Antennal club small, equal to all the preceding joints united, last joint almost equal to the two others together.

The distinguishing characters of this species are the narrow prosternum ; structure of male antennal club ; the elytra, black and piceous, bearing three distinct white fasciæ.

Occurs in the Pacific States.

DEARTHURUS Lec.

Head as wide as anterior border of thorax. Eyes round, large, very prominent, entire. Antennæ 9-jointed, terminated by a 3-jointed club (fig. 33). Thorax not twice as wide as long, slightly bisinuate at base. Elytra elongate, sides nearly parallel. Prosternum one-third as long as wide, tip sub-acute, not produced beyond anterior coxæ. No true antennal fossæ. Mesosternum narrowly divided. Mesocoxæ not widely separated (fig. 32). Metasternum short, side pieces wide. Posterior coxæ not reaching the sides of body. Coxal plates short and wide, covering more than basal half of femora. Legs slender, first four joints of tarsi subequal, last joint much longer, hardly equal to all the others taken together.

This genus, founded upon one species, has been merged into *Attagenus*, from which, however, it is undoubtedly distinct. The 9-jointed antennæ, the peculiar prosternum, the narrowly divided mesosternum, the short and wide posterior coxal plates like those of *Trogoderma* and allied genera, and finally, the entire facies of the insect, are characters too important to be overlooked or underestimated.

D. longulus Lec. Elongate, compressed, black, clothed with sparse yellow semi-erect pubescence. Head black, coarsely punctate, sparsely pubescent. Thorax coarsely punctate, sparsely pubescent. Elytra black or piceous, coarsely punctate, sparsely pubescent. Body beneath rufous, moderately coarsely punctate, clothed with sparse, cinereous pubescence. Abdominal segments rufous, margined with rufo-testaceous, punctate, pubescent. Legs rufous. (Fig. 31.)

Length .1 inch ; 2.5 mm.

Male. Antennæ of nine joints, first very large, sub-oval; second somewhat smaller; 3-6 small; 7-9 forming the club equal to all the preceding united, of which the first is very small; the second wider and longer; the last twice as wide as the second and almost three times as long as the two united, obtusely pointed at tip.

Female. Club of antennæ a little more than half as long as the preceding joints taken together; last joint as wide as, and little longer than the second; nearly truncate at tip.

Occurs in the Atlantic district.

PERIMEGATOMA Horn.

Form elongated, only moderately convex, body dark in color. Head moderately wide, front flat, epistoma moderately short; a distinct ocellus. Antennæ 11-jointed, club 3-jointed, except in *Belfragi*, where it is 5-jointed. Eyes large, round, prominent, and entire. Thorax twice as wide at base as at apex, and half as long as the greatest width, very convex and prominent in front, with a transverse depression across the base, which is slightly bisinuate. Sides arcuate, hind angles prominent, except in *Belfragi*, where they are somewhat retracted. Scutellum small, but distinct. Elytra long, sides nearly parallel, apices not separately rounded. Prosternum only moderately broad, and very long, lobed in front, covering all the mouth parts, except the labrum, produced behind into a short tip received into the mesosternum, which is narrow and deeply emarginate. No antennal fossæ, spaces between prosternum and lateral margins slightly concave (Fig. 35), metasternum short, side pieces wide. Legs stout. Posterior coxæ do not attain the sides; coxal plate short, moderately wide (Fig. 34); first joint of tarsus long, 2-3-4 successively shorter, 5 as long as first.

This genus was established for several species, occurring from Lake Superior to Texas, California and Sitka, which agree with *Megatoma* in all the characters except in the antennal fossæ, which are absent in this genus. The ornamentation, by the pubescence of the surface, resembles somewhat that of *Megatoma*, there being two transverse, undulating, cinereous bands, the one at the basal third, the other at the apical fourth.

The following is the arrangement of the species, proposed by Dr. Horn (Trans. Am. Ent. Soc. 1875, p. 135):

Antennal club 3-jointed.

First joint of club in both sexes, very little smaller than the second joint.

Pubescence unicolored, grayish-white (.16 inch)..... **cylindricum.**

Pubescence bicolored (.20 inch)..... **variegatum.**

First joint of club extremely short.

Pubescence bicolored (.14) **falsum.**

Antennal club 5-jointed.

Pubescence bicolored..... **Belfragi.**

P. cylindricum Kby. Oblong, oval, piceous, shining, sparsely clothed with moderately short, semi-erect, easily removed, cinereous pubescence. Elytra uniformly piceous or marked by two transverse rufous bands. Head coarsely and densely punctate, pubescence sparse. Antennæ rufous. Thorax very densely and coarsely punctate, moderately densely pubescent, especially at sides. Elytra less densely and coarsely punctate, either black and uniformly pubescent or marked by two piceous bands at apical and basal third, to which the pubescence is more closely adherent. Body beneath piceous, coarsely punctate, moderately densely pubescent. Legs piceous. Length .13-.16 inch ; 3.2-4 mm.

Male. First and second joints of antennæ large, sub-equal, 3-8 very small, 9-11 forming a club which is longer than all the preceding joints together, the first nearly as large as the second, and the last longer than the other two together, and pointed at tip. (Fig. 37.)

Female. Club of antennæ only half as long as the preceding joints together, last joint not much larger than second, obtusely pointed at tip. (Fig. 38.)

Occurs from Hudson Bay Territory to California.

