Resembles L. affinis, but is only one third the size; the impressions of the elytra are also more irregularly distributed, and their sides are more rounded.
6. L. longior, magis elongatus, thorace inæquali, in latera fortius impresso elytris humeris paulo productis. Long. 23 .
Narrower than any of the others: thorax one third longer than wide, very gradually narrowed at base and tip, with the four dorsal impressions, and the lateral ones well marked. Elytra only moderately emarginate at base, with the humeri only slightly produced, and somewhat acute.
7. L. morbillosus, thorace inæquali, in latera minus profunde impresso, ad apicem transversim paulo elevato, elytris humeris parum productis. Long. $\cdot 25$. - 3 .

Resembles in form and characters L. affinis and L. erosus; it is intermediate in size, but the humeral angles are less prolonged, being, in fact, but slightly produced, and subacute.

These species occur under dried buffalo excrement in the desert region along the valleys of the Platte and Arkansas river: and are sometimes very abundant.

## Notice of three genera of Scarabeides found in the United ${ }_{\mathrm{L}}$ States.

By John L. Le Conte, M. D

On account of the great resemblance in appearance betwetn species of different genera among several of the tribes of Scarabæidæ, much confusion has resulted from the effort to place our species properly. This has perhaps been particularly the case with our smaller Dynastidæ. Eight species were placed by me in the genus Bothynus, and the species known to Burmeister were placed by that author in Podalgus and Heteronychus. A more careful examination convinced him that the reference to the former of these two genera was incorrect, and peculiarities in the stridulating organs required the construction of a new genus, Ligyrus Burm. (Lamell. 3,542.) Although Heteronychus relictus is not mentioned, it also belongs to this genus, which comprises all the species from the United States known to Burmeister, except his Podalgus obesus (Bothynus castaneus Mels.)

The genus Ligyrus possesses a small elliptical plate of stridulating surface on the inner surface of the elytra, near the outer and posterior margin; the mandibles are strongly dentate externally, and the outer lobe of the maxillæ are toothed at the tip.

In the third volume of Prof. Lacordaire's admirable work on the genera of Coleoptera, these genera are carefully divided into groups, with the characters subordinated; and in one of the valuable notes he indicates the existence of a genus not recognized by Burmeister, and distinguished by having no organs of stridulation. No name was suggested, as the scope of Lacordaire's book permitted the introduction of no new materials; but, as I find myself under the necessity of referring to the species in some catalogues now preparing for publication, I bave been obliged again to review those referred by me to Bothynus, and now present the results, with the addition of two other remarkable genera.

## Ligyrus Burm.

As the inner surface of the elytra cannot always be conveniently examined, the following characters may be used to recognize the species of this genus. The mandibles are strongly toothed externally; the clypeus is only narrowly margined, furnished usually with two small upright teeth at the apex; the front is always transversely carinated, but the carina does not reach the sides of the head. The species may be divided into two groups, and the first may again be subdivided according as the clypeus has one or two apical teeth.

1. Thorax with an anterior fovea and acute tubercle; anterior tibiæ tridentate.

## A. Clypeus bidentate at tip.

1. L. morio, oblongus, postice paulo latior, subtus ferrugineus, supra picens vel ferrugineus, capite transversim æqualiter carinato, thorace parce punctato, lateribus subangulatis, elytris punctato-striatis, pygidio vix punctato; (maxillarum galea bidentata.) Long. $53-6$.

Bothynus morio Lec. Journ. Acad. Nat. Sc. 2d ser. 1, 87.
Middle States, not rare. Differs from the next by the less deep punctures of the elytra, by the less dense and less coarse punctures of the thorax, and the more distinctly angulated sides of the latter, and by the pygidium being hardly punctured. The body is also more elongated and less dilated posteriorly.
2. L. gibbosus, oblongus, postice latior, subtus ferrugineus, supra piceus vel ferrugineus, capite transversim carinato, rugoso opaco, thorace parce fortius punctato, lateribus vix angulatis, elytris sæpissime fortius punctato-striatis, pygidio parce punctato ; (maxillarum galea bidentata.) Long. $48-67$.

