

Description of a new **PSEUDOMORPHA** from California, with notes on the
Pseudomorphidæ.

BY GEO. H. HORN, M. D.

[Communicated June 10th, 1867.]

The species described in the present paper was found by myself in Owen's Valley, California, on the flowers of the Lupin (*Astragalus*). It was subsequently collected by Dr. Cronkhite, Ass't. Surg. U. S. A., in the same region, and this, with other interesting species, sent me for examination. These insects are not easy to obtain, as they are provokingly agile. The same fact has been noticed in our eastern species by Dr. Zimmerman, of Columbia, S. C., who has occasionally seen a few specimens without being able to catch them.

PSEUDOMORPHA, Kirby.

P. Cronkhitei, elongato-ovalis, modice depressa, brunneo-castanea, nitida, vix punctata, thorace latitudine duplo longiore, lateribus rotundatis, marginatis et margine parce fimbriolata, angulis posticis obtusis, elytris subparallelis, margine parce fimbriata; subtus ferruginea. Long .35.

This species may be readily known by its smoothness, being almost entirely free from punctures, except near the lateral margin of the thorax, where but few exist. The thorax is scarcely broader than the elytra, slightly emarginate in front, truncate behind, sides ciliate with short hairs, margin broader anteriorly. Elytra impunctured, subparallel, slightly ciliate. Beneath ferruginous. The third, fourth and fifth abdominal segments have each a transverse pilose spot near the middle, which may indicate sexual differences. The specimens in my collection, three in number, are all alike and exhibit among themselves no differences of a sexual nature.

I dedicate the species with great pleasure to Dr. Cronkhite, whose liberality has aided me greatly in the study of the Coleoptera of California and Oregon. The discovery of a species of this genus in California is remarkable and adds another fact to the already inexplicable law of distribution of genera in Australia, South America and California.

There is no group among the Carabidæ, as at present recognized, presenting so many anomalies as that to which this insect belongs;

consequently diverse opinions have been expressed regarding its systematic position. The most striking peculiarity at first sight is their form. They resemble anything else but Geodephagous Adephaga, while on the contrary, without an examination of the legs, any of the species of *Sphallomorpha* or *Silphomorpha* would be considered aquatic entomophaga related to *Gyrinus*. This similarity has been adverted to by Westwood (*Trans. Linn. Soc.* xviii, p. 409), in an interesting paper on relations between various families and orders of insects, in which several new genera and species were described, and those of a form still more removed from the type of Carabidæ than *Pseudomorpha*. *Adelotopus* is, however, the most abnormal, not only in form but also in structure as seen notably in the antennæ. The idea that these insects should constitute a family apart of equal value with Carabidæ, Dytiscidæ and Gyrinidæ, has been put forward by Mr. E. Newman, (*Entomologist*, p. 365, et seq.) without stating any special characters, mentioning only that, as *Pseudomorpha* is the first genus described, its characters should be those of the proposed family. Westwood, Lacordaire and others dissent from the opinion of Newman, and prefer to retain the Pseudomorphidæ among the Carabidæ as a tribe, though equally out of place wherever it may be interpolated.

Certain peculiarities in these insects have been pointed out by Dr. LeConte (*Class. Coleop. N. A.* p. 15), which appear to have been overlooked by the European writers such as the form and position of the eyes and the form of the posterior coxæ. The eyes are more or less irregular in outline, either truncate on one side or angulated. They are really confined to the upper side of the head; for the margin of the head appears to dip down under the eye and form a floor to the eye. The margin of this plate is at times thickened, as in *Adelotopus*, and appears to be a canthus dividing the eyes into two, as in *Gyrinus*. The error of considering the eyes double is still further aided by the smoothness of this portion of the head under the eyes. Lacordaire allowed himself to fall into the error of describing the eyes of *Adelotopus* as being divided into two by a slender canthus.

The posterior coxæ show considerable divergence from the true Carabideous type, being contiguous on the median line and of a form more nearly resembling the Dytiscidæ. The articular lobe is narrow, and the points with which the thighs are articulated are at the tips of these lobes, and more nearly approximated than in the Carabidæ. In the Carabidæ the articular lobe is broader, and permits the femoral articulation rather externally than at the tips.

The very narrow separation of the middle coxæ, and the connate mentum and gula, are characters not without some value in the isolation of the Pseudomorphidæ as a separate family. The narrow separation of the middle coxæ is not however a constant character in this family. In the species just described these coxæ are as widely separated as in many species of *Platynus*.

The form of the antennæ of *Adelotopus*, and the number of abdominal segments in *Hydroporomorpha*, though very anomalous characters, cannot assist materially in the establishment of the family, each character being found singly in the genera named. The principal character, therefore, will be found in the contiguity of the posterior coxæ, and the consequent separation of the metasternum from the abdominal segments.

The relationships of the Pseudomorphidæ with the Carabidæ and Dytiscidæ may be thus tabulated:—

Legs cursorial.

Metasternum attaining the abdomen; hind coxæ separated.

Antennæ inserted on the front.....Cicindelidæ.

Antennæ inserted under the margin of the front.....Carabidæ.

Metasternum not attaining the abdomen; hind coxæ contiguous.

Metasternal parapleuræ attaining the abdomen.....Pseudomorphidæ.

Metasternal parapleuræ not attaining the abdomen....Amphizoidæ.

Legs natatorial.

Eyes two; antennæ filiform.....Dytiscidæ.

Eyes four; antennæ irregular.....Gyrinidæ.