Certain specimens from California, in Dr. LeConte's collections, differ somewhat in the ornamentation of the elytra. Dr. Horn describes them as follows :

Specimen a. Uniformly piceous, pubescence normal, slightly denser at the sides of the thorax (*angularis* Mann).

Specimen b. Similar to *a*, but with the pubescence adhering more closely, and forming a very indistinct sinuous band at basal and apical third.

Specimen c. Elytra with sinuous, transverse, rufo-piceous bands at apical and basal third, to which the pubescence is very closely adherent, causing the elytra to be conspicuously marked.

This species is easily recognized by the uniform color of the pubescence and by the antennal club.

P. falsum Horn. Form, color, and ornamentation as in *cylindricum*, *variety c.* The pubescence of the elytra is bicolored, composed of pale-brownish and grayish-white hairs intermixed, the former forming a narrow, transverse band in front of the rufous bands of the elytra. Length .14 inch ; 3½ mm.

Male. Club of antennæ slightly longer than all the preceding joints together, first joint extremely short, but nearly as wide as the second, terminal joint more than twice as long as the two preceding together, and pointed at tip. (Fig. 41.)

Female. Club of antennæ not longer than the preceding joints taken together, first joint much shorter than the second, terminal joint slightly longer than the first two united, and but little longer than wide, oval at tip. (Fig. 42.)

Occurs in California, and is to be known by the short first joint of the antennal club.

P. variegatum Horn. Oblong-oval, piceous or piceo-rufous. Elytra with two sinuous transverse bands of rufous, with dense white pubescence. Head and thorax densely punctured, covered with intermixed pale-brown and white hairs. Elytra oblong-oval, sides sub-parallel, surface less densely punctured than the thorax. Color piceous, with a sinuous rufous band at basal and another at apical third, rather densely covered with white pubescence, the remainder of the surface with intermixed pale-brown and whitish hairs. Body beneath densely punctured, sparsely covered with cinereous hairs. Antennæ rufous or pale brown. Length .20-.22 inch; 5-5.5 mm. (Fig. 36.)

Male.—Club of antennæ not quite equal to the preceding joints united, first joint as large as second, terminal as long as the first and second together, and pointed at tip. (Fig. 39.)

Female. Club of antennæ not longer than preceding joints together, first two joints nearly equal, and the terminal shorter than the other two united, oval and slightly obliquely truncate on the inner side. (Fig. 40.)

Occurs in California and Oregon. This species is larger and broader than the two just considered. It may be recognized by the bicolored pubescence and the structure of the antennal club.

P. Belfragi Lec. Structure, color and ornamentation similar to the preceding species, but the form is decidedly more elongate. Length .22 inch; 5.5 mm.

Male. Club of antennæ of five joints, twice as long as all the preceding joints united, first and second joints moderately wide, but short, subequal, third and fourth much wider, and twice as long, terminal as long as the four preceding together, and obtusely pointed at tip. (Fig. 43.)

Female. Club of antennæ of five joints, about equal to the preceding joints united; terminal joint hardly equaling third and fourth, almost globular. (Fig. 44.)

Occurs in Texas.

ACOLPUS, n. g.

Head as wide as front margin of thorax. Frontal ocellus distinct. Eyes large, prominent, round and entire, moderately coarsely granulated, mouth parts free, antennæ 11-jointed, thorax about twice as wide at base as long, apex only one fourth as wide as base, sides arcuate, lateral margins somewhat flattened, hind angles prominent, base bisinuate. Scutellum small, nearly covered by the thorax; elytra about twice as long as wide, sides subparallel, apices slightly separately rounded; no antennal fossæ; spaces between prosternum and lateral margin concave, coarsely punctate; prosternum broad, moderately long, produced posteriorly into an acute long tip, completely dividing the mesosternum, which is wide. Mesocoxæ therefore widely separated. Mesosternum short, side pieces

wide; hind coxæ moderately long, narrow, coxal plates only attaining side pieces. Legs stout, reaching sides of body; first joint of tarsus long, second shorter, third and fourth still smaller, the fifth equals the first.

This genus differs from *Trogoderma* by the absence of the antennal fossæ. There is but one species.

A. primus, n. sp. Elongate, moderately convex, black, clothed with very sparse, semi-erect, moderately long, cinereous pubescence. Elytra piceous, with a moderately broad transverse sinuous band on the basal third yellow, antennæ, abdomen and legs, piceous. Head densely and very coarsely punctate, antennæ 11-jointed; joints 1-2 large; 3-5 much smaller; 6-11 large and wide, forming an elongate serrated club. Thorax very densely and coarsely punctate, pubescent at sides. Elytra coarsely, much less densely punctate; a transverse depression across the base, piceous except a transverse sinuous yellow band at the junction of the basal and middle thirds, which is moderately broad and directed slightly forward, and somewhat more densely covered with lighter hair. Body beneath rufous, very coarsely punctate, pubescence shorter, more dense and recumbent. Length .68 inch; 2mm. (Fig. 45.)

Two specimens from Texas in Dr. LeConte's cabinet, from Mr. Bel-frage.

The single light band on the elytra will serve as an additional character to separate this species from any of our known *Trogoderma*.

TROGODERMA Latr.