Scarabaus gibbosus De Geer, 4, 322 ; tab. 19, fig. 7.
Podalgus variolosus Burm. Lamell. 3, 121.
Ligyrus variolosus Burm. Lamell. 3, 542.
Var. Elytrus minus profunde punctato-striatis, seriebus internis fere obliteratis.
Bothynus obsoletus Lec. Journ. Acad. Nat. Sc. 2d ser. 1, 87.
Our most common species; found from Massachusetts to Texas, and westwardly to Santa Fe, Colorado River and Oregon. The specimens from California, Oregon and Texas differ in having the sides of the thorax more regularly rounded, and in the Californian and Oregon specimens the inner striæ of the elytra are frequently almost obliterated, and the thorax scarcely foveate. From the locality there can be no doubt that this is De Geer's species, with the description of which it corresponds. The differences between this and the preceding have been already mentioned; from the next it differs (apart from the maxillæ) by the less deep punctures of the elytra, and by the rugosely punctured and almost opake clypeus.
3. L. juvencus, ferrugineus, supra et subtus concolor, postice dilatatus, capite transversim carinato, antice fere lævi, thorace grossius minus dense punctato, lateribus rotundatis, elytris fortiter punctato-striatis, pygidio parcius punetato ; (maxillarum galea tridentata.) Long. $\cdot 53-6$.
? Lygerus juvencus Burm. Lamell. 3, 542.
? Podalgus juvencus Burm. ibid. 3, 121.
? Geotrupes juvencus Fabr. Ent. Syst. emend. 1, 32 ; Syst. El. 1, 20.
? Scarabaus juvencus Oliv. Ent. 3, 45, tab. 8, fig. 66, and tab. 16, fig. 143.
Bothynus neglectus Lec. Journ. Acad. Nat. Sc. 2d ser. 1, 87.
Georgia and South Carolina, common. The description of the clypeus " finely wrinkled, bidentate, the frontal suture elevated, abbreviated at the sides, slightly emarginate in the middle," given by Burmeister, leaves a doubt in my mind whether our species are really identical. The clypens in mine is nearly smooth, and the frontal carina is in no respect different from that of the two preceding species. The references to Fabricius and Olivier are acknowledged by Burmeister to be doubtful, and it must be a matter of regret that the name was not allowed to become obsolete.

## B. Clypeus at tip, with only a single elevated tooth.

4. L. ruginasus, ferrugineus, supra et subtus concolor, postice paulo latior capite rugose punctato, ad apicem acumine unico mucronato, transversim leviter carinato, thorace minus dense punctato, lateribus rotundatis fovea antica rugosa, elytris regulariter sat fortiter punctato-striatis, pygidio vix punctulato, (maxillarum galea tridentata.) Long. 65 .

One specimen found at Ringgold Barracks, Texas, by Lieut. Haldeman. In form and sculpture of the head and thorax this species exactly resembles $L$.
gibbosus, but the apical tooth of the clypeus is central, and therefore is not produced by wearing from a bidentate form ; the transverse carina is less elevated. On the elytra the rows of punctures are somewhat more regular and smaller than in the specimens from the Atlautic States. The fovea behind the anterior acute tubercle of the thorax is rounded and densely rugous, while in all the species of division A it is polished. The maxillæ are distinctly visible in the specimen, and their galea is obviously tridentate at tip. The form of the stridulating organs and the sculpture of the propygidium is precisely as in the other species.

## 2. Thorax without anterior fovea and acute tubercle ; anterior tibiæ sub-4-dentate.

5. L.relictus, nigro-piceus oblongus, capite leviter rugose punctato, clypeo antice bidentato, transversim carinato, carina medio interrupta, thorace parce punctato, lateribus rotundato, elytris linea suturali, alterisque 8 punctatis per paria approximatis, interstitiis alternis punctis plus minusve confusis notatis, pygidio parce punctato, ad basin subtiliter rugoso. Long. •7- 9 .

Scarabceus relictus Say, Journ. Acad. Nat. Sc. 5, 194.
Heteronychus relictus Burm. Lamell. 3, 92.
Bothynus relictus Lec. Journ. Acad. Nat. Sc. 2d ser. 1, 87.
Middle and Southern States, and Kansas as far as the Rocky Mountains ; those from the latter locality are smaller than those found in Pennsylvania. Slight differences are observed in form in this species; females occur usually of a regular oblong form like the males, but occasionally they are quite considerably ovate.

