

FOSSIL COLEOPTERA FROM FLORISSANT IN THE UNITED STATES NATIONAL MUSEUM.

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INTRODUCTION.

In furtherance of a plan for completing the study of all the accessible fossil Coleoptera from the Miocene shales of Florissant, I have been intrusted with the unworked material in this group contained in the collections of the United States National Museum. Several interesting novelties have been met with in examination of the specimens, the most remarkable of which is the beautifully preserved example of *Miostenosis lacordairei*, apparently most closely related to a tribe of Tenebrionidæ not now occurring in North America. The present report does not exhaust the material, but contains descriptions and figures of most of the species of immediate importance, the balance of the collection, consisting principally of more obscure insects, can be handled better in a comparative study with others now in hand from different sources.

SYSTEMATIC LIST OF SPECIES STUDIED.

CARABIDÆ.

Pterostichus walcotti Scudder.

Amara veterata Scudder.

powellii Scudder.

DYTISCIDÆ.

Agabus florissantensis, new species.

SILPHIDÆ.

Anisotoma sibylla, new species.

STAPHYLINIDÆ.

Aleocharopsis caseyi, new species.

secunda, new species.

Quedius chamberlini Scudder.

Staphylinus vulcan, new species.

Philonthus marcidulus Scudder.

Stenus morsei Scudder.

Miolithocharis lithographica, new species.

CUCUJIDÆ.

Lithocoryne arcuata, new species.

CRYPTOPHAGIDÆ.

Cryptophagus bassleri, new species.

TEMNOCHILIDÆ.

Tenebroides corrugata, new species.

BYRRHIDÆ.

Nosotetocus debilis Scudder.

Amphicyrta inhæsa Scudder.

Byrrhus romingeri Scudder.

BUPRESTIDÆ.

Anthaxia exhumata, new species.

SYSTEMATIC LIST OF SPECIES STUDIED—Continued.

LAMPYRIDÆ.

- Chauliognathus pristinus* Scudder.
Podabrus wheeleri Wickham.

LUCANIDÆ.

- Lucanus fossilis*, new species.

SCARABÆIDÆ.

- Atænius patescens* Scudder.
Aphodius granarioides, new species.
Macrodactylus pluto Wickham.
Diplotaxis aurora, new species.

CERAMBYCIDÆ.

- Leptura antecurrens*, new species.
ponderosissima, new species.

CHRYSOMELIDÆ.

- Systema florissantensis*, new species.

BRUCHIDÆ.

- Bruchus dormescens*, new species.
exhumatus Wickham.

TENEBRIONIDÆ.

- Miostenosis lacordairei*, new species.
Blapstinus linellii, new species.
Platydemia bethunei, new species.

RHYNCHITIDÆ.

- Rhynchites subterraneus* Scudder.

OTIORHYNCHIDÆ.

- Evopes veneratus* Scudder.

CURCULIONIDÆ.

- Geralophus antiquarius* Scudder.
saxuosus Scudder.
fossicius Scudder.
repositus Scudder.
lassatus Scudder.
retritus Scudder.
Coniatus evisceratus Scudder.
Cleonus exterraneus Scudder.
færsteri Scudder.
Dorytomus williamsi Scudder.
Rhysosternum longirostre Scudder.
Cryptorhynchus profusus Scudder.
Balaninus minusculus Scudder.

DESCRIPTIONS OF GENERA AND SPECIES.

Genus PTEROSTICHUS Bonelli.

PTEROSTICHUS WALCOTTI Scudder.

A specimen referred here is slightly smaller than the measurements given by Scudder. The elytron shows the large ocellate punctures along the eighth stria which are common among recent species but which were not mentioned in the original description of the present insect.

Cat. No. 59644, U.S.N.M.

Genus AMARA Bonelli.

AMARA VETERATA Scudder.

The fossil referred to this species is in rather poor condition. It exceeds the measurements given by Scudder by about 1 millimeter, but is not otherwise tangibly different. Length, 8.75 mm.

Cat. No. 59645, U.S.N.M.

AMARA POWELLII Scudder.

One specimen, agreeing well with figures and description.

Cat. No. 59646, U.S.N.M.

Genus AGABUS Leach.

AGABUS FLORISSANTENSIS, new species.

Plate 23, figs. 1, 2.

Preserved in ventral view and much carbonized so that most of the sutures and details of minute structure are lost. Form ovate, sides not parallel. Line of demarcation between head and prothorax not distinguishable, but the latter is broader posteriorly, as in most of the species of the genus. Hind leg with the third and fourth tarsal joints shorter than the second and fifth, claws rather long, curved and equal. Length, 11.35 mm.; width of elytra, about the middle, 6.30 mm.

Type.—Cat. No. 59632, U.S.N.M.

One specimen. This insect is somewhat similar in form to *Agabus* (*Gaurodytes*) *austini*, but is more obtuse behind. It is also much larger, equaling in size any of the specimens of *A. lugens* in my collection. The generic reference seems fairly safe, the facies agrees with *Agabus*, so do the ventral sclerites as far as shown, while the claws are entirely unlike those of our other genera of large Dytiscids to which the specimen might otherwise be presumed to belong, although they agree closely with *Agabus*. The tarsal joints are also proportioned as in this genus. The coxal processes are less divergent than in the recent forms with which I have compared this species, but they are evidently somewhat shifted, as will be seen from their position in the figure. On account of the peculiar preservation of the specimen in hand the outlines have a haziness of definition defying close delineation. The figures are therefore more diagrammatic than usual, and the vestiture of the hind tarsus must be considered as a conventional representation, not as a copy. In the original, the hair prints are too obscure for reproduction in the camera lucida.

Genus ANISOTOMA Illiger.

ANISOTOMA SIBYLLA, new species.

Plate 24, figs. 5-8.

Preserved in part profile. Head rather large, slightly deflexed, pronotum regularly but not strongly arched on the disk, elytral disk more arched and not continuing the thoracic curve. No sculpture can be distinguished upon the head and thorax, but the elytra are marked with rather distant shallow striæ, showing traces of lightly impressed moderately large punctures, these punctures separated by considerably more than their own diameters. Legs rather long, front tibia broadened at tip and spinose on the anterior margin, middle tibiæ wanting, hind tibiæ about straight, more slender than the anterior, with apparently three rows of short spines on the face,

serially arranged so as to give a striate effect. Antenna with the first joint concealed, the second and third subequal but with the latter a little more slender, fourth, fifth, and sixth gradually a little broader, seventh much larger, eighth small, ninth about the size of the seventh, tenth similar to the ninth, eleventh a little narrower and rounded at the tip. Length, 3.35 mm. Height, at base of elytra, 1.70 mm.

Type.—Cat. No. 59633, U.S.N.M.

One specimen. In general build, it seems nearer *A. valida* than to any of the other recent North American species, but differs in sculpture and in leg structure. The antenna exactly answers the characters of the genus, as will be seen by reference to the figure.

ALEOCHAROPSIS, new genus.

This name is proposed for a magazine genus to contain fossil forms of an Aleocharinid facies but of undetermined affinities. The type is *A. caseyi*, described below, which has a general likeness to some of the large recent Aleocharini, notably to *Maseochara*, but differs in the shorter antennæ, the thoracic outline and the long setæ of the pronotal disk. It agrees with the genera related to *Maseochara* and *Baryodma* in the short elytra and the long blunt strongly margined abdomen, with apparently seven exposed segments, the basal portion being uncovered because of the brevity of the wing covers.

ALEOCHAROPSIS CASEYI, new species.

Plate 22, fig. 4.