Oblong, convex, dark, elytra marked with sinuous rufous bands, bearing light pubescence. Head small, a distinct ocellus, front flat, clypeus short. Eyes prominent, moderately coarsely granulated, round, entire in *simplex*, *sternale* and *ornatum*, emarginate in front in *inclusum*. Thorax very convex, twice as wide at base as long, base three times as wide as apex, bisinuated, slightly produced sub-acutely in the median line, sides arcuate, hind angles moderately prominent. The antennæ are 11-jointed, terminated by a club which is 6-jointed and strongly serrate in the males of *sternale* and *ornatum*, 7-jointed, not pectinate in the males of *inclusum*, and 5-jointed in the females of *simplex*, and 4-jointed in the females of the other species. Scutellum moderately large, uncovered. Elytra with sides sub-parallel, apices separately rounded.

Antennal fossa occupying the entire space between the prosternum and lateral margin of thorax, except in *simplex*, where they are limited to the anterior part of the prosternal suture. Prosternum moderately broad and long, not lobed in front, produced behind into a long tip, which is broad, entirely dividing the mesosternum in *simplex*, *ornatum* and *inclusum*, acute in *sternale*, the mesosternum being only deeply emarginated. Mesocoxæ very widely separated. Posterior coxal plates moderately long and wide, not reaching the sides. Legs stout, femora grooved beneath to receive

the tibiæ; first joint of tarsi long, second, third and fourth successively shorter, together equaling the fifth.

The elytra of all the species, in our fauna at least, are fasciate. The anatomical characters by which to recognize this genus are: the distinct antennal fossæ, characteristic antennæ, prosternum not lobed in front, the broad, deeply emarginate or entirely divided mesosternum, and the moderately wide and long posterior coxal plate.

Our species may be arranged as follows:

Eyes entire.

Antennal fossa near prosternal suture..... **simplex.**

Antennal fossa sub-marginal.

Prosternal tip broad.

Mesosternum broadly divided..... **ornatum.**

Prosternal tip narrow.

Mesosternum deeply emarginate..... **sternale.**

Eyes emarginate in front..... **inclusum.**

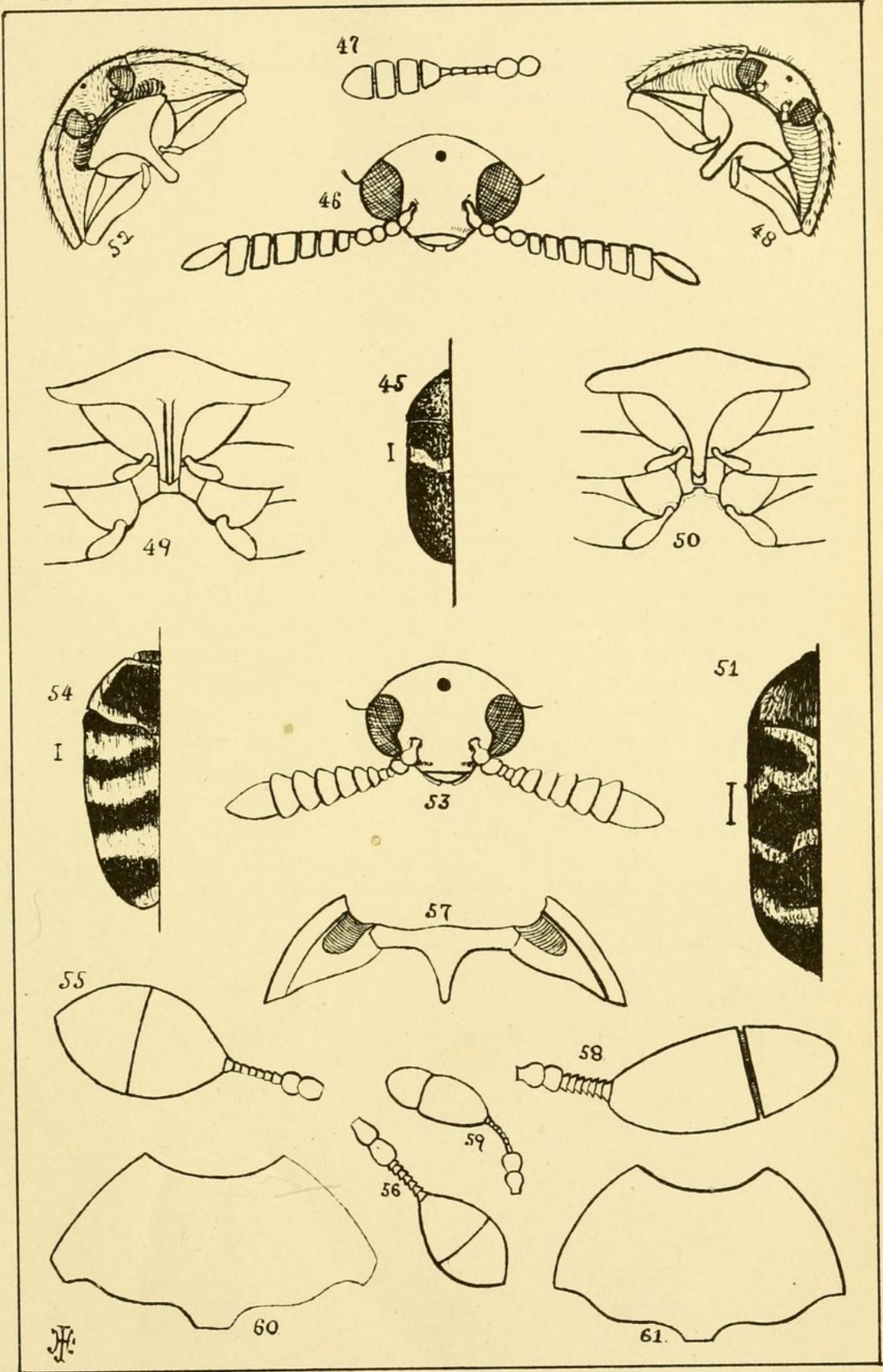
T. simplex, n. sp. Oblong, black, clothed with black semi-erect pubescence. Elytra black, with three sinuous bands and apical spot rufous with white pubescence. Head coarsely punctate, front covered with coarse yellow hair. Eyes entire, moderately prominent. Antennæ piceotestaceous, joints 1 and 2 rufous. Thorax coarsely, not very densely, punctate, with whitish-yellow pubescence at sides and base, disc less pubescent. Scutellum pubescent. Elytra coarsely punctate, black, with three irregular bands of red, bearing semi-erect whitish pubescence. Body beneath black, coarsely punctured, clothed with short recumbent cinereous pubescence. Antennal fossa limited to a small space near prosternal suture. Prosternum long, moderately broad, tip prolonged, completely dividing the mesosternum. Abdominal segments black, margined with rufous, clothed with cinereous pubescence. Legs piceous, tibiæ and tarsi rufous. Length .20 inch; 5 mm. (Figs. 51, 52.)

