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John Chorn
University of Kansas Main Campus

Barbara A. Frase
Bradley University

Carl D. Frailey
Midland College

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LATE PLEISTOCENE PRONGHORN, *ANTILOCAPRA AMERICANA*, FROM NATURAL TRAP CAVE, WYOMING

John Chorn[1], Barbara A. Frase[2], and **Carl D. Frailey[3]**

[1]Museum of Natural History
University of Kansas
Lawrence, Kansas 66045
[2]Department of Biology
Bradley University
Peoria, Illinois 61625
[3]Midland College
Midland, Texas 79705

Natural Trap Cave, Wyoming, has yielded one of the more reliable records of *Antilocapra* from the Late Pleistocene of North America. Generic assignment is based on horn cores from two individuals, with a minimum of 13 individuals represented by other elements. Morphometric analysis of postcranial material indicates that this form is indistinguishable from the living *A. americana*. Fossils were recovered from a stratum dated at 17,000-20,000 yr BP. Presence of *Antilocapra* at other sites is probably over-reported. Secure records based on horn cores are known from only two other sites. *Antilocapra americana* may have been the preferred prey of the American cheetah, *Miracinonyx trumani*. Teeth, horn cores, and much of the postcranial skeleton of the Natural Trap pronghorn are figured.

† † †

INTRODUCTION

Natural Trap Cave, on the northwestern flank of the Big Horn Mountains, north-central Wyoming, has been a deadfall animal trap since the Sangamonian Interglacial. It is located at an elevation of 1500+ m. General discussions of the site can be found in Gilbert and Martin (1984) and Martin and Gilbert (1978).

Natural Trap Cave contains the best-documented Pleistocene record of *Antilocapra americana*. Although the American pronghorn was abundant and wide-ranging in historic times, its Pleistocene record is surprisingly meager (Fig. 1, Table I). Much of this record is based on isolated teeth, which closely resemble those of other antilocaprid genera. At the generic level, horn cores are the most useful element for positive identification. Because horn cores and postcranial material are rare, it is important to discuss in some detail *A. americana* in north-central Wyoming during the Late Pleistocene.

LIVING PRONGHORN

The American pronghorn (*Antilocapra americana*) is the only extant member of the genus. It is widely distributed throughout the western United States, and extends into Mexico and Canada (O'Gara, 1978). This artiodactyl is not a true antelope, but represents a distinct family, the Antilocapridae, which is closely allied with the Bovidae (e.g., Simpson, 1945). Males may average up to 57 kg, depending on the subspecies (Mitchell, 1971; O'Gara, 1978), and have paired horns with an anterior prong; females are smaller and may lack horns altogether. Pronghorns are the fleetest North American mammal and can attain speeds of about 65 km per hour (Kurtén and Anderson, 1980: 325); they are gracile and highly adapted to their cursorial existence. Cheek teeth are exceptionally high-crowned and enable these animals to eat grit-covered and siliceous forage. Grasses, forbs, and shrubs are included in the diet; the importance of grazing versus browsing is dependent on the season and locality (O'Gara, 1978). Their habitat includes short-grass prairie, open shrubland, and mountain parks (Armstrong, 1972).