Form elongate and rather slender, subparallel. Head not very well preserved, the shape distorted. Eye apparently small but not distinctly shown. Antennæ, one of which is complete, only as long as the head, moderately incrassate distally. Prothorax, as preserved, nearly one and a half times as broad as long, broader at apex than at base, a long seta in each anterior angle, sides regularly arcuate, the greatest width slightly in front of the middle, all the angles obtuse. Elytra strikingly small, about as long as the prothorax, the length of each elytron approximately equal to one and one-third times its own breadth. Abdomen longer than all the rest of the body, distinctly margined at sides, the apical appendages presumably indicated by a cloud in the position usually occupied by these structures. Sculpture of the head, prothorax, and elytra probably very fine, since no definite characters can be made out except a few scattered punctures which may belong to the stone, the abdominal segments minutely scabrous, distinctly and rather strongly hairy along the posterior margins and with a few somewhat longer hairs projecting from the sides. Length, exclusive of apical cloud, 10.80 mm.; of head, 1.40 mm.; of prothorax, about the same; of elytra, a very little more. Width of elytra, conjointly, 2.40 mm.

Type.—Cat. No. 59634, U.S.N.M.

I can not see that this is related to any of the Staphylinidæ described by Scudder. Perhaps the most striking feature is the small elytra which remind one of *Sunius* in the Pæderini. I believe that the shape of the prothorax is correctly given in the description, and that the lobate structure at the base of this segment is a displaced piece, though in some lights it appears continuous with the thoracic disk, and in that event the prothorax would be broader toward the base than in front of the middle.

The insect is named for Col. Thomas L. Casey, of Washington, District of Columbia

ALEOCHAROPSIS SECUNDA, new species.

Plate 22, figs. 5, 6.

Less elongate than *A. caseyi*. Head, as preserved, a little longer than broad. Antenna short, reaching slightly beyond the prothoracic apex, first joint large, the third hardly longer than the second, remainder, to the ninth, more or less strongly transverse, extreme apex indistinct. Prothoracic width equal to about one and one-half times the length, form somewhat distorted so that the shape of the sides is not determinable. Elytra, conjointly, broader than the prothorax, which they distinctly exceed in length, apices truncate, the sides subparallel. Abdomen, at base, about as broad as the elytral apices, tapering thence to the tip. Legs moderate or rather short. Sculpture not visible at any point, except on the abdomen, where it consists of fine punctures giving rise to rather long moderately close-set hairs. Like *A. caseyi*, this insect has a long seta (not shown in the figure) inside of each anterior prothoracic angle. Length, to tip of middle abdominal projection, 9.90 mm. Width, across elytra, 2.25 mm.

Type.—Cat. No. 59635, U.S.N.M.

One specimen. Compared with *A. caseyi*, this insect is readily known by the relatively longer elytra. The difference in abdominal appearance may be due to accidental expansion or contraction. This one shows the last segment to be apparently tridentate, but under high power the middle process is seen to be double. It can not be *Tachinus sommatius* (to which, at first sight, it has some resemblance) because of the difference in antennal structure.

Genus **QUEDIUS** Stephens.

QUEDIUS CHAMBERLINI Scudder.

A single example is presumed to belong here. In view of the fact that the original figure of this species was not made from the type and that the two later figures¹ differ in thoracic proportions to such an extent as to preclude the possibility of their representing a single species, the identification is open to some doubt.

Cat. No. 59647, U.S.N.M.

¹ Mon. U. S. Geol. Surv., vol. 40, pl. 5, figs. 10 and 11.

Genus STAPHYLINUS Linnæus.

STAPHYLINUS VULCAN, new species.

Plate 22, fig. 7.

Preserved in dorsal view. Form elongate, more like that of *Ocypus* than of *Staphylinus*, head suborbicular as in the group containing the recent *S. badipes*. Antennæ rather short and but slightly enlarged distally, the first to third joints elongate, the second shorter than either the first or third, the remainder transverse, the last a little longer and rounded at the tip. Eyes not definable as such, but not prominent nor disturbing the contour of the head. Prothorax about equal to the head in size, base and apex subequal, sides apparently regularly arcuate each way from about the middle, the angles not well defined but obtuse and not prominent. Elytra about one and a half times as long as the prothorax, humeri ill-defined, sides somewhat rounded, the pair (as preserved) probably overlapping a little along the suture which is not distinctly marked. Abdomen with the sides subparallel to the anterior margin of the fifth segment, thence tapering to the tip. Terminal processes obscure. Legs moderate, the front pair stouter, the tarsus (in this specimen, which is therefore presumably a male) strongly dilated. The sculpture of the insect is not well shown, but appears to have been a subscabrous punctuation. A few well defined hair prints on the cheeks indicate vestiture of a type similar to that now seen on *S. badipes*. Length, exclusive of the terminal appendages, 13.50 mm.; of the head, 2.20 mm.; of the prothorax, a little less; of the elytra, 2.65 mm.; of antenna, from margin of head, 2.75 mm. Width of head, 2.10 mm; of elytra, 2.30 mm.; of the abdomen across the fourth exposed segment, 2.45 mm.

Type.—Cat. No. 59636, U.S.N.M.

This insect, known from a single specimen, has the slender form of an *Ocypus*, but I have preferred to place it in *Staphylinus* on account of the shape of the head and the antennal structure, both of these features allying it with *S. badipes*, to which it has been compared. In the specimens of *Ocypus* at my command, the antennæ are much more slender. It is a somewhat larger insect than Scudder's *S. lesleyi*, from these shales, and that species is described as having a subtriangular head, which would put it in a different group. From *S. vetulus* Scudder, the new species differs in being much smaller and more slender.

Genus PHILONTHUS C_u, tis.

PHILONTHUS MARCIDULUS Scudder.

A specimen with reverse, showing underside and antennæ, is assigned here with some doubt. It is a little larger than the measurements given by Scudder, reaching the length of 13.75 mm.

Cat. No. 59648, U.S.N.M.

Genus *STENUS* Latreille.*STENUS MORSEI* Scudder.

Plate 22, fig. 3.

A fairly good specimen of a Staphylinid in this collection agrees in all respects with the figure and description of *Bledius morsei* Scudder. However, I refer it with some confidence to *Stenus* and believe that Scudder erred in his generic assignment. All the visible characters of his figure are those of *Stenus*, the coarse sculpture (Scudder speaks of granulations, but I presume that his specimen, like mine, was a reverse), the long abdomen with seven plainly visible segments, the slender legs and antennæ, none of which features are in the least like *Bledius armatus*, with which he compares his insect. I figure the specimen in hand, since it gives a somewhat different view of the species.

It is interesting to note in this connection that Scudder was inclined to refer *Stenus prodromus* Heer (from Aix) to *Bledius*. In this he is not followed by Handlirsch, who lists several other *Steni* from the Tertiaries of Europe.

Cat. No. 59637, U.S.N.M.

MIOLITHOCHARIS, new genus.

Resembles *Lithocharis* (*L. corticina*) in general form and differs in the rounded head, much less quadrate prothorax, and particularly in the lack of long setæ on the edges of the head, prothorax, and abdomen. The type is *M. lithographica*, described below, which seems best assigned near *Lithocharis* by the antennal structure, the form of the body, and by the uniform sculpture of fine punctuation accompanied by a covering of short delicate hairs.

MIOLITHOCHARIS LITHOGRAPHICA, new species.

Plate 22, figs. 1, 2.

Form moderately elongate. Head about as long as broad, ovate, the hind angles rounded, eyes not defined. Antennæ longer than usual in the Staphylinidæ of Florissant, reaching to within about one-third of the prothoracic base, the first joint large and apparently about as long as the next two, the second scarcely shorter than the third, which is longer than the fourth, fifth still a little shorter, sixth to tenth more transverse, submoniliform, eleventh longer, oval, the incrustation of the terminal joints not strong. Prothorax a little shorter than the head, subquadrate but broader than long, the angles rounded. Elytra about one-fourth longer than the prothorax, conjointly a little more than one-fifth wider than long, tips truncate, sides subparallel. Abdomen a little longer than the rest of the body, subparallel at sides to about the middle, thence tapering to the tip. Legs

moderate in length, rather slender. Sculpture of head, prothorax, and abdomen, as far as shown, almost uniform, consisting of a fine, microscopic, not very close punctuation with a clothing of short fine hairs. Length, 6.25 mm. Width across elytra, 1.25 mm.