Male unknown.

Female. Antennæ with joints 1 and 2 large, almost equal, 3-6 small, globular, 7-11 forming the club, which is fusiform.

The distinguishing characters of this species are the completely divided mesosternum, the entire eyes, and antennal fossæ limited to the prosternal sutures. It is of larger form than any of our known species. Found in the Western States.

T. ornatum Say. Oval, black, clothed with semi-erect, black pubescence. Elytra with three irregular confluent bands and apical and basal spots of gray pubescence. Head with front densely and coarsely punctate, clothed with erect black pubescence, eyes entire, moderately prominent. Antennæ testaceous. Thorax moderately sparsely punctate. Scutellum pubescent. Elytra coarsely, moderately sparsely punctate, black, clothed with black pubescence and with three irregular bands of red, bearing gray pubescence.



Body beneath black, clothed with cinereous pubescence, coarsely punctate. Antennal fossæ deep and large. Prosternum long and moderately broad, tip broad, sub-carinate. Mesosternum completely and broadly divided to receive prosternum. Abdominal segments black or rufous, coarsely punctate and pubescent. Legs rufous. Length .08-.20 inch ; 2.5 mm. (Figs. 46, 47, 48.)

Male. Antennæ with joints 1-2 large and equal, globular, 3-5 small and globular, 6-11 strongly pectinate, forming the club.

Female. Antennæ with joints 1 and 2 almost equal, large, globular, 3-7 small, globular, 8-11 forming the club.

This species may be separated by its entire eyes, the character of the antennæ, the large antennal fossæ, the broad tip of the prosternum and the widely divided mesosternum. It is of moderate size.

Occurs everywhere.

T. sternale, n. sp. Oblong, black, clothed with sparse, black, semi-erect pubescence. Elytra black, with three irregular confluent bands and apical and basal spots of red, bearing whitish pubescence. Head coarsely punctate, sparsely pubescent. Eyes entire, moderately prominent. Antennæ rufo-testaceous. Thorax coarsely punctate, sides and base bearing whitish pubescence. Elytra black, with three variable rufo-testaceous bands, bearing white or gray pubescence, the rest sparsely clothed with black hairs. Body beneath piceous, coarsely punctate, with cinereous pubescence. Antennal fossa moderately deep, occupying all the space between prosternum and lateral margins. Prosternum short, moderately wide, tip convex and acute. Mesosternum deeply incised but not entirely divided. Abdominal segments piceous (variable to rufous), apical margins testaceous. Legs rufous. Length .08-.16 inch ; 2-4 mm. (Fig. 50.)

Male. Antennæ with joints 1 and 2 large, 3-5 small and equal, 6-11 forming a deeply pectinate club ; joints 10 and 11 are usually connate.

Female. Antennæ with joints 1 and 2 large, 4-7 small, 8-11 forming the club.

The distinctive characters of this species are the entire eyes ; pectinate antennæ ; large antennal fossæ ; acute tip of prosternum and the mesosternum only deeply incised. It is the smallest form in the genus.

Occurs in California, New Mexico, Arizona, Texas, &c.

T. inclusum Lec. Oval, somewhat oblong, black, clothed with moderately long semi-erect black pubescence. Elytra with four sinuous confluent bands of red, bearing whitish pubescence. Head coarsely and densely punctured, quite sparsely pubescent. Eyes deeply emarginate in front, not very prominent. Antennæ testaceous. Thorax finely punctate, moderately sparsely pubescent. Elytra black, with four irregular bands of red, bearing grayish pubescence, the rest with sparse black pubescence, coarsely punctate. Body beneath piceous, coarsely punctate, with cinereous recumbent pubescence. Antennal fossa deep, occupying nearly all

the space between the front and lateral margins. Prosternum short, moderately wide, tip wide, convex, not carinate. Abdominal segments rufous, apical margins paler, pubescent. Legs rufo-testaceous. Length .08-.16 inch; 2-4 mm. (Fig. 53.)

Male. Antennal joints 1 and 2 large, 3-4 very small, 5-11 forming the club, which is not deeply pectinate.

