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Supplementary data to accompany Barnosky et al., 2007, Biostratigraphy and magnetostratigraphy of the mid-Miocene Railroad Canyon Sequence, Montana and Idaho, and age of the Mid-Tertiary unconformity west of the continental divide.

APPENDIX 1S

Details of magnetostratigraphic collec-tion and analyses. See Zheng (1996) for additional information.

Magnetostratigraphy Methods

Field collection and analysis of the magneto-stratigraphic samples was done by J. Zheng. Details of his work are reported in Zheng (1996). Information extracted from that source and pertinent to the present report is as follows.

Samples were collected by rasping the surface of the outcrop flat, recording and marking dip angle, then chiseling the marked specimen free. Samples were shaped at the University of Pittsburgh Paleomagnetics Laboratory using dry grinding methods. Physical disruption of weakly consolidated sediments would have occurred if coolant fluids had been used. The dry grinding methods included using a non-magnetic saw to dry-cut samples into smaller cubes, then carefully grinding each into a 24 mm cube, and placing the cubes in the magnetometer sample holder. Some specimens (ca. 60) were well enough consolidated to drill (in the lab) into cores of 25 mm diameter, which were then sliced into cylinders 24 mm long. Selected samples from each stratigraphic section were first subjected to Alternating Field (AF) demagnetization, which led to the determination that the maximum limit of the AF demagnetizer (ca. 1200 *Oe*) was insufficient to remove all of the remnant demagnetization. Therefore 860 samples were subjected to multi-step thermal demagnetization. Between 5–14 heating steps were used to demagnetize the samples. The maximum temperature was 680° C. First, one of the three samples from each site was subjected to detailed heating, cooling, and measurement cycles up to 14 steps. Based on the analysis of the result from the first sample, unnecessary cycles were eliminated, resulting in fewer cycles in demagnetizing the remaining two samples. The process was conducted in a very low-field environment within a magnetically-shielded room (< 300 nT inside the room, ca. 50,000 nT outside), which significantly reduced the possible magnetization induced from the time the samples were taken out of the cooling chamber to the time they were measured, thus increasing reliability of the data. Results were plotted on Zijderveld diagrams (Zheng, 1996) and principal components analysis was used to extract all components present in the sediments and to identify the primary component (Kirschvink, 1980). Efforts were concentrated on the intermediate-temperature component carried by detrital magnetite, which is most likely to carry the magnetic polarity recorded at or near the time of deposition.

After primary components were identified for all three samples from one site, the mean direction and related statistical parameters were obtained using Fisher statistics (Fisher, 1953). The rating system of Lindsay et al. (1987) was used to rank sites as: A (class one), all three samples from a site agree in polarity and results are statistically significant; B (class two), two of the samples agree but the third is missing or forms a wide angle relative to the other two; C (class three), sample directions are strung between a reversed and normal direction; or D (class four), directions of magnetization are randomly distributed.

APPENDIX 2S

Systematic paleontology for taxa that were represented by material that precluded more detailed identification, or that were identified by other investigators.

Class MAMMALIA Linnaeus, 1758
Order LIPOTYPHLA Haeckel, 1866
Family TALPIDAE Fischer de Waldheim, 1817
Talpidae gen. et sp. indet.

Occurrence—UCMP V99490, V99097, V99457.

Referred material—V99490: proximal fragment of right humerus, UCMP 146475. V99097: trigonid of left lower molar, UCMP 189981. V99457: shaft of left humerus, UCMP 189878.

Description—The specimens are too fragmentary to confidently assign to a genus, although the relatively broad shaft of UCMP 189878 suggests referral to *Domninoides*. The tooth fragment could belong to either a talpid or proscalopid; it is listed under talpid for convenience.

Family ERINACEIDAE Fischer de Waldheim, 1817
Erinaceidae, gen. et sp. indet.

Occurrence—UCMP V99097.

Referred material—Fragment of p4, UCMP 189983.

