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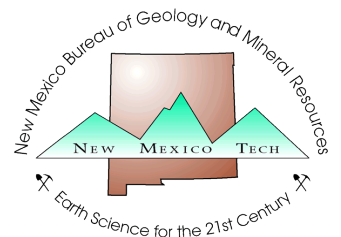
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may have limited the circulation of meteoric water during the skarn-destructive stage.

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Pincushion cactus

Preliminary report on the vertebrate fauna of U-Bar Cave, Hidalgo County, New Mexico

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Introduction

Current excavations in southwestern New Mexico are producing a major late Pleistocene vertebrate assemblage that is adding greatly to our knowledge of the biota and past ecology of the state. Since December 1983, evidence of more than 90 vertebrate taxa has been produced in U-Bar Cave. The complexity and extent of the cave deposits and faunas will require an extensive period of study; however, the importance of the early findings to understanding the Pleistocene biology of New Mexico is such that these preliminary data should be made available now.

U-Bar Cave (site LA 5689) is in the U-Bar

Limestone (Cretaceous) about 6 mi from the Mexican border in the "boot heel" of southwestern New Mexico. The altitude is about 5150 ft. The cave is surrounded by Chihuahuan desertscrub mixed with Upper Sonoran woodland elements. The main chamber of the cave (Fig. 1) is about 315 ft long and averages about 50 ft wide.

The cave has produced archaeological material since about 1935 (Lambert and Ambler, 1961), and it was the site of formal excavations by Lambert and Ambler in 1960. They considered the archaeological material as most probably assignable to the Animas Phase of the Casas Grandes culture, with a likely date

