

Article V.—FOSSIL COLEOPTERA FROM FLORISSANT, WITH DESCRIPTIONS OF SEVERAL NEW SPECIES.

BY H. F. WICKHAM.

This paper is concerned with a collection of fossil beetles secured at Florissant by various expeditions under the charge of Professor Theo. D. A. Cockerell of the University of Colorado. Through his kindness, the series has been transmitted to me for study, and I have thought it worth while to make an occasional note on described species, as indicating, in a way, their relative abundance at the time of the formation of the shales wherein they are entombed. Judging from the number of striking new species, the possibilities of these shales, in the way of still further illustrating the life of the olden time, has by no means been exhausted.

Arranged by families, the species treated of are as follows:

CARABIDÆ.	MELANDRYIDÆ.
Harpalus maceratus n. sp.	Synchroa quiescens n. sp.
DYTISCIDÆ.	RHYNCHITIDÆ.
Miodytiscus hirtipes n. gen. et sp.	Docirhynchus culex <i>Scudd.</i>
HYDROPHILIDÆ.	Toxorhynchus grandis n. sp.
Hydrobius prisconatator n. sp.	OTIORHYNCHIDÆ.
STAPHYLINIDÆ.	Otiorhynchites florissantensis n. sp.
Tachinus sommatus <i>Scudd.</i>	Cyphus subterraneus n. sp.
PARNIDÆ.	CURCULIONIDÆ.
Dryops eruptus n. sp.	Geralophus antiquarius <i>Scudd.</i>
DASCYLLIDÆ.	“ occultus <i>Scudd.</i>
Dascyllus lithographus n. sp.	“ scuderi n. sp.
LYMEXYLIDÆ.	“ repositus <i>Scudd.</i>
Lymexylon lacustrinum n. sp.	“ lassatus <i>Scudd.</i>
LUCANIDÆ.	“ fossicius <i>Scudd.</i>
Ceruchus fuchsii n. sp.	Apion cockerelli n. sp.
SCARABÆIDÆ.	Cleonus rohweri n. sp.
Aphodius florissantensis n. sp.	Magdalis striaticeps n. sp.
“ laminicola <i>Wickh.</i>	Ceutorhynchus clausus <i>Scudd.</i>
Ligyrum compositus n. sp.	Balaninus restrictus <i>Scudd.</i>
CERAMBYCIDÆ.	“ minusculoides n. sp.
Elaphidion fracticorne n. sp.	“ minusculus <i>Scudd.</i>
Callimoxys primordialis n. sp.	CALANDRIDÆ.
CHRYSOMELIDÆ.	Scyphophorus tertiaris n. sp.
Colaspis ætatis n. sp.	ANTHRIBIDÆ.
Diabrotica exesa n. sp.	Cratoparis adumbratus n. sp.
	SCOLYTIDÆ.
	Hylesinus extractus <i>Scudd.</i>

Harpalus Latr.

H. maceratus n. sp. The specimen, with its reverse, represents a species equalling in size the large individuals of our common recent *H. pennsylvanicus* and *H. erraticus*, but while the outlines have been well preserved the body has been so badly macerated that all details of sculpture and all sutures are lost. The head is broad, nearly as wide as the prothorax (as preserved), this latter, however, is apparently defective on one side while the other is irregular but approximately straight and without evidences of tapering towards either end — I think undoubtedly distorted. Body broadest across the area between the middle and hind legs, arcuately narrowing posteriorly. Antenna, as far as shown, indicating joints proportionately similar to those of *H. erraticus*. Front tarsus moderately dilated, showing that the specimen was a male. Hind legs more slender than in *H. erraticus*, middle leg mostly wanting, but the tarsus is seen to be somewhat dilated. Length, 19.50 mm.; of hind tibia, 5.35 mm.; of front tarsus without claws, 3.00 mm.; of four antennal joints (probably the 3rd, 4th, 5th and 6th), 4.15 mm. Width across base of mandibles, 3.75 mm.; of body at widest point, 7.00 mm.

Station number 14. Collected at Florissant by Mrs. Cockerell. The type is in the Museum of the University of Colorado.

The elytra are not distinguishable in the specimen. The mandibles are of the projecting type shown in *H. erraticus*, giving the appearance of a sort of muzzle. It is a much larger insect than any of the fossil Florissant species described by Dr. Scudder.

Miodytiscus n. g.

Related to the modern genus *Dytiscus*, resembling in form the common *D. fasciventris* but somewhat narrower, the distance from the middle coxæ to the insertion of the hind legs very much less. Hind femora broad, sub-elliptic in outline with a distinct row of numerous rather long strong bristles near the posterior margin which is thus bordered by them for nearly its entire length. Hind tibiæ fringed internally with long hairs.

I have ventured to establish this genus principally on account of the vestiture of the hind legs, this being different from that of any other known Dytiscid, if one may judge by the full discussion of characters in Dr. Sharp's monograph of the family. Unfortunately I cannot satisfy myself as to the structure of the coxal plates and the metasternum. The punctuation of the elytra, as far as shown, is a very unusual type, if, indeed, it occurs elsewhere in the Dytiscidæ.