Description—The quadritubercular shape and sharp cusps of this small tooth (2.5 mm anteroposterior

diameter) indicate it is from an erinaceid, but breakage of the lingual portion precludes more definite identification.

Order CARNIVORA Bowdich, 1821
Family AMPHICYONIDAE Haeckel, 1866
Amphicyonidae, gen. et sp. indet.

Occurrence—UM MV7338.

Referred material—broken upper molar, UM 5798.

Comments—This amphicyonid tooth fragment is inadequate to be identified below the family level.

Family CANIDAE Fischer de Waldheim, 1817
Canidae, gen. et sp. indet.

Occurrence—UM MV7323.

Referred Material—Fragment of left maxilla with broken P4 and alveolus for M1, UM 4223.

Comments—The specimen is too fragmentary for generic assignment.

Order LAGOMORPHA Brandt, 1855
Family OCHOTONIDAE Thomas, 1897
Genus *OREOLAGUS* Dice, 1917
Oreolagus sp.

Occurrence—UM MV7322, MV7325, MV7330, MV7328, MV7338, CM loc. 2221, UCMP V99452.

Referred material—MV7322: right dentary with three molariforms, UM 5843. MV7325: upper right molariform tooth, UM 6396. MV7328: left dentary with p3-4, UM 4382. MV7330: right dentary with m2–3, UM 4395. MV7338: upper molariform tooth, UM 5814. UCMP V99452: broken unworn upper premolar, UCMP 146498; two lower left molariform teeth, UCMP 146499; upper molariform tooth, UCMP 146500; two upper molariform teeth, UCMP 146501. CM loc. 2221: right dentary with broken p3, p4–m2, CM 16907.

Comments—It is unclear where the CM specimen is from, as the locality information provided by Kay and Yarmer (1946 field notes) is restricted to "Railroad Canyon, Idaho." None of the material is sufficient to confidently identify the species.

Family LEPORIDAE Fischer de Waldheim 1817
Genus *HYPOLAGUS* Dice 1917
Hypolagus sp.

Occurrence—UCMP V99453, V99094.

Referred material—V99453: upper molariform tooth, UCMP 146502. V99094: right p3, UCMP 146492.

Comments—As is characteristic of *Hypolagus*, the p3 lacks an anterior reentrant and has a posteroexternal reentrant that extends about 50% of the width of the tooth. The material is inadequate to confidently assign to species.

Order RODENTIA Bowdich 1821
Family SCIURIDAE, Gray 1821
Sciuridae, gen. et sp. indet.

Occurrence—UCMP V99097.

Referred material—left m1 or m2, UCMP 189982.

Description—The lower molar (1.8 mm anteroposterior diameter, 1.9 mm transverse) is about the size of those of *Spermophilus primitivus* Bryant 1945 and species of *Miospermophilus* Black 1963, but in the absence of more diagnostic teeth firm identification is not warranted.

Family DIPODIDAE Fischer de Waldheim, 1817
Subfamily SICISTINAE Allen, 1901
Genus *PLESIOSMINTHUS* Viret, 1926
Plesiosminthus sp.

Occurrence—UCMP V99452, V99453.

Referred material—V99452: left P4-M1, UCMP 146505. V99453: left dentary with p4–m3, UCMP 146506.

Description—These specimens compare favorably with *Plesiosminthus* illustrated by Storer (1975:89), but are not identified to species because species-level taxonomy of this group is not well understood.

Family GEOMYIDAE Bonaparte, 1845
Subfamily HETEROMYINAE Coues, 1875
Genus *PERIDIOMYS* Matthew, 1924
Peridiomys sp.

Occurrence—UCMP V99097.

Referred material—five m1 or m2, UCMP 189963, 189974, 189975, 189990, 189993; three M1 or M2, UCMP 189957, 189976, 189988; P4, UCMP 189956. M3 UCMP 189965.