Type.—Cat. No. 59638, U.S.N.M.

This finely preserved insect can not be referred to any of the species described by Scudder. It is absolutely unlike his *Lithocharis scottii*, the antennæ alone serving to differentiate the two. Only a single specimen is known.

Genus LITHOCORYNE Scudder.

LITHOCORYNE ARCUATA, new species.

Plate 24, figs. 3, 4.

Resembles *L. gravis* from the Florissant shales, but differs in size, sculpture, and the form of the prothorax. General shape similar to that of *L. gravis*, prothorax with the perfect side regularly arcuate throughout, the front angles prominent and sharp. Head distinctly closely and subconfluently but not deeply punctured, the prothorax at sides similarly but somewhat more strongly punctured, the median area much less distinctly and more finely so. Elytra with the basal area less strongly punctured than the thoracic sides, the punctures forming vague series but fading out toward the apex. Length, 4.75 mm. Width across the elytra at middle, 2 mm.

Type.—Cat. No. 59639, U.S.N.M.

One specimen. A comparison of the figure of this species with the figure and description of *L. gravis* will show several differences. The prothoracic side is regularly arcuate in *L. arcuata*, but nearly straight, except near the apex, in *L. gravis*. The sculpture is different, since Scudder describes the prothorax of his species as being covered with minute but not crowded nor prominent granulations. If his example were a reverse, this would mean that the punctuation of that part, in the obverse, would be rather fine and well separated, while in *L. arcuata* it is rather coarse and very much crowded. There is a very serious discrepancy between the description and figure of the antennæ in Scudder's work, but I have assumed the former to be correct, in which case the antennæ of *L. gravis* and *L. arcuata* are similar excepting the proportions of the club joints. In my species the terminal articulation is truncate, possibly due to distortion.

Genus CRYPTOPHAGUS Herbst.

CRYPTOPHAGUS BASSLERI, new species.

Plate 24, figs. 1, 2.

Preserved in ventral view. Form rather short, head broad, antenna 11-jointed, the first joint large, second and third narrower and successively shorter, fourth to seventh subequal, submoniliform, shorter than the third, eighth apparently partially decomposed,

judging from its shape and texture, ninth to eleventh forming a rather long and distinct club. Prothorax injured on the left side, the right is furnished with two subgranular tooth-like projections, sides in front and behind these processes oblique to apex and base. Elytra slightly broader than the prothorax, sides subparallel to behind the middle, thence arcuate to tip, inflexed margin long and rather broad. Length, 2.40 mm. Width of elytra, 1.20 mm.

Type.—Cat. No. 59640, U.S.N.M.

One specimen, which seems to be a good *Cryptophagus*. The basal antennal joint is less swollen than in the numerous recent species examined. The sculpture is obliterated and the legs can not be made out. The species is named after Dr. R. S. Bassler, of the United States National Museum.

Genus TENEBROIDES Piller.

TENEBROIDES CORRUGATA, new species.

Plate 23, fig. 3.

Preserved in ventral view. Body elongate, head somewhat roughened beneath. Prothorax distinctly broader than long, front margin concave, basal nearly straight, sides nearly straight and divergent from base to a point in front of the middle, thence arcuately narrower to apex, which is the same width as the base. Front angles acute. Elytra showing only the epipleural portion, which is transversely corrugated, as shown in the figure. Metasternum long, side piece narrow, subcuneiform. Posterior coxæ transverse, approximate. Abdominal ventral segments subequal, except the last, which is somewhat shorter. Length, 6.55 mm. Greatest width of elytra, 2.25 mm.

Type.—Cat. No. 59641, U.S.N.M.

One specimen. By the form, and what can be seen of the sternal, coxal and abdominal structure, this insect agrees well with the genus in which I have placed it, the size being about equal to that of our smallest living North American species. The corrugation of the elytral epipleuræ, which seemed at first to be a disturbing element, is shown, in less degree, by several of our native forms. I have found evidence of it in *T. mauritanica*, *T. castanea*, *T. laticollis*, *T. marginata*, and *T. semicylindrica*.

Genus NOSOTETOCUS Scudder.

NOSOTETOCUS DEBILIS Scudder.

One specimen, length, 4.50 mm., width, 3.25 mm. These measurements correspond with those of Scudder, but the outline is a little different.

Cat. No. 59649, U.S.N.M.

Genus AMPHICYRTA Erichson.

AMPHICYRTA INHÆSA Scudder.

Two specimens, not differing in size nor other appreciable detail from Scudder's description and figure.

Cat. No. 59650, U.S.N.M.

Genus BYRRHUS Linnæus.

BYRRHUS ROMINGERI Scudder.

One specimen, agreeing almost exactly with the original in size.

Cat. No. 59651, U.S.N.M.

Genus ANTHAXIA Eschscholtz.

ANTHAXIA EXHUMATA, new species.

Plate 23, figs. 4, 5, 6.

Preserved in dorsal view. Form similar to that of the recent *A. xneogaster*, but somewhat less obtuse posteriorly. Head broad and short, anterior outline slightly concave. Antennæ extending about to the hind margin of the prothorax. Prothorax a little more than twice as wide as long, sides prominent, the right showing the squarish truncation, which is so well marked in *A. xneogaster*, anterior margin arcuately, rather weakly lobed at middle, hind margin sinuate each side. Elytra at humeri a little broader than the thoracic base, tapering to apex, which is a little truncate. The entire upper surface of the body shows the same type of sculpture as in *A. xneogaster*—a coarse reticulation (fig. 6). In the fossil these reticulations are slightly larger on the prothorax than on the elytra and considerably larger than on the head. Length, 7 mm.; of elytron, from humerus to apex, 4.90 mm. Width of prothorax, 2.90 mm.; of one elytron at middle, 1.50 mm.

Type.—Cat. No. 59642, U.S.N.M.

One specimen. This insect goes well into the genus *Anthaxia* by all the visible features. As far as can be told, it was not very unlike the species with which it has been compared in the foregoing description, but has a slightly differently shaped head and elytra. *A. xneogaster*, in the sense understood by Dr. George Horn, extends across the continent from Maine to British Columbia and southward to the mountains of Southern California, including in its range the territory formerly inhabited by *A. exhumata*. The figures will show the relative coarseness of reticulation in the two species.

Genus CHAULIOGNATHUS Hentz.

CHAULIOGNATHUS PRISTINUS Scudder.

Here I refer a specimen from the Lacoe collection, which answers the description of the above species in what I regard as the chief essentials. The abdomen is similarly though less strongly elongate,

the elytral proportions are very nearly the same, those of the head almost exactly so. Length of this example, 10.60 mm.; of elytra, 6 mm.; of head, 1.50 mm. Width of elytron near middle, 1.55 mm.; of head, 1.75 mm.; of abdomen, 3 mm.

Cat. No. 59652, U.S.N.M.

Genus *PODABRUS* Westwood.

PODABRUS WHEELERI Wickham.

Two specimens in rather poor condition.

Cat. No. 59653, U.S.N.M.

Genus *LUCANUS* Linnæus.

LUCANUS FOSSILIS, new species.

Plate 23, fig. 7.

Represented by an elytron, a scutellum and a few fragments of tissue belonging to the prothoracic disk. The elytron is proportioned almost exactly as in the recent *L. dama*. The sculpture, however, is much rougher, somewhat coarser than in *L. placidus*, and in the specimen is granulate, so that the object is probably in reverse. The scutellum is similar in shape to that of *L. placidus* and, as in that species, is smoother at the tip, this latter character being less marked in *L. fossilis*. Length of elytron, 18.50 mm.; width, 11 mm.

Type.—Cat. No. 59643, U.S.N.M.

One specimen. The generic reference is made upon the proportions, form, texture and sculpture of the elytron, after comparison with recent species. It is possible that the fragment belonged to some large Scarabæid.