M. hirtipes n. sp. Form ovate, slightly wider behind the middle, as in most recent species of *Dytiscus*. Head a confused mass with no details of sculpture or appendages visible. Prothorax, as preserved, with the sides not continuing the outline of the elytra, less convergent towards apex than usual in this family. Elytra

showing through the abdominal elements, with apparently nine or ten striæ not strongly impressed, those on the disk showing only traces of scarcely discernible punctures, the four or five nearest the outer margin finely and distinctly but distantly punctate; a few scattered punctures are also seen in the basal marginal region. Middle coxæ approximate, the femora of this pair of legs thick, rather regularly narrowly elliptical, with a longitudinal row of closely set fine bristles extending about the full length and inserted a short distance inside of the posterior margin, tibix not differing much in length from the femora, stout, apparently with scattered short appressed spines (possibly like those occupying the same area in modern species of *Cybister*), the only exposed terminal spur long, tarsi not much flattened, claws not shown. Hind legs approximate at the trochanterial insertion, though this region is slightly obscured, femora broader than the middle pair and similarly armed with bristles, tibix about like the intermediate ones, tarsi not very broad but not clear. Abdomen showing six ventral segments, about smooth except for a fine median carina. Length, 24 mm.; from posterior edge of middle coxæ to base of hind femur, 3.85 mm.; of middle femur, 4.65 mm.; of hind femur, 4.75 mm.; of their tibix, about the same. Width, at widest part, of elytra, 15.50 mm.; of middle femur, 1.75 mm.; of hind femur, 2.85 mm.

Station R. 14. No collection number. Florissant Expedition, 1907. The type is in the American Museum of Natural History.

This is an exceptionally interesting specimen since it represents a beetle of a type hitherto unknown. My interpretation of it is that it indicates a Dytiscid of less specialized structure than any of the existent forms of like size. The most striking characters that can be made out with any certainty are the spiny armature of the femora and the shortness of the distance from the middle to the hind legs. Besides the vestiture mentioned in the preceding lines, certain impressions of bristles on the underside of the prothoracic region appear to represent a row on each front femur, of the same character as those on the femora of the middle and hind legs. Recent species of *Acilius* have a beautifully developed fringe on the front and middle femora, and certain forms of *Dytiscus* show the same structure in lesser degree.

Hydrobius *Leach.*

H. prisconator n. sp. Not greatly differing from the modern *H. fuscipes*, if allowed to be made for flattening. The exact proportions of length to width are made in the measurements at the end of this description. Head rounded anteriorly, the maxillary palpus about as in *H. fuscipes*, antenna also of the same general structure as in that species although the stem joints are thicker in the fossil and the club joints less abruptly larger and proportionately somewhat narrower. Prothorax broadest at about the base, sides regularly arcuately narrowing to apex, posterior angles, obtuse, anterior somewhat projecting to the front but not sharp. Elytra subparallel at sides, arcuately narrowing posteriorly to apex, with about nine or ten fine, regular, subequidistant, apparently impunctured striæ. Scutellum triangular, about as in *H. fuscipes*. Legs short, all the tibix with distinct longitudinal grooves

marked with rows of spines similar to the structures on the same parts in that species. Tibial spurs strong, but none of them preserved in entirety. Tarsal claws apparently simple, they appear also to be less divergent than in *H. fuscipes*, but I believe this to be due to the position of the legs when the insect was enclosed in its matrix. Ventral abdominal segments five. The abdomen is slightly distended, giving the insect a somewhat greater length than normal. Length, total, 9.50 mm.; of head, 1.25 mm.; of prothorax along median line, 1.65 mm.; from middle to hind coxæ, along median ventral line, 1.00 mm.; of antenna, 1.40 mm. Width of prothorax at base, 3.50 mm.; of elytra at middle, a little more.

Two specimens, the type from Station number 14, numbered, with its reverse, 175 and 185, Florissant Expedition, 1906. The other, with reverse, is from the 1908 expedition and bears neither station nor collection number. While the antennal characters are drawn from one example, those of the palpus come from the other. The type is in the Museum of the University of Colorado. The cotype is in the American Museum of Natural History.

Aside from the striation of the elytra, very little of the sculpture can be made out. However, groups of coarse punctures (representing similar ones in *H. fuscipes*) are discernible near the front and hind thoracic angles. It is probable that the surface of the body was nearly smooth or very finely punctate. The generic reference seems quite safe.

Tachinus *Grav.*

T. sommatus *Scudd.* One specimen, in poor condition, comes from Station number J 4. It bears the collection number 22. No details additional to those given by Dr. Scudder can be made out.

Dryops *Oliv.*

D. eruptus n. sp. Preserved in dorsal view. A species is indicated resembling the recent *D. lithophilus* in outline but with the anterior margin of the prothorax much less emarginate, the front angles about right. Elytra with striæ faintly indicated, other surface sculpture obliterated. Legs long and slender. Length, 4.75 mm.; of elytra, 3.40 mm.; of prothorax along median line, 1.25 mm. Width of prothorax, 1.75 mm.; of elytra (conjointly) near middle, 2.35 mm.

Station number 13. Collection number 244. Florissant Expedition, 1906. The type is in the American Museum of Natural History.

While this specimen does not show any characters of import, the outline and the long slender legs are very characteristic of the genus to which I have referred it.

Dascyllus Latr.