Description and Comments—These specimens exhibit the bilophodont teeth typical of heteromyine rodents and were identified on the basis of their size (molar widths 1.4–1.8 mm, n = 8), the presence of thin enamel, low hypsodonty (labial enamel height = 0.4–0.5 mm, n = 3), labial fusion of upper molar roots, and a very slight basal bulge to the crown wall (Barnosky, 1986:26). We do not refer them to a known species because we do not consider the material diagnostic below the generic level.

Family MYLAGAULIDAE Cope, 1881
Mylagaulidae, gen. et sp. indet.

Occurrence—UM MV7322, MV7323, MV7330, MV 7338.

Referred material—MV7322: right distal end and shaft of humerus, UM 4168. MV7323: left humerus, UM 4305; distal shaft of femur, UM 4306. MV7330: broken incisor, UM 4394. MV 7338: broken incisor, UM 6439.

Comments—The large size and derived fossorial morphology of these bones indicate referral to a mylagaulid. The incisors are broad, shallow and flattened anteriorly. The humeri are broadened distally and very robust, with a very prominent, enlarged deltoid crest. The only other taxon of the appropriate age, size, and morphology to which such remains could be assigned, Castoridae, is not represented among preserved dentitions, so these fossils are assigned to the Mylagaulidae.

Family APLODONTIDAE Trouessart, 1897
Subfamily APLODONTINAE Trouessart, 1897
Aplodontinae, gen. et sp. indet.

Occurrence—UM MV7330.

Referred material—right dentary fragment with m3, UM 5860.

Description—This specimen is referred to the Aplodontinae (sensu Korth, 1994), based on its occlusal outline and extreme hypsodonty, combined with the reduction of the anterior and posterior enamel. The gonial angle of the jaw is extremely flared with a well-developed masseteric ridge, as in all aplodontines. This specimen cannot be referred to any known genus or species, however. UM 5860 differs from *Liodontia* in having the posterior reentrant prominent and persistent with wear; the tooth is in early to mid-wear, and the reentrant is present in all of the tooth crown emergent from the jaw. Few, if any, specimens of *Liodontia* possess this reentrant even in unworn specimens, and never in worn teeth. *Tardontia* has a much narrower (transverse) m3 in proportion to its width, and the tooth has a much shorter (anteroposterior) trigonid, with the anterior moiety of the tooth much smaller than the posterior portion. The only other two described genera of aplodontines, *Pseudaplodon* and *Tschalimys*, are known from individual specimens. *Pseudaplodon* is known only from an extremely worn dentary. Although the proportions of the m3 of *Pseudaplodon* are comparable to UM5860, the type of this genus is in extremely late occlusal wear, and it is impossible to say whether the specimen from Railroad Canyon can be referred to this genus until more material has been recovered. *Tschalimys* is known from only a single isolated P4.

Rodentia, gen. et sp. indet.

Occurrence—UM MV7322, MV7323, MV7326, MV7327, MV7330.

Referred material—MV7322: calcaneum and fragment of proximal ulna, UM 4335; three incisors, UM 4343, 5811, 5845; cheek tooth, UM 4169. MV7323: incisor, UM 5825. MV7326: calcaneum and proximal ulna, UM 4370; calcaneum, UM 6394. MV7327: incisor, UM 4411; five incisor fragments, six phalanges, two caudal vertebra, eight unidentifiable fragments. MV7330: occipital region of skull, UM 5863.

Comments—These specimens are not complete enough for referral to a finer taxonomic level.

Order PERRISODACTYLA Owen, 1848
Family CHALICOTHERIIDAE Gill, 1872
Subfamily SCHIZOTHERIINAE Holland and Peterson, 1914
Genus *TYLOCEPHALONYX* Coombs, 1979
Tylocephalonyx cf. *T. skinneri* Coombs, 1979

Occurrence—IMNH 2125.

Referred material—Metatarsal IV, IMNH 44602; distal tibia, IMNH 44603.