Genus *ATÆNIUS* Harold.

ATÆNIUS PATESCENS Scudder.

A specimen in very soft shale is referred here, although it exceeds the measurements given by Scudder a little.

Cat. No. 59654, U.S.N.M.

Genus *APHODIUS* Illiger.

APHODIUS GRANARIOIDES, new species.

Plate 25, fig. 1.

Preserved as a reverse, in dorsal view. Form somewhat resembling the recent cosmopolitan *A. granarius*, but at once separable therefrom by the narrower elytral sutural interval. Head somewhat distorted, clypeus only sparsely and rather finely punctate, anteriorly subtruncate, front angle of one side rounded, that of the other side apparently prominent, but I believe the prominence is due to displaced mouth parts, since there is some evidence of a demarcation matching the opposite curve. Prothorax very nearly twice as broad

as long, sides rather regularly arcuate, apex and base subequal, front margin a little arcuately prominent at middle, base nearly straight, anterior angles similar to those of the head, posterior angles obtuse, surface of disk not very closely sculptured with irregularly placed distinct rounded punctures which become smaller (or less well preserved) at the sides and anteriorly. Scutellum small, subtriangular. Elytra incomplete along the margins and with the apices broken off but with distinct sculpture in the form of regular striæ (eight of which show on the better side), sharp and well impressed, the striæ with regular rounded punctures separated by not much more than their own diameters. Interspaces broad, impunctate. Legs wanting. Length, as preserved, 6.10 mm., actual length in life probably about 6.25 mm. Width across humeri at most prominent part, 2.60 mm.

Type.—Cat. No. 59655, U.S.N.M.

One specimen which is larger than *Atænius patescens* and differs from it in sculpture. Since the fossil is in reverse, the striæ and punctures described above are represented by ridges and granules. It is easily separable from the other known Florissant species by the characters given.

Genus MACRODACTYLUS Latreille.

MACRODACTYLUS PLUTO Wickham.

Two specimens are contained in the collection, one of which allows us to supplement the observations made upon the type by display of the left antenna. This organ is composed, as far as can be made out in the somewhat indistinct preservation of the articulations, of seven joints, besides the club, the scape large, the stem-joints subequal in length excepting the third which is rather longer. The club is not spread.

Cat. No. 59656, U.S.N.M.

Genus DIPLLOTAXIS Kirby.

DIPLLOTAXIS AURORA, new species.

Plate 25, fig. 2.

Represented by an elytron about the size of that of the recent *D. brevicollis* LeConte, which occurs in the same general region. The punctuation is fairly coarse for this genus, more so than in the species cited, the punctures moderately closely placed and regular, slightly smaller toward the apex. Besides the smooth sutural margin, the elytron is marked with four double series of regular punctures, inclosing as many smooth longitudinal lines, as in most recent species of *Diplotaxis*. Length of elytron, 9.50 mm.; greatest breadth of same, 4 mm.

Type.—Cat. No. 59657, U.S.N.M.

One specimen. I feel quite satisfied with the generic reference. The fossil is more coarsely sculptured than *D. brevicollis*, with which it is comparable in size, resembling some of the Arizona species in its heavy punctuation. Since the specimen is a reverse, the punctures are represented by corresponding elevations.

Genus LEPTURA Serville.

LEPTURA ANTECURENS, new species.

Plate 25, fig. 3.

Preserved in profile. A small-headed form, evidently of a type similar to the recent *L. sexmaculata*. Eye large, extending the full width of the head. Antennæ of moderate length, the last four joints subequal, the remainder more or less obscured except the second and third, which show the ordinary proportions of the group, the second being short, the third several times as long, all visible joints more or less roughened and pubescent or hairy, the basal three more strongly. Front of head apparently finely and closely punctate and granulate. Prothorax, in side view, strongly tapering from the base, the back scarcely or not at all arched, sculpture weak and indefinable. Elytron narrowed at the tip which is shortly truncate but not spinose nor dentate, the surface rather strongly punctate, punctures crowded at base, becoming less so (separated by about their own diameters) at middle and sparse toward the apex, each puncture carrying a well-defined hair. Toward the apex, these hairs are approximately five times as long as the diameter of the punctures. Abdomen with no definable sculpture. Only one leg is visible, this incomplete and indicating that these organs were short. Length, 10.25 mm.; of elytron, 6.85 mm.; of antenna, from presumed point of attachment to tip, along chord of arc, 6 mm.

Type.—Cat. No. 59658, U.S.N.M.

One specimen. Not very closely allied to any of the North American forms with which I am acquainted. The use of the generic term *Leptura* is to be understood in its broad sense, though I see no characters which would invalidate the reference in a more restricted acceptance. The appearance of carination on one of the antennæ is due to some adventitious circumstance, since careful examination shows that the carina runs off on to the stone.

LEPTURA PONDEROSISSIMA, new species.

Preserved in profile. A specimen in poor condition, but with the anterior portion of the body fairly well preserved and showing one antenna and a front leg is at hand. Form of a heavy Lepturoid type, sculpture of all parts obliterated by the rather coarse grain of the stone on which it is outlined. Leg heavy, femur stout, tibia slightly curved,

tarsus distinctly longer than the tibia. Antenna short, extremely stout, the joints near the apex as broad or broader than long. Length of the fragment, 14.75 mm.; of head and prothorax about 4.50 mm.; of the fore tibia, 2.65 mm.; of the fore tarsus, 3.50 mm.; of antenna, straightened, about 8 mm.

Type.—Cat. No. 59659, U.S.N.M.

By the heavy antennæ, this species reminds one of the recent *L. brevicornis*, but it is probable, allowing for possible flattening through pressure, that they were even broader than in that insect. The antenna and the tibia both show some signs of carination, but I believe these marks are accidental or due to some peculiarity in the decomposition of the exoskeleton. It will be readily recognized, among fossil forms, by the stout antennæ. Quite probably, this insect is not strictly congeneric with our recent *Lepturæ*. Owing to the poor condition of the type, and its hazy outlines, I have not attempted to figure it.

Genus *SYSTEMA* Chevrolat.

SYSTEMA FLORISSANTENSIS, new species.

Plate 25, fig. 5.

Preserved in ventral view. Form rather stout for this genus, but not especially so. Head moderate, width equal to about one and one-half times the length, eyes not definable, antennæ filiform, slender, not showing the basal joints, but the remainder are subequal in length among themselves, except that the distal five are somewhat shorter than those nearer the head. Prothorax transverse, slightly narrowed anteriorly, the sides slightly arcuate, anterior margin faintly emarginate, posterior apparently lobed, but the appearance may be due to the tip of the prosternum being bent out straight instead of resting in the normal position. Anterior coxæ well separated, but their other boundaries not certainly defined. Meso and metasternal side pieces similar to those of recent *Systemæ*, as will be seen by reference to the figure, middle and hind coxæ transverse, the former obliquely so, both pairs well separated. Metasternum broad. Abdomen with the first and last visible segments longer than the intermediate, but the first is not excessively lengthened. Legs lacking, except one posterior femur which is only moderately thickened. Length, 6.30 mm.

Type.—Cat. No. 59660, U.S.N.M.

One specimen. The generic reference is open to some question, the most dubious feature, in my estimation, being the antennal structure. These organs are imperfectly preserved, but may possibly have been only 10-jointed, while in *Systema* there are 11 joints. In other respects, the generic correspondence is sufficiently close. The insect had well-developed functional wings, which are seen partly unfolded and extending beyond the elytral apices.

Genus BRUCHUS Linnæus.

BRUCHUS DORMESCENS, new species.

Plate 25, fig. 4.

Form short and stout, sculpture almost effaced except that the elytra are marked with fine shallow striæ which seem to be composed of series of very elongate punctures. Head and thorax not separable in this specimen, the former may be bent under and hidden. The posterior prothoracic margin is apparently only regularly arcuate instead of being lobed. Antennæ with eight exposed joints, strongly serrate. Posterior thigh without visible tooth, hind tibiæ strongly arcuate and with the tip prolonged into a spine-like point. Length, 3.75 mm.