D. lithographus n. sp. Preserved in dorsal view, with many of the structures of the underside showing through. Head and eyes, so far as determinable, of about the same form as in the recent *D. plumbeus*, maxillary palpi somewhat larger and stouter but with the joints similarly proportioned amongst themselves when compared to the corresponding structures in the before-mentioned species. Antennæ flattened, subserrate, the distal joints longer than the intermediate ones, and reaching to the middle coxæ or a little beyond. Prothorax broadest close to the base, tapering anteriorly, hind angle (showing on one side only) rather acute. Elytra with numerous fine longitudinal striæ of which at least twelve can be counted, while others, more or less confused, occupy the marginal area. These striæ are deeply but finely punctured, the punctures separated by at least their own diameters or by more than that distance towards the tip. Interstitial spaces smooth or nearly so, apparently slightly convex. Abdominal segments five in number, subequal, though the fifth is a little longer than the one preceding, its sides regularly arcuate to apex instead of being sinuate as in the two recent Californian species before me. Legs of moderate length and rather stout, the tarsi broad but with the individual joints not well shown. Length, 21.75 mm.; of head, 3.15 mm.; of prothorax, about the same, but the posterior margin is not well defined; of elytron, 14.65 mm.; of hind femur, 4.50 mm.; of hind tibia, 4.15 mm.; of middle tibia, a little less. I have omitted measurements of the width of prothorax and elytra, because of the uncertainty of the definitions of their margins.

Station number 17. Collected by Mrs. Cockerell. While this was taken at Florissant, the particular expedition is not specified. The type is in the Museum of the University of Colorado.

The only character which might lead one to doubt the accuracy of the generic assignment is the difference in the shape of the last abdominal segment, when the fossil is compared to the recent species. In other respects, the agreement seems very close. The genus has not been reported from the Tertiary deposits heretofore.

Lymexylon Fabr.

L. lacustrinum n. sp. Preserved in profile. Body elongate, head deflexed, finely rugosely granulate, eyes large, coarsely faceted, transverse but distorted in shape. Antenna short, weakly serrate from about the second joint, the second to eighth subequal in length and not greatly varying in width, each joint being approximately as broad as long. Palpus terminated by a large subcampanulate appendage. Prothorax elongate, disk finely granulate, side more finely so. Elytra shorter than the abdomen, narrow, subparallel at sides, separately rounding at tip, finely, closely evenly punctate. Abdomen apparently with five ventral segments, alutaceous. Length, 15 mm.; elytron, 9.75 mm.; of prothorax, 3.00 mm.; of terminal palpal appendage, 1.15 mm. Width of elytron about middle, 2.25 mm.; of palpal appendage near tip, 0.90 mm.

Station number 14. Collected by Mrs. Cockerell. The type is in the Museum of the University of Colorado.

This is a most interesting find, and introduces another new family into the Florissant fossil fauna. The identification seems satisfactory, the *Lymexylidæ* being quite peculiar in ocular, antennal and palpal structure, and the characteristic form of the body is well enough preserved. The abdomen is somewhat elongate, probably on account of maceration. The elytra retain enough of the original substance to show that the surface sculpture was of the fine nature shown in the European members of the family. The palpal appendage may be distorted a little, but its enormous size is the most striking feature of the fossil. The legs are about gone, a single portion of one tarsus showing it to have been slender. The insect was not far from the size of the recent North American *Lymexylon sericeum*.

Ceruchus MacL.

C. fuchsii n. sp. Preserved in dorsal view, showing head, thorax, one elytron, part of the antennæ and the abdominal segments, but without legs. The specimen, judging from the head, was a female, and is compared with recent species of the same sex. Head a little broader in proportion than in *C. striatus*, more narrowed anteriorly, the jaws about equally as prominent as in that species, antenna, when directed straight backwards, slightly encroaching on the prothorax. The left one seems to have the club damaged or showing on edge, the other exhibits the three enlarged terminal joints very plainly and indicates that they are not very different from the species with which it is compared. The intermediate joints are confused. Prothorax short, the coxæ, which show through, very transverse, extending about to the outer margin as in *C. striatus*. Elytron with about eight fairly well-marked costæ, between which are double rows of rather deep large punctures. Length, 16.40 mm.; of elytron, 11.00 mm.; of prothorax (under side?) 2.50 mm.; Width of prothorax, 5.00 mm.; of elytron, near middle, 3.50 mm.

Station number 13 B. Collected by Mrs. Cockerell. The type is in the Museum of the University of Colorado.

A fine specimen, seeming undoubtedly to belong in the neighborhood of *Ceruchus*, thus adding another family to the list of those known to have inhabited the Florissant lake basin. I have named it after an old friend and veteran entomologist, Charles Fuchs, to whom we are indebted for an able and well-illustrated review of the *Lucanidæ* of North America. I have not described the sculpture of the head and prothorax in the foregoing diagnosis, since the specimen is much more truly an impression than is ordinarily the case, and the chitinous exoskeleton seems to have been almost completely obliterated on those parts of the body. There remains only a granular or subrugose appearance, though the modern American species of the genus are heavily punctured. The abdomen shows five segments.

Aphodius Illiger.

A. florissantensis n. sp. Form much like that of the recent *A. granarius* Linn. Head rather large, clypeus slightly truncate at middle, rounded to the sides, angles rounded. Prothorax regularly arcuate at the sides, more strongly narrowed in front, the middle width slightly greater than the basal, apex much narrower than the base. Elytra with deep fairly broad impunctured regular striæ, the striæ duplicate, *i. e.* each one has the edges more deeply impressed than the middle, so as to appear double. Scutellum short. Length, 5.25 mm.; width, 2.25 mm.

Station number 13. Collection number 141. Florissant Expedition, 1906. The holotype is a reverse and is in the American Museum of Natural History.