Description—The two specimens are probably from the same individual. Both are similar to *Tylocephalonyx skinneri* in form; the metatarsal IV has proximal articular facets only for metatarsal III and the cuboid, and none for the ectocuneiform, unlike *Moropus* (Coombs, pers. comm., January, 2006). The distal tibia is less diagnostic, but is referred based on assumed association. IMNH 44602 is larger than any other metatarsal IV attributed to *Tylocephalonyx*.

Comments—These specimens come from near the center of the SW1/4 of the SW1/4 of Section 8, T17N, R27E, Bannock Pass Quad. The locality has not been tied precisely to the measured sections, but is ca. 20–25 m stratigraphically above the West Railroad Cut section; on that basis it appears to equate to near the middle of the Snowfence section. The specimens were identified by M. Coombs (pers. comm., September, 2002 and January, 2006).

Family EQUIDAE Gray, 1821
Genus *HYPOHIPPUS* Leidy, 1858
Hypohippus sp.

Occurrence—UM MV7322, MV7323, MV7325, MV 7338.

Referred material—UM MV7322: upper cheek teeth, UM 4151-4152; distal tibia, UM 5934. UM

MV7323: broken astragalus, UM 4365; broken cuneiform, UM 4366. UM MV7325: two broken astragali, UM 5850. MV7338: broken astragalus, UM 4444; magnum, UM 5768; upper cheek tooth, UM 5890.

Comments—This equid material was referred to *Hypohippus* on the basis of its large size (UM 5890 measures 19.6 mm anteroposterior, 20.8 mm transverse), as is also the case for the *Hypohippus* specimens identified from Railroad Canyon by R. Tedford (Table 3). The material does not support more precise identification.

Genus *"MERYCHIPPUS"* Leidy 1858
"Merychippus" sp.

Occurrence—UM MV7322, MV7323, MV7324, MV7325, MV7327, MV7330, MV7331, MV7332, MV7333, MV7334, MV7338, UCMP V99092, V99094, V99203, V99204, V99205, V99210, V99211, V99455, V99459, V99460, V99490.