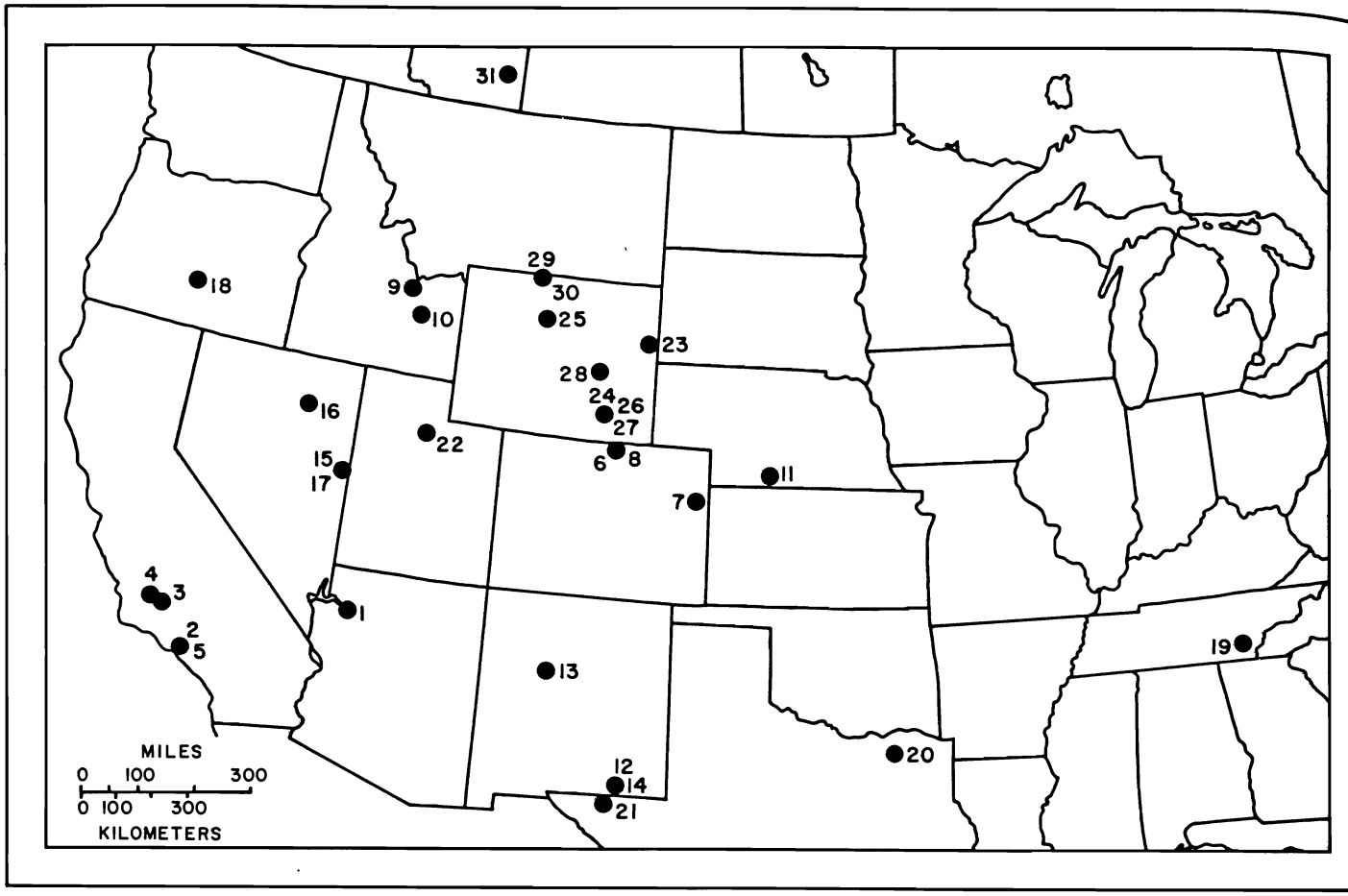

FIGURE 1. Map showing Wisconsinan (100,000–10,000 BP) localities from which *Antilocapra* has been at least tentatively reported. Not shown are the Riddell Site, Saskatoon, Saskatchewan, Canada; Jimenez Cave, Chihuahua, Mexico and Tlapacoya, Central Mexico. **1**-Vulture Cave, **2**-Emery Barrow Pit, **3**-Maricopa, **4**-McKittrick, **5**-Rancho La Brea, **6**-Chimney Rock Animal Trap, **7**-Dutton, **8**-Lindenmeier, **9**-Jaguar Cave, **10**-Owl Cave (Wasden), **11**-Red Willow, **12**-Dry Cave, **13**-Isleta Caves, **14**-Muskox Cave, **15**-Council Hall Cave, **16**-Mineral Hill Cave, **17**-Smith Creek Cave, **18**-Fossil Lake, **19**-Kyle Quarry, **20**-Ben Franklin Local Fauna, **21**-Williams Cave, **22**-Silver Creek Local Fauna, **23**-Agate Basin area, **24**-Bell Cave, **25**-Colby Mammoth Kill, **26**-Horned Owl Cave, **27**-Laramie & North Platte River Gravel Terraces, **28**-Little Box Elder Cave, **29**-Natural Trap Cave, **30**-Prospects Shelter, **31**-Medicine Hat Faunas.

TABLE I. Published Records of *Antilocapra americana* from the Wisconsin (100,000–10,000 years BP).

Locality	*Age*	*Taxon*	*Material*
Vulture Cave, AZ (Mead & Philips, 1981)	14,000 BP	*A. americana*	1 metacarpal, lacking distal articular surface
Emery Barrow Pit, CA (Kurtén & Anderson, 1980)	Rancholabrean	*A. americana*	?
Maricopa, CA (Kurtén & Anderson, 1980)	Wisconsin	*A. americana*	?
McKittrick, CA (Furlong, 1932; Schultz, 1938)	Wisconsin: 38,000 ± 2,500 BP	*A.* cf. *americana* (Furlong, 1932) *A. americana* (Schultz, 1938)	2 horn cores, 2 mandibular rami (1 adult, 1 juvenile)
Rancho La Brea, CA (Furlong, 1932; Reynolds, 1976)	Wisconsin (some Recent): 12,650 ± 160–19,300 ± 395 BP (Pit 3);	*A.* cf. *americana* (Furlong, 1932)	partial skull with nearly complete horn core
	25,000-40,000 BP (Pit 91)	cf. *A. americana* (Reynolds, 1976)	5 specimens from 3 individuals

TABLE I—*(Continued on page 129)*

TABLE I—*(Continued from page 128)*

Chimney Rock Animal Trap, CO (Hager, 1972)	Late Pleistocene & Recent: 11,980 ± 180 BP (at the 48 inch level)	*A. americana*	?
Dutton, CO (Graham, 1981)	Found below mammoth bone dated 11,710 ± 150 BP	*Antilocapra* sp.	1 incomplete M_2
Lindenmeier, CO (Wilmsen & Roberts, 1978)	Wisconsin: 11,000 BP	*A. americana*	1 vertebra, 1 radius, 1 carpus, 1 phalanx, 3 tarsals & 3 teeth (minimum of 2 individuals)
Jaguar Cave, ID (Kurtén & Anderson, 1972; Sadek-Koros, 1966)	Wisconsin & Recent: 10,370 ± 350 BP (hearth) 11,580 ± 250 BP (hearth)	*A. americana*	?
Owl Cave (Wasden), ID (Guilday, 1969; Miller & Dort, 1978)	Wisconsin & Recent: 8,000 BP (Bison bone); 12,500 BP (Mammoth bone);	*A.* cf. *americana*	?
Red Willow, NE (Corner, 1977)	Late Pleistocene & Recent.	*A. americana*	distal half of humerus, fragment of lower jaw with P_4, C_1-P_3, 1 metatarsal, 1 tibia, distal end of metacarpal
Dry Cave, NM (Harris, 1970)	Late Wisconsin. 14,470–250 BP (part of site)	cf. *Antilocapra* pronghorn? from dated part of site. Minimum of 1 individual from undated parts of site.	?
Isleta Caves, NM (Harris & Findley, 1964)	Pleistocene & Recent: Pleistocene age based on presence of extinct faunal elements that are presumed to have been confined temporally to the Pleistocene *(Arctodus, Camelops, Tanupolama).*	*A. americana*	?
Muskox Cave, NM (Logan, 1981)	Sangamon to Recent: 25,000 ± 1,100-18,140 ± 200 BP	cf. *A. americana*	?
Council Hall Cave, NV (S. J. Miller, 1979; Harris, 1985)	23,900 ± 970 & 13,040 ± 190 BP	*A. americana*	?
Mineral Hill Cave, NV (McGuire, 1980)	Late Pleistocene-Recent	*Antilocapra*	?
Smith Creek Cave, NV (Mead, *et al.*, 1982; S. J. Miller, 1979)	Late or Middle Wisconsin: ≥12,000 BP	*A. americana*	?
Fossil Lake, OR (Elftman, 1931; Allison, 1966)	Wisconsin?	*A.* cf. *americana*	3 astragali, distal end of humerus, proximal part of ulna, acetabular region of pelvis, 1 tooth I_3, or C_1
Kyle Quarry, TN (Kurtén & Anderson, 1980)	Rancholabrean.	*A. americana*	?
Ben Franklin Local Fauna, TX (Slaughter & Hoover, 1963)	Late Wisconsin & Recent: 9,550 ± 375 BP (hearth); 11,135 ± 450 BP (mussel shell)	? *A. americana*	1 incomplete M_3
Williams Cave, TX (Ayer, 1936; Harris, 1985)	Pleistocene mixed with Recent: 11,140 ± 320 & 12,100 ± 210 dates on sloth dung.	*A. a. americana*	articulated vertebral column, occipital region of skull, left innominate, fragment of sacrum, distal metapodial, proximal fragment of right radius, fragmentary right maxilla with PM^{1-3}
Silver Creek Local Fauna, UT (W. E. Miller, 1976)	>40,000 BP: Late Sangamon or Early Wisconsin	*A.* cf. *americana*	P_4 (and medial phalanx which is indistinguishable from cervid)
Agate Basin area, WY (Walker, 1982; Frison, 1982)	Latest Wisconsin dates > 10,000 BP;	*A. americana*	
	Clovis faunule 10,030 ± 280 BP;		proximal left metatarsal
	Hell Gap faunule 10,445 ± 110 BP;		1 astragalus, 3 carpals
	7Folsom faunule 10,780 ± 120 BP		numerous elements including teeth (horn cores not present)