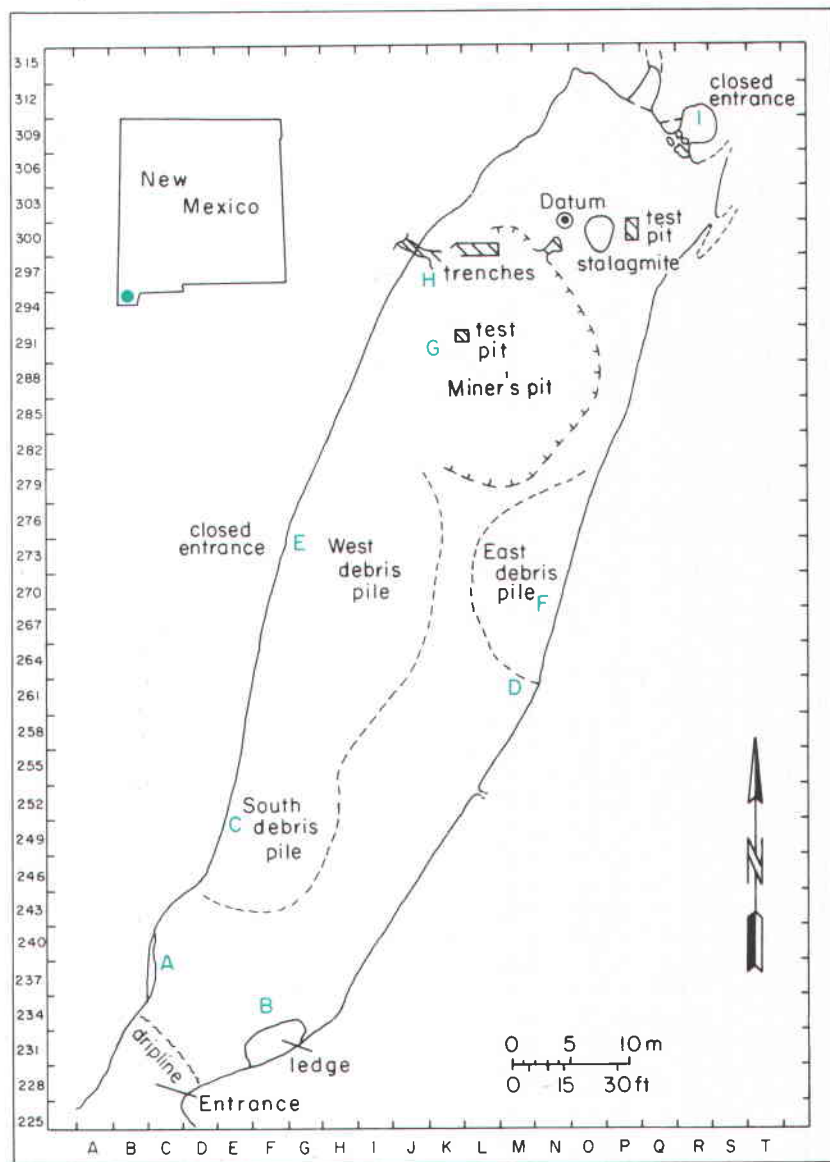


FIGURE 1—Sketch map of U-Bar Cave showing grid system, features, and regions referred to in the text.

of A.D. 1350 or 1400. The single exception was a "small polished rodent bone associated with extinct Pleistocene horse bones" (Lambert and Ambler, 1961, p. 86).

Lambert and Ambler sent a selection of the recovered bone material to the U.S. National Museum, where Johnson (1961) identified 15 taxa, including ground sloth, horse, extinct pronghorn, and "muskox." The published record of these extinct Pleistocene mammals, appearing in an archaeological source, went virtually unnoticed by paleontologists.

In 1983, representatives of New Mexico state agencies became aware that approval had been issued earlier for mining of guano at a site that was reported to contain archaeological and paleontological material. With this realization, a series of meetings was held between archaeologists, paleontologists, and representatives of mine operators and several government agencies. Paleontologists from the New Mexico Bureau of Mines and Mineral Resources (NMBMMR) and the University of Texas (El Paso; UTEP) visited the site in December 1983. A small sample of faunal remains, which was recovered from mining spoil, quickly made apparent the paleontological importance of the site.

Subsequent meetings between concerned parties resulted in a decision to allow continued mining activity, but only under stringent conditions necessary to prevent loss of valuable archaeological and paleontological data. In March 1984 the New Mexico State Land Office issued an excavation permit to Donald Wolberg (NMBMMR) as principal investigator and to myself as field director. Findings from the recent activities have not been published, except Harris (1985) published a very short faunal list as an addendum to his book.

Materials and methods

Several hundred thousand biological specimens have been recovered from mining spoil and from a variety of cave deposits by screening and hand picking. Useful materials are being catalogued with Museum of New Mexico (Santa Fe) numbers, but they are being maintained at UTEP (Resource Collections, Laboratory for Environmental Biology) for study. Fossils excavated by Lambert and Ambler have been borrowed for study.

To facilitate study, a grid system was adapted from one set up by C. Schaafsma of the Museum of New Mexico during archaeological reevaluation in March 1984. Schaafsma established an arbitrary datum toward the rear of the cave, and lines oriented magnetic north-south and east-west were subdivided at 3-m intervals, with columns denoted by letters and rows denoted by numbers (Fig. 1). Schaafsma's datum forms the northwestern corner of grid O-300. Where desirable, his 3-m² grids have been subdivided into m² grids. For purposes of discussion, various larger regions of the cave have been assigned letters (Fig. 1).

Testing of deposits in the pathway of mining activity has been done to determine feasibility and placement of mining excavations.

Other shallow tests with material sieved through window screen have been made throughout the cave to determine distribution of fossil materials, extent of disturbance, and to obtain samples for taxonomic studies. Material from mining spoil also has been recovered by screening and hand picking. Excavation in several deposits undisturbed by mining is continuing in P-300 and region H (Fig. 1).

Results

Findings at this point are tentative. Acquisition of more dates and study of depositional relationships are required to clarify depositional history; taxonomic studies are at an early stage.

The cave deposits consist of both undecomposed and highly altered animal guano, plant debris, rock from cave walls and ceilings, and sediments washed into the cave from elsewhere. As much as 13 ft of fill has been removed by mining in some sections of the cave. Little original surface remains in the front 80% of the site, and most of the upper parts of the remaining fill in this area have been churned and contaminated. Locally, small pockets of undisturbed fill remain in protected areas (Fig. 1, A, C, and F), and a small, virtually complete section of consolidated deposits (Fig. 1, B) remains near the entrance.