From the above table it will be seen that the Pseudomorphidæ form a link from the Carabidæ through Amphizoidæ to the Dytiscidæ, with undoubted tendencies toward the Gyrinidæ; and by their removal from the Carabidæ tend to render that great family more homogeneous.

The Pseudomorphidæ are contained at present in five genera, and may be arranged as follows:—

Head horizontal; mouth anterior; antennæ filiform.

Without antennal grooves.....Pseudomorpha.

With antennal grooves.

Mentum entire; ventral segments four.....Hydroporomorpha.

Mentum emarginate; ventral segments six.

Posterior angles of prothorax distinct.....Sphallomorpha.

Posterior angles of prothorax rounded.....Silphomorpha.

Head deflexed, front very convex; mouth inferior; antennæ clavate.....

Adelotopus.

In the monographic notice of these insects, (*Rev. et Mag. Zool.* 1853, p. 395), Westwood unites the first, third and fourth genera, without as-

signing any reason, at the same time describing new species which should not be included in *Pseudomorpha*. The two genera, *Silphomorpha* and *Sphallomorpha*, can hardly be considered as distinct, the characters separating them being hardly of more value than as a means of defining generic groups. The whole subject has yet need of a revision, and it is to be hoped that those entomologists who have a full series of species accessible will determine their synonymy, and relieve them from the partial confusion in which they are at present found.

The habits of these insects are remarkable. Both our North American species live on flowers, and are very agile, while that from South America and those of Australia appear to live under bark.

For an opportunity of examining a small series of these insects, I am indebted to Dr. Leconte, to whom all the species in the Cambridge Museum were sent by Prof. Agassiz for study and identification.

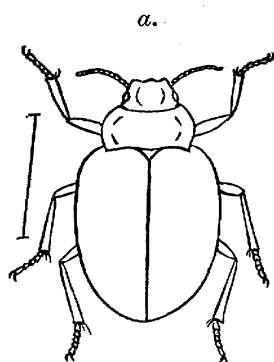
On **AMPHIZOA INSOLENS**, Leconte.

BY GEO. H. HORN, M. D.

It is not expected that anything new will be written in the present paper, as the insect has been fully described by Dr. Leconte, (*Proc. Acad.* vi, p. 227,) and its systematic position ably discussed, while Dr. Schaum (*Insecten Deutschlands*) reviews the work and expresses a different opinion regarding its relationships. As it is very desirable to have all difficulties removed and differences of opinion adjusted, it has been thought advisable to present the subject anew to systematists, in order that the end may be reached. With this view, wood-cuts, carefully drawn, have been prepared, to illustrate the various external parts.

As the habits of this insect have been fully exposed (*Proc. Ent. Soc. Phil.*, Vol. vi, p. 289), it will be unnecessary to reiterate in the present paper, except to state that they live as do the Parnidæ, adhering to stones under running water. They are entirely sub-aquatic, and have never been found on land. It was my good fortune to capture a fine series of this insect while traveling in north-eastern California, among the streams tributary to Pit River, itself the larger fork of the Sacramento. Though still a rare insect in collections, it has been

thought desirable and advantageous to science to dissect a few specimens so that better illustrations could be presented, and its external

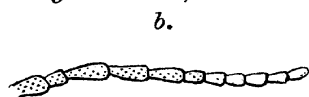


anatomy fully exposed. In the views of the under side the sutures have been more distinctly drawn than they can be seen in cabinet specimens. These sutures have been rendered thus distinct by macerating the insect in a solution of caustic potassa, a means so well known to Microscopists as to need no further comment.

The accompanying outline view (a) will serve to give an idea of the general configuration of the insect. An excellent figure, illustrative of the sculpture, and from which the above outline was copied, may be found in Vol. ix, of the Pacific Rail Road Explorations and Surveys.

Head broad, wider behind the eyes, with a broad longitudinal impression each side, epistoma truncate.

Eyes small, round and finely granulate.

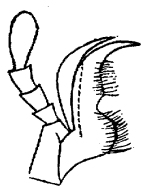


Antennæ (b) eleven-jointed, inserted under the margin of the front, rather above the base of mandibles, in a manner similar to *Loricera*, glabrous, sparsely punctured on the upper sur-

c. face, the terminal three joints smooth, entirely destitute of sculpture.

d. *Labrum* (c) transverse, faintly trilobed in front.

Mandibles (d) short, obtuse, with a few small teeth and a slight brush of hair on the inner face.



Maxillæ (e) entirely corneous, inner lobe with a slight emargination internally, and ciliate with spinose hairs in front of and behind the emargination. External lobe corneous not bi-articulate. This lobe appears *at all times* to be articulated beneath the inner lobe, so that from a view in front the insect appears to have double maxillæ.

Maxillary palpi short, four-jointed, the first joint very small, the second and third longer and equal, the last joint equal to the two preceding together, and thicker.



Ligula (f) quadrate, filling the emargination of the mentum, broader than long, ciliate on its margins, and without paraglossæ. Under surface with a Y-shaped elevated line.

Labial palpi short, three-jointed, supports prominent, first and se-

cond joints small, terminal equal to the two preceding. In the accompanying cut the palpi are pushed farther back than in nature, in order that the individual parts might be better represented.

Mentum (*g*) large, connate with the gula without trace of suture, *g.* entirely concealing the parts of the mouth above, deeply emarginate, with a broad tooth at the bottom of the emargination, lobes obtusely rounded. Lateral sutures of gula distinct.



