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SYMBOS CAVIFRONS (ARTIODACTYLA: BOVIDAE) FROM DELTA COUNTY, COLORADO

Jerry N. McDonald[1]

ABSTRACT.— A partial cranium belonging to the extinct woodland musk-ox, *Symbos cavifrons*, is reported from the headwaters of Oak Creek, Delta County, Colorado. This is the first cranium of the genus *Symbos* to be described from the Colorado Plateau, and it helps to define the southwest boundary of the known range of the genus.

The extinct musk-ox genus *Symbos* was distributed widely across much of North America during the late Quaternary, ranging from Alaska to Louisiana and from California to the Atlantic continental shelf off New Jersey and Virginia (Kurtén and Anderson 1980, J. N. McDonald, unpubl. data, C. E. Ray, unpubl. data). Records of *Symbos* from the Basin and Range Province, however, are rare except from the pluvial Lake Bonneville region of Utah and its discharge area in southeastern Idaho. Indeed, all 16 cranial specimens from the Basin and Range identified as *Symbos* in the literature are from this area (Gazin 1935, Nelson and Madsen 1978). At least 10 other cranial specimens are known from Basin and Range localities, including: Minidoka County (4) and one unknown location (1) in Idaho; Modoc County (1), California; Delta (1) and Montezuma (1) counties, Colorado; Wasco County (1), Oregon, and Whitman County (1), Washington (S. W. Neusius, written comm., 12 January 1984; J. A. White, oral comm., 9 May 1984; J. N. McDonald, unpubl. data; C. E. Ray, unpubl. data). In addition to specimens positively identified as *Symbos*, several other ovibovine specimens are also known from the Basin and Range, including cranial records assigned to the low-horned genera *Boötherium* and *Gidleya* as well as numerous postcranial, facial, mandibular, and dental remains that cannot yet be identified with confidence to the genus level (Gidley 1906, Cossmann 1907, Allen 1913, Gazin 1935, Nelson and Madsen 1978, Kurtén and Anderson 1980, J. N. McDonald, unpubl. data, C. E. Ray, unpubl. data).

A partial skull treated here as *Symbos cavifrons*, from Delta County, Colorado, is of special interest because (1) it represents the first record of *Symbos* from the Colorado Plateau, and (2) it falls upon, and thus helps to define, the southwestern limits of the documented range of the genus (Fig. 1). This specimen was donated to the Field Museum of Natural History, Chicago, Illinois, in August 1946 by Alfred A. Look of Grand Junction, Colorado. The following notes made by Bryan Patterson upon receipt of the specimen at the museum provide some relevant historical details:

> In July, 1946, Mr. Alfred A. Look of Grand Junction, Colorado, to whom Paleontology is indebted for the discovery or preservation of a number of interesting fossil vertebrates, sent in for determination an incomplete cranium of an extinct musk-ox. This specimen had been turned over to him by the members of a fishing party who had found it on the south side of Grand Mesa, near the rim, at an elevation of some 9000 feet. Mr. Look later visited the spot, which he informs me is about 200 yards downstream on Oak Creek from the dam face of Davey Reservoir. This places it approximately in Section 17, Twp 13 S, R 96 W, Delta Co. The fossil was evidently derived from a pit south of the dam out of which sand and clay had been taken for construction purposes. He was unsuccessful in finding any additional remains. Thanks to the original finders and to Mr. Look, the specimen has been presented to this Museum and now bears number PM _____.
>
> The deposits from which the fossil appears to have come is almost surely post-Wisconsin. Henderson (1923) has described glacial tills on the top of Grand Mesa that he attributed to the Wisconsin stage. (See also Flint et al., 1945); it is likely that the sediments observed by Mr. Look in the pit just mentioned were derived from this source. (Notes attached to letter: B. Patterson to C. E. Ray, Nov. 4, 1968).