While this insect fairly closely resembles Dr. Scudder's best figure of his *Atenius patescens*, I cannot refer it to that species on account of several features. In the present specimen the head is much broader, less narrowed anteriorly, the sides of the clypeus more broadly rounded and its apex less so, the clypeal disk without traces of plication. The prothorax is apparently a little longer proportionately, the sides less rounded and the punctuation sparse. Dr. Scudder makes no mention of any such peculiarity of the elytral striation as I have described, though it seems that his number 8147 would have shown it if existent. Further, I prefer to assign the example in hand to *Aphodius* rather than to *Atenius*, the hind tibiæ being broad and apparently ridged.

A. laminicola Wickh. A specimen of this species (in reverse) is somewhat better in certain respects than the type, and affords an opportunity for a few remarks. In the example at hand, the clypeus is hardly truncate anteriorly, but rather faintly arcuate. The side of the prothorax (only one side is preserved) is nearly straight except near the front angle, where it is rounded. The scutellum is plainly evident and is of the small type seen in recent species of the genus *Aphodius* proper. The elytral characters are those of the type. In measurements, this specimen is a little less than the type, the total length being only 9.25 mm.

Station 11 or 12. Collection number 39. Florissant Expedition, 1906.

Ligyris Burm.

L. compositus n. sp. Form elongate for this genus, proportionately more so than in our recent *L. relictus*. Head rather short, the clypeus somewhat broadly rounded and slightly sinuate in front, while beyond it is an irregularly arcuate mark which I believe represents the projecting mouth parts, since they sometimes give a similar effect in recent specimens of this genus. Mandibles apparently with a strong external tooth. Eye moderate. The entire upper surface of the head is closely and rather coarsely granulate in the specimen, which, being a reverse, would indicate that

the insect was correspondingly punctured. Prothorax one-third wider than long, distinctly broader at base than at apex, one side (apparently the better preserved) regularly arcuate, the other more nearly straight, front angle acute (on the better side) hind angles somewhat obscured but apparently obtuse and rounded, surface granulated (in reverse) sparsely on the disk but more closely at the sides. Elytra subparallel at sides, each with about twelve rows of granules (in reverse) which indicate corresponding punctures; these punctures rather large and not located in distinct impressed striæ, the interstitial spaces being only moderately well marked off and not geminate but bearing a few scattered granules. Legs short. A fore tibia, which is well exposed, shows two large external teeth, above which can be seen the base of another, probably of similar size, while between the last named and the knee are evidences of three smaller teeth. Both the middle and hind tibiæ show a strong transverse ridge near the middle of their length, in the relative position of a similar ridge in recent species of *Ligyris*. Middle and posterior tarsi of moderate length, about as in *L. relictus*. Length, total, 16.50 mm.; of head, 2.00 mm.; of prothorax along middle line, 4.50 mm.; of elytra, 9.65 mm.; of fore tibia, 3.50 mm.; of hind tibia, 4.10 mm. Width of prothorax at base, 6.25 mm.; of one elytron about middle, 4.25 mm.

Station number 13 B. Collected at Florissant, Colorado, in 1909 by Willard Rusk. The type, a reverse, is in the Museum of the University of Colorado.

This insect may be placed in *Ligyris* without violating any of the characters ascribed to that genus. Nevertheless it is apparently a rather composite form, combining the characters of several recent species. In shape, it is not unlike *L. relictus*, though more slender. The elytral sculpture is something like that of certain specimens of *L. ruginasus*, with the strial gemination less marked. The granules of the elytra (and to a less extent those of the prothorax) are evidently reverse impressions of the peculiar mammillate punctures seen on many of the recent species of *Ligyris*. I find no exact duplication of the tothing of the front tibia, but have not considered this feature of sufficient importance to invalidate the generic reference. The Mexican *L. sallæi* has five tibial teeth, *L. bryanti* has four, while those common in the United States have but three. The pronotum was evidently cracked by pressure, giving, at first sight, the appearance of a median line.

Elaphidion *Serv.*

E. fracticorne n. sp. Preserved in profile. Head moderate, eye strongly transverse and moderately deeply emarginate, the upper lobe a little more than half as large as the lower. Antennæ with basal and apical parts wanting, the intermediate joints four or five times as long as wide, not spinose and only slightly broader at apex than at base. Elytron with the finer sculpture not definable, disk apparently with a fine and not strongly marked costa near the outer margin. Legs with only gradually clavate thighs, tibiæ rather slender and straight. Length, 12.50 mm.; of front femur, 3.75 mm.; of front tibia, 2.75 mm.; of hind tibia, 3.35 mm.; of four antennal joints, (probably the 4th, 5th, 6th, and 7th), 6.25 mm.

Station number 14. Collection number 217. Florissant Expedition, 1906. The type is in the Museum of the University of Colorado.

The apex of the elytra and of the body is broken off, so that the entire length of the insect in complete condition was probably about 2 mm. greater than given above. The general aspect, as preserved, is that of a Podabrid, but the eye, antenna and legs point to a different reference, though the assignment to *Elaphidion* must be considered provisional. Unfortunately the prothorax is in too poor condition to yield any clue to the armament or sculpture.