In his work on the genera of Coleoptera, Lacordaire commits the curious mistake of ascribing a totally different form to the ligula from that indicated by the above description; he says, "languette en forme de T." This mistake originated from a misinterpretation of the meaning of Dr. Leconte, (*Proc. Ac. l. c.*) in the first description of the insect, as follows:—"The ligula is large, filling the emargination of the chin, truncate at tip and prominent along the middle and apex, so as to present a form like the letter T." The inner lobes of the maxillæ are ciliate internally, and not as Lacordaire says, "lobe interne des machoires non cilié." The above-named author had, however, no opportunity of examining the insect, as no specimens had been sent abroad at the time the above extracts were written.

In the above descriptions of the head and parts of the mouth, hardly anything can be found in which this insect differs from the Carabidæ. The large size of the mentum is remarkable, also the absence of the gular suture, a character found only in a few Pseudomorphides and Siagonides,* the former being, however, insects of a very anomalous form, and whose claim to rank as members of the family Carabidæ has been doubted by various entomologists. In *Metrius* more particularly, and in other Carabidæ, the mentum is large, broad, and deeply emarginate, though never so entirely hiding all the parts above it, as in *Amphizoa*. The antennæ are also anomalous in being entirely glabrous, without pubescence, and only a few punctures on their upper surface.

Prothorax narrower than the elytra and in close contact with them, nearly twice as broad as long, narrower before than behind, sides ob-

* The form of mentum among these insects is very similar to that seen in *Amphizoa*, particularly that of *Enceladus*, where the suture is entirely obliterated. In fact, its mentum might well represent an enlarged view of that of *Amphizoa*, excepting in the form of the tooth at the bottom of the excavation. Notwithstanding its large size in the Siagonides and Ditomides, the mentum never hides so completely the other parts of the mouth, as in *Amphizoa*. The mandibles are very prominent in the two tribes mentioned above, and in *Enceladus* recalling the form met with among the Scaritides, particularly *Pasimachus*.

tusely rounded. Anteriorly emarginate, posteriorly sinuate, with the angles distinct. Above with a longitudinal impressed line, with vague impressions laterally.

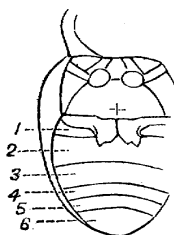
Prosternum (*h*, front view; *i*, side view) prolonged, behind the



i. coxæ broader and flattened, received in an excavation of the mesosternum, meeting the prolongation of the metasternum between the middle coxæ.

Coxal cavities rounded, open behind closed in front by the sternum and epimera, completed behind by the sternum of the mesothorax.

Mesosternum short, separating the middle coxæ, concealed at its middle by the prolongation of the prosternum, side pieces diagonally divided, the epimera alone attaining the coxæ.



Coxal cavities rounded, closed in front by the sternum, laterally by the epimera of the mesothorax and the episternum of the metathorax, and behind by the metasternum.

Metasternum broad, truncate posteriorly, side pieces simple, consisting of the episterna alone.

Coxæ broad, separated from the metathorax by a nearly straight suture, contiguous in the middle and attaining the margin of the body, cutting off all contact between the metathoracic parapleuræ and the abdomen.

Abdomen with six ventral segments, the anterior three connate. The first segment is entirely lateral and the second in contact with the coxæ at its middle. The second, third and sixth segments are much longer than the others.

Elytra oval, moderately convex, slightly flattened at the sides, humeri rounded. Epipleural fold broad anteriorly, suddenly narrowing opposite the hind coxæ and not reaching the apex of the elytron. Scutellum moderate, triangular. Under wings well developed, though probably never used, as the elytra are in close contact and, it is probable, totally inseparable by the action of the insect.

Legs slender, femora slightly thickened, tibiæ with two small terminal spurs. Front and middle tarsi with the first four joints small, sub-



k. equal, the terminal joint longer. Posterior tarsi with the first and last joints longer, the intermediate short and equal. Claws small, simple. The joints of the tarsi are rounded beneath, and have (excepting the last joint) a small pubescent spot on each side.

The characters, as above given, drawn from the lower portion of the

body, present but little of special importance, excepting the large size of the posterior coxæ, their contiguity on the median line, and the straight line separating them from the metasternum. It is curious that another error should have crept into the copied description of Lacordaire, as he states that these coxæ are not contiguous on the median line of the body.

There would seem to be but little doubt that this insect should occupy the systematic position assigned it by Dr. Leconte, although two eminent entomologists have, the one (Dr. Schaum) called it an aberrant Carabide, the other (Prof. Lacordaire) assigned it a position among the Dytiscidæ, in a subfamily of equal value to Haliplidæ and Pelobiidæ. Both opinions appear untenable by a review of the characters above given.

With the Dytiscidæ, *Amphizoa* has but little in common, excepting the large size of the posterior coxæ. The parts of the mouth, as stated by Schaum, have but little analogy to those of Dytiscidæ. The broad posterior coxæ separate it very easily from the Carabides, while at the same time, they are bounded anteriorly by a straight line, and cut off entirely the metasternum from the abdomen. It is not, however, on one character that the separation of *Amphizoa* from the two named families must depend. The whole conformation presents anomalies found singly in aberrant members of either family; but that the concentration of so many should occur in one insect is remarkable. Either this insect should link the two families into one, or it should form a family apart. The latter course would, therefore, seem the more rational.

Dr. Schaum has seen considerable resemblances to the Tenebrionidæ in its structure. There may be some resemblance in form (as to *Nyctopetus*) or even in its sculpture. *Metrius* has also been said to resemble some of the same family. It is difficult, however, to perceive any real structural similarities.