Referred material—MV7322: mandible fragment with p1-p4, UM 4153; lower cheek tooth, UM 4154; M3, UM 4155; P2, UM 4156-4157; P4, UM 4158; M3, UM 4159-4160, 4219; upper cheek tooth, UM 4161; calcaneum, UM 4325; distal tibia, UM 3344; broken upper cheek tooth, UM5839. UM MV7323: unworn P2, UM 4292; fragment of lower cheek tooth, UM 4295; fragments of jaw with symphysis, broken canine, alveoli for incisors, UM4296 and 4307; astragalus fragment, UM 4304; distal metapodial and fragments of proximal metapodial, UM 4308; fragments of upper and lower cheek teeth and incisors, UM 4309; fragment of calcaneum, UM 4314; two upper cheek teeth, UM 4318; three podials, UM4324; broken metapodial, UM 5939; intermediate phalanx, UM 5959; astragalus, UM 7180. MV 7324: fragment of left dentary with p2–p4 and m1, UM 4319; dP2–3, dp4, deciduous upper and lower cheek tooth fragments, in association with UM 4321, UM 4320; three broken upper cheek teeth, four incisors, femur, tibia, parts of right and left pelves, tarsals, metatarsal, metacarpal splint, two ungual phalanges, median phalanges II and III, distal half of radius, astragalus, UM 4321; ungual phalanx, UM 4322; two lower cheek teeth (not numbered). MV7325: dentary with incisors, dp1–4, UM 4346; left dentary fragment with p4 and m1–3, UM 4349; ungual phalanx, UM 4354; proximal metacarpal splint, UM 4356; lower cheek tooth fragment, UM4358; upper cheek tooth, UM 6397. MV7327: R dentary with dp4, p4, m1–2, UM 4381; maxilla fragment with two cheek teeth, UM 4410. MV 7330: rostrum with alveoli for I1, C, plus P1–4, broken pelvis, UM 4392; anterior cranium and mandible with LI1–P3, RI1–M3, and Li1–c, Lp2–m2, Ri1–c, Rp2–m1, UM 5859; cheek tooth fragment, UM 5861. MV7331: broken upper cheek teeth, UM 4400. MV7332: M3, UM 4401; broken upper cheek teeth, UM 4402. MV7333: maxilla fragment with three broken cheek teeth, UM 4406; upper cheek tooth, UM 4407; broken cheek tooth, UM 6393. MV7334: maxilla with dP1-4, M1 erupting, UM 7298. MV 7338: canine, UM 4447; 16 upper cheek teeth, UM 4452; seven lower cheek teeth, UM 4453; upper cheek teeth, UM 6420–21; P2, UM 6422; lower cheek tooth, UM 6423. UCMP V99490: upper tooth, UCMP 189837; articulated podials and metapodials, UCMP 189852. UCMP V99092: four upper teeth, UCMP 189784–189787; molar with maxillary fragment, UCMP 189788; lower tooth fragment, UCMP 189848. UCMP V99094: nine lower teeth, UCMP 189802, 189818, 189819, 189821, 189823, 189824, 189828, 189831, 189843; two m3, UCMP 189816, 189844; 15 upper teeth, UCMP 189817, 189822, 189825, 189826, 189827, 189829, 189832, 189833, 189834, 189836, 189838, 189839, 189841, 189842, 189846. UCMP V99202: RP2, UCMP 189710. UCMP V99203: lower tooth, UCMP 189830. UCMP V99204: LP2, P3, R upper tooth, UCMP 189720. UCMP V99205: dentary fragment with four teeth, UCMP 189776. UCMP V99210: lower tooth fragment, UCMP 189845. UCMP V99211: two upper teeth, UCMP 189719 and 189840. V99455: upper tooth, UCMP 189718. V99459: right ulna, radius, carpals, metacarpals, and proximal, intermediate, and distal phalanges (articulated); fragments of right and left os coaxae and sacrum (articulated); L ulna; metapodials (articulated); left calcaneum and astragalus fragment (articulated); right humerus; indeterminate shaft fragments, all UCMP 189850. From unknown locality in RCS (UCMP V99460): lower tooth, UCMP 189721.

Comments—Most specimens are too incomplete to be referred confidently to species. We regard these all as of merychippine grade, and probably most are referable to taxa that Hulbert and MacFadden (1991) called "*Merychippus*" (i.e., merychippine species that cannot confidently be referred to a recognized monophyletic genus of equid). Merychippine grade equids are characterized as being of intermediate size, exhibiting mesodonty and the presence of a moderate to thick layer of cement on the cheek teeth. The merychippine sample from Railroad Canyon is noteworthy in its relative morphological homogeneity across the relatively long time span represented (ca. 3.5 Ma), suggesting perhaps the presence of only a single species. In general, all cheek teeth exhibit similar length and width proportions (ca. 17.0–18.5 mm for length of P3–M2 and ca. 16.0–20.0 mm for width at mid-height), similar crown height values among unworn and little-worn specimens (ca. 26–28 mm at the parastyle), and consistent moderate expression of cement (ca. 1 mm thick at the crown). Taxonomy of horses of this grade is complex and has yet to be resolved. Because such

treatment is beyond the scope of this paper, detailed morphological descriptions and taxonomic study are deferred to a later paper.

Order ARTIODACTYLA Owen, 1848
Family PALAEOMERYCIDAE Lydekker, 1883
Subfamily DROMOMERYCINAE Frick, 1937
Genus *BOUROMERYX* Frick, 1937
cf. *Bouromeryx* sp.

Occurrence—UM MV7323, MV7325, MV7333

Referred material—MV7323: lower cheek tooth, UM 4228. UM MV7325: left maxilla fragment with P2–M3, UM 4347; fragment of left dentary with broken p2, p3, roots of p4, UM 4348. MV7333: skull fragment with horn core, UM 4404.