TABLE I—*(Continued on page 130)*

TABLE I—*(Continued from page 129)*

Bell Cave, WY (Zeimens & Walker, 1974)	Pleistocene & Recent same as above — *(Martes nobilis, Equus, Camelops)*	*A. americana*	?
Colby Mammoth Kill, WY (Walker & Frison, 1980)	Wisconsin: 11,200 ± 200 BP	*A. americana*	1 ulna lacking proximal & distal ends
Horned Owl Cave, WY (Guilday, Hamilton & Adams, 1967)	Wisconsin & Recent.	*A. americana*	1 phalanx from ft. #4, 1 phalanx from ft. #5
Laramie & North Platte River Gravel Terraces, WY (Walker, 1982)	Late Pleistocene	*A. americana*	?
Little Box Elder Cave, WY (Anderson, 1968)	Late Pleistocene & Recent	*A. americana*	?
Natural Trap Cave, WY (Martin & Gilbert, 1978)	Wisconsin & Recent (some older unpublished material): 17,620–20,170 BP for "Gley" soil level.	*A. americana*	dissociated skeletons, partial skulls, horn cores for minimum of 2 individuals
Prospects Shelter, WY (Chomko & Gilbert, 1987)	ca. 17,500 BP	Antilocapra sp.	?
Medicine Hat Faunas, Canada (2 sites) (Harington, 1978)	Late mid-Wisconsin & Early mid-Wisconsin: 37,900 ± 1,100 BP & 38,700 ± 1,100 BP from above fauna.	?*A.* cf. *americana*	?
Riddell Site, Canada (SkwaraWoolf, 1980)	Late Rancholabrean, presumably based on the presence of *Equus, Camelops* & Proboscidea indet.	*Antilocapra* cf. *A. americana* (text indicates that specimens cannot be certainly determined at the generic level)	damaged humerus, astragalus, fragmented pelvis, juvenile 2nd phalanx, distal epiphysis of metapodial
Jimenez Cave, Mexico (Messing, 1986)	Late Pleistocene & Recent, based on "extinct forms and the general fossilized nature of the bones."	*A. americana*	?
Tlapacoya, Mexico (Mirambell, 1978)	Wisconsin: 33,000–23,000 BP	*Antilocapra*	?

Note: Pronghorn remains from Brynjulfson Caves, Missouri are from Cave 2 which is Late Holocene (Parmalee & Oesch, 1972).

FOSSIL PRONGHORNS

Identification of the Natural Trap pronghorns at the generic level rests on horn cores from two individuals; one pair of horns is still joined to the parietal bone (Fig. 6B, C). Determination of the species as *A. americana* is based on morphological similarity and morphometric analysis; neither skeleton nor dentition differed materially from Recent pronghorns. Reliable statistical analysis of this material is difficult because samples of both fossil and Recent pronghorns are small. *F*-ratios from discriminant function analysis (BMDP7M: Dixon, 1983) of skeletal measurements indicated that fossil and Recent *A. americana* are morphometrically similar. Standard measurements (Table II) on metatarsals, metacarpals, tibiae, femora, and humeri did not consistently discriminate between fossil and Recent elements. Estimated means of fossil and Recent metacarpals and humeri were statistically equivalent ($p > 0.1$). Greatest length of the radius produced the best discrimination based on any of the other elements listed, and correctly classified only 77% of the pronghorns. This lack of discriminatory power, in addition to the similar morphology, is consistent with the hypothesis that the fossil and Recent pronghorns are conspecific and differ in no significant detail despite a lapse of nearly 20,000 years betweer our samples. Fossil tibiae, metatarsals, and femora were slightly larger in at least one dimension ($p < 0.05$) than those of the Recent sample. However, the greatest length of the radius was larger ($p < 0.05$) for Recent specimens. That certain dimensions are larger in the fossil specimens is consistent with, but cannot demonstrate, the phenomenon of size reduction observed in other genera following the close of the Pleistocene (Gilbert and Martin, 1984). Figures 2–6 illustrate representative specimens from Natural Trap Cave, all reposited at the Musem of Natural History, University of Kansas (KUVP). Most of the pronghorn bones from Natural Trap Cave illustrated here (Figs. 2–6) may be compared with Recent *A. americana* by referring to illustrations in Colbert and Chaffee (1939).