Callimoxys *Kraatz.*

C. primordialis n. sp. The specimen is preserved in dorsal view, showing the head and trunk, parts of the legs, basal joints of the antennæ, and both pairs of wings, since the hind pair is expanded. Head and prothorax punctured, the former rather finely the latter more coarsely and very densely. Basal antennal joint large and clavate, the others wanting. Prothorax narrowed anteriorly, the sides subparallel from base to about apical third, disk irregular but not alike on both sides, possibly on account of oblique pressure. The appearance is of two dorsal grooves separated by a raised median line, much as in the recent *C. sanguinicollis*. Elytra abbreviated, wedge-shaped, comparatively a little shorter and broader than in *C. sanguinicollis* and more finely punctured, the outer margin broadly darker. Hind wings with the greater part of the venation intact, and so far as exhibited agreeing with that of *C. sanguinicollis*, a similar large brownish spot occupying the area around the end of the long discal cell. Abdomen blackish, the sculpture apparently fine, alutaceous or granulate. Front and hind femora strongly clavate. Length, 9.10 mm.; of elytron, 2.90 mm.

Station number 13 B. There is no collection number, but the specimen is one of the many interesting finds of Mrs. W. P. Cockerell. The type is in the Museum of the University of Colorado.

The genus has not hitherto been recognized in the Florissant fossil fauna, but the assignment seems perfectly safe as far as agreement of characters is concerned.

Colaspis *Fabr.*

C. ætatis n. sp. Preserved in profile. Head obscure, the eye not defined distinctly, but apparently of moderate size and approximately circular, prothorax with the notum slightly arched, elytron somewhat arched posteriorly. Legs and antennæ slender, hind tibiæ straight. The sculpture is obscured by the rather coarse texture of the piece of shale in which the specimen is contained, but the elytron shows traces of stria sculpture near the sutural tip. Length, 8.00 mm.; of elytron, 6.25 mm.; height of body at humerus, 3.00 mm.

Station number 14. Collection number 61. Florissant Expedition, 1906. The type is in the Museum of the University of Colorado.

The generic reference is only an approximation, though the few characters shown, and especially the facies, point to this determination. Differs from *C. luti* Scudd., from the same rocks, in the much greater size.

Diabrotica Chev.

D. exesa n. sp. Preserved in part profile. A species is indicated of rather small size and without striking characters, the antennæ moderately stout, the legs a little heavy for this genus. The sculpture is not definable, the elytra showing a number of pitted markings, reminiscent of the ocellate punctures of *Elaphrus*, probably due to the texture of the shale and to decomposition. Length, 5.35 mm.; of elytra, 4.15 mm.; of prothorax, 1.25 mm.

Station number 13. Collection number 123. Florissant Expedition, 1906. The type is in the American Museum of Natural History.

Reliance must be placed mainly upon the measurements for the future determination of this species. It is doubtful if many of the Galerucini can be accurately differentiated as fossils.

Synchroa Newm.

S. quiescens n. sp. A specimen showing obverse and reverse is in the collection, the elytra, part of the dorsal portions of the abdomen, the pronotum, head, portions of the antennæ and palpi, together with one leg being fairly well preserved. Body elongate, fairly similar to our recent *S. punctata*. Head rather cuneiform, without visible sculpture, eyes apparently only moderately or scarcely prominent, antennæ with first joint stouter but not entirely exposed, so that the length cannot be determined, second small, about half the length of the third which is slightly narrower and shorter than the fourth, the remainder lost. Maxillary palpi showing three joints, (apparently the second, third and fourth), distinctly serriform, the last joint wider, somewhat securiform, the middle one shorter than either of the other two which are about equal in length. Prothorax evidently distorted, since the sides are asymmetrical, but it is apparently broader at base, tapering slightly with nearly straight sides to the apex, basal and apical margins both straight, hind angles acute, front angles nearly right or slightly rounded. The thoracic width at base is about 1.6 times the length. Elytra spread in the specimen, and (as flattened) conjointly wider at base than the base of the pronotum, slightly broader to behind the middle, gently and regularly narrowing to the subacute tip, surface regularly marked with fine striæ (about eleven) which are finely but distinctly punctured, the punctures separated by about their own diameters, interspaces not visibly sculptured. Seven abdominal segments are visible in dorsal aspect, the proximal four being subequal in length, the others more or less obscured. Length, from front of head to apex of elytra, 18 mm.; of prothorax, 2.5 mm.; of elytron, 12.5 mm.; width of prothorax at base, 4 mm.

Station number R. 13. Collection numbers 219 and 240. Florissant Expedition, 1906. The type is in the Museum of the University of Colorado.

I believe that the generic reference is approximately correct. It is, of course, entirely possible that better specimens may show characters requiring another assignment.

Docirhynchus Scudd.

D. culex Scudd. Under the number 121, the collection contains a beautiful specimen of this species. It was collected at station 13, and is preserved in almost precisely the same position as Dr. Scudder's example, figured in the volume of Tertiary Rhynchophorous Coleoptera, plate viii, figure 2, and presents the same relative proportions of beak and elytra. The corrugations of the head and granulations of the prothorax are well shown. The middle femur is a trifle more slender at base than the front one, and rather more thickened towards the tip. Both middle and hind tibiae are straight and of approximately the same length as the anterior pair. The elytra appear to have been weakly striatopunctate. A second specimen, number 261, from the same station, is also placed here with some little doubt, the state of preservation being less satisfactory and the size a little less, though the relative proportions are maintained.

Toxorhynchus Scudd.