The antennæ do not resemble those of the Tenebrionidæ as Schaum insists. There is a total absence of pubescence, sensitive pores and spongy patches, such as are found on the terminal joints in that family. Here the case is reversed and the terminal joints are entirely smooth and glabrous. The similarity of the coxæ, particularly the posterior, to those of *Tentyria* is not very evident.

The sexual distinctions are not well marked, the female is broader and rather more robust.

Notes on the ZOPHERI of the United States.

BY GEO. H. HORN, M. D.

The occurrence of several new species of the genus *Zopherus* has suggested the propriety of bringing into one paper the descriptions of the other species known from the western parts of our territory.

The form of these insects is so well known as hardly to need any general description, and so peculiar as to enable them to be distinguished from any other Tenebrionidæ. They are all of moderate or even of large size, elongate, convex, and furnished with a tegument so hard, as to be with difficulty perforated by the ordinary cabinet pin.

The species from Mexico are whitish above, with elevated subopaque black spots, varying in size according to the species. Those from our own country, (excepting *nodulosus*), are all black, and readily distinguished by the sculpture of the elytra. The last ventral segment is also ornamented with tubercles, though not varying sufficiently among the several species as to be of any value in indicating specific differences. This same style of ornamentation obtains in all the Zopherini, and disappears almost entirely in the next group, Usechini. With one exception (*Jourdanii* Sallé) all the bicolored species have the apices of the elytra quadrituberculate, the black species are bituberculate. The apices of the elytra in all the species have a deep groove on each side, making the suture appear elevated, and bounding the tubercle on the inner side.

ZOPHERUS, Gray.

Z. nodulosus, elongate, convex. Head black, subopaque, finely and sparsely punctured, and with a triangular, white occipital spot. Thorax convex, nearly as broad as long, anteriorly emarginate, with the angles rounded, posteriorly subtruncate, sides anteriorly scarcely sinuate, posteriorly sinuate and crenulate, much narrower behind than before; above white, with a central black stripe much narrower at its middle, and with a few lateral black spots sparsely placed. Elytra elliptical, convex, sides moderately rounded, base slightly emarginate, with the angles distinct; above white, with elevated, smooth, black spots, arranged as follows;—a sutural row of spots not distinct from each other, a subsutural row of four or five larger spots, two central rows of four or five spots each, and a marginal row, a few very small black spots in rows representing the striæ, of which the rows of larger spots mark the interspaces. Apex four-tuberculate. Legs black. Beneath black, coarsely punctured, with the side pieces of the metathorax and the sides of the second and third abdominal segments white. Length .80—1.10 inch.

SOLIER, Ann. Ent. Soc. France, V, 42.

This species is very abundant in western and south-western Texas, whence specimens are sent in every collection made. It resembles closely several Mexican species, though readily distinguished by its less convex form, and the fewer number and less elevation of the black tubercles.

Z. concolor, black, moderately shining; head sparsely punctured; thorax moderately convex, sparsely punctured, sides anteriorly rounded, posteriorly crenulate, base subtruncate, much narrower than at apex; elytra elliptical, sides moderately rounded, base slightly emarginate, humeral angles distinct, surface deeply wrinkled, forming very convex tubercles, with a tendency to a longitudinal arrangement; apex of elytra forming two tubercles, separated from the sutural elevation by a deep groove. Beneath black, coarsely and densely punctured. Length .6 inch.

LECONTE, Ann. Lyc. V, 130.

Found near Santa Fé, New Mexico, by Mr. Fendler. This species is at present rare in collections, the type being the only one at present known. Cabinet of Dr. Leconte.

Z. guttulatus, black, subopaque; head very sparsely punctured; thorax sparsely punctured, moderately convex, anteriorly emarginate, posterior margin subtruncate; elytra oval, convex; sides rounded, apex bituberculate, tubercles attaining the sutural elevation, groove distinct, surface subopaque, with smooth, elevated spots arranged in eight or more longitudinal rows; spots more or less rounded, distinct from each other. Beneath subopaque, sparsely though rather coarsely punctured. Long .64—.77 inch.

This pretty species occurs in south-western Texas, whence two specimens were brought by Mr. E. T. Cresson, and are now in the Collection of the American Entomological Society. This may be distinguished very readily from all our other species by the peculiar, almost sericeous, appearance of the surface above and below, and by the form and arrangement of the smoother elevated spots. These are more distinct than in *tristis* and more distantly placed, at the same time preserving a nearly rounded form; they are less convex than in *concolor* and not nearly so glossy. The interspaces are distinct, and deep opaque-black in color. On comparison with *tristis*, and which it would be the more readily confounded by descriptions, the thorax will be found much less convex, the sides more distinctly angulate, and with comparatively few punctures on the upper surface. The elytra are more rounded on the sides and more convex above. The apical groove is also much shorter. In outline the elytra more nearly resemble those of *concolor*. From *concolor* this species may be distinguished by the peculiar appearance of its surface, and by the less convex, less shining elevated spots, and by the distance at which they are placed from each other.

Z. tristis, black, subopaque; head coarsely and sparsely punctured; thorax slightly longer than wide, coarsely and sparsely punctured on the disk, more densely at the sides; sides subangulate before the middle, posteriorly crenulate. Elytra elliptical, moderately convex, base slightly emarginate, angles distinct, surface roughened, with slightly elevated, smoother tubercles, on one side of each a fine puncture, from which arises a minute yellow scale-like hair; apex of elytra bituberculate, suture elevated at apex, groove short. Beneath as in *concolor*. Length .55—.85 inch.

LECONTE, Ann. Lyc. V, 130.