TEXT—*(Continued on page 132)*

TABLE II. Measurements of skeletal elements of fossil and Recent *Antilocapra americana* in mm (mean, standard deviation, range). **GL**—greatest length; **BP**—breadth of proximal end; **LL**—lateral length on outer side; **SD**—smallest breadth of diaphysis; **BD**—breadth of distal end; **DD**—depth of distal end; **GLC**—greatest length from caput femoris (head); **DC**—greatest depth of caput femoris; **DP**—depth of proximal end; **BT**—breadth of trochlea. Method and abbreviations as found in von den Driesch (1976). Measurements were taken from one side only where both right and left were present.

TABLE II.

	GL	BP	LL	SD	BD	DD	GLC	DC	DP	BT
FOSSIL										
Metatarsal (n = 9)	225.7	26.0	—	15.6	29.8**	22.5**	—	—	29.1	—
	7.9	1.4	—	1.2	1.7	2.7	—	—	4.3	—
	215.0-240.0	23.9-28.2	—	14.3-17.6	26.8-32.0	20.5-29.5	—	—	18.5-33.1	—
Metacarpal (n = 7)	212.0	29.0	—	16.2	27.6	20.8	—	—	22.0	—
	4.0	1.7	—	0.8	3.5	1.0	—	—	3.4	—
	207.0-216.0	26.1-31.8	—	14.7-17.3	20.3-31.2	19.1-22.2	—	—	18.3-32.1	—
Humerus (n = 5)	196.2	48.3	—	18.4	38.8	—	—	—	—	32.4
	6.5	4.3	—	0.5	1.3	—	—	—	—	1.7
	187.0-205.0	42.7-54.3	—	17.8-19.0	37.0-40.2	—	—	—	—	31.2-35.4
Tibia (n = 5)	274.6	48.4	274.6	19.4	32.6	25.2*	—	—	—	—
	5.3	2.8	5.2	0.7	1.9	0.6	—	—	—	—
	267.0-281.0	47.7-51.2	251.0-264.0	18.5-20.2	31.1-35.9	24.3-26.1	—	—	—	—
Femur (n = 5)	234.6	60.9	—	19.6	46.4	—	226.6	25.2*	—	—
	5.4	3.1	—	0.8	3.0	—	4.7	1.0	—	—
	227.0-236.0	56.7-64.9	—	18.7-20.7	42.5-49.7	—	220.2-233.0	24.0-26.2	—	—
Radius (n = 3)	204.0*	37.0	—	19.6	33.7	—	—	—	—	—
	2.4	2.0	—	0.3	1.4	—	—	—	—	—
	201.0-207.0	34.7-39.7	—	19.3-20.1	32.0-35.4	—	—	—	—	—
RECENT										
Metatarsal (n = 7)	219.9	25.0	—	15.3	28.2**	20.5**	—	—	28.6	—
	8.0	0.4	—	0.8	1.2	1.0	—	—	0.9	—
	206.0-229.3	24.4-26.1	—	14.6-16.7	26.7-29.7	12.7-14.2	—	—	26.8-29.3	—
Metacarpal (n = 9)	210.0	28.6	—	15.8	28.3	20.4	—	—	20.7	—
	6.0	1.1	—	0.7	1.2	0.9	—	—	1.3	—
	200.0-219.8	27.4-29.8	—	14.9-17.1	26.4-29.9	11.2-12.8	—	—	19.1-22.9	—
Humerus (n = 11)	194.8	50.4	—	19.1	38.7	—	—	—	—	32.1
	3.2	2.0	—	0.1	1.2	—	—	—	—	0.9
	190.0-200.0	47.7-54.2	—	17.1-20.1	36.9-40.5	—	—	—	—	30.7-33.1
Tibia (n = 11)	272.7	48.9	255.3	20.1	32.3	24.1*	—	—	—	—
	7.3	2.0	7.2	0.8	1.2	0.9	—	—	—	—
	261.0-283.0	46.8-52.7	244.0-262.5	18.6-21.8	29.3-34.0	22.9-25.0	—	—	—	—
Femur (n = 11)	232.6	58.2	—	20.0	45.8	—	225.0	24.0*	—	—
	6.3	2.4	—	0.8	1.2	—	6.0	1.0	—	—
	220.0-242.0	53.9-61.5	—	18.1-20.7	44.1-47.7	—	216.0-235.0	22.2-25.2	—	—
Radius (n = 10)	210.9*	37.4	—	21.2	32.8	—	—	—	—	—
	7.6	1.4	—	1.4	1.7	—	—	—	—	—
	199.0-229.0	34.5-38.7	—	19.3-32.6	29.3-34.8	—	—	—	—	—

*Significant difference between fossil and Recent means ($p<0.05$).
**Significant difference between fossil and Recent means using combined variables ($p<0.05$).

TABLE III. Specimens measured for Table II

Fossils from Natural Trap Cave. University of Kansas, Museum of Natural History (KUVP).

Metatarsal	Metacarpal	Humerus	Tibia	Femur	Radius
KUVP	KUVP	KUVP	KUVP	KUVP	KUVP
38243	35470	51012	52923	57644	47975
26677	42541	56789	34105	38208	54258
50665	38960	51747	46979	51097	51778
35162	50427	41264	50666	56978	
47420	51226	61156	54596	47829	
50530	39933				
27237	62927				
51973					
42416					

Recent specimens from Carnegie Museum of Natural History (CM) and American Museum of Natural History (AMNH).

Metatarsal	Metacarpal	Humerus	Tibia	Femur	Radius
CM	CM	CM	CM	CM	CM
57215	57215	57215	57215	57215	57215
57217	57217	57217	57217	57217	57217
AMNH	AMNH	AMNH	AMNH	AMNH	AMNH
10419	10419	10419	10419	10419	10419
142361	142361	142361	142361	142361	142361
130197	130197	130196	130196	130196	130196
130198	130198	130197	130197	130197	130197
130201	130201	130198	130198	130198	130198
	100353	130201	130201	130201	134766
	100354	134766	134766	134766	100353
		100353	100353	100353	100354
		100354	100354	100354	

Adults of both sexes are represented by horn cores and at least one female by a nearly complete pelvis (Fig. 3F-G). This pelvis bears the following female characteristics: a groove traverses the dorsal margin of the superior pubic ramus; it lacks the suspensory tuberosities for the crura of the penis; and the ventral-dorsal thickness of the pubic symphysis is less than expected for a male (Gilbert, 1980).