Type.—Cat. No. 59661, U.S.N.M.

In form, this species may be compared with the recent *B. discoides*, but the sculpture is of a weak type, judging by the elytral striæ. The antennæ are quite different though of a type common in this genus which is remarkable for the diversity of structure offered by these organs.

BRUCHUS EXHUMATUS Wickham.

One specimen, agreeing with the type and showing, in addition, the antenna, which I have figured elsewhere.

Cat. No. 59662, U.S.N.M.

MIOSTENOSIS, new genus.

Recalls the Palearctic genus *Stenosis* in form, and agrees with it in antennal structure, but differs in the coxæ and the shape of the intercoxal process of the first ventral abdominal segment. In this new genus the anterior and middle coxæ are closely approximate, though apparently not actually contiguous, while the hind coxæ meet on the median line. The metasternum is moderately elongate and the intercoxal process of the first ventral is sharp and short. The type and only known species is *M. lacordairei*, described below.

MIOSTENOSIS LACORDAIREI, new species.

Plate 26, fig. 1.

Form elongate, narrow, in general resembling *Aræoschizus*, *Stenosis*, or *Dacoderus*. Head subrectangular, longer than broad. Eyes rather large. Antennæ eleven jointed, joints submoniliform but transverse, third longer than the second or the fourth, distal articulations not forming a distinct club, terminal joint small but distinct and probably free. Prothorax broadest in front of the middle, arcuately narrowed, slightly to apex and more so to the base, anterior angles acute but not projecting. Front and middle coxæ rounded,

small, approximate, hind coxæ transverse, femora moderately stout subclavate, tibiæ simple, straight, the anterior shortest, middle a little longer, posterior still longer, spurs entirely wanting, hind tarsi more slender than the others. First abdominal segment longest, the three following subequal among themselves, fifth short, sutures nearly straight. Under side of head granulate, more densely toward the sides, under surface of pro- and mesothorax similarly but more strongly and less densely sculptured, metasternum and abdomen still less granulate. Elytra only showing for a short distance along one edge and not displaying any markings. Length, from front of labrum to abdominal apex, 7.60 mm. Width, at point half way between the middle and hind coxæ, 2.40 mm.

Type.—Cat. No. 59663, U.S.N.M.

Known from a well-preserved specimen in reverse, showing the under side only, the granules, therefore, represent punctures. In this punctuation the insect bears a rather close resemblance to *Stenosis brentoides* Rossi (*angustata* Herbst), of southern Europe, a Corsican specimen having served as the basis of comparison. It seems that *Miostenosis* must be an intermediate or ancestral type, with affinities toward the Stenosiini on one hand and the Dacoderini on the other. It has the eleven jointed antennæ of the Stenosiini, with a coxal structure somewhat approaching *Dacoderus* as far as the front and middle members are concerned, but differs from both in the hind pair. It is evidently heteromerous, though the claws do not show on any of the tarsi. The eyes are distorted and give no good clue to the affinities. The Stenosiini proper are not represented by recent North American species though they are abundant in Europe, Asia, and the Mediterranean region of Africa, with a few generic types occurring in Madagascar, South America, and Australia. The genus *Aræoschizus*, fairly well represented to-day in our Southwestern States, has been separated from this group by Colonel Casey, to form a distinct tribe, the *Aræoschiziniæ*. I think that *Miostenosis* is not as closely related to *Aræoschizus* as to *Stenosis*. It differs from my examples of both genera in the short terminal segment of the abdomen and in the relatively long penultimate segment.

This very interesting insect is dedicated to the great French master, Lacordaire.

Genus BLAPSTINUS Latreille.

BLAPSTINUS LINELLII, new species.

Plate 26, figs. 6-9.

Represented by a specimen in dorsal aspect. Form rather elongate for this genus, subparallel. Head somewhat distorted in shape, the labrum bent up so as to be freely exposed, this part broader than

long and truncate anteriorly, top of head closely, rather finely, but distinctly punctured, the punctures barely separated but not confluent to any extent. Eye rather small but not much more so than usual in this genus. Antennæ about reaching the base of the prothorax, second joint short, third distinctly longer than the fourth, eighth somewhat broadened, and, with the ninth, tenth, and eleventh, forming a distinct but not abrupt club, these last three joints being still wider than the eighth. The eleventh joint seems to have been more or less ovate, but is broken on one antenna. The prothorax is somewhat distorted but is about twice as broad as the length along the median line, more coarsely punctured than the head but much less closely, the punctures separated by at least their own diameters and often by more, surface hairy. The sides are apparently rather regularly arcuate, the base distinctly broader than the apex, which is arcuately emarginate. Elytra subparallel at sides, pointed at tip, humeri distinct, surface with faint evidences of about eight fine punctured striæ, the punctures weak and only evident in good light, the interstitial spaces plainly but not deeply punctate, and hairy. Length, 6.75 mm.; of elytron, 4.40 mm. Width across elytra near humeri, 2.65 mm.

Type.—Cat. No. 59664, U.S.N.M.

This insect goes well into *Blapstinus*, with which it agrees in form, antennal structure, sculpture, and especially in vestiture. The legs are not shown. The abdominal segmentation is only faintly indicated through the elytra. The eye seems more anterior than in the recent *Blapstini*, and reaches the margin of the head, but this may be due to spreading and flattening. Comparing it with recent forms, I should place it in the neighborhood of *B. elongatus*, but without implying any close relationship between them.

I have named this beetle in memory of the late Martin L. Linell.

Genus PLATYDEMA Laporte.

PLATYDEMA BETHUNEL, new species.

Plate 26, figs. 2-5.

Preserved in dorsal view, lacking the legs, except a small portion of one member. Form rather elongate for this genus. Head rather finely, closely, and quite regularly punctured. Antenna showing ten joints, another being presumably missing, first joint stout, second small, third elongate, fourth longer than the fifth, distal joints gradually enlarging to form a rather narrow club. Palpus showing a terminal subtriangular joint. Prothorax injured on one edge, but nearly twice as broad as long, perfect side arcuate, most prominent near the middle, very little narrowed at base, front angle prominent and acute, hind angle damaged but apparently sharp, base and apex both nearly straight except near the angles, disk rather finely,

distinctly, and closely punctate, a little more densely toward the sides. Scutellum subtriangular. Elytra distorted by pressure and with the tips broken off, but showing the sculpture very nicely, each with eight entire striae, well impressed and sharp, the bottom of the striae with slightly irregularly spaced elongate punctures, interstices nearly or quite smooth. A distinct and rather long scutellar stria is present in addition to the entire ones described above. Length of fragment, 8.50 mm.; if complete it would probably reach between 9 and 10 mm.

Type.—Cat. No. 59665, U.S.N.M.

This specimen seems well referable to *Platydema*, though the size is large compared with most of the recent forms. In life, *P. bethunei* probably had the facies of *P. subcostatum*, but was larger. Several of the recent Mexican species reach a length of 8 mm., and at least one (*P. 15-maculatum*) measures up to 9 mm. The scutellar stria is distinct in recent forms, and may be well demonstrated by our common *P. excavatum*. The genus is already known from the Tertiaries, *P. geinitzi* having been described from the upper Oligocene of Rott, in the Siebengebirge.

I name this beetle after Dr. Charles J. S. Bethune, of Guelph, Ontario, Canada.

Genus RHYNCHITES Herbst.

RHYNCHITES SUBTERRANEUS Scudder.

An obverse and reverse in good condition, showing dorsal view, are referred to this species with which they agree in every essential noted by Scudder. However, the head, between and behind the eyes, and the entire discal surfaces of prothorax and elytra are clothed with long slender curved hairs, not closely placed nor arranged in series. Unfortunately the antennal club of this specimen is crossed by a front leg, obscuring the basal joints, so I am unable to determine whether this part is composed of three or of four joints. Length, exclusive of rostrum, 5.25 mm.; of rostrum, 2.75 mm.; of elytra, 3 mm. Width of elytron, 1.65 mm.