T. grandis n. sp. Form stout, compact, rather regularly shortly elliptical, but broadest a little behind the elytral humeri. Head small, incomplete but apparently smooth. Prothorax at base as broad as the elytra and continuing their outline, sides rather rapidly and barely arcuately narrowing to apex, basal angles strongly acute, apical ones much less so and possibly rounded at tip. Pronotum rather finely and quite closely granulate and punctate on the disk, the median carina sharp and well marked from base to middle, effaced (perhaps accidentally) anteriorly, basal margin strongly and broadly lobed at middle. Scutellum apparently somewhat longer than broad, but I am not able to make out the anterior limit with certainty. Elytra broader just behind the humeri, each with eight strong fine longitudinal carinae which are rather weakly broken into granules or catenulations, these carinae not united in any way but distinct and separate to the elytral margin; interspaces in the form of wide fairly deep grooves, finely punctate and somewhat granulate at bottom. Near the elytral bases are a few strong scattered punctures, arranged without reference to the other sculpture, the carinae fading out in this region. Length, from front of head to elytral apex 4.50 mm.; of elytral suture, 3.75 mm.; width at broadest part, 3.00 mm.

Station number 7. Collection number 284. Florissant Expedition, 1906. The type is in the Museum of the University of Colorado.

This insect is strongly suggestive of the recent *Pterocobus ovatus* in outline and in some of the sculptural characters. However, I have preferred to place it in *Toxorhynchus*, since it is equally reminiscent of *T. oculus*

Scudd., from the Florissant shales. This last named species is smaller and has heavier elytral carinæ, lacking also the scattered basal punctures of *T. grandis*. No comparison of rostral characters can be made, since the beak is wanting in the present example which is preserved in dorsal view.

Otiorthynchites *Fritsch* (emend. *Scudd.*).

O. florissantensis n. sp. The specimen consists of obverse and reverse of a peculiar elytron in good preservation, as regards the disk, but somewhat damaged at base and apparently distorted by pressure. The sculpture consists of regular rows of rather large and fairly deep ocellate punctures, the best preserved of which show a central puncture with the impression of a hair or scale still visible. The disk is traversed by four fairly distinct longitudinal costæ, between which the punctures are arranged in sets of three rows each, but towards the side the costæ are less regular and closer together, enclosing but one or two rows. In all there are about eighteen punctured series. Length of elytron, 8.30 mm.; greatest width, 3.20 mm. It is very convex and seems to have had a distinct bulge on the side of the declivity.

Station 14. Collection numbers 213 and 215. Florissant Expedition, 1906. The type is in the Museum of the University of Colorado.

I have used the term *Otiorthynchites* in the same sense as Dr. Scudder, to apply to what seems undoubtedly an Otiorthynchid elytron without characters that would allow of its being definitely referred to any genus with which I am acquainted.

Cyphus *Germ.*

C. subterraneus n. sp. Comparable with the recent *C. lautus* Lec., but smaller. Beak short, with intricate fine granulate sculpture, longitudinally disposed, probably due chiefly to the imprint of scales, the median line fine but distinct, extending from near the tip of the rostrum to a point slightly posterior to the anterior margin of the eyes. Eye moderate and nearly circular, but, as preserved, showing a spur-like projection from the upper posterior margin, probably due to distortion. Prothorax coarsely subrugosely longitudinally sculptured at sides, about smooth, excepting scale marks, on the disk, sides regularly gently arcuate, base nearly straight. Elytra less parallel-sided than *C. lautus*, each showing about eight well-marked fine ridges, bearing regularly spaced subcircular or slightly elongate small granules, these ridges and granules indicating that the elytra were correspondingly finely striate and punctate. Front femur (all that shows of the legs) only moderately and gradually thickened. Length, over all, 8.75 mm.; of elytron, 5.00 mm.; of prothorax, 1.85 mm.; of rostrum, to eye, about 0.75 mm. Width of rostrum, about middle 1.15 mm.; of prothorax at middle, 2.25 mm.; of elytra, conjointly, about middle, 3.85 mm.

Station number 7 A. Collection number 235. Florissant Expedition, 1906. The type is a reverse and is in the Museum of the University of Colorado.

Nothing at all similar to this insect has been described by Dr. Scudder; it seems to agree well with the genus in which it is here placed.

Geralophus Scudd.

G. antiquarius Scudd. Five specimens, all from station 14. Collection numbers 85, 104, 177, 180 and 251.

G. occultus Scudd. One specimen, station 14. Collection number 43. Another from station 13, collected by S. A. Rohwer.

G. repositus Scudd. One specimen, referred here with some doubt, comes from station 11. Collection number 247.

G. scudderi n. sp. Above medium size. Head granulate, apparently with fine punctures intermixed, beak, in profile, almost absolutely straight, sculptured like the head, the sides parallel to near the tip where they diverge slightly and thence converge to the extreme apex, thus forming a slight rostral dilatation. Prothorax finely granulate and obliquely substrigose. Elytra finely and distantly striatopunctate, the bristles mostly removed, but from the few that remain it is evident that they were separated by about their own lengths. Femora stout. Length, excluding rostrum, 7.00 mm.; of rostrum, 1.85 mm.; of prothorax, on chord of the dorsal arc, 1.85 mm. Width of beak at middle, 0.50 mm. Height of body, 3.5 mm.

Station number 14. Collection number 11, Florissant Expedition, 1906. The type is in the Museum of the University of Colorado.

By description, this would come nearest *G. repositus* Scudd., common in the same shales; but the figure shows that species to have had a much coarser punctuation and thicker beak.

G. lassatus Scudd. Four specimens, stations 11, 13 and 14. Collection numbers respectively 224, 148, and 6. The other example was collected in 1909 and has neither station nor collection number.

G. fossicius Scudd. A specimen without station or collection number, taken in 1908, is referred here, but shows only the ventral surface.

Apion Hbst.