This species resembles *concolor* more decidedly than it does any other species, but may be readily distinguished by the characters above given. The smooth elevated spots have a stronger tendency to a linear arrangement, the interspaces are well marked, and the elevations themselves much less convex than in *concolor*. The humeral angles are more distinct, and the space between them distinctly broader than the base of the thorax. The groove at the apex of the elytra is shortened behind, allowing the tubercles and the sutural elevation to join. In some specimens there is also a slight longitudinal thoracic impression.

This species is not rare in Arizona. In my sojourn in that region, eighteen individuals were found. Those captured at Fort Grant lived under the dead bark of Mesquite, others on the Maricopa desert, were under the dead trunks of *Cereus giganteus*, another was found at Yuma in my tent. A short time since, I received a specimen, from which the larger measurement was taken, from Mr. Wm. M. Gabb, collected from near the upper end of the peninsula of Lower California. This differs in no other particular than size, from the specimens from Yuma and Arizona.

Z. opacus, black, opaque; head finely and sparsely punctured; thorax longer than broad, sides moderately rounded in front of the middle, posteriorly crenulate, base subtruncate and narrower than the apex; above coarsely and densely punctured; elytra elliptical, moderately convex, with very fine granular elevations arranged in irregular longitudinal series, with a fine puncture at the base of each granule, from which arises a very short scale-like hair. Apex of elytra bituberculate, sutural elevation prolonged, groove deep. Beneath sculptured as in the two preceding species. Length .85 inch.

This species may be readily distinguished from any others of the genus known, by the peculiar sculpture of the elytra. The punctures of the thorax have, in many instances, a slight elevation of their margin on one side, giving a granulated appearance to the surface. The humeral angles of the elytra are less distinct in this than the two preceding species, and the bases of the thorax and elytra are equal.

This species is found in Nevada, probably near the southern boundary. For the specimen in my possession I am indebted to Mr. John Akhurst, of Brooklyn; another remains in his cabinet.

Through the kindness of Mr. Ulke I have been permitted to examine a specimen of this species from his cabinet. It differs from the type only in being smaller, and with the granules less distinctly marked. This obliteration of sculpture is probably the result of age in the specimen. While at Fort Tejon, California, I had abundant opportunity of examining the *Phlæodes* of various ages, and found that while in those of the present season were sharply sculptured, and the granules very distinct, those of the preceding seasons were comparatively smooth. As all these insects live under bark on logs and stumps, it is probable that the smoothness of some is merely the result of mechanical action.

Z. gracilis, black, shining; head finely and sparsely punctured; thorax finely and sparsely punctured, sides subangulate, before the middle slightly sinuate, posteriorly finely crenulate; base narrow, subtruncate; elytra elongate, oval, surface very slightly rugose, and with striæ of fine, rather distant punctures, in each of which is a short, scale-like golden hair. Apex bituberculate, groove broad. Prothorax beneath coarsely and densely punctured. Abdomen sparsely punctured. Length .63 inch.

This species may be readily distinguished by its slender form and almost total absence of elytral sculpture. It is more glossy than any of the already described species. The bases of the thorax and elytra are nearly equal in width. In all of the preceding species the basal margin of the thorax is slightly elevated, and with a slight groove in front of the elevation; this totally disappears in the present species.

This species inhabits Arizona, in the neighborhood of Fort Whipple, where it was collected by Dr. Coues, who placed it at the disposal of Mr. Ulke, to whom Dr. Leconte is indebted for the only specimen of this fine species now in his cabinet.

In order to render the species now known, easily determinable, the following synoptic table is added:—

Elytra quadrituberculate at apex	nodulosus , Solier.
Elytra bituberculate at apex.	
Elytra with smooth elevated tubercles.	
Tubercles round, very convex, approximate and shining.....	concolor , Lec.
Tubercles round, flattened, distinct and subopaque....	guttulatus , Horn.
Tubercles elongate, flattened, moderately shining.....	tristis , Lec.
Elytra finely granulate.....	opacus , Horn.
Elytra finely punctured.....	gracilis , Horn.

Descriptions of new Genera and Species of Western SCARABÆIDÆ,
with notes on others already known.

BY GEO. H. HORN, M. D.

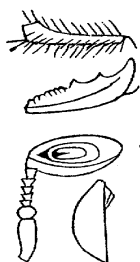
PHÆOCHROUS, Casteln.

P? Behrensii, elongate-oval, blackish-brown, moderately convex and shining. Head paler in front, densely and coarsely punctured. Thorax twice broader than long, narrowed in front, above moderately convex, sparsely punctured, anteriorly emarginate, sides margined, moderately rounded, base sinuate, angles obtuse. Elytra oval, convex, margin slightly thickened, above striate, with striæ coarsely and closely punctured, interstices slightly convex, with a single row of minute punctures. Body beneath paler, scarcely punctured. Femora thickened; anterior tibiæ crenulate and with three large teeth on the outer edge; middle and posterior tibiæ thickened at tip, obliquely truncate, and with rows of spinose hairs. Length .4 inch. Breadth .22 inch.

I refer to *Phæochrous* Casteln. (*Silphodes* Westw.) an insect from California, (in the Cabinet of Henry Ulke, of Washington,) though not without suspicion, that it may constitute a distinct genus, differing from the descriptions of *Phæochrous* by such slight characters, that, without reference to specimens, I am unwilling to separate it.