The specimens bear the United States National Museum accession number 38133.

Cat. No. 59666, U.S.N.M.

Genus EVOPES Scudder.

EVOPES VENERATUS Scudder.

Two specimens in side view, agreeing fully with the original description and figures.

Cat. No. 59667, U.S.N.M.

Genus *GERALOPHUS* Scudder.*GERALOPHUS ANTIQUARIUS* Scudder.

Five examples, all assigned here with some doubt on account of their poor condition.

Cat. No. 59668, U.S.N.M.

GERALOPHUS SAXUOSUS Scudder.

One specimen.

Cat. No. 59669, U.S.N.M.

GERALOPHUS FOSSICIUS Scudder.

Three examples.

Cat. No. 59670, U.S.N.M.

GERALOPHUS REPOSITUS Scudder.

Three specimens.

Cat. No. 59671, U.S.N.M.

GERALOPHUS LASSATUS Scudder

Four examples.

Cat. No. 59672, U.S.N.M.

GERALOPHUS RETRITUS Scudder.

One example.

Cat. No. 59673, U.S.N.M.

Genus *CONIATUS* Germar.*CONIATUS EVISCERATUS* Scudder.

One specimen, closely corresponding to the figures and description of the type, except that it is a trifle smaller. Length, exclusive of rostrum, 3.75 mm.; of rostrum, 0.80 mm. Height of body, 1.80 mm.

Cat. No. 59674, U.S.N.M.

Genus *CLEONUS* Schönherr.*CLEONUS EXTERRANEUS* Scudder.

One specimen, referred here on account of its size, is represented in ventral view and shows the abdominal and sternal structures of the genus, as far as they can be made out. The suture between the first and second abdominal segments is strongly sinuate, the third and fourth segments together are slightly longer than the second at its sides. The middle coxæ are rather narrowly separated, the hind ones more widely so.

Cat. No. 59675, U.S.N.M.

CLEONUS FØRSTERI Scudder.

Represented by one good specimen in side view, a reverse. Three poor examples of undersides are referred here with some doubt.

Cat. No. 59676, U.S.N.M.

Genus *DORYTOMUS* Germar.*DORYTOMUS WILLIAMSII* Scudder.

A single example, in reverse, is contained in the collection. It is somewhat smaller than the Scudder type and I can not be sure that the elytral interspaces were hairy. The abdominal sutures are as in recent *Dorytomus*, the first only slightly curved at middle. The sides of the meso and metasterna are strongly granulate in the present specimen (representing corresponding punctuation) this sculpture also extending on to the first and second abdominal segments but becoming evanescent on those following. The rostrum is slightly more arcuate than in the type figure, but this character is variable in the genus. Length, excluding rostrum, 3.45 mm.; of rostrum, on chord of arc, 1.75 mm. Height of body about 2 mm.

Cat. No. 59677, U.S.N.M.

Genus *RHYSOSTERNUM* Scudder.*RHYSOSTERNUM LONGIROSTRE* Scudder.

Three specimens, all side views. Two are in fine preservation, the other is much poorer.

Cat. No. 59678, U.S.N.M.

Genus *CRYPTORHYNCHUS* Illiger.*CRYPTORHYNCHUS PROFUSUS* Scudder.

Two specimens.

Cat. No. 59679, U.S.N.M.

Genus *BALANINUS* Germar.*BALANINUS MINUSCULUS* Scudder.

A beautiful specimen of this genus, referred here, differs slightly in measurements from the type as described by Scudder. In view of the known variation in modern species it does not seem wise to give the present example a different name. Total length, excluding rostrum, 4.25 mm.; of rostrum, along chord of arc, 2.20 mm.

Cat. No. 59680, U.S.N.M.

EXPLANATION OF PLATES.

PLATE 22.

- Fig. 1. *Miolithocharis lithographica*.
 2. *Miolithocharis lithographica*, antenna.
 3. *Stenus morsei*.
 4. *Aleocharopsis caseyi*.
 5. *Aleocharopsis secunda*.
 6. *Aleocharopsis secunda*, antenna.
 7. *Staphylinus vulcan*.

PLATE 23.

- Fig. 1. *Agabus florissantensis*.
 2. *Agabus florissantensis*, hind tarsus.
 3. *Tenebroides corrugata*.
 4. *Anthaxia exhumata*.
 5. *Anthaxia exhumata*, thoracic reticulations.
 6. *Anthaxia æneogaster*, thoracic reticulations.
 7. *Lucanus fossilis*.

PLATE 24.

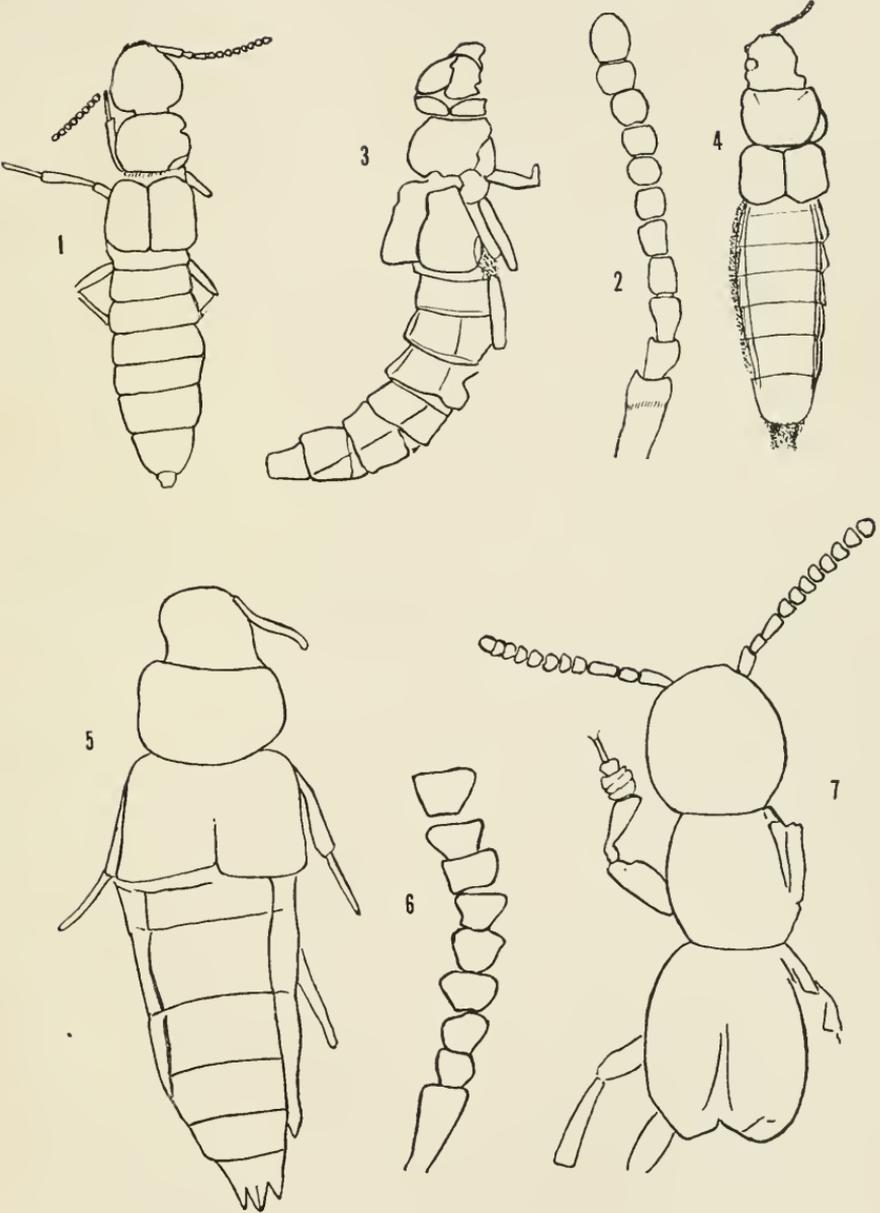
- Fig. 1. *Cryptophagus bassleri*.
 2. *Cryptophagus bassleri*, antenna.
 3. *Lithocoryne arcuata*.
 4. *Lithocoryne arcuata*, antenna.
 5. *Anisotoma sibylla*.
 6. *Anisotoma sibylla*, antenna.
 7. *Anisotoma sibylla*, front leg.
 8. *Anisotoma sibylla*, hind leg.