A. cockerelli n. sp. Preserved in profile, giving a good view of the head and beak, prothorax, one elytron and part of the legs. General outline pyriform, as in most of the species of *Apion*, rather slender. Head, exclusive of the rostrum, nearly as long as the prothorax, not rapidly narrowing anteriorly but tapering gradually and almost imperceptibly into the beak. Rostrum rather stout and only slightly bent, a trifle enlarged just before the tip, antennæ inserted about two-fifths from the base, Eye somewhat remote from the prothoracic margin. Prothorax longer on the dorsal than on the ventral aspect, with some evidence of coarse variolate punctuation laterally. Elytra broadest behind the middle, moderately declivous behind, striae very wide and deep, interspaces strongly convex and rather broad, apparently finely irregularly punctate. Legs rather slender, the front femur not at all strongly clavate. Length, including rostrum, 2.70 mm.; of elytron, 1.32 mm.; of prothorax, .45 mm.

Station number W. 9, L. Collection number 255. Florissant Expedition, 1906. The type is in the American Museum of Natural History.

A species not differing greatly in size and form from the recent *A. melanarium* Gerst., but with less clavate thighs and much stronger and broader elytral striæ and more convex interstices. I am not sure of the punctuation of the elytral striæ, but the outer ones at least appear to be marked with widely separated large punctures. In comparison with the described fossil species from Florissant, it comes nearest in size to *A. pumilum* Scudd., which is of a different shape.

Cleonus Schönh.

C. rohweri n. sp. Preserved in part profile, the elytra flattened and overlapping along the suture, so that the characteristic outline of this genus is lost. Rostrum short and thick, nearly straight, but apparently the head is twisted at the articulation with the thorax, so as to give an oblique view. Eye transverse. Prothorax short, coarsely and irregularly punctured on the disk, finely granulate and punctate on the sides. Elytra with strongly marked series of elevations representing rows of distinct nearly circular punctures in regular shallow sub-equidistant striæ, the exact number of which is indeterminable but is not less than eight. These punctures are separated by their own diameters, or a little less. Interspaces flattened and without definite sculpture, other than a fine granulation which may be due to the marks of scales. Legs of moderate length, anterior and middle femora stout, but not excessively so, front tibiæ distinctly curved. Length from front margin of pronotum to tip of elytra, 10.25 mm.; of prothorax, 2.00 mm.; of beak, about 1.75 mm.

Station number 14. Collection numbers 71 and 88, both representing the same specimen. Florissant Expedition, 1906. Received from Professor Cockerell and named for Mr. S. A. Rohwer, one of his associates on this expedition. The type is in the Museum of the University of Colorado.

The middle femur looks as if it had a distinct rather large triangular tooth beyond the middle, but I believe this appearance is due to a bit of vegetable debris under and projecting from it. In comparison with Dr. Scudder's fossil species, it comes nearest to *C. exterraneus* in size, but differs in having transverse eyes and by the more approximate punctures of the elytral striæ.

Magdalis Germ.

M. striaticeps n. sp. Comparable to the recent *M. armicollis*, if allowance is made for flattening. The specimen is preserved so as to show parts of the dorsal and ventral aspects (*i. e.*, not in profile as are most of the weevils) but is partly disintegrated so that the principal sculptural features are lost, as well as the legs and antennæ. The most striking characteristic is shown in the marking of the underside of the head, which is provided with many distinct transverse strigosities, extending quite from side to side, reproducing the similar but less distinct striæ on *M. armicollis* and *M. olyra*, or even more closely those of *M. barbata*. This part of the under side is in reverse, and shows, on the beak, a distinct sharp median longitudinal ridge,

representing the corresponding groove of *M. olyra*. Eyes about as in *M. olyra*. Thoracic outline not perfectly preserved, but I see no evidence of gross serrations on the best side, though the other is irregular. The hind angles appear not to have been strongly laminate, but are somewhat obscured. What little remains of one elytron in good enough preservation for study shows a trace of a line of moderate-sized close-set rounded punctures, something like the strial series in *M. lecontei*. Length, including the rostrum which continues the median axis of the body, 7.00 mm.; of rostrum, from eye to tip, 2.10 mm.; of head and prothorax, from front of eye to thoracic base, 1.65 mm.

Station number 13. Collection numbers 256 and 195. Florissant Expedition, 1906. The description is made from the first specimen, which, though not all on the same level, is at least partly a reverse, number 195 being the other half of the same insect. The type is in the Museum of the University of Colorado.

Differs from *M. sedimentorum* Scudder (described from the Florissant shales) in the coarser elytral punctuation as well as in being more than twice as large. Too much reliance should not be placed upon the latter character, however, since the recent species of *Magdalis* vary widely in size.

Ceutorhynchus Germ.

C. clausus Scudd. I have referred here, a specimen from Station number 4, collection number 162, in very soft shale which seems not to have been subjected to much pressure, since the insect is not flattened so much as usual but projects from the matrix quite strongly. It is preserved in profile and shows the scales of the under surface to have been large and rounding, something like those of the recent *Phytobius griseomicans*. Although I have assigned the specimen to Dr. Scudder's species cited above, I doubt the generic reference, but have not found a more satisfactory place for it.

Balaninus Germ.

B. restrictus Scudd. A single specimen, in only fair condition, is in the collection and shows the under surface. The coarseness of the piece of shale in which it is preserved, together with some disintegration of the integuments, render any description of the ventral plates impossible. This example is a little longer than Scudder's unique, measuring 8.00 mm., exclusive of the rostrum which is 3.65 mm. in length.