Juvenile elements of *A. americana* are rare in the Natural Trap fauna. Four proximal limb bones and none of the metapodials show incomplete fusion of the epiphyses. This is in striking contrast to Natural Trap *Ovis* material. Although the rate of epiphyseal fusion may be slower in sheep than in pronghorns, comparison of the two probably reflects real differences. Fifty (25 right, 25 left) *Ovis* metacarpals show fusion of the distal metacarpal epiphysis. Fusion was incomplete in 18 (12 right and 6 left) metacarpals. Thus one third of the right *Ovis* metacarpals were not fully matured at the time of death. Perhaps these differences reflect differences in behavior of the young: pronghorn fawns spend much of their time lying hidden in one spot and would thus have less chance of encountering the cave opening than would the *Ovis* kids that typically travel with the herd (Lent, 1974).

All of the Natural Trap pronghorns except for one specimen came from the "gley" soil (Stratum 3 of Martin and Gilbert, 1978) which is the major bone-bearing unit in the Cave. Radiometric dates based on bone collagen indicated an age of 17,000–20,000 yr BP for this unit. A partial scapula of an undetermined antilocaprid was recovered from beneath a layer of volcanic ash. This ash was dated by the fission track method at 110,000 yr BP (Gilbert et al., 1980).

Although no complete pronghorn skulls are known from the Cave, selected postcranial material is well-preserved and undistorted. Based on right astragali, the minimum number of individuals from the Cave is 13.

TEXT—*(Continued on page 134)*

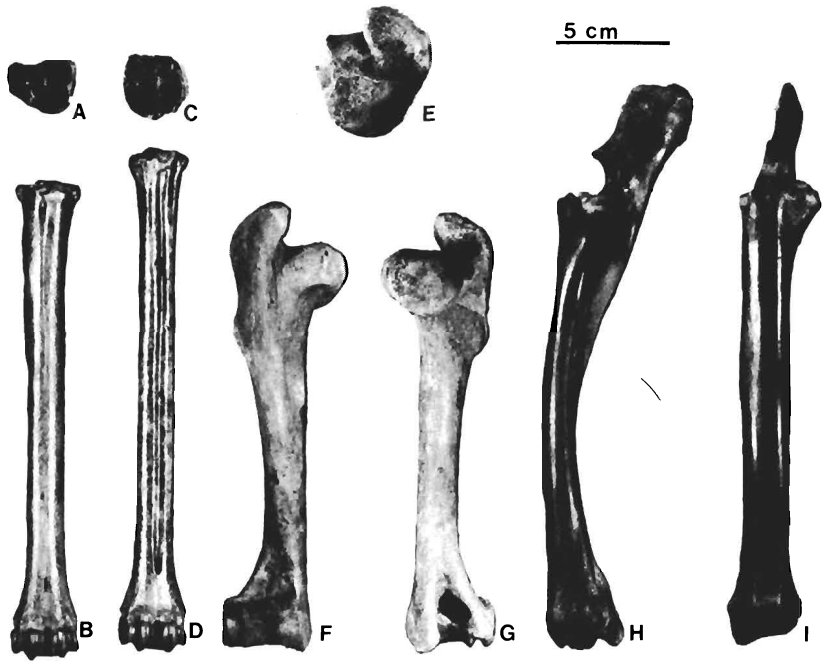

FIGURE 2. **A.** KUVP 51226, right metacarpus, proximal end view; **B.** dorsal view; **C.** KUVP 51665, left metatarsus, proximal end view; **D.** dorsal view; **E.** KUVP 41264, right humerus, proximal end view; **F.** anterior view; **G.** posterior view; **H.** KUVP 54258, left radio-ulna, lateral view; **I.** dorsal view.

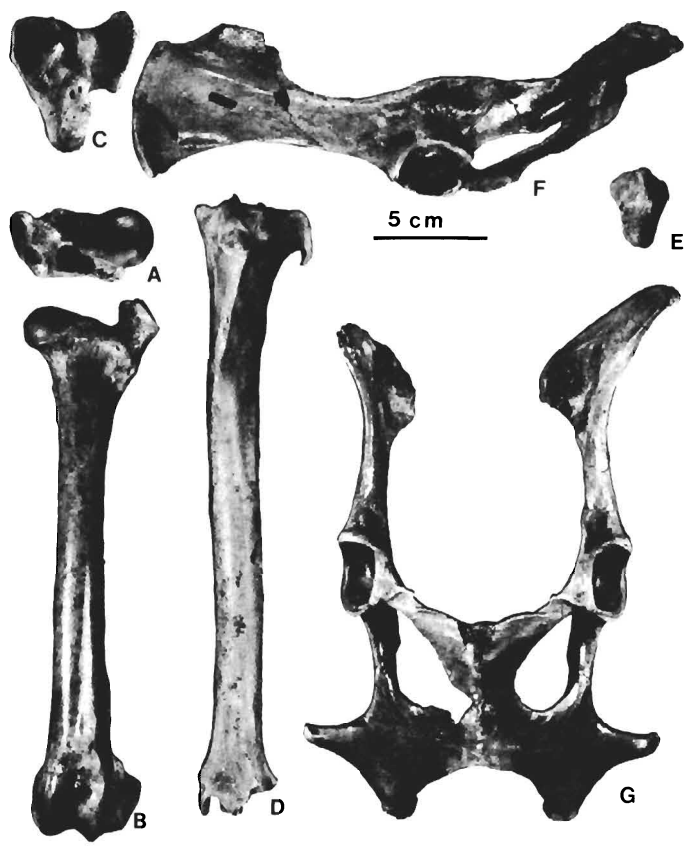

FIGURE 3. **A.** KUVP 5448, left femur, proximal end view; **B.** anterior view; **C.** KUVP 45371, left tibia, proximal end view; **D.** dorsal view; **E.** KUVP 54114, left patella, anterior view; **F.** KUVP 62189, pelvis, left lateral view; **G.** ventral view.