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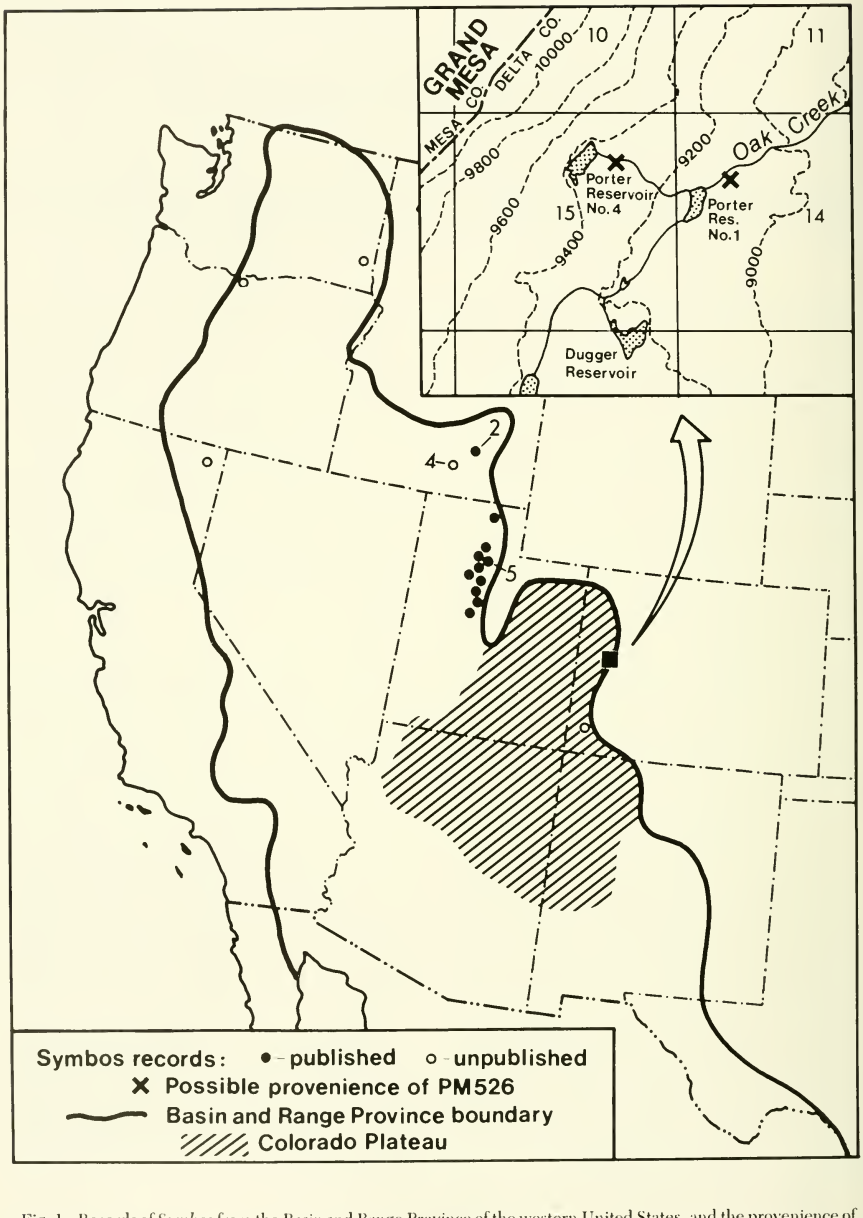

Fig. 1. Records of *Symbos* from the Basin and Range Province of the western United States, and the provenience of PM 526 near Grand Mesa, Colorado. The insert is from the Hells Kitchen, Colorado, Quadrangle, USGS 7.5′ series, 1965 edition.

Later, Patterson wrote in a foreword to Look's book on the Colorado Plateau that Look "has followed leads that have taken him hunting a fossil musk-ox in the pines and spruces at ten thousand feet on Grand Mesa" (Look, 1955: ix).