Station 14. Collection number 74. Florissant Expedition, 1906.

B. minusculoides n. sp. Resembles *B. minusculus* Scudd. (from the Florissant shales). Beak nearly straight from the base for about half its length, thence regularly but not strongly arcuate, head finely granulate, eyes relatively small (in comparison with the recent *B. baculi* Chitt.) and, as preserved, strongly transverse.

Prothorax tapering, transversely granulato-strigose, this appearance perhaps due in part to hair impressions. Elytra with strong, sharply defined catenate ridges, which indicate impressed, distinctly punctured striæ in which the punctures were elongate, separated by about their own length on the basal portions of the disk, but becoming more nearly circular and comparatively more distant towards the tip. Legs not showing any of the femora in entirety, but the visible tips indicate that they were strongly clavate near the apices. The only tibia showing, a posterior one, is slender and about straight. Length, exclusive of rostrum, 5.75 mm.; of rostrum, on chord of arc, 2.75 mm.

Station 14. A single specimen, in reverse, numbered 34, collected by Mrs. Cockerell. Florissant Expedition, 1906. The type is in the Museum of the University of Colorado.

Comes nearest to *B. minusculus* Scudd., but is larger, the beak more elongate and the elytra differently sculptured. The antennal scape is folded back, but does not attain the eye; the remaining portion of the antenna, though the slender club seems incomplete, is about 1.50 mm. long.

B. minusculus Scudd. Represented by a single reverse, in beautiful condition except that the beak is missing. It is just the size of Dr. Scudder's type, has a finely and densely punctured prothorax, and the elytral striæ (represented of course by ridges) are sharp with fine, widely separated punctures.

Station 13 B. No collection number. Florissant, 1908.

Scyphophorus Schönh.

S. tertarius n. sp. Body stout, head twisted but not retracted in the specimen, beak rather slender, not showing a basal dilatation, though this may be due to the angle at which it lies, since the tip is not in the same plane as the rest of the remains. Prothorax near the base as broad as the elytra, widest a little in front of the broadly rounded hind angles, thence slightly narrowed to about three fourths, whence the convergence is much more rapid to the tip. No definite sculpture can be made out on either the head or the thorax. Elytra subparallel to about the middle, thence narrowing to tip, each with nine very fine impressed apparently impunctate regular striæ, subequidistant upon the disk but more approximate towards the sides, interstitial spaces broad and flat, not visibly sculptured. Pygidium exposed, sculpture not evident. The plates of the underside are fairly well marked, and are best described by the measurements which follow. Length of specimen, from front of head to tip of abdomen, 14.75 mm.; of head, 1.75 mm.; of beak, 3.50 mm.; of prothorax along median line, 3.75 mm.; of elytra, 8.00 mm.; of metasternum along median line, 2.65 mm.; of first abdominal segment at middle, 1.60 mm.; of second, 1.40 mm.; of third and fourth united, 1.40 mm. Width of prothorax at broadest point, 6.35 mm.; of elytra at broadest point, 6.35 mm.; of prosternum between coxæ at narrowest point, 0.575 mm.; of mesosternal process between coxæ, 1.25 mm. Distance between points of posterior coxal cavities, about 1.25 mm. Longitudinal diameter of anterior coxal cavity, 1.50 mm.; transverse diameter, 1.75 mm.

Station number 14. Collection numbers 110 (obverse) and 159 (reverse).

Florissant Expedition, 1906. Collected by Mrs. W. P. Cockerell. The type is in the American Museum of Natural History.

The specimen is in fair preservation as regards the body, but antennæ and legs are wanting, thus failing to show characters necessary for exact generic determination. I believe that the insect was at any rate closely allied to our recent *Scyphophori*, with which it agrees quite well in proportional measurements of the ventral sclerites. The prothorax, however, is relatively broader (due perhaps to flattening) though otherwise similar in outline, and the same remark may be applied to the elytra. The elytral striæ are fine, like those of *Cactophagus validus*, and this feature, as well as the shape of the prothorax and the size will serve to differentiate it from the two fossil species described by Scudder.

Cratoparis Schönh.

C. adumbratus n. sp. The specimen is a reverse in profile. Head finely granulate, rugose on the side, beak short with a distinct, rather sharp median groove extending on to the vertex, antennæ deficient, only one being left, which is defective at base, but apparently about equal in length to the head and prothorax, terminated by a distinct three-jointed club, of which the first and second joints are about equal, the last a little longer and pointed at tip. Prothorax finely, closely granulate on the disk. Elytron with regular rather distant rows of fine circular granules separated longitudinally by about their own diameters. Front coxæ rounded, legs moderately stout, abdominal segments subequal. Length, 8.75 mm.; of elytron, 6.50 mm.

Station W. 9, L. Collection number 113. Florissant expedition, 1906. The type is in the Museum of the University of Colorado.

Much larger and more finely sculptured than *C. arcessitus* Scudd., from the Florissant shales. It also slightly exceeds the measurements of the recent *C. lunatus*, which is a more coarsely sculptured insect with a somewhat larger antennal club. In applying the above description it must be borne in mind that since the characters refer to the reverse or cast, the granules and groove there mentioned represent punctures and carina in the insect itself.

Hylesinus Erichs.

H. extractus Scudd. One specimen, in rather poor condition, taken at Florissant, but without station or collection number, is assigned here. It is a little larger than the type, measuring a full two millimeters in length.