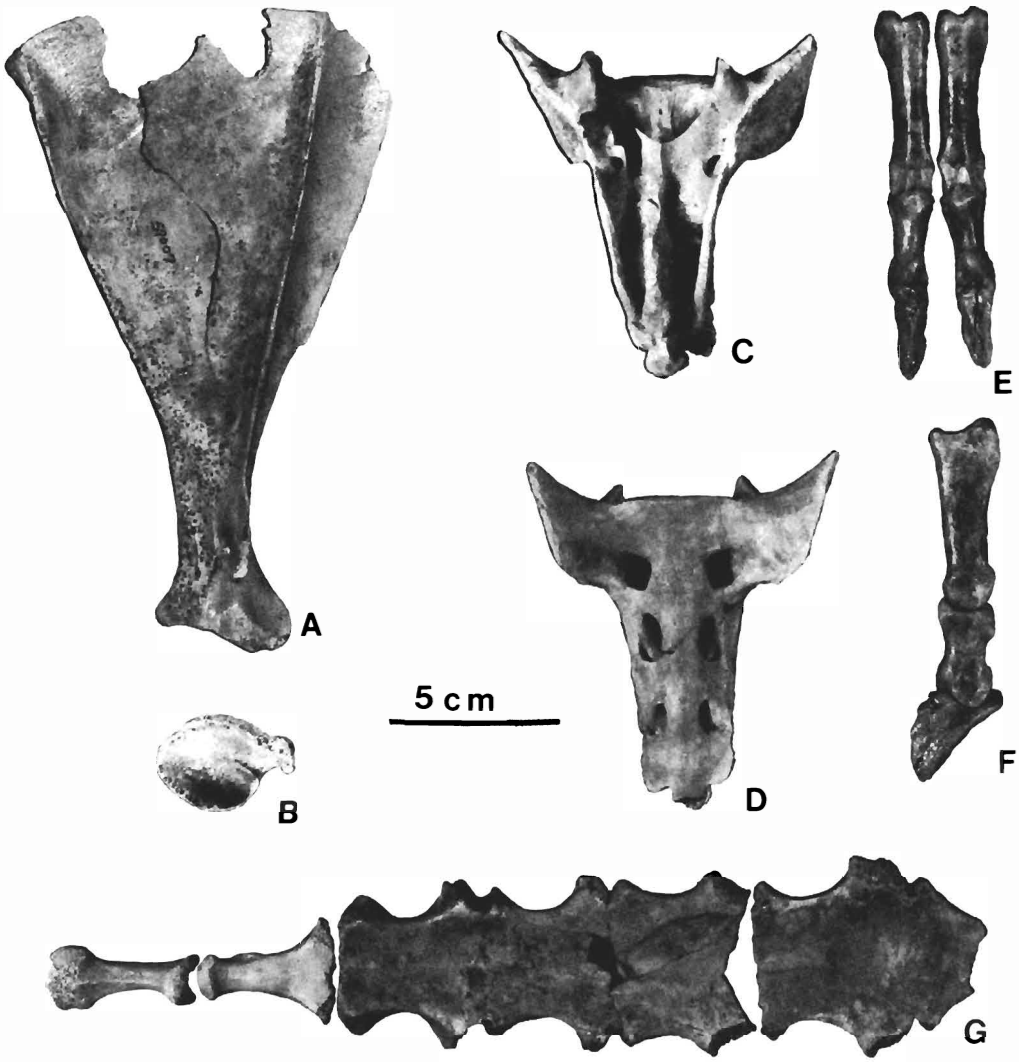

FIGURE 4. **A.** KUVP 57007, right scapula, lateral view; **B.** distal end view; **C.** KUVP 45405, sacrum, dorsal view; **D.** ventral view; **E.** KUVP 62842, KUVP 62844, 1st, KUVP 61736, KUVP 62386, 2nd, KUVP 62845, KUVP 62526, 3rd, phalanges in dorsal view; **F.** KUVP 62842, KUVP 62386, KUVP 62526, phalanges in axial view; **G.** from left to right, KUVP 38953, KUVP 56777, KUVP 62680, KUVP 56980, composite sternum, internal view.

Fossil pronghorns of all kinds are rarely found. The meagerness of the *A. antilocapra* fossil record is comparable to that of other extinct pronghorns. Precise numerical comparisons are not practical because some of the extinct taxa may be synonymous with other forms, and some of the records are based on nondiagnostic material. Of the Pleistocene forms reviewed by Kurtén and Anderson (1980), one species occurred at five localities, four species occurred at four localities each, and five species were known from only one locality each. Extinct pronghorns may be represented by large samples, however, *Stockoceros onusrosagris,* for example, is known from more than 60 individuals at Papago Springs, Arizona, although it is found at only two other sites.

According to Kurtén and Anderson (1980), *A. americana* is Wisconsinan and Recent in age. Records of the species are so inadequate, however, that it is difficult to make a meaningful assessment of its temporal range. Webb (1973) documented the existence of the genus in the Pliocene. Pre-Wisconsinan generic records include the Palos Verde Sand, California (M^3 and M_3) (Reynolds, 1976), with a suggested date of 110,000–140,000 yr BP or younger; Doby Springs, Oklahoma (P_4 "probably *Antilocapra*") (Stephens, 1960); and *Antilocapra* cf. *americana* from the Sangamon near the Alberta-Saskatchewan border (Churcher, 1982). Further references to *Antilocapra* can be found in Hay (1923, 1924), but these are in general difficult to date; the locality (even which state) is sometimes unknown, the type of material is not discussed, and the present whereabouts of the specimens is frequently unknown.