The epistoma is broadly truncate, labrum very short, transverse, slightly emarginate. Mandibles projecting slightly beyond the labrum, giving the front a bilobed appearance. The antennæ are nearly as in *Phæochrous*, with the eighth joint very large and concave, almost entirely hiding the ninth and tenth joints, which are much shorter, and are spongy, except slightly corneous at base; scutellum moderate, apex rounded. The four hinder tibiæ are rather suddenly thickened at apex and obliquely truncate, and with three rows of spinous hairs. The tarsi are somewhat shorter than the tibiæ, the last joint longer, with strongly curved, equal claws.

The discovery of this insect in California is remarkable, as it affords an analogue of the *Hybosorus* of our Eastern States, itself being an emigrant from Europe. It is indeed possible that the insect just described may have been imported from the East Indies to California, as the commerce between the two countries has already assumed some magnitude. I have in my collection also a Cerambycide, found by Mr. Gabb, in the Coast Range south of San Francisco, undoubtedly identical with an Australian species, and with the knowledge of the introduction of this and other insects by transportation in ships, I have supposed that even *P? Behrensii* may be really a foreigner to our



shores. The species of *Phæochrous* live on decomposing animal substances, and it is possible that, like some *Dermestes*, it may have found lodgment aboard ship in material suitable for its subsistence.

I dedicate the species to Dr. Jas. Behrens, of San Francisco, in acknowledgement of the interest he has shown in the advancement of entomological science.

DASYDERA, Lec.

D. Cooperi, brassy-green; head densely and coarsely punctured, front sparsely clothed with erect yellow hairs; thorax subquadrate, sides moderately rounded, anterior margin truncate, posterior slightly rounded, with the angles rounded; above coarsely and densely punctured, with suberect yellow hairs and a slight longitudinal impression. Elytra testaceous, lateral margins converging strongly, contiguous along the first two-thirds of the suture, then dehiscent, apices moderately rounded, above clothed with short, black, recumbent, bristly hairs, arising from rather densely placed punctures. Beneath brassy-green; abdomen paler, clothed with yellowish hairs. Antennal club and tarsal claws testaceous. Length .40 inch.

Readily distinguishable from the other two species of this genus by the characters above given. The elytra extend to the suture between the last and penultimate abdominal segments. The lateral tooth of the anterior tibia is also well marked.

I dedicate this species to Dr. J. G. Cooper, of Santa Cruz, California, to whose liberality I am indebted for this and other valuable species. It is from near Sacramento, California.

LICHNANTHE, Burm.

L. canina, head obscure, brassy-green, coarsely and confluent punctured, clothed at the middle with yellow, and laterally with shorter black, suberect hairs. Thorax brassy-green, slightly broader than long, narrower anteriorly; sides very slightly rounded; apex truncate, base feebly rounded, posterior angles slightly elevated, above coarsely and densely punctured, with yellow erect hairs. Elytra dark testaceous, with two rows of paler spots; sides slightly convergent, contiguous along the anterior half of the suture, posteriorly strongly divergent, apices rounded, above finely and densely punctured with recumbent black hairs. Margin paler, with short yellow hairs. Beneath obscure brassy-green sparsely clothed with yellow hair; antennal club, tarsi and tip of abdomen obscure testaceous. Length .48 inch.

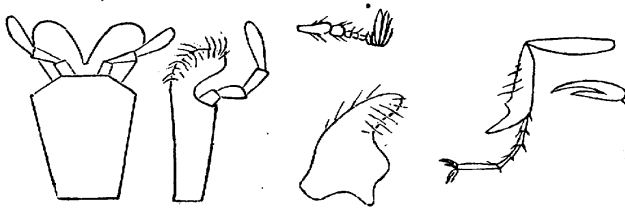
Readily distinguishable from our other species by the characters above given. The epistoma is also strongly margined on the sides. The front has two elevated lines continuous with the margin of the epistoma, which converge and meet on a line with the eyes. The portion of the head thus enclosed is brassy-green and clothed with yellow hairs, the remainder of the front is covered with shorter black hairs. The thorax is less coarsely punctured than the head, which appears to be almost wrinkled transversely.

The elytra are still more finely punctured, and though somewhat longer in this species than in *vulpina* and yet shorter than in *lupina*, they are also more divergent along the suture than in either of the preceding species. This species is, without doubt, identical with that mentioned by Doubleday as having occurred in Oregon, though probably considered by him as identical with *lupina*. Occurs near Fort Klamath, Oregon. For this interesting addition to our western fauna, I am indebted to Mr. Wm. M. Gabb, Palæontologist Cal. Geolog. Survey, whose kindness in placing his collection at my disposal, has already been acknowledged.

ACRATUS, nov. gen.

Head elongate, epistoma trapezoidal, narrower anteriorly, concealing the parts of mouth beneath, separated from the front by a sinuous impressed line, anterior edge margined and notched. Labrum small, transverse, not emarginate. Mandibles short, coriaceous on the inner margins and ciliate internally at apex. Maxillæ elongate, ciliate with curved spinous hairs at apex. Palpi long, last joint fusiform. Mentum trapezoidal, longer than broad, narrower behind, anterior angles rounded. Ligula distinct from the mentum, coriaceous and deeply bilobed. Palpi very small, last joint somewhat longer. Antennæ ten-jointed, first and second thick, third—seventh small, eighth—tenth forming a suboval mass. Abdomen six-jointed, joints, except the last, connate. Pygidium exposed. Tarsi slender, claws small and divided. Anterior tibiæ tridentate externally, with a small spine internally, middle and posterior tibiæ bispinose, the latter broad and triangular, and with one transverse ridge.