Female. Antennal joints 1 and 2 large, 3-7 small, 8-11 forming the club.

This well known species possesses well marked characters by which it can be at once separated from the preceding forms. The emarginate eyes and non-pectinate antennæ united with large antennal fossæ, broad prosternal tip and completely divided mesosternum are conclusive. *T. tarsale* Mels. and *T. pallipes* Zieg. are identical with this species.

Occurs in Pennsylvania, Massachusetts and South Carolina.

CRYPTORHOPALUM Guér.

Head moderately large, front wide, with a prominent ocellus, the epistoma short and on the same plane with the front, eyes prominent, round, moderately coarsely granulated, entire. The antennæ are 11-jointed, terminated by a 2-jointed club, which is twice as long in the males as in the females, the joints being equal in *hemorrhoidale*, the terminal joint much shorter than the preceding in all the other species. The thorax at base is twice as wide as long, apex one half the width of the base; the latter bisinuate, quite strong, lobed behind on the middle line, lobe truncate, partially overlapping the scutellum; the sides are arcuate, somewhat dilated over the antennal fossæ in the males of all the species, very markedly so in *ruficorne*; hind angles acute and prominent except in the male of *ruficorne*, where they are retracted. Scutellum distinct, triangular. Elytra widest at base, sides oval, apices separately rounded. Antennal fossæ distinct; the mouth parts, except the labrum, are covered by the prosternum which is not lobed in front, but is wide, moderately long, the tip broadly produced, widely dividing the mesosternum and consequently causing the mesocoxæ to be widely separated. Metasternum short, side pieces wide. Hind coxal plates moderately long, wide, reaching the epimera of metathorax. Legs stout, femora grooved beneath for tibiæ, first and last joint of tarsi long, nearly equaling the small intermediate ones united.

The species of this genus are small, black or piceous, and moderately coarsely punctate, the elytra are sparsely pubescent except in *balteatum*, where the grayish hairs are arranged in fasciate form. The anatomical characters by which this genus is separated from the others, are the wide, short, flat front; the 2-jointed club of the antennæ; the submarginal antennal fossæ; the prosternum covering all the mouth parts except the labrum; its broad tip dividing widely the broad mesosternum; and the wide, moderately long, posterior coxal plates.

The species can be tabulated as follows :—

Elytra with two sinuous transverse bands, humeral ring, and apical spot of yellowish white pubescence.....	balteatum.
Elytra sparsely and uniformly pubescent. Posterior third distinctly lighter in color than the re- mainder. Both joints of the antennal club sub- equal; metasternum finely and sparsely punctate..	hemorrhoidale.
Apex only distinctly lighter than remainder. Last joint of antennal club much smaller than pre- ceding. Metasternum coarsely and densely punctate,	apicale.
Elytra uniform in color. Last joint of antennal club smaller than preceding. Thorax finely and densely punctate; sides nearly arcuate and hind angles acute in the male.....	triste.
Thorax almost smooth; sides greatly dilated and hind angles retracted in the male.....	ruficorne.

C. balteatum Lec. Oval, convex, piceous or fuscous, clothed with moderately long, yellowish, semi-erect pubescence. Elytra marked by two transverse sinuous bands, a humeral ring, and apical spot of longer whitish pubescence. Head coarsely punctate. Antennæ fuscous, terminated by a large 2-jointed club. Thorax convex, hind angles acute, moderately finely punctate, pubescence more dense at sides and base. Scutellum small, naked. Elytra coarsely punctate, piceous, sparsely clothed with semi-erect, yellow and black pubescence, with humeral ring, two transverse bands, and apical spot of dense whitish-yellow hairs. Body beneath black or piceous, coarsely punctate, covered with fine, long, semi-erect, yellowish-white pubescence. Metasternum moderately finely punctate. Abdomen fuscous, coarsely punctate, densely pubescent. Legs rufous.

Male. I have not been able to see any males of this species.

Female. Antennal club elongate, made up of two joints, nearly equal, about as wide as long, together equaling all the preceding joints. The club is received into a fossa which occupies only the anterior half of the space between the prosternum and lateral margin, is almost circular, and appears to lie transversely. Length .10 inch; 2.5 mm. (Fig. 44.)

The distinguishing characters of this species are the coarsely punctate, piceous, fasciate elytra, and the structure of the antennal club.

The banded elytra give the insect the appearance of a *Trogoderma*, but the generic characters, already given, serve to separate this species with certainty.

Occurs in the Pacific States.

C. hemorrhoidale Lec. Elongate-oval, moderately convex, reddish-brown, clothed with moderately long, yellow, semi-erect pubescence. Elytra reddish-brown, posterior third lighter. Head black, very coarsely and densely punctate, sparsely pubescent. Antennæ light brown. Thorax

convex, moderately finely punctate, pubescence long and yellow. Scutellum naked and rough. Elytra black as far as the posterior third, which is piceous or rufous, very sparsely pubescent, coarsely and moderately densely punctate. Body beneath black, coarsely, except the metasternum, which is finely punctate; pubescence long and yellow. Legs with thighs rufous, tibiae and tarsi lighter. Length .09 inch; 2.1 mm.

Male. Antennal club very large, composed of two sub-equal joints, almost disc-shaped, and twice as long as the preceding segments united. (Fig. 45.)

Female. Antennal club of two sub-equal joints, together only as long as all the other joints united. (Fig. 46.)