Description—A. Tabrum (pers. comm., March, 2003) found that these dental specimens are significantly smaller than *Dromomeryx borealis* (in which length of p2–p4 = 43 mm, length of m1–m3 = 67 mm; Douglass, 1909), and that UM 4228 (anteroposterior = 15.0 mm, transverse = 11.5 mm) compared well to the m2 of the holotype of *Bouromeryx americanus* (anteroposterior = 14.0 mm, transverse = 10.4 mm; Douglass, 1899). The dimensions of p3 (UM 4348, AP = 12.1 mm, TR = 7.2 mm) and length of the horn core (105 mm, UM 4404) also are within expected dimensions for a species of *Bouromeryx*. The fragmentary nature of the RCS material coupled with the fact that the group needs further study prevents conclusive identification.

Family OREODONTIDAE Leidy, 1869
Subfamily TICHOLEPTINAE Schultz & Falkenbach, 1940
Genus *MERYCHYUS* Leidy, 1858
Merychyus sp.

Occurrence—AMNH Tunnel Draw.

Referred material—From AMNH Tunnel Draw: skull, mandible, AMNH Ida-5-46 (Schultz and Falkenbach, 1968).

Description—The AMNH specimen was referred originally by Schultz and Falkenbach (1968) to this genus, but not placed in a species.

Merychyus? *elegans* (Cope, 1884)

Occurrence—AMNH "West of Tunnel Draw", UM MV7330.

Referred material— "West of Tunnel Draw": partial skull and mandible with I1–M3, i1–m3, partial ulna, and associated unidentifiable fragments, F:AM 72389; partial left maxilla with dP1–dP3, M1, F:AM 72390. From UM MV7330: complete cranium with LI1–M3, UM 4396.

Description— F:AM specimens 72389 and 72390 were described by Schultz and Falkenbach (1968:379–380). Kelly and Lander (1988) referred them to *Merychyus*? *elegans smithi*. UM 4396 differs from *Ticholeptus* in having a more lightly built skull with a more gracile zygoma and less laterally projecting squamosal bones. The sagittal crest is also lower, and the posterior end of the skull is lower and slopes posteroventrally. It matches *M. arenarum* from the Hemingfordian Marsland Formation (Wyoming) in cranial and dental size, overall proportions, and the skull features diagnostic of this genus. Schultz and Falkenbach (1947) described a similar specimen from Mollie Gulch as *Merychyus arenarum idahonesis*, but Lander (1998) included that in *M.*? *elegans*, the taxonomy we follow here.

Genus *TICHOLEPTUS* Cope, 1878
Ticholeptus zygomaticus Cope, 1878
Ticholeptus zygomaticus leadorensis (Schultz & Falkenbach, 1968)

Occurrence—AMNH Tunnel Draw.

Referred material—Partial skull with C–M3, F:AM 72334.

Description—Schultz and Falkenbach (1968) named this new subspecies on the basis of its large size relative to other subspecies in the genus. In the original publication, F:AM 72334 was identified as *T. hypsodus leadorensis*. *Ticholeptus hypsodus leadorensis* was synonymized with *T. zygomaticus leadorensis* by Morea (1981), Kelly and Lander (1988), and Lander (1988).

Subfamily MERYCOCHOERINAE Schultz & Falkenbach 1940
Genus *BRACHYCRUS* Matthew 1901
Brachycrus laticeps Douglass, 1900

Occurrence—AMNH Tunnel Draw.

Referred material—Mandible with c–m3, F:AM 72327A; partial mandible with i1, dp1–m3 (germ), F:AM 72327B.

Description—These specimens were described as *Brachycrus sp.* by Schultz and Falkenbach (1968:370). Kelly and Lander (1988) referred the specimens to *Brachycrus laticeps*.

Family OREODONTIDAE Leidy, 1869
Subfamily "MERYCODONTINAE" Matthew, 1909
"Merycodontinae" gen. et sp. indet.

Occurrence—MV7323, MV7326, MV7338.