In the other species of the genus I have been able to detect no sexual differences; here, however, the inner claw of the anterior tarsi of the male is thickened, dilated and suddenly curved.
L. rugiceps, oblongus, nigro-piceus, capite valde rugose punctato, clypeo antice bidentato, transversim carinato, carina medio interrupta, thorace parce punctato, lateribus rotundatis, elytris punctis densioribus sicut in priore insculptis. Long. 55 .
Two specimens without any abdomen, from Georgia. Very closely resembles the preceding in form and sculpture, but the size is so different that I cannot consider them as the same species. The only specific differences I can find, however, are the more strongly rugose head and more densely punctured elytra.

## Aphonus Lec.

This genus contains species agreeing with Ligyrus in every respect, except that the elytra on the inner surface are not furnished with stridulating plates, and the mandibles are not dentate externally ; to avoid, however, the necessity of raising the elytra, recourse may be had to the structure of the head, which is narrowly margined, hardly transversely carinate just before the eyes, but at most furnished with a slight tubercle ; the tip of the clypeus is varied in form ; in the first division the tip itself is elevated, and immediately behind it is a sharp transverse elevated line, which is either uniform or tridentate. In the second division the tip is rounded, and the elerated line is strongly bidentate.

The species of the first division are of a very short ovate convex form ; the mandibles are not prominent, the antennæ are 10 -jointed, the 6th and 7 th joints wider than the preceding ones ; the one forming the second division is, however, only moderately dilated behind, the mandibles are more prominent, and the fifth and sixth joints of the antennæ are of the same size and closely united.

## I. Thorax not foveate near the apex.

A. Pygidium moderately convex ; last abdominal segment hardly finely margined.

1. A. pyriformis, breviter ovatus, obscure ferrugineus, capite confertim rugoso, vertice medio obsolete tuberculato, fronte ad apicem truncata, mox pone
apicem alte et paulo concave transversim reflexa, thorace lateribus rotundatis, punctato, parcius in disco pone medium, elytris sat grosse punctato-striatis, pygidio punctulato, parcius ad apicem. Long. 67 .

Bothynus pyriformis Lec. Journ. Acad. Nat. Sc. 2d ser. 1, 88.
Found near the forks of the Platte River. I observed in the collection of Capt. Wilkes' Exploring Expedition a specimen from Oregon, that I referred to this species, but as I have not now an opportunity of re-examining it, I cannot answer for the correctness of the reference. The sides of the head are extremely narrowly margined.

## B. Pygidium very convex, last abdominal segment with a very strong line near the margin.

2. A. $\operatorname{tridentatus,~ovatus,~piceus,~subtus~obscure~ferrugineus,~capite~dense~}$ rugoso tenuiter marginato, fronte ad apicem emarginata et medio submucronata, mox pone apicem alte transversim reflexo tridentato, thorace lateribus rotundatis, punctato, parcius in disco pone medium, elytris grosse punctato-striatis, pygidio subtilissime punctulato, abdominis segmento ventrali ultimo linea marginali insculpto. Long. •64.

Scarabceus tridentatus Say, Journ. Acad. Nat. Sc. 3, 209.
Bothynus tridentatus Lec. Journ. Acad. Nat. Sc. 2d ser. 1, 88,
One specimen found by me near Long's Peak; another from Missouri was given me by Prof. Agassiz. Both are females, and have the marginal line of the last abdominal segment sinuate at the middle.
3. A.frater, nigro-piceus, subtus nigro-ferrugineus, capite rugoso tenuiter marginato, in vertice obsolete elevato, clypeo ad apicem emarginato et mucronato, mox pone apicem linea transversa elevata tridentata, thorace lateribus rotundatis, punctato, parcius in disco pone medium, elytris rarius punctato-striatis, pygidio punctulato, versus apicem parce punctato, abdominis segmento ultimo ventrali linea marginali insculpto. Long. 65 .