PLATE 25.

- Fig. 1. *Aphodius granarioides*.
 2. *Diplotaxis aurora*.
 3. *Leptura antecurrens*.
 4. *Bruchus dormescens*.
 5. *Systema florissantensis*.

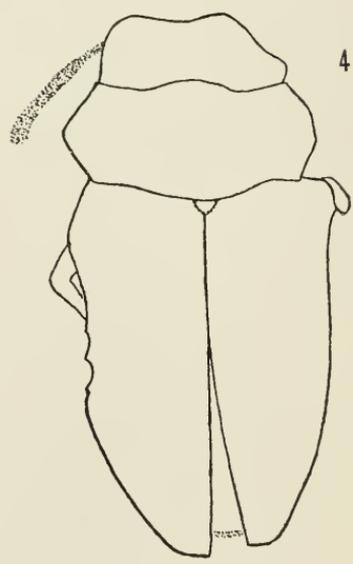
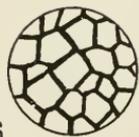
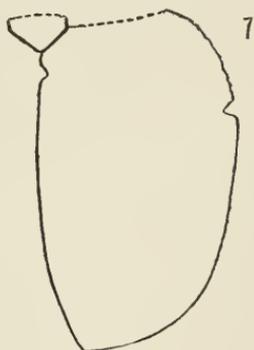
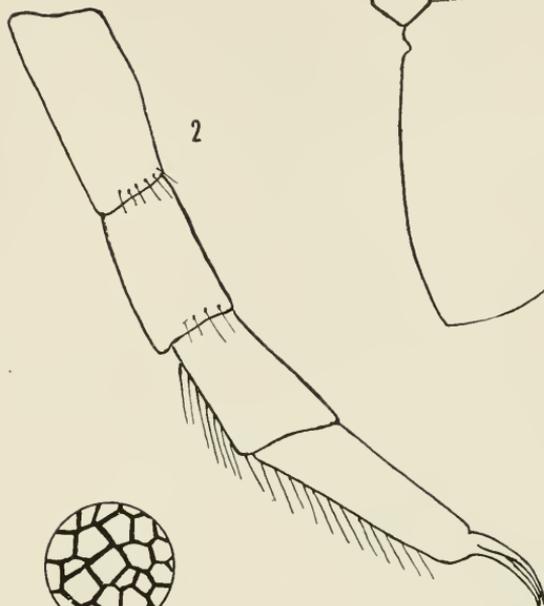
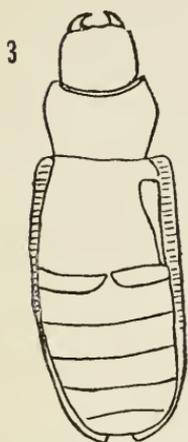
PLATE 26.

- Fig. 1. *Miostenosis lacordairei*.
 2. *Platydema bethunei*.
 3. *Platydema bethunei*, antenna.
 4. *Platydema bethunei*, elytral stria.
 5. *Platydema bethunei*, prothoracic punctuation.
 6. *Blapstinus linellii*.
 7. *Blapstinus linellii*, antenna.
 8. *Blapstinus linellii*, unbroken antennal tip.
 9. *Blapstinus linellii*, vestiture.



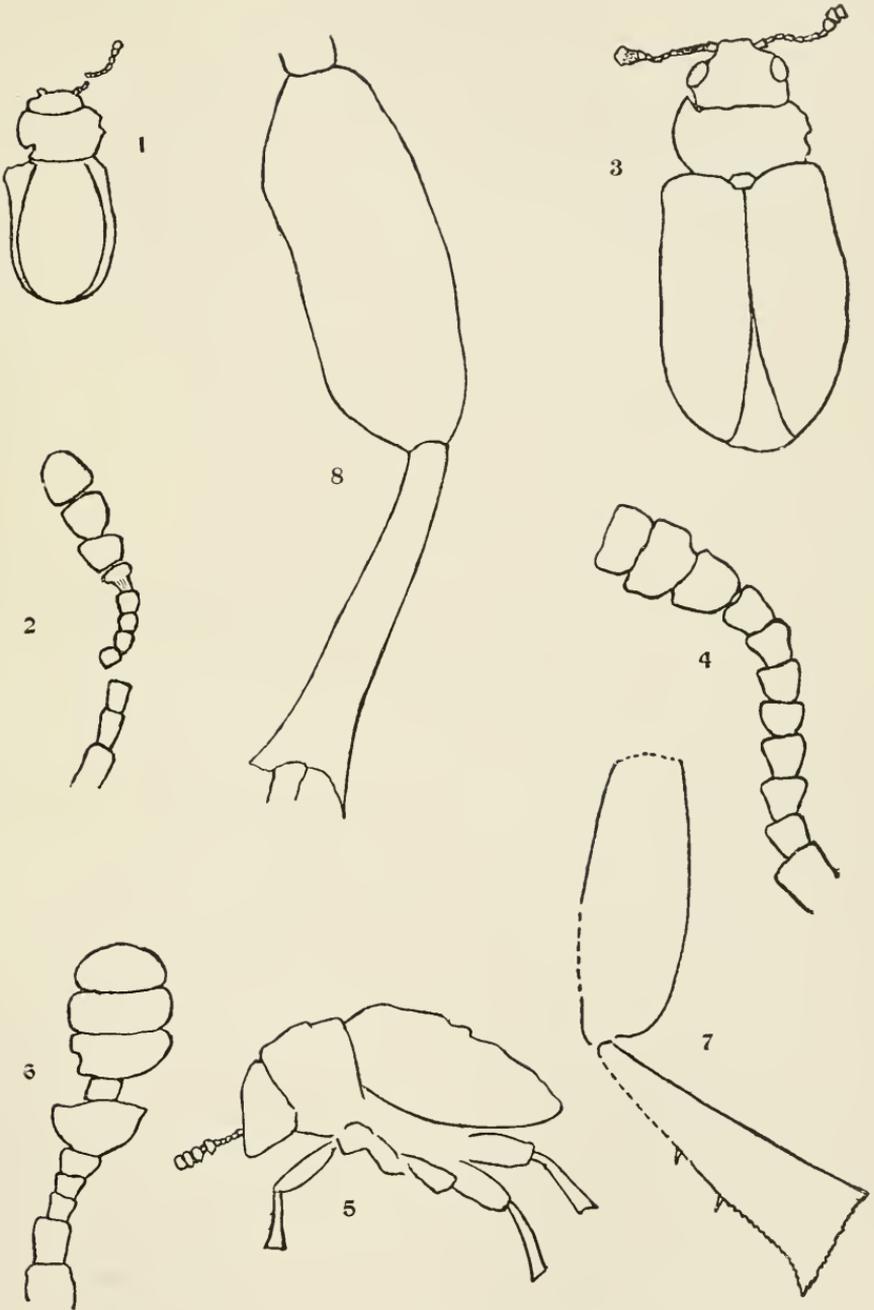
FOSSIL COLEOPTERA FROM FLORISSANT.

FOR EXPLANATION OF PLATE SEE PAGE 303.