The specimen is cataloged as PM 526. The museum records that put the place of discovery in Section 17, T 13 S, R 96 W are, however, incorrect. Section 17 lies about 10,000 ft atop Grand Mesa, > $1\frac{1}{2}$ miles west of the "Davey" (actually Davies, now Porter) reservoirs, outside the Oak Creek watershed (Grand Mesa National Forest, Colorado, Map, USFS, 1959 ed.; Indian Point, Colorado, Quadrangle, USGS 7.5′ series, 1965 ed.; L. Brooks, oral comm., 9 May 1984). Porter Reservoir 4 (formerly Little Davies Reservoir) is located in Section 15, just below 9400 ft elevation, at the base of the southeast-facing scarpment of Grand Mesa (Fig. 1). Porter Reservoir 1 (formerly Davies Reservoir) lies at about 9100 ft elevation in Section 14. The segment of Oak Creek below Porter 4 flows southeasterly through forest, whereas the first half-mile of Oak Creek below Porter 1 flows northeasterly through a treeless region. Porter 1 is nearer the elevation of discovery as recorded in Patterson's notes. Available information does not permit an unequivocal determination of the provenience of this specimen, yet Patterson's notes and the battered condition of the specimen indicate that it came from below, not on, Grand Mesa. The provenience should be given, therefore, as along or near Oak Creek, Section 14 or 15, T 13 S, R 96 W, Hells Kitchen, Colorado, Quadrangle, USGS 7.5′ series (Fig. 1). The geographic coordinates of this area are approximately 38°55′30″ N, 108°6′ W; it lies within the 1-km square formed by UTM coordinates 750,500 E, 4,312,000 N, 12, N.

Symbos cavifrons is considered to have been extant from the late Irvingtonian to the Wisconsin-Holocene boundary (i.e., from ca. > 500,000 y.a.–10,000 y.a.) (Kurtén and Anderson 1980).

Description of the Specimen

This specimen consists of most of the cranium caudal to the orbits; it is badly abraded and weathered and is stained by iron. Most of the horn cores are missing, as are most of the left and part of the right occipital condyles, the jugular processes, the lateral part of the right half of the basioccipital, the rostral part of the presphenoid, the zygomatic processes, and the external occipital process, the nuchal line, and the temporal crest. The pattern of bone loss found in this specimen suggests that it has been battered by heavy objects and "rounded," such as would probably occur to skulls subjected to stream transport (Harington 1968, 1975, Shipman 1981).

The dorsal surface of the parietals and remaining frontals is concave transversely. The depression occupying the intercornual region is oval, with the greatest breadth being near the caudal edge of the horn cores. Although the intercornual surface shows abrasive damage, it appears to have been completely covered with exostoses associated with the spread of the keratinous bases of the horn sheaths into the intercornual region. There is no evidence that a longitudinal crest and trough of exostoses existed on the median plane. Some of the frontal sinuses are exposed, probably a result of abrasion of the dorsal surface (Fig. 2).

The bases and proximal parts of both horn cores remain. The dorsal surface of the horn core bases are relatively flat (i.e., they are not concave) rostrocaudally, but this flatness could have been exaggerated by abrasion. The horn core bases are convex on the ventral surface where—especially on the right core—prominent longitudinal grooves are evident (Fig. 3). The transverse breadth of the cranium at the level of the frontal sinuses is greater than the breadth at the temporal fossae (Fig. 4). The frontoparietotemporal suture is roughly parallel to the dorsal surface of the cranium (Fig. 3).

The caudal surface of the cranium is abraded and so badly weathered that most of the natural bone surface is missing (Fig. 5). Part of the natural surface of the right half of the occipital remains, and the deeper reaches of the right insertion for *M. semispinalis capitis* is evident. The breadth of the caudal end of the basioccipital, if complete, would be approximately one-half that of the complete occipital condyles. The lateral edges of the basioccipital trend gradually, then abruptly, toward the median line, producing a V or shield shape with the apex directed rostrad. A

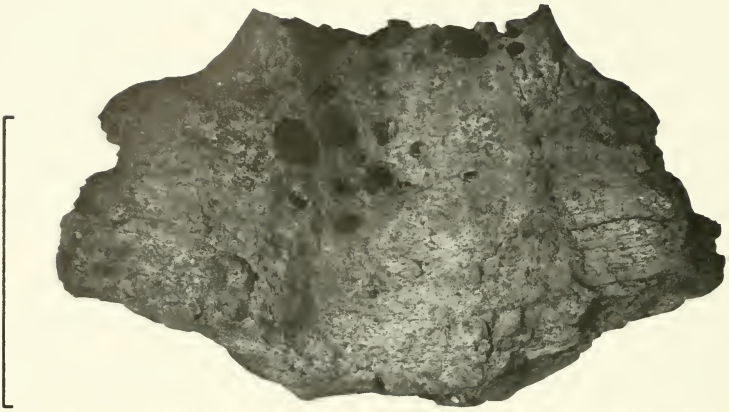

Fig. 2. Dorsal surface, PM 526. Rostral direction toward top. Line represents 10 cm.