One male found in New Jersey, given me by Mr. Guex. Differs from A. tridentatus only by the pygidium being nearly smooth at the tip, with a few distinct punctures, and by the punctures of the elytra being smaller and the striæ less numerous; this is produced by the absence of the rows between the alternate strix; these intermediate rows are usually known by being slightly irregular. From the next species it differs by this character, as well as by the color and shape.
4. A. hydropicus, breviter ovatus, ferrugineus, capite rugoso fortius marginato in vertice obsolete elevato, clypeo ad apicem emarginato et mucronato, mox pone apicem linea transversa elevata tridentata, thorace lateribns rotundatis, punctato, parcius in disco pone medium, elytris fortiter punctato-striatis, pygidio parce subtiliter punctato, ad basin dense punctulato, abdominis segmento ultimo ventrali linea marginali insculpto. Long. • 57 .

Bothynus variolosus|| Lec. Journ. Acad. Nat. Sc. 2d. ser. 1, 88.
Georgia, not rare. Much more dilated behind than the two preceding, with the punctures of the elytra large and the rows numerous. The pygidium of the female is much more convex than that of the male, and the submarginal line of the last ventral segment is sinuous in the middle, while in the male it is uniformly curved.
5. A. castaneus, breriter ovatus, ferrugineus, capite rugoso fortius marginato, vertice vix elevato, clypeo ad apicem emarginato et acute mucronato, mox pone apicem linea transversa elevata tridentata (dente medio minore, thorace parcius punctato, elytris fortiter punctato-striatis, pygidio parce subtiliter punctato, ad basin punctulato, abdominis stgmento ultimo ventrali linea submarginali inculpto. Long. 45 .

Bothynus castaneus Mels. Proc. Acad. Nat. Sc. 2, 138.
Podalgus obesus Burm. Lamell. 3, 119.

Middle and Southern States. Of the same form as the preceding, but only one-third the size, with the thorax less punctured, and the alternate striæ of the elytra arranged in pairs and composed of smaller punctures than in A. hydropicus. The sexual differences are as in H. hydropicus.

## II. Thorax at the apex submucronate and slightly foveate.

6. A. clunalis, oblongus, convexus, piceo-castaneus, postice parum dilatatus, capite dense rugose punctato, tenuissime marginato, clypeo ad apicem rotundato submucronato, mox pone apicem linea valde elevata bidentata armato, sutura frontali distincta emarginata, medio tuberculo parvo notata, thorace lateribus valde rotundatis, subtilius punctato, disco versus basin sublævi, ante apicem fovea parva punctata notato, et in apicem brevissime mucronato, elytris punc-tato-striatis, punctis externis minoribus confusis, propygidio subtilius punctato, ad apicem lævi, pygidio lævigato modice convexo; abdominis segmentis singulo serie transversa grosse punctato, ultimo tenuiter marginato, (maxillarum galea bidentata.) Long. 95 .

One specimen found by Dr. Thos. H. Webb, of the Boundary Commission, and probably in the valley of the Gila. This species differs so much from the other species of the genus, that it can hardly be associated with them ; I have, however, failed to discover any better place for it, and do not desire at present to increase the number of genera. Although the propygidium is somewhat rough with punctures, I do not perceive any transverse rugæ, such as indicate the organs of stridulation in other genera. The hind tibiæ are thicker than usual, and the transverse crest at the middle is prolonged externally into an acute tooth; it does not, however, agree with any of the genera of Pimelopides described by Lacordaire, and seems rather to belong to the division Pentodontides.

## Polymgehus Lec.

Clypeus trilobatus, lobis rotundatis, margine fortiter reflexo, ad apicem dentibus duobus parvis erectis armato, fronte utrinque transversim carinata, carinis margine adnexis; oculi valde incisi; mandibulæ extrorsum haud dentatæ, ad apicem acutæ et sursum productæ ; palpi articulo ultimo subcylindrico; (maxillæ haud visæ ;) antennæ 10 -articulatæ, clava triphylla, feminæ reliqua parte paulo, maris sesqui longiore; in hoc sexu articulis funiculi externis crassioribus compressis. Prosternum pone coxas haud prominulum. Pedes breves, crassi, tibiæ femoribus haud longiores, anticæ ultra medium tridentatæ, dentibus approximatis ; intermediæ et posticæ ultra medium extrorsum emarginatæ et unicoronatæ; ad apicem vix ciliatæ, angulo externo paulo producto; tarsi tibiis haud longiores, articulis $1-4$ æqualibus parce setosis, posteriores articulo 1 mo haud elevato, 4to vero subtus longe acuminato ; 5to omnium longiore, unguiculis anticis sexus utriusque simplicibus, posterioribus feminæ simplicibus, maris externis ad medium fortiter dentatis, dente ungue ipso vix breviore. Podex biarticulatus nudus.