TEXT—*(Continued on page 137)*

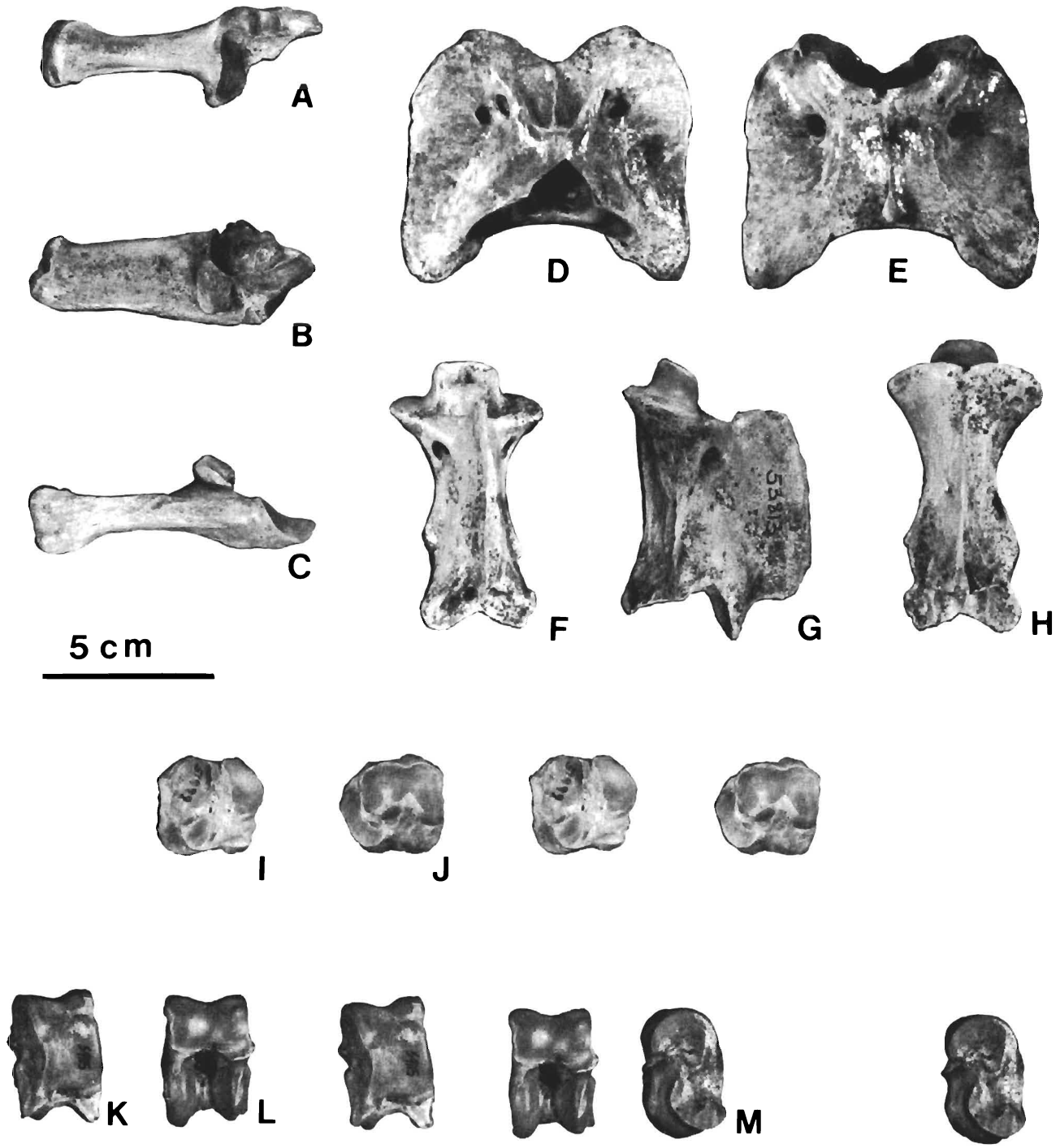

FIGURE 5. **A.** KUVP 54498, left calcaneum, dorsal view; **B.** medial view; **C.** plantar view; **D.** KUVP 52974, atlas, dorsal view; **E.** ventral view; **F.** KUVP 53813, axis, dorsal view; **G.** left lateral view; **H.** ventral view; **I.** KUVP 51999, left naviculo-cuboid, distal view; **J.** proximal view; **K.** KUVP 54115, left astragalus, plantar view; **L.** dorsal view; **M.** medial view.

