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A FOSSIL CARABID BEETLE FROM THE MIOCENE OF MONTANA

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ABSTRACT—Five specimens of fossil beetles from Miocene strata exposed in the Ruby Basin of Montana can only be identified as "Carabid species (Harpalini?), Darlington 1968."

RECENTLY I HAVE EXAMINED and sorted to families 44 specimens of fossil beetles collected along Peterson Creek in the Ruby Basin, Montana. The locality is in sec. 23, T 7 S, R 5 W, Madison County. The specimens were collected in 1947 and 1948 by fiield parties from the Museum of Paleontology, The University of Michigan. Members of the parties included H. F. Becker, J. A. Dorr, Jr., G. R. L. Gaughran, C. W. Hibbard, W. H. Wheeler, and H. P. Zuidema. The specimens are now cataloged in the Museum of Paleontology at Ann Arbor.

The beetles studied I place, some more or less doubtfully, in the following families:

Carabidae, probably 1 species	5	specimens
Staphylinidae, 1 or more species	3	"
Elateridae, 2 or more species	5	"
Scarabaeidae, 2 or more species of Aphodiini and 2 or more other species	8	"
Curculionidae, 2 or more species	14	"
Fair specimens perhaps identifiable on further study but not placed now	3	"
Probably unidentifiable	6	"
Total	44	"

Of these, I have studied critically only the Carabidae, represented by specimens Nos. 26060, 26061, 26080, 26084 (obverse and reverse), and 26091 in The University of Michigan collection. These five specimens seem to represent a single species. It was 8 to 10 mm long, probably *Anisotarsus*- or *Calathus*-like in form, more or less fusiform, with antennae and legs of the usual, slender carabid type. The eyes were of moderate size. The mandibles were short, curved, and toothed. The mentum was deeply emarginate, and perhaps toothed at middle (26061: pl. 2, fig. 3), but I am not sure about the tooth. The prothorax was rather broad, narrowed anteriorly, with sides broadly and evenly rounded, and with posterior angles obtuse or narrowly rounded. Some specimens suggest at first glance that the pronotum had unusually wide, even, lateral margins, but the apparent margins are probably artifacts produced by crushing of the prothorax and forcing of the lower against the upper surface. The actual pronotal margins cannot be made out, and were probably not sharply defined. The elytra were each 8-striate, the striae entire and apparently impunctate. The striae appear as fine costae rather than impressed lines, presumably as a result of the particular process of fossilization. The inner wings were probably well developed. I judge this from the general appearance of the insect. What seems to be the base of a strong wing or possibly the entire folded wing is visible, detached, beside one of the specimens (26091: pl. 2, fig. 1), but there is no certainty that it is really part of that specimen. The abdomen (best preserved in 26061: pl. 2, fig. 3) was of the commonest carabid type, 6-segmented ventrally, with segment 1 divided into a pair of lateral triangles, 1 to 3 lightly connate but with sutures visible, 4 to 6 free and with sutures more distinct. The posterior coxae were contiguous and the posterior trochanters normal.

Against this list of things that can be seen must be placed an impressive list of things that cannot. Good as some of the specimens seem to be on first examination, I can distinguish no significant spurs or setae, few of the important characters of the mouth parts, none of the fundamental characters of the sterna, and nothing of the male anterior tarsi or genitalia—in short, almost none of the things needed to show the insect's position within the family Carabidae, can be observed.

This Miocene carabid was obviously neither very primitive nor strikingly peculiar. It seems

to have been an ordinary, "modern" sort of carabid, and that is the principal thing that can be said of it. It was probably ground-living but could have been arboreal. I cannot assign it with certainty to any one tribe. Judging chiefly from its appearance, I think that it was most likely a member of the Harpalini. Within that tribe it could be an *Harpalus,* a *Trichotichnus,* an *Anisodactylus,* an *Anisotarsus,* or any one of many other genera, some of which occur in every part of the world. But it may have belonged to any of several other tribes.

If this fossil were to be named, either it must be referred to an existing genus, or a new genus must be made for it. I cannot conscientiously do either. I cannot refer it to an existing genus, because the necessary characters cannot be made out. But, on the other hand, almost all of the older (late Eocene or early Oligocene) but better-preserved fossil Carabidae of the Baltic amber are existing genera, and the Miocene species is probably an existing genus too, even though I cannot say which. I do not believe that it is a new genus, and I am not willing to call it one. Perhaps this decision will seem naive to paleontologists, but so far as I am concerned the beetle will remain without a name at least for the time being, and may be cited as "Carabid species (Harpalini?), Darlington 1968."