A very remarkable genus of regularly oblong oval form, and not furnished with stridulating organs. Its characters approach those of Pachylus, from which, however, it is quite distinct. Professor Lacordaire, to whom I sent a specimen submitted it to a careful examination, and from his letter I translate the following extract, convinced that the opinion of my most learned friend, who has examined mearly all the genera of this family, will be of more service to the student than any thing I could say: "The Lamellicorn which you have sent is very remarkable, but there can be no doubt regarding its place in the entomological series. It is a genuine Dynastide, as is proved by the last abdominal stigmata diverging strongly, and by the form of the mentum, the mandibles and the clypeus; but it is related to the Melolonthides by the form of the head, the eyes, the antennæ and the tarsi. Its facies is at once that of certain species of both groups. In short, it is a completely new form, intermediate between the two groups mentioned, and you can without fear found upon it a new genus,
which ought, in my opinion, be placed among the Cyclocephalides, along side of Pachylus, which is also a very anomalous genus.
P. brevipes, nigro-piceus, vel obscure castaneus, oblongus, convexus, capite rugose punctato, clypeo ad apicem bidentato, fronte utrinque transversim carinata, margine reflexo, thorace lateribus rotundatis, confertim punctato, parce autem in disco pone medium, elytris punctato-striatis, punctis versus suturam confusis, podice punctato; abdomine coxisque posticis confertim aciculatis. Long. $63-7$.

Pennsylvania, New York and Missouri ; rare. Larger, more convex and more regularly oblong than Ligyrus variolosus. The outer striæ of punctures are almost entirely regular, while those next the suture are confused, especially towards the base. The eyes of the male are larger and more prominent than those of the female.

## Pleocoma Lec.

Clypeus (labrum?) prolongatus, antice angustatus acute rotundatus, pone apicem cornu transverso erecto furcato armatus ; caput ante oculos acute extrorsum angulatum, vertice inter oculos cornu brevi erecto armatum ; oculi magni vix emarginati. Antennæ 11-articulatæ, articulo 2ndo sequentibus crassiore ; 3io paulo elongato, 4 et 5to æqualibus, 6to paulo dilatato ; 7 mo adhuc duplo latiore, $8-11$ lamellatis, valde elongatis æqualibus. Mandibulæ, maxillæque haud visæ, palpi tenues. Thorax latus antrorsum angustatus parum convexus, disco antice declivi subdeplanato. Elytra parum convexa postice late rotundata. Prosternum haud prominulum. Tibiæ anticæ elongatæ 7-dentatæ, dentibus supernis tribus minutis, 4 mediocri, 5-7 magnis; posteriores elongatæ parum incrassatæ, extrorsum ultra medium emarginatæ et ad medium unidentatæ, ad apicem oblique truncatæ, ciliatæ, angulo externo parum producto; tarsi (intermedii) tenues, tibia longiores, articulis $1-4$ æqualibus, 5 to præcedente duplo longiore, unguibus simplicibus, paranychia angusta bisetosa. Corpus subtus, os pedes elytraque ad marginem longe fulvo-pilosa.

A very remarkable insect, apparently belonging to the Dynastidæ, but differing from all the described genera of that tribe by the 11-jointed antennæ baving a four-jointed club; the 7th joint might almost be considered as belonging to the club, but is only half the length of the four following. The very long hairs fringing the body give a strong resemblance in appearance to Syrichthus. The anterior tibiæ are somewhat as in Atbyreus ferrugineus and other Geotrupides, but the teeth are more unequal ; the anteocular lateral horns are seen also in that species; the eyes are very large, and contract the mouth so much beneath that the maxillæ and mandibles are invisible, or have been destroyed by insects ; the thick hair also prevents me from seeing the form of the mentum. The form of the prosternum is the same as in Athyreus; the anterior femora are very densely clothed with hair on the anterior surface. The anterior and posterior tarsi and abdomen are unfortunately destroyed ; the middle tarsi are exactly as in Athyreus. Doubt must therefore be entertained whether this genus should be placed with the Dynastidæ or Geotrupidæ; the form of the antennæ is equally repugnant to each, while the irregular puncturing of the elytra finds no parallel in the latter tribe.