The important characters which enable us to separate this species are, the constant light color of the posterior third of the elytra, the oval antennal club of two sub-equal joints, and the finely punctate metasternum.

Occurs in the Southern and Western States.

C. apicale Mann. Elongate, convex, black, sparsely clothed with moderately long, yellowish, semi-erect pubescence. Head coarsely punctate, sparsely pubescent. Antennae light brown. Thorax with hind angles acute, black, finely and densely punctate, pubescence sparse. Scutellum small, scabrous, naked. Elytra black, apex rufous, coarsely punctate, pubescence sparse, yellow and black; apex usually clothed with dense yellow hairs. Body beneath black, moderately coarsely punctate, sparsely pubescent. Metasternum very coarsely punctured. Abdomen black or piceous. Legs rufous, tibiae, etc., lighter. Length .11 inch; 2.3 mm.

Male. Antennal club elongate, of two joints, the last of which is half as long as the preceding, together twice as long as all the others united. Club received into a fossa which extends almost to the posterior angle of lateral space. (Fig. 57.)

Female. Antennal club as in male, but only half as long; the fossa occupies only the anterior half of the lateral space. (Figs. 58, 59.)

The prominent characters of this species, are found in the apical color of the elytra, the coarse puncturing of the metasternum and the elongate antennal club, composed of two unequal joints.

Occurs in California.

C. ruficorne Lec. Sub-oval, convex, black or piceous, clothed with yellowish semi-erect pubescence. Head coarsely punctate, pubescence sparse and yellow. Antennae very light, almost testaceous. Thorax convex; in the male the lateral margins are strongly dilated over the antennal fossae and the hind angles are retracted, very finely and sparsely punctured, pubescent at sides. Scutellum naked, black. Elytra piceous, coarsely punctured, clothed with sparse yellow and black hairs. Body beneath almost black, coarsely punctured, sparsely pubescent. Metasternum very coarsely punctate. Legs rufous. Length .08 inch; 2 mm. (Fig. 61.)

Male. Antennal club very broad—in other respects like the preceding species.

Female. Antennal club like the preceding species.

This form may be easily distinguished by the plain piceous elytra, the almost smooth thorax, which in the male has the margin dilated and convex where it forms a roof for the antennal fossa, and the hind angles retracted. The male club is very light in color and extremely broad.

Occurs in California.

C. triste Lec. Elongate-oval, black or piceous, convex, clothed with sparse, yellowish-red, semi-erect pubescence.

Head coarsely punctate, pubescence sparse and yellow. Antennæ light, last joint rufous or black. Thorax convex, hind angles acute in both sexes, finely but very densely punctured, sparsely pubescent at sides. Scutellum black, naked. Elytra entirely black, moderately coarsely punctate, pubescence very sparse, yellowish-red. Body beneath black, covered with sparse, fine, yellow, semi-erect, hairs. Metasternum very coarsely punctate. Legs entirely rufous. Length .08 inch; 2 mm. (Fig. 60.)

Male. Antennal club as in preceding species but more elongate and darker.

Female. Antennal club as in *ruficorne*, darker.

The distinguishing characters are, the plain dark colored elytra, the finely but very densely punctured thorax, and the elongate antennal club of two unequal joints.

I can see no valid difference between this species and *nigricorne* Lec. and *pivicorne* Lec; *fusculum* Lec. appears to be only a smaller variety which is more pubescent.

Occurs everywhere, in the Atlantic region.

AXINOCERUS, n. g.

Head large, front convex between the eyes, clypeus forming an angle with the front, retracted (Fig. 64). Eyes large, globular, finely granulated, entire, a distinct ocellus. Antennæ inserted under the angle formed by the meeting of the clypeus and front, of eleven joints, bearing an enormous securiform club of one joint. (Fig. 63.) Thorax about twice as wide at base, as long; apex less than half the width of the base, margined; sides arcuate, slightly flattened, margined; posterior angles acute, base slightly bisinuate, broadly lobed at middle, lobe truncate. Scutellum small. Elytra with humeral angles not prominent, sides arcuate, apices separately rounded. Antennal fossa large, somewhat triangular, occupying the entire space between prosternum and lateral margin. Mouth parts, except labrum, covered by the prosternum, which is broad, moderately long, the anterior margin somewhat deflexed, the tip broadly produced posteriorly, dividing the mesosternum. Mesocoxæ widely sepa-

rated. Metasternum broadly truncate in front. Hind coxæ, coxal plates and legs as in *Cryptorhopalum*.

The creation of this genus is made necessary by the discovery of a new species which cannot be relegated to any of the existing genera. It is closely allied to *Cryptorhopalum* from which it differs only by having a long, retracted clypeus and an antennal club unlike anything heretofore described as occurring in this family. The general form, moreover, is more broadly oval than in the preceding genus.

A. americanus, n. sp. Broadly oval, convex, black, shining, clothed with moderately long, semi-erect, brown pubescence. Elytra uniformly black. Abdomen, legs, and antennæ rufous. Head coarsely not densely punctate. Antennæ of eleven joints, of which 1 and 2 are moderately large, globular, sub-equal. 3-10 small, increasing in size as they recede from the head, to be joined to the basal portion of the upper edge of the large terminal joint, which is flat, broad at base, pointed at apex, three times as long as wide, a little more than twice as long as all the preceding joints taken together. Thorax sparsely and finely punctate at middle, more densely and coarsely at sides. Scutellum smooth and naked. Elytra rather coarsely, not densely punctate, black, side margins near apex rufous. Body beneath black, coarsely and moderately densely punctate, very sparsely pubescent. Length .08 inch; 2 mm. (Fig. 62.)