Fig. 3. Lateral surface, right side, PM 526. Rostral direction toward right. Line represents 10 cm.

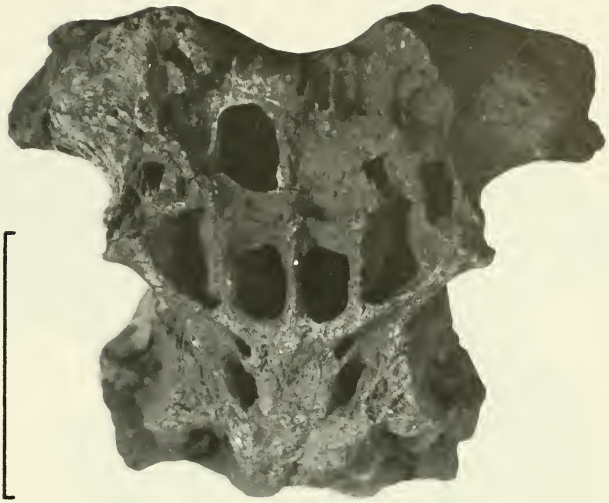

Fig. 4. Rostral view, PM 526. Line represents 10 cm.

Fig. 5. Caudal surface, PM 526. Line represents 10 cm.

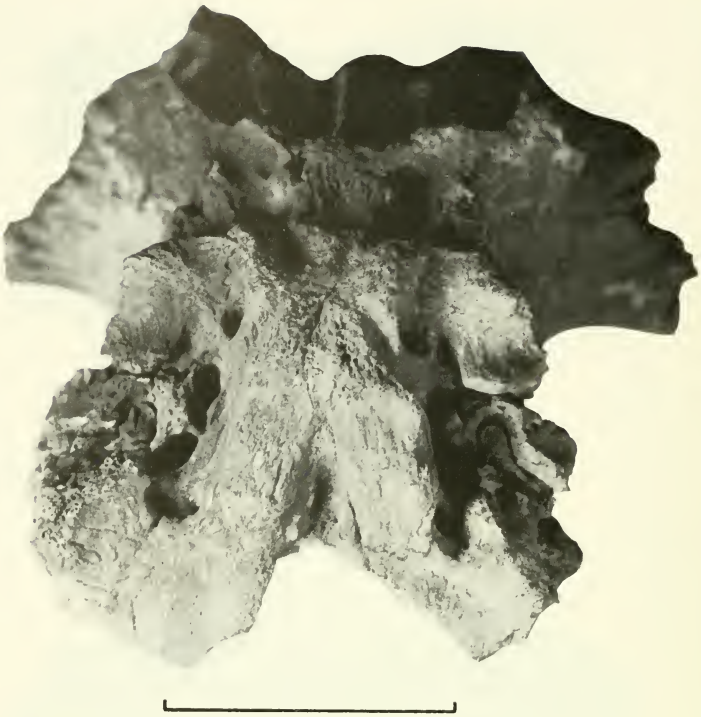

Fig. 6. Ventral surface, PM 526. Rostral direction toward top. Line represents 10 cm.

median groove divides the caudal half of the basioccipital into right and left halves (Fig. 6). Measurements of selected characters are given in Table 1.

Identity of the Specimen

PM 526 is referred to *Symbos* (Osgood 1905a, 1905b) on the basis of the concave, exostosis-covered dorsal surface of the parietals and the remaining frontals, the deep frontal sinuses, and the morphology of the ventral surface of the basioccipital, including (a) the presence of a median groove, (b) the V or shield shape resulting from the convergence of its lateral edges rostrally toward the median plane, and (c) the relatively great transverse breadth of the caudal part, being approximately one-half the transverse breadth of the occipital condyles (Leidy 1852, Osgood 1905a, Harington 1968, 1975, J. N. McDonald, unpubl. notes).