I find it impossible to determine whether the projecting part of the head beyond the anterior horn is a clypeus or labrum ; there is a slight appearance of a suture, but I am not certain of its existence; the part in question is longer than wide, gradually narrowed in front and acutely narrowed at tip.
P. fimbriata, latiuscula, ovalis parum convexa, nigra nitida supra glabra, capite inter cornua excavato lævi, occipite subtiliter rugose punctato, thorace latitudine fere triplo breviore antrorsum valde angustato, lateribus rotundatis parce punctulato, antice modice declivi, elytris stria suturali, alterisque 8 per paria approximatis parum distinctis punctatis, interstitiis sat dense punctatis, margine et subtus dense et longe fulvo-villosa. Long. $1 \cdot 05$.

A specimen found in California by Dr. A. H. Heermann was given by him to

Prof. Haldeman, and by the latter most liberally placed in my collection. It is, unfortunately, in a very bad state of preservation, but the remarkable characters will enable it to be readily identified when it again occurs. Mr. Motschulsky informed me, when in this country, that be had seen at the Imperial Museum of St. Petersburg, specimens of the same insect, which had been collected in California. He regarded it as allied to Ceratophyus Fischer, (a division of Geotrupes).

## Analytical table of the species of Chlanius found in the United States.

## By John L. Le Conte, M. D.

The close relationship existing between several of our species of Chlænius, and the fact that many species have been described under more than one name, induces me to believe that an analytical table by which the species, which are really distinct, may be readily recognized, will be of service to the students of the entomology of the United States. They may be thus arranged:
A. Caput punctatum; antennis articulo 3io longiore; pedes rufo-testacei.
A. Thorax convexus, grosse punctatus, subcordatus.
-45, supra cyaneus, elytris macula magna apicali flavo. 1. C. posticus Lec.
( $\cdot 6$, supra violaceus, elytris nigris,
$\cdot 58$, supra totus viridis
2. C. viridifrons Esch.
$B$. Thorax planiusculus, æqualiter dense punctatus:
a. supra bicolores ;
thorax postice subangustatus ;
$-6-7$, supra æneus, elytris atris, labro truncato 4. C. æstivus Say.
$\cdot 3$, supra æneus, elytris atris, labro emarginato 5. C. pusillus Say.
thorax postice non angustatus;
$\cdot 5-6$, supra æneus, elytris atris, labro emarginato 6. C. emarginatus Say.
-4, supra viridis, elytris paulo obscurioribus, labro
emarginato
7. C. amœnus $D_{e j \text {. }}$
b. supra cyanei, concolores ;
$\cdot 75-85$, magnus, thorace lateribus sinuatis 8. C. rufilabris $D e j$.
-85, magnus, thorace lateribus non sinuatis 9. C. erythropus Germ.
$\cdot 55,-65$, mediocris, elytris valde punctulatis 10. C. laticollis Say.
mediocres, elytris obsolete punctulatis;
-65, thorace lateribus subsinuatis 11. C. regularis Lec.
$\cdot 6$ - 65 , thorace lateribus haud sinuatis 12. C. rufipes $D e j$. c. supra virides, concolores;
$\cdot 35$, ovalis, thorace antrorsum valde angustato, angulis posticis obtusis,
$\cdot 7$, thorace antrorsum valde angustato, angulis posticis rectis
$\cdot 55$, thorace antrorsum subangustato, basi impresso
14. C. angustus Newm.
${ }^{7} 75$, (•75, thorace postice haud angustato, ano rufo 16.C.smaragdinus Chaud.
C. Thorax planiusculus inæqualiter punctatus, subcordatus;
$\cdot 6-7$, viridis, thorace subtiliter versus basin dense
punctulato
17. C. prasinus $D e j$.
$\cdot 6$, cyaneus, thorace vage minus subtiliter punctato
18. C. cumatilis Lec.
B. Caput læve, vel subtilissime punctulatum.
D. Thorax inæqualiter punctatus, cordatus; antennis articulo 3io longiore.
-50, cyaneus, thorace depresso
19. C. leucoscelis Chevr.


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