One specimen from Lavaca county, Texas, in Dr. LeConte's collection, collected by Mr. Schwarz.

ANTHRENUS Geoff.

Ovate, convex, dark, covered with scales which are large and triangular in *scrophulariæ*, smaller in *muscorum* and *claviger*, and very long and narrow in *varius*. Head small, a distinct ocellus, epistoma moderately long and flat, mouth parts entirely protected by the prosternum. Eyes moderately large, prominent, emarginate in *scrophulariæ*, entire in the rest of our species. Antennæ short, 11-jointed in *scrophulariæ* and *varius*, terminated by a 3-jointed club; 8-jointed in *muscorum*, bearing a 2-jointed club, and 5-jointed in *claviger*, with a large club of one joint. Thorax very convex at base, more than twice as wide as long; base three or four times as wide as apex, bisinuate, lobed behind in the median line; lobe acute, covering almost the entire scutellum; lateral margins slightly expanded, arcuate; hind angles prominent. Elytra ovate, apices slightly separately rounded. Antennal fossa dividing the anterior part of the lateral margin of thorax. (Fig. 65.) Prosternum short and wide, lobed in front, covering all the mouth parts except the labrum, produced behind into a broad tip, which does not reach much beyond the anterior coxæ. Mesosternum very wide, completely and broadly divided. Mesocoxæ very widely separated. Metasternum short, side pieces wide. Posterior coxal plate moderately short, wide, but not reaching the sides. Femora stout, grooved beneath

for the tibiæ, which are quite slender. First four joints of tarsi small, sub-equal, terminal joint nearly as long as the four united.

This genus possesses very distinct characters by which it may be separated from all others, viz : The short, broad form ; the thorax, so wide at base and narrow in front, with the antennal fossæ dividing its lateral margin ; the mouth parts covered, except the labrum, by the prosternum ; the widely separated mesocoxæ, and finally the clothing, consisting of large or small variegated scales.

The following table will enable us to recognize the species :

Antennæ 11-jointed ; club 3-jointed.

Eyes emarginate ; scales coarse, large, triangular, as wide as long. Antennal club oval..... **scrophulariæ.**

Eyes entire ; scales fine, not triangular, three times as long as wide. Antennal club oblong..... **varius.**

Antennæ 8-jointed ; club 2-jointed.

Eyes entire, scales small, triangular..... **museorum.**

Antennæ 5-jointed ; club of a single very long joint.

Eyes entire, scales small, triangular..... **claviger.**

A. scrophulariæ Linn. Ovate, moderately convex, black, clothed with large, triangular, black, white, and orange-red scales. Elytra marked by a sutural longitudinal band and apical spot of orange-red scales and two transverse bands and basal spots of white. Head black, coarsely punctate, thickly covered with black scales, a few orange-red scales around the eyes and on clypeus. Eyes emarginate in front, not very prominent. Antennæ black, 11-jointed, terminated by a broadly oval 3-jointed club, which is as long as all the preceding joints united. Thorax black, coarsely punctate, disc covered with black, sides and base with white and orange scales. Scutellum hardly visible. Elytra black, mostly covered with black scales, but the suture is broadly orange with three equi-distant lateral projections of the same color, the first two of which join sinuous white bands ; the posterior is obscurely connected with an apical orange spot ; usually a distinct basal white spot. Body beneath black, covered with white and orange scales. First abdominal segment with two naked hollows, on each side of base, to receive the posterior femora, last four with lateral black spots ; terminal segment with a large median quadrilateral black space. Legs black or rufous, femora clothed sparsely with white and yellow scales. Length .09-.14 inch ; 2.2-3.5 mm. (Figs. 66, 69.)

A common and widely distributed species, to be recognized by the emarginate eyes, large scales, and broadly oval antennal club. The ornamentation varies greatly in color and arrangement. The entire color of the upper surface may be altered, the orange in the sutural band may be replaced by white, and the transverse bands may become indistinct and small, or again large and confluent.

Two varieties dependent on these changes are to be found in our fauna.

Variety flavipes Lec. In this, yellow scales seem to have replaced the black, on the head, on the disc of the thorax, between the sinuous bands on the elytra, arranged in spots on the sides of the abdomen and in a quadrilateral space on the last segment. Only a faint trace of white on each side of anterior part of suture. The white bands are larger than in a typical *scrophularia*, two large white spots near the apex, represent the posterior lateral prolongation of the sutural orange, and the apical spot. (Fig. 67.)