The accompanying wood-cuts represent magnified views of the parts of the mouth, an antenna, and an anterior leg and one of the tarsal



claws of *Acratus*. The parts have, however, been magnified in different degrees, as will be seen by a comparison of the mentum and the maxilla adjoining it.

In nature the hairs at the tip of the maxilla are even more curved than represented. Both claws on all the feet are deeply cleft to within a third of the base, the inferior portion being a fourth shorter than the superior.

This genus recalls strikingly the characters of *Chnaunanthus* of the Sericoidini, and from the description, by which it is alone known to

me, resembles it even in specific characters. The connate ventral segments, however, forbid its entrance into the group, unless that character should have escaped notice in the genus above named. The antennæ are ten-jointed in the present genus and but nine-jointed in *Chnaunanthus*, though this would hardly warrant generic separation without the presence of other characters. I place the genus provisionally among the Oncerini of Leconte, although equally out of place by the presence of the anterior tibial spine. As in *Oncerus* and *Lasiopus* the abdomen is rather small and the segments connate. The position of the Oncerini among the Laparostict Melolonthidæ, seems somewhat objectionable, as the spiracles in *Oncerus* are placed "on the dorsal inflexed portion of the ventral segments," (Lec. *Synopsis Melolonthidæ*, *Jour. Acad.*, 1856,) as in the genuine Melolonthidæ, while the connate abdominal segments of *Oncerus*, *Lasiopus* and *Acratus* is a character at variance with the Glaphyrini, to which the division of Laparostict Melolonthidæ of Leconte, for the most corresponds. These genera may form a sub-tribe of Melolonthidæ near the Sericoidini, in the position originally assigned them in the monograph above cited, or *Acratus* may be placed among the Chasmatopterides after *Chnaunanthus*.

A. flavipennis, black, slightly glossy; head black, rather coarsely and densely punctured, narrowed in front. Thorax black, broader than long, base and sides rounded, anteriorly emarginate, less densely punctured than the head; posterior and lateral margins ciliate with whitish hairs. Head and thorax with short suberect hair. Elytra yellow-testaceous, oval, sparsely punctured, and with a short yellow hair arising from each puncture. Mentum with a brush of yellow erect hair beneath. Feet yellowish. Length .15—.18 inch.

The under surface of the insect varies in color in different individuals, in some being entirely black, in others with the abdomen yellowish.

This insect is found in tolerable abundance in April, on the flowers of *Larrea mexicana*, on the sandy desert east of Antelope peak, and on the banks of the Gila River, Arizona.

PLECTRODES, nov. gen.

Head quadrate. Epistome broad, thickened in front, concave above, separated from the front by a slightly raised line. Labrum distinct, emarginate. Mandibles thick, obtuse, not prominent. Maxillæ short, with two or three obtuse teeth at apex. Palpi moderate, first joint small, last joint longer than second and third together, deeply channelled on its outer face. Mentum quadrate, concave, sides rounded. Ligula short, transverse, connate with the mentum, corneous. Palpi short, last joint rather larger. Antennæ ten-jointed, first joint equal

to half the scape, thicker; second joint transverse; third—seventh closely connate; eighth—tenth forming an oval mass. Anterior coxæ moderately prominent, prosternum not prolonged. Metathoracic parapleuræ moderate, epimera triangular. Segments of abdomen distinct, penultimate joint rather longer. Anterior tibiæ tridentate externally, with a spine on the inner side. Middle and posterior tibiæ with a transverse ridge terminating in a slight spine. Posterior femora thickened. Tarsi equal to the tibiæ. Claws dissimilar, the anterior claw armed with a long tooth from near the base, posterior claw with a short slightly emarginate tooth near the base. Penultimate dorsal and ventral segments connate. Spiracle placed on the middle of the line of the suture, and connected by a groove with the suture between the pygidium and propygidium.

Figures 1 and 2 represent respectively the maxilla and palpus and the claws of the tarsi of *Plectrodes*. In the first it will be seen that the palpus is longer than the maxilla, and with the first joint very slender as compared with the others. The last joint is oval, slightly curved, and with the deep groove mentioned in the above diagnosis. The second is a representation of the tarsal claws of the right anterior tarsus, the claws are the same, however, on all the feet and in both sexes. The anterior claw is much larger and with a strong tooth, its outer face is also sulcate in the manner above indicated.



Figure 1.



Figure 2.

P. pubescens, light testaceous brown, slightly shining, robust, convex above; head coarsely and densely punctured, with short, yellow, suberect hairs arising from the punctures. Thorax broader than long, convex, anteriorly emarginate, posteriorly broadly lobed; sides strongly rounded, coarsely punctured above, and clothed with suberect yellow hairs. Scutellum moderate, triangular, with rounded sides. Elytra convex, more finely punctured with very short, recumbent, yellow pubescence. Body beneath clothed with long yellowish-white hairs; abdomen with shorter pubescence. Legs slightly fimbriate with hair. Length .70—.85 inch.

Occurs rather abundantly at Visalia, California, whence specimens were sent me by Mr. S. W. Marple. They fly among the oak trees of that region and are attracted by light at night.

Genus related to *Hypotrachia* Lec., though without any similarity whatever of form. The former resembling *Tanyproctus* somewhat, while the present genus is almost a counterpart of certain species of *Plectris*, in form, color and pubescence. By the peculiar sculpture of the last joint of the maxillary palpi, these two genera seem to be related to the *Tanyproctini*, though in neither do we find the dilatation

of the tarsal joints of the male. The anterior claws of the front and middle tarsi of *Hypotrichia* have a broad tooth, free, except at base. The anterior claw of the posterior tarsi has a slight dilatation at base.