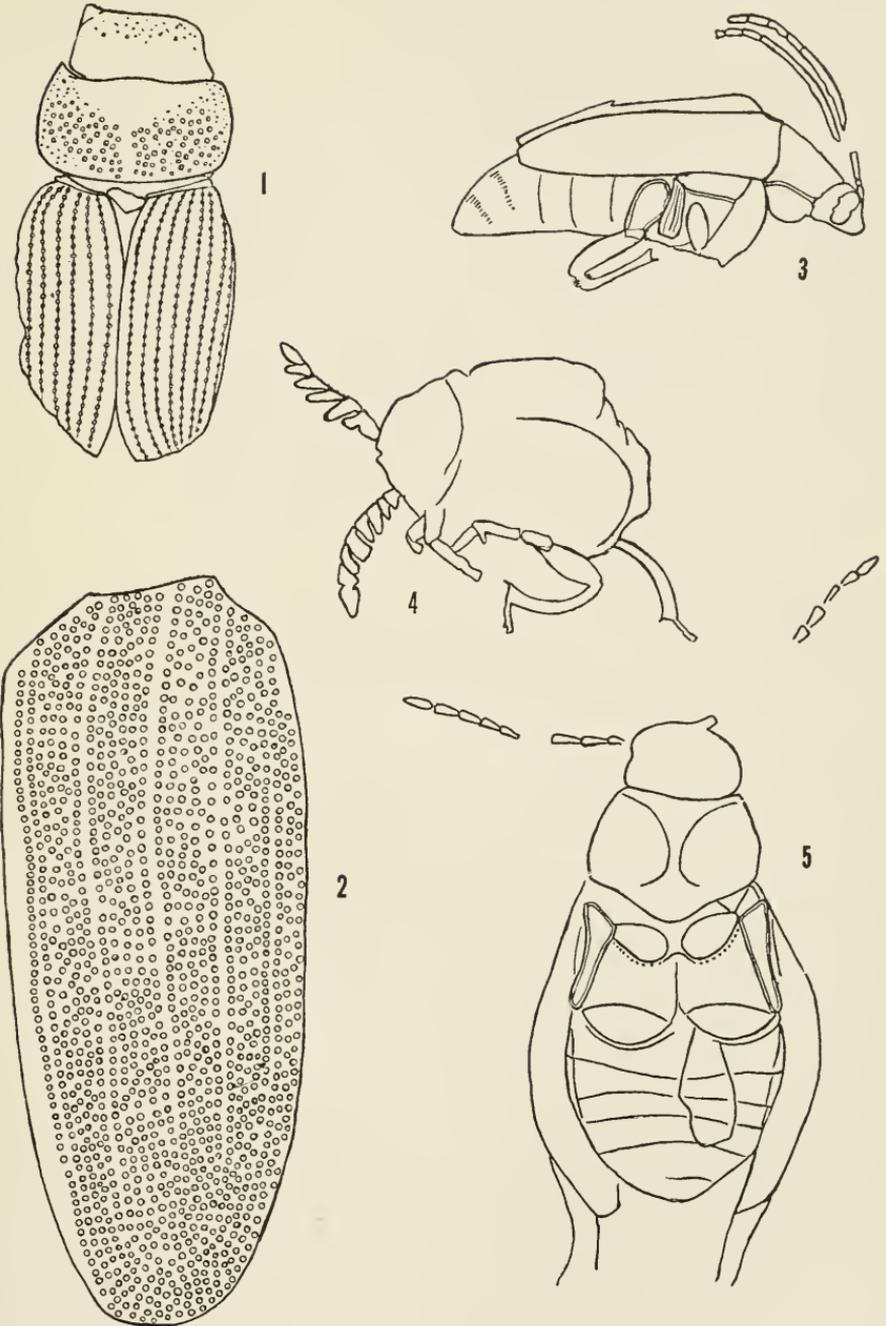
FOSSIL COLEOPTERA FROM FLORISSANT.

FOR EXPLANATION OF PLATE SEE PAGE 303.



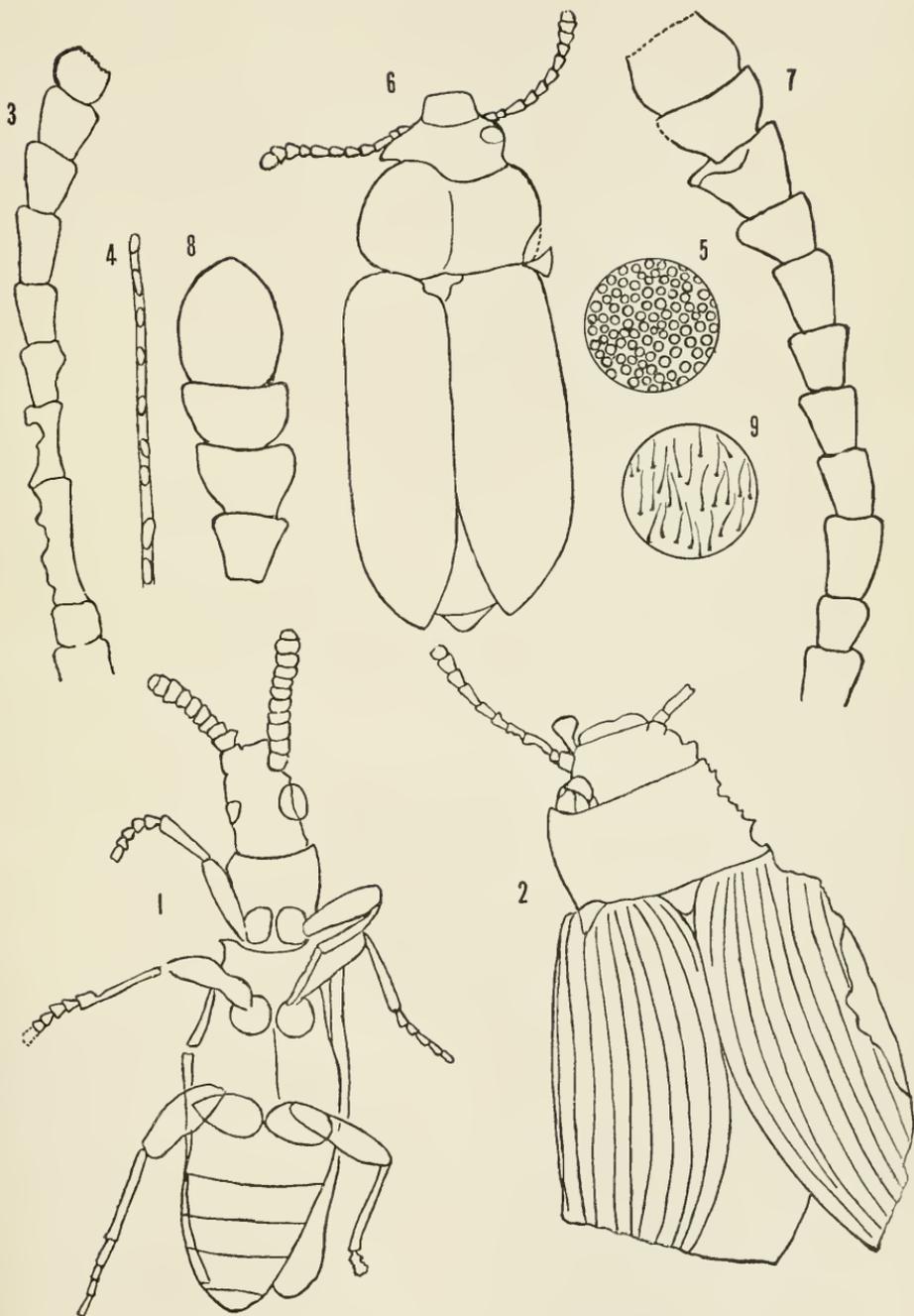
FOSSIL COLEOPTERA FROM FLORISSANT.

FOR EXPLANATION OF PLATE SEE PAGE 303.



FOSSIL COLEOPTERA FROM FLORISSANT.

FOR EXPLANATION OF PLATE SEE PAGE 303.



FOSSIL COLEOPTERA FROM FLORISSANT.

FOR EXPLANATION OF PLATE SEE PAGE 303.