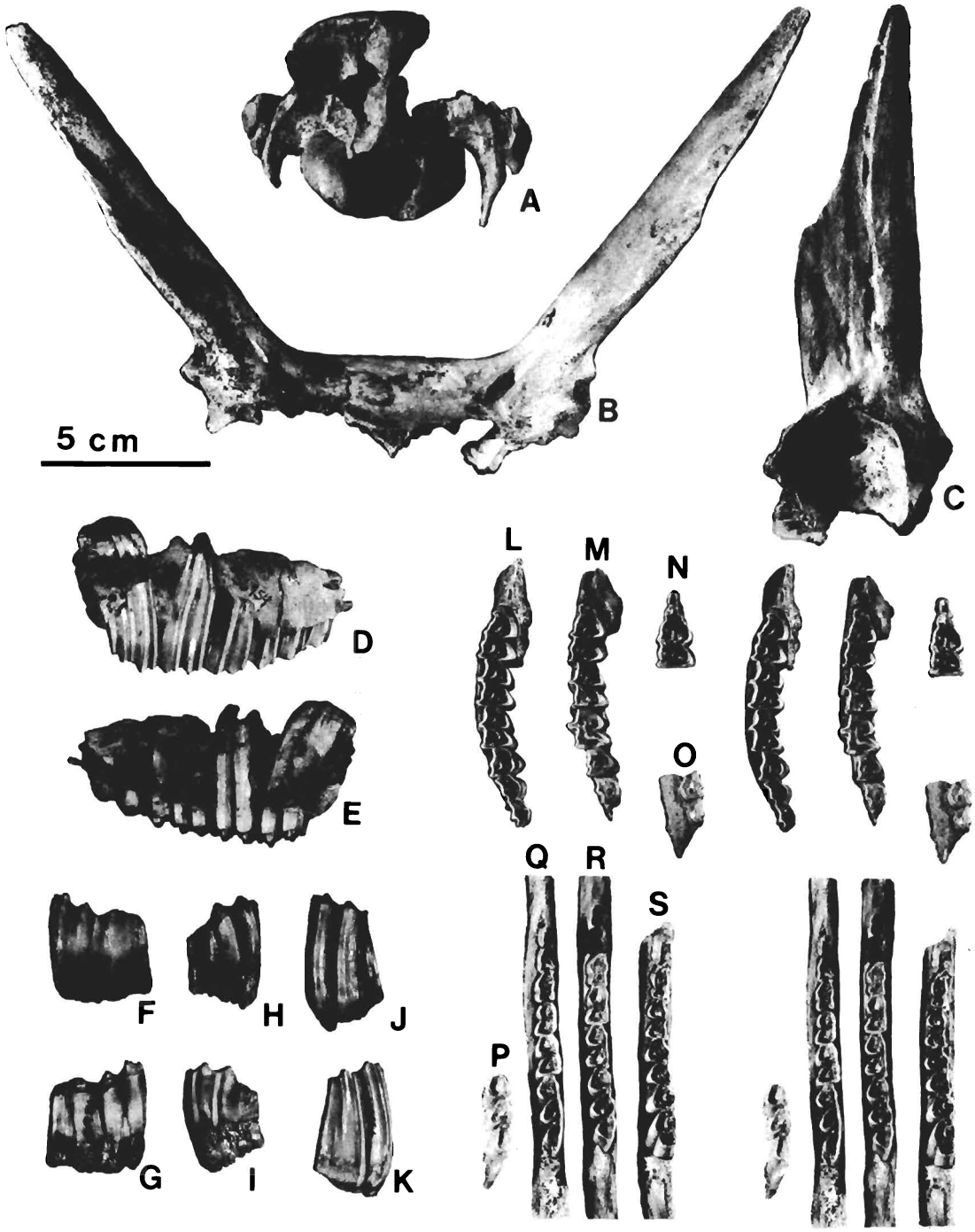

FIGURE 6. **A.** KUVP 70586, occiput of skull; **B.** KUVP 70586, anterior and **C.** left lateral view of horn cores; **D.** KUVP 56954, labial view of right maxilla with P^2-M^3 and **E.** lingual view; **F.** KUVP 51934, lower right M_3 with less than half of the crown remaining, lingual view, and **G.** labial view; **H.** KUVP 51934, upper right M^3 with less than half of the crown remaining, lingual view and **I.** labial view; **J.** KUVP 46524, left upper M^3, crown less than half worn, lingual view and **K.** labial view; **L.** KUVP 56954, left maxilla with P^3-M^3 with more than half of the crown remaining on M^2, occlusal view; **M.** KUVP 62626, left maxilla with P^3-M^3 with approximately half of the crown remaining on M^3, occlusal view; **N.** KUVP 51370, left upper M^3 with less than half of the crown remaining, occlusal view; **O.** KUVP 61645, fragment of right maxilla with P^2-P^3 showing advanced stage of wear, occlusal view; **P.** KUVP 51752, lower left M_3 showing advanced stage of wear, occlusal view; **Q.** KUVP 51126, left mandibular tooth row, P_2-M_3, showing advanced wear comparable to that of KUVP 51752 but with the posterior loph less developed, occlusal view; **R.** KUVP 62141, left mandibular tooth row, P_4-M_3, showing intermediate wear, occlusal view; **S.** KUVP 56793, left mandibular tooth row, P_3-M_3, early stage of wear with well over half of crown remaining, occlusal view.

Several studies (Colbert and Chaffee, 1939: 8; Savage, 1951: 275; Lundelius, 1972; and others) indicate that records based on teeth alone are not adequate to distinguish *A. americana* from other antilocaprids. For example, large contemporaneous forms such as *Tetrameryx shuleri* and *Stockoceros onusrosagris* differ little in dental morphology, and their teeth are of similar size (Colbert and Chaffee, 1939; Kurtén and Anderson, 1980). Selected postcranial elements may prove to be diagnostic at the generic level, but without a secure knowledge of the range of variation in these antilocaprids it is probably futile to assign small samples of fragmentary elements to species.

Of the thirty-four sites listed in Table I that list *Antilocapra* as a faunal member, few can be said to unequivocally represent *A. americana*. For twenty-four sites the species (or even genus) is uncertain. For nine sites, the possibility exists that the pronghorn material could be Recent; for seven sites the material could be much older than the presumed range of the species, i.e., pre-Wisconsinan. Only La Brea, McKittrick (California), and Natural Trap Cave yield horn cores. These three sites, and possibly Lindenmeier (Colorado) and Red Willow (Nebraska), yield material that offers a secure Wisconsinan record of this genus. The knowledge of this genus in the Pleistocene is therefore far more incomplete than one would suspect based on referred material now in the literature.

Kurtén and Anderson (1980) and Harris (1985) were used extensively in the compilation of Table I. Original sources were consulted wherever possible. Additional references to fossil *Antilocapra* are found in Harris (1985).

PRONGHORNS AND CHEETAH

Pronghorns are the most likely candidates for being the preferred prey of the American cheetah, *Miracinonyx trumani*. The American cheetah is second only to the wolf (*Canis lupus*) in abundance among Natural Trap predators (Martin and Gilbert, 1978). There are at least 11 individuals present versus 29 wolves (Xiaoming Wang, pers. comm.). Although slightly more robust than the African cheetah, *M. trumani* no doubt preyed upon relatively small ungulates, as does its modern African counterpart. African cheetahs prey mostly on small to medium-size antelopes, specializing on the diminutive Thompson's gazelle (*Gazella thompsoni*) (weight 17.5 kg. Eisenberg, 1981) in the Serengeti (Kruuk and Turner, 1967; Schaller, 1968). Young of larger antelopes are occasionally taken. Stilt-legged horses (*Equus* cf. *hemionus*) and bighorn sheep (*Ovis canadensis*) were part of the Trap fauna, and juveniles or females of these species may have been included in the cheetah diet. Because pronghorns and gazelles are behaviorally similar (Eisenberg, 1981: 204) and rank low in relative body size among their respective ungulate faunas, it is reasonable to expect that these artiodactyls fell prey to ecologically equivalent predators. Cheetahs are highly adapted to a cursorial existence and rely on their great speed to successfully capture prey. The pronghorn's great speed may in part be the result of an evolutionary race between it and its major predator.

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