TABLE 1. Cranial measurements (mm).

Greatest breadth, occipital condyles		137.2
Greatest breadth, occipital condyles with auxiliary articular surface		(156.3)[a]
Greatest breadth of basioccipital		(76.2)[a]
Least breadth of parietals		132.4
Least breadth, dorsal surface of frontals		156.0
Least breadth of frontals at the ventral base of horn cores		160.9
Greatest (rostrocaudal) length, horn core base	R - 111.9	L - 105.4
Greatest dorsoventral diameter, horn core base	R - ——	L - 66.2
Greatest circumference of horn core	R - ——	L - 268.0

[a]Values in parentheses are estimates.

Symbos is considered informally to be a monospecific genus containing only *Symbos cavifrons* (Kurtén and Anderson 1980), to which species this specimen is referred on the basis of its horn core, dorsal cranial, and basioccipital morphology and frontoparietotemporal suture pattern. The difference in size between the type specimen of *Symbos cavifrons* (Leidy 1852, Osgood 1905a) and PM 526 is slight. The characters of PM 526 differ from those of the type specimen of *Symbos cavifrons* (Leidy 1852, Osgood 1905a) and other referred specimens only in minor details, none of which seem to be greater than should be expected of individual variation within a representative population sample.

Acknowledgments

I thank William Turnbull (Field Museum of Natural History) for permission to study PM 526 and Len Brooks (U.S. Forest Service), Clayton E. Ray (National Museum of Natural History), and John A. White (Idaho Museum of Natural History) for providing unpublished information for use in this paper. I also thank Susan L. Woodward for preparing Figure 1.

Literature Cited

Allen, J. A. 1913. Ontogenetic and other variations in muskoxen with a systematic review of the muskox group, recent and extinct. Mem. Amer. Mus. Nat. Hist., n.s., 1(4):103–226.

Cossmann, M. 1907. (Proposal to replace *Liops* with *Gidleya*.) Rev. Critique Paléozoologie 11th year (1):64.

Flint, R. F., et al. 1945. Glacial map of North America. Geol. Soc. Amer. Spec. Paper 60. Map and 37 pp.

Gazin, C. L. 1935. Annotated list of Pleistocene mammalia from American Falls, Idaho. J. Washington Acad. Sci. 25:297–302.

Gidley, J. W. 1906. A new ruminant from the Pleistocene of New Mexico. Proc. U.S. Natl. Mus. 30(1447): 165–167.

Harington, C. R. 1968. A Pleistocene muskox (*Symbos*) from Dease Lake, British Columbia. Canadian J. Earth Sci. 5:1161–1165.

———. 1975. Pleistocene muskoxen (*Symbos*) from Alberta and British Columbia. Canadian J. Earth Sci. 12:903–919.

Henderson, J. 1923. The glacial geology of Grand Mesa, Colorado. J. Geol. 31:676–678.

Kurtén, B., and E. Anderson. 1980. Pleistocene mammals of North America. Columbia Univ. Press, New York. 442 pp.

Leidy, J. 1852. Memoir on the extinct species of American ox. Smithsonian Contrib. Knowl. 5, art. 3. 20 pp.

Look, A. A. 1955. 1,000 million years on the Colorado Plateau, land of uranium. Bell Publications, Denver, Co. 344 pp.

Nelson, M. E., and J. H. Madsen, Jr. 1978. Late Pleistocene musk oxen from Utah. Trans. Kans. Acad. Sci. 81:277–295.

Osgood, W. H. 1905a. *Scaphoceros tyrelli*, an extinct ruminant from the Klondike gravels. Smithsonian Misc. Coll. 48(1589):173–185.

———. 1905b. *Symbos*, a substitute for *Scaphoceros*. Proc. Biol. Soc. Washington 18:223–224.

Shipman, P. 1981. Life history of a fossil, an introduction to taphonomy and paleoecology. Harvard University Press, Cambridge. 222 pp.