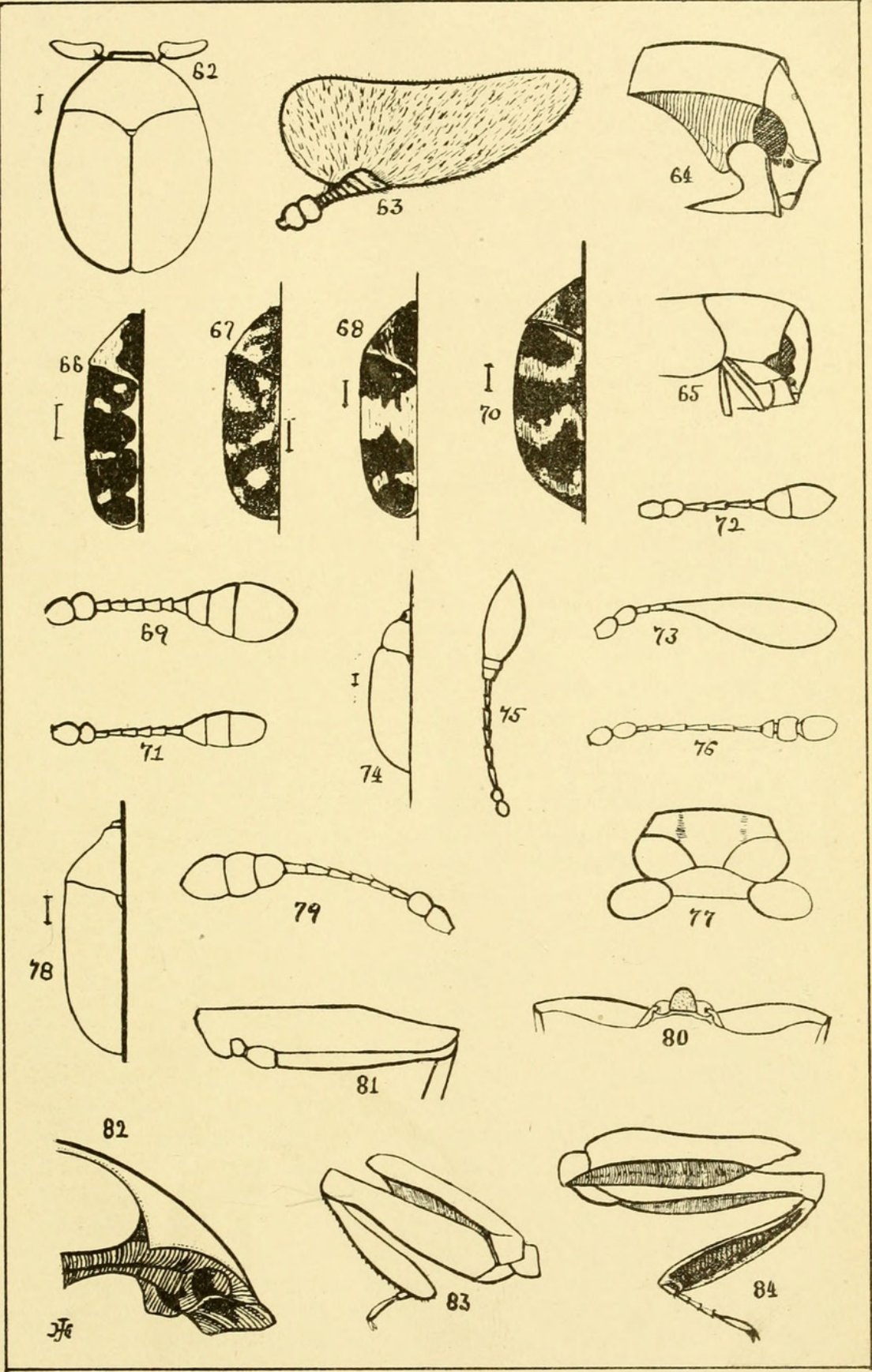
This variety I believe from the description given by Reitter to be the variety *albidus* of Brullé, but I have not had the opportunity for comparison.

Variety thoracicus Mels. The scales on the upper surface are black as in *scrophularia*, the orange suture may be present or replaced by white; the first and second transverse bands are large, confluent at the sides only, or throughout their entire extent, forming a very wide sub-basal band. (Fig. 58.)

A. varius Fabr. Ovate convex, black, clothed with yellow, white, and black, fine, long scales. Elytra marked by a larger humeral ring, a transverse sinuous band, and an apical spot of mixed yellow and white scales. Head coarsely punctate, covered with fine yellow scales. Eyes quite prominent, entire; antennæ black or rufous, 11-jointed, first and second joints large, globular, sub-equal; 3-8 small, equal, compressed; 9-11 form a club which equals the preceding part of the antennæ, the last joint decidedly larger than the other two. Thorax coarsely punctate, disc sparsely clothed with yellow, sides and lobe of base covered with white scales. Scutellum hardly discernible. Elytra black, coarsely punctate, covered with black scales and ornamented with a large basal ring, a transverse median sinuous band, and an apical spot of mixed white and yellow. Body beneath black, clothed with fine, long, yellowish-gray scales, mixed at sides with yellow, first abdominal segment with a naked groove on each side of base to receive the posterior femora, last four marked with brownish-yellow spots at lateral margins; only a faint spot of black in the middle of the last segment. Legs black, femora covered with scales. Length .07-.12 inch; 1.7-3 mm. (Figs. 70, 71.)

The distinguishing characters of this species are the fine, narrow and long scales which clothe it; the entire, prominent eyes, the 3-jointed elongate antennal club, and the almost uniform absence of a large black spot at the last ventral segment. The markings on the elytra vary considerably in different specimens, showing a series from a perfectly banded to an obscurely mottled form. The insects are widely distributed and in the larval stage are especially destructive to zoölogical collections.

A. museorum Linn. Oblong, brown, moderately convex, covered with black and yellowish-white, small, triangular scales. Elytra with black or brown scales sparsely mixed with white, three indefinite, irregular bands also white. Head covered with scales which are brown, around the eyes





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