Referred specimens—MV7323: right maxilla with M1–2, UM 4250; upper cheek tooth fragment, UM

4226. MV7326: associated R M1–3, UM 4373. MV7338: tooth fragment, UM 4432; astragalus, UM 5899.

Comments—Although these specimens are referable on the basis of overall morphology to the Merycodontinae, none of them is adequately diagnostic to be definitely referred to a species; however, none is inconsistent with assignment to *Paracosoryx wilsoni*, suggesting that they may represent additional material of the same taxon we describe in the main body (Systematic Paleontology) of this article.

Family CAMELIDAE Gray, 1821
Subfamily MIOLABINAE Hay, 1902
Miolabinae gen. et sp. indet.

Occurrence—MV 7329.

Referred material—Right dentary with dp2–dp4, m1, UM 4387.

Description—UM 4387 is from a juvenile. Only the adult m1 from this specimen is described since the deciduous dentition is not taxonomically informative among miolabine camels. The m1 is in early wear. It is 18.8 mm in anteroposterior length and 8.4 mm in maximal transverse width. Crown height, measured from the exposed dentine-enamel junction to the tip of the little-worn posterolingual cusp, is ca. 19 mm. The labial cusps are strongly 'v'-shaped in occlusal view. No intercolumnar tubercles or stylids are present. An anterior cingulum (also called an anterior buttress) is present, connecting the parastylid to a well-developed columnar protostylid. No metastylid is present. The lingual ribs are weak, and the lingual surface as a whole is relatively flat.

Discussion—The absence of a metastylid and the correspondingly flat lingual crown surface of UM 4387 suggests it belongs to an unnamed group of miolabine camelids described only as miolabine sp. by Honey et al. (1998). These characters also suggest an affinity between UM 4387 and *Nothotylopus*, a better known miolabine. However, assignment to *Nothotylopus* or to any other genus or species is not possible without a more complete adult dentition.

Subfamily CAMELINAE Gray, 1821
Genus *AEPYCAMELUS* Macdonald, 1956
Aepycamelus sp.

Occurrence—UM MV7331, MV7338.

Referred material—MV7331: incom-plete mandible with symphysis, i1–3, p2-m3, maxilla with P2–M3, UM 4398; distal tibia, unciform, tarsal, proximal phalanx, distal phalanx, UM 4399. MV7338: metacarpal, UM 5609.

Comments—Based on their large size alone these specimens can clearly be referred to *Aepycamelus*. There is nothing in the cranial and dental morphology which would preclude such a referral. An unprepared plaster jacket at UCMP from the same locality as MV7331 very likely contains elements of the same animal as UM 4398. More complete description of the material awaits revision of this taxon, as well as more extensive preparation of the specimen.

Camelidae, gen. et sp. indet.

Occurrence—CM 2225.

Referred material—Partial right jaw and scapula (juvenile), partial metapodial (adult), CM 09239.

Comments—The provenance of this material is uncertain. It was collected by Kay in 1944 and is listed in the CM database as *Oxydactylus* sp. We have not examined the material and thus list it simply as Camelidae. Most of the CM material is from Mollie Gulch and it is unclear whether these camel specimens come from low or high in the RCS.

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TABLE 1S. Dip and strike directions in formations above and below the Mid-Tertiary Unconformity (MTU) in the Railroad Canyon Sequence. One asterisk (*) indicates near MTU; two asterisks (**) indicates at MTU. **Abbreviations**: **CC**, Cruikshank Creek; **DS**, Dead Squirrel; **MRC**, Middle Railroad Cut; **SF**, Snowfence; **ST1**, Snowfence-Turtle 1; **T2**, Turtle 2; **WH**, Whiskey Spring; **WRC**, West Railroad Cut. Dip direction is given in terms of compass quadrant (i.e., NNE means north north east) and azimuth (in parentheses).