The tribes of Scarabæidæ, in the vicinity of the Sericoidini, have need of a thorough revision. The position of the last spiracle, whether in or out of the line of the suture between the penultimate dorsal and ventral segments, appears to be a character of some value, as also the presence of a groove leading backwards from the spiracle toward the last dorsal suture.

The genus is placed provisionally with *Hypotrichia* among the Sericoidini, with the hope that renewed observations on larger series of genera may afford a better clue to its true relationships.

COTALPA, Burm.

For a long time the only known species of this genus was ranked among the Areodæ, Kirby being the first to indicate generic differences. The typical species appears to have an extensive range, being found over nearly the whole region eastward of a line drawn midway between the Rocky Mountains and the Mississippi River. In 1852 Prof. Haldeman described a second species from Utah; lately Dr. Leconte has made known a third, from a point still farther westward, New Mexico, and while in San Francisco, during the first few days of my stay there, I was surprised at receiving a fourth species from the Southern Coast Range. Subsequently other specimens were collected near the base of the South-eastern Sierras, again in Owen's Valley, and finally along the mountainous region between Temescal and the Laguna grande, on the road towards Fort Yuma.

C. ursina, bluish-black; head and thorax coarsely and densely punctured; thorax convex, sides strongly rounded, narrower anteriorly, base broadly lobed, elytra broadly oval, brownish testaceous, coarsely punctured. Beneath bluish-black, tibiæ paler. Length .95, ♂; .62, ♀, inch.

The clypeus is parabolic, slightly margined in front. The head and thorax are rather densely clothed with suberect yellowish hairs, the hairs of the elytra are much shorter, recumbent and more sparsely placed. Beneath the body is also densely clothed with long hairs, particularly on the sides of the metasternum. The elytra vary somewhat in color, among the specimens from different localities. Those from the maritime slope of California are brownish testaceous, those from the mountain regions of the south-eastern portion of the State are much lighter in color, while a unique from Owen's Valley is orange-red. The first and last regions furnished specimens with much more

pubescence. Those captured by myself near Temescal were almost entirely deprived of the hair on the thorax and elytra, and are much less densely and coarsely punctured. I can find no differences to warrant specific separation among my specimens, though the extremes differ greatly in size and in sculpture as above indicated.

The genus *Cotalpa* may be separated into two sections, according as the metasternum is produced or not between the middle coxæ.

Metasternum conical, prominent between the middle coxæ.

Thorax scarcely punctured.....*lanigera*, Linn.

Thorax coarsely punctured.....*puncticollis*, Lec.

Metasternum short, obtuse, not produced.

Thorax coarsely not confluent punctured; hairs

yellowish.....*ursina*, Horn.

Thorax coarsely and confluent punctured; hairs

grey.....*granicollis*, Hald.

In the above table it will be seen that two species have the metasternum prolonged forward, so as to be distinctly seen between the middle coxæ and even in front of them, this spine being at the same time in the plane of the rest of the metasternum and without any depression of its point. In the last two, however, this process is reduced to a mere tubercle below the plane of the metasternum, and is not at all prominent, and never projects beyond the coxæ. The species of the first group may be distinguished from those of the second by their greater convexity, more glossy appearance and less elytral punctuation, while from each other no other characters are needed than that given in the table. The epistoma of *puncticollis* is relatively much longer and more convex than *lanigera*. The two species of the second group resemble each other in form. The thorax of *granicollis* is, however, metallic-green and very coarsely and confluent punctured, and clothed with erect whitish or greyish-white hairs. In *ursina* the thorax is much more finely punctured and with the punctures distinct, the hairs are longer and yellowish; the color of the thorax is bluish-black.

ERRATUM.

Page 168, line 16, for "appear" read "appears."

EXPLANATION OF PLATE III.

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Fig. 1.—*Phæochrous Behrensi*, Horn. San Francisco, Cal.

Fig. 2.—*Acratus flavipennis*, Horn. Arizona.

Fig. 3.—*Lasiopus ferrugineus*, Lec. (Synopsis of the Melolonthidæ of U. S., Jour. Acad. 1856, p. 282.) The unguis of this insect are simple and the tarsi very much longer than the tibiæ. The anterior tibia is without spine. Antennæ nine-jointed, palpi slender. Clypeus rounded, concave and subemarginate at apex. Its surface is moderately glossy and ferruginous in color, coarsely punctured and with sparsely placed short hairs, the margin is fringed and the under surface with longer hairs. Ringgold Barracks, Texas.

Fig. 4.—*Oncerus floralis*, Lec. (Loc. cit. p. 283.) As in the preceding species the anterior tibiæ are without spine, the tarsi long and the femora thickened. Clypeus flattened, parallel, and with a lateral incisure and transverse suture forming a double clypeus. The claws are deeply cleft as in *Acratus*. The head and thorax are shining black, the elytra brownish testaceous and sparsely clothed with short pale hairs. Vallecito, California.

Fig. 5.—*Hypotrachia spissipes*, Lec. (Class. Col. N. A., 137.)

Fig. 6.—*Plectrodes pubescens*, Horn. Visalia, Cal.

Fig. 7.—*Macropnus crassipes*, Horn. (Proc. Acad. 1866, 397.) Though not mentioned in the preceding Papers, I introduce this insect for the opportunity afforded of figuring it. A view of its upper surface hardly affords any difference of outline from the common *Areodæ*, except in being rather more suddenly broader. Honduras.

Fig. 8.—*Pseudomorpha Cronkhitei*, Horn. Owens' Valley, Cal.