I considered reconstructing the insect in a line drawing, showing only the outline and such structures as are actually visible in the specimens, but all of the specimens are crushed so that the outline cannot be made out exactly, and some of the details are distorted too. Therefore, the insect cannot be reconstructed accurately.

If these fossils were of an insect with membranous forewings, six such good specimens would probably allow us to characterize and place the species exactly—but diagnostic characters are not so obvious in beetles. Far enough back in the geological record, the occurrence of such an insect might tell us something about the time of origin of modern Carabidae—but not in the Miocene. If we knew the relationships of the species more exactly, it might reveal something about carabid phylogeny, or rate of evolution, or geographical distribution in the Miocene—but we do not know its relationships so exactly. Therefore the specimens are not presently significant. Nevertheless, they were well worth collecting and preserving. Future study of them may eventually tell more about the species they represent, and discovery of additional specimens may allow a more detailed and accurate reconstruction. To reconstruct even one Miocene carabid accurately enough to place it exactly among living Carabidae would be a noteworthy and valuable accomplishment.

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EXPLANATION OF PLATE 1

All figures × 10

FIGS. *1–3*—Carabid species (Harpalini?), Darlington 1968. *1,* UMMP 26060. *2,* UMMP 26084A. *3,* UMMP 26084B.

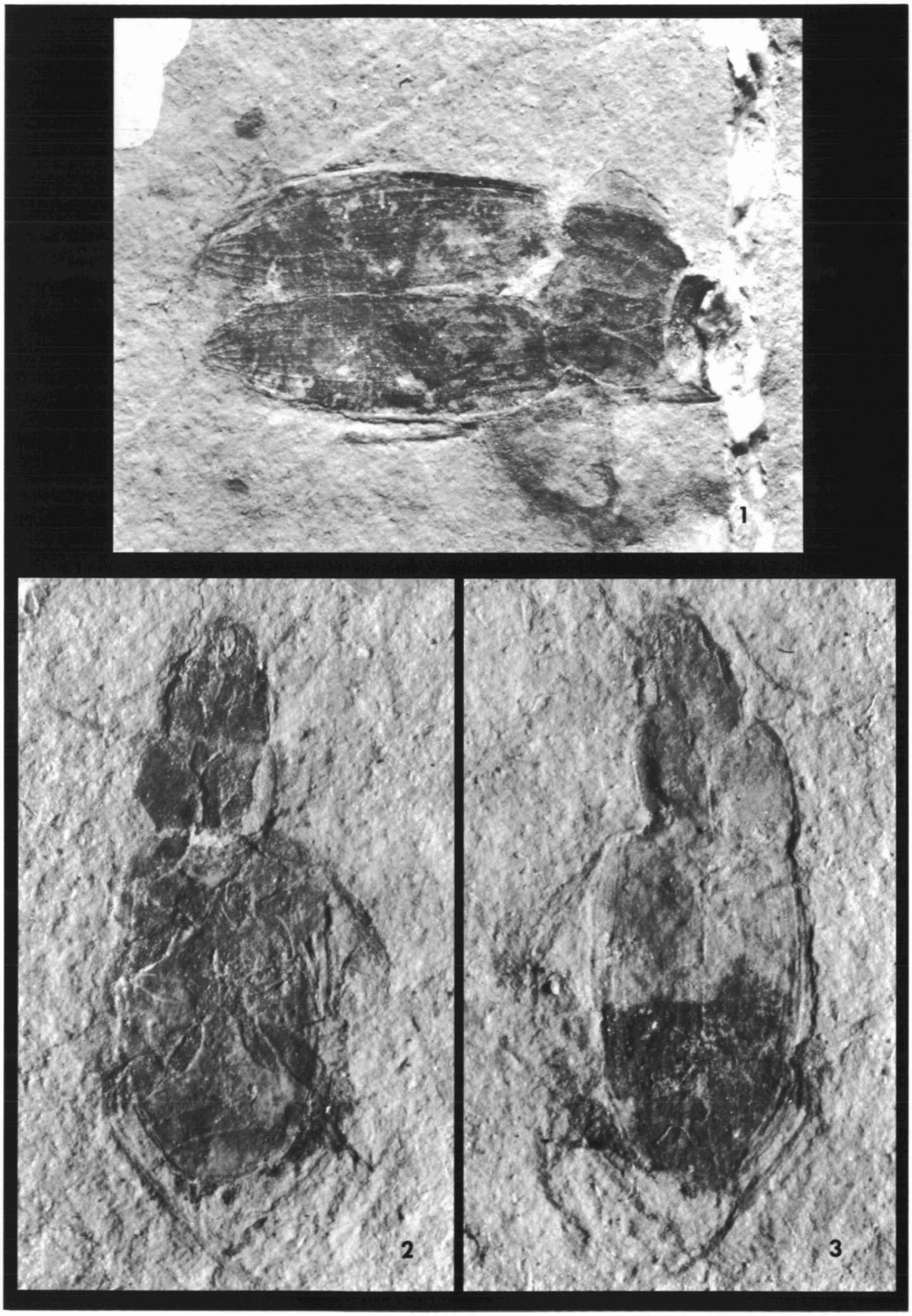

PLATE 1

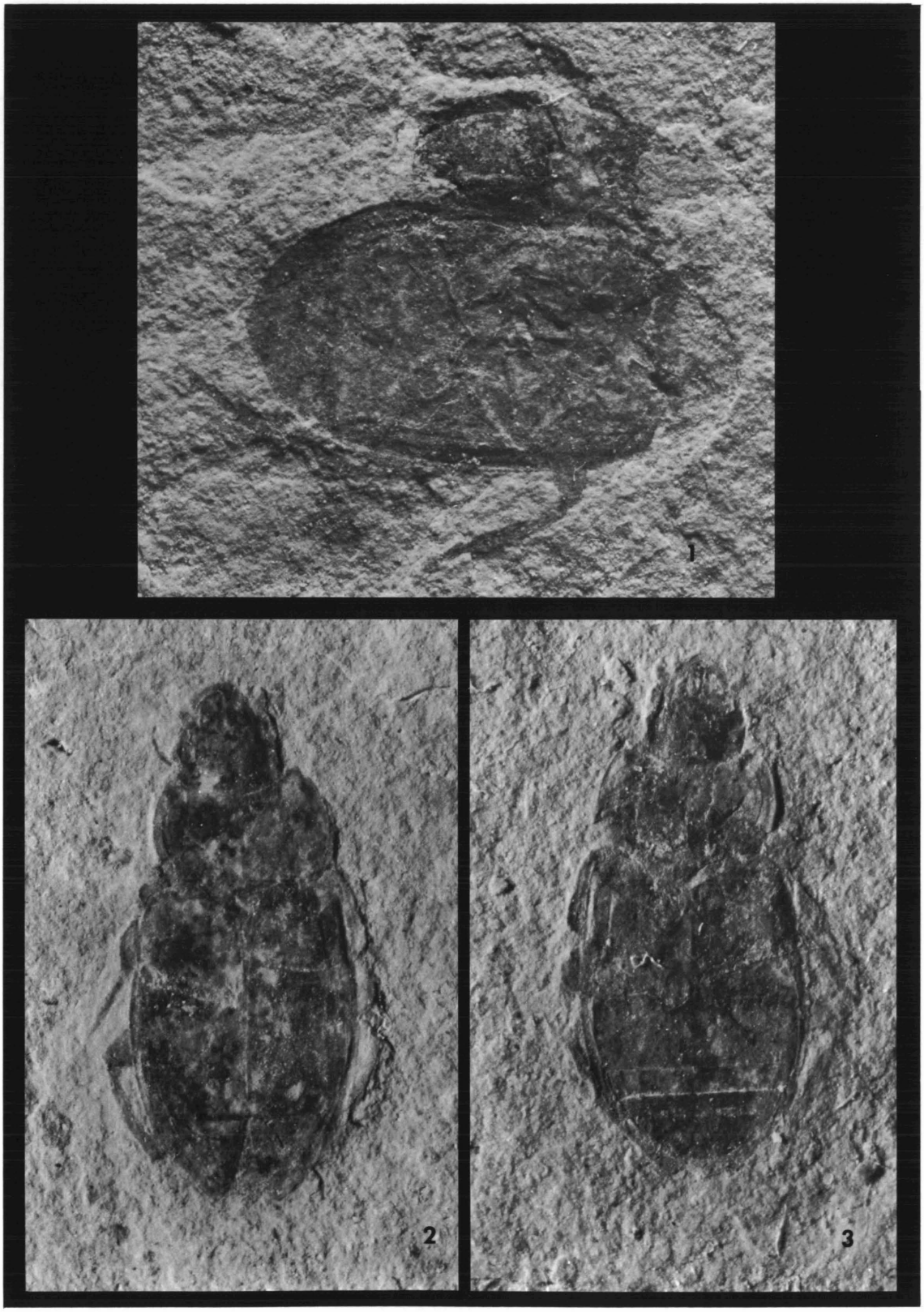

PLATE 2

EXPLANATION OF PLATE 2

All figures × 10

FIGS. *1–3*—Carabid species (Harpalini?). Darlington 1968. *1*, UMMP 26091. *2*, UMMP 26080. *3*, UMMP 26061.