Formation	Exposure	Strike	Dip Direction	Dip Angle
Arikareean				
Renova	CC	123	SE (213)	3
Hemingfordian				
Renova	WH4 +21	76	NNE (346)	10
Renova	WH4 +21	94	NNW (4)	9
Renova	WH4 +21	85	NNE (355)	9
Renova	WH3 +44	86	NNE (356)	3
Renova	WH3 +44	132	NW (42)	5
Renova	WH3 +44	91	NNW (1)	17
Renova	WH3 +44	140	NW (50)	7
Renova	WH3 +44	146	NW (56)	7
Renova	WH3 +44	113	NNW (23)	12
Renova	WH3 +44	140	NW (50)	7
Renova	WH3 +44	155	WNW (65)	10
Renova	WH4 +67	76	NE (346)	9
Renova	WH4 +67	65	ENE (325)	4
Renova	WH4 +67	81	NE (351)	4
Renova	WH4 +67	107	NNW (17)	16
Renova	WH4 +67	111	NNW (21)	12
Renova	WH4 $\pm$70*	141	NW (51)	16
Renova	WH4 +70**	123	NW (33)	10
Renova	MRC	170	E (260)	7
Hemingfordian or Barstovian				
Sixmile Creek	WH4 +72*	165	WNW (75)	9
Sixmile Creek	WH4 +72*	150	NW (60)	16
Sixmile Creek	WH4 +75	135	NW (45)	7
Sixmile Creek	WH4 +75	166	NW (56)	8
Sixmile Creek	WH4 +75	161	NW (51)	9
Sixmile Creek	WH4 +75	135	NW (45)	13
Sixmile Creek	WH4 +87	131	NW (41)	9
Sixmile Creek	SF	160	NW (70)	12
Sixmile Creek	T2	122	NW (32)	4
Sixmile Creek	ST1	117	NNW (27)	7
Sixmile Creek	WRC	188	ENE (278)	8
Sixmile Creek	WRC	181	E (271)	8.5
Sixmile Creek	Above WRC	128	SE (218)	3.5
Sixmile Creek	DS	117	NNW (27)	7

TABLE 2S. AMNH specimens from the Railroad Canyon Sequence identified by R. H. Tedford (pers. comm., January, 2003). AMNH loc. Tunnel Draw (SW corner sec. 9, T17N, R27E, just north of Idaho 29) is thought to be the same as ST1–3 in Figs. 2–3. There is some confusion about the exact location of "one mile SE of Tunnel Draw." The geographic description provided by Tedford as inferred from Falkenbach's field notes is "NW 1/4 sec. 16, [T17N], R27E," which would place it near localities FH and FE in Figs. 2-3, but Tedford noted that matching of field photos suggests it corresponds with SNF1/2 (R. H. Tedford, pers. comm., May, 2002).

Taxon	Locality	Specimens
Carnivora		
Amphicyonidae		
Genus indet.	AMNH Tunnel Draw	AMNH Ida-7-29
Lagomorpha		
Leporidae		
Hypolagus sp.	AMNH Tunnel Draw	AMNH Ida-7-43
Perissodactyla		
Equidae		
Archaeohippus cf. *A. penultimus*	AMNH Tunnel Draw	AMNH Ida-9-54
Hypohippus cf. *H. osborni*	AMNH Tunnel Draw	AMNH Ida-7-22
"*Merychippus*" cf. "*M.*" *insignis*	AMNH Tunnel Draw	AMNH Ida-4-33, AMNH Ida-33A-B
Acritohippus cf. *A. isonesus*	AMNH, "One mile SE of Tunnel Draw"	AMNH Ida-7-32
Artiodactyla	AMNH Tunnel Draw	AMNH Ida-7-34
Palaeomerycidae		
Rakomeryx cf. *R. kinseyi*		
Antilocapridae	AMNH Tunnel Draw	AMNH Ida-9-52
Merycodus sp.		
Moschidae	AMNH "Road cut 20ft. W of MT/ID line"	AMNH Ida-7-44
Blastomeryx sp.		
Camelidae	AMNH Tunnel Draw	F:AM 73860
Paramiolabis cf. *P. singularis*		
Aepycamelus sp.	AMNH Tunnel Draw	F:AM 73860