A radiocarbon date of >31,150 B.P. (A-4128) is available on guano from undisturbed deposits in grid D-246 (Fig. 1). (Radiocarbon dates were determined by the Laboratory of Isotope Geochemistry, University of Arizona (A). The lab code is followed by that laboratory's sample number.) The sample was obtained from the immediate vicinity of an undescribed, extinct genus of rabbit.

Topographic highs C and F (Fig. 1) appear to be guano-veneered rockfall from the walls and ceilings, but debris pile E has a core of material that entered through a now-closed entrance. Other clogged entrances appear to have been sources of sedimentary material in the rear section of the chamber.

Fossiliferous gravels and finer sediments, which make up the surface and near-surface deposits of the back portion of the cave, seem to have entered the system near grid S-312. A large, flatish stalagmite (marking the late Wisconsinan full glacial?) in O-300 and P-300 was formed after these deposits.

In region H (Fig. 1) deposits that were apparently laid down in ponded water reveal a radiocarbon date (on guano and intermixed charcoal) of 29,000 $\pm$ 2600/-2000 B.P. (A-4129), and they antedate channel cutting, which was followed by deposition of fossiliferous channel gravels alternating with guano layers. The gravels appear to have originated from the west-southwest. After cessation of gravel deposition, thick guano deposits were laid down.

To the south, contemporaneous deposition was limited to guano. Dates from a test pit on the line between grids K-294 and L-294 (Fig. 1) are 20,320 $\pm$ 540 B.P. (A-4009) on guano from the 25-35-cm level, >35,500

B.P. on charcoal from the 90-100-cm level (AA-678), and 21,720 $\pm$ 750 (A-4011) from the 150-cm level (depth measurements from surface of decomposed guano). Reexamination of samples from the three levels indicates a strong likelihood of contamination of the two guano samples by more recent matter.

Wherever sufficient original structure is present to allow recognition, natural disturbance of the cave sediments is frequent. Numerous krotovinas (filled voids) were observed in such deposits, often associated with fresh-appearing plant fragments. Such fragments have not been observed in definitely undisturbed sediments. Although some filled (and open) burrows were about the size of woodrat burrows, others were as large as a porcupine-sized animal. Some areas displayed extensive (>3 ft) lateral churning, particularly under gravel layers and rocks. Faunal identifications are given in Table 1, and representative elements of several extinct taxa are shown in Fig. 2.

Discussion

The cave obviously has a long, complex depositional history. At least three, and probably four, entrances have provided access to animals and permitted intrusion of sediments. The chronological relationships between these openings are unknown currently, although some speculation is possible.

Distribution of archaeological material implies that the historic entrance (now greatly enlarged because of mining activities) was open during a period of time between about A.D. 1000 and A.D. 1450, and the entrance also has been open during much of the 20th century. The occurrence of the archaeological material, essentially on top of Pleistocene-age deposits, suggests that no entrance was open between late Wisconsinan and late Holocene time. Likewise, the relatively shallow post-aboriginal accumulations of guano may imply closure during much of the time since then, or alternatively, large bat colonies did not use the cave again until recently. That the present entrance is relatively recent also is suggested by the presence of only a small alluvial fan, "concentrated in the top two feet of the [1960] fill" (Lambert and Ambler, 1961, p. 15).

Little evidence pertains to chronological order in which other entrances were open. The source of gravels for region H probably antedates, at least in part, that of the gravels from region I (Fig. 1). Some fossiliferous gravels are present in region G at depths below gravels in other parts of the cave. Virtually nothing is known of their source at present because large blocks of roof-fall prevent free access.

At this stage of recovery and interpretation, the biota is not clearly separable into faunas of different characteristics. However, regions A and B, areas where mostly disturbed deposits have been examined, show presence of the chestnut-sided pocket go-

pher (*Pappogeomys castanops*), the southern grasshopper mouse (*Onychomys cf. torridus*), the eastern cottontail (*Sylvilagus floridanus*), a cotton rat (*Sigmodon sp.*), and a small kangaroo rat (*Dipodomys merriami*). These taxa, rare or absent in collections from other areas, are mostly indicative of southern or eastern influences. These sites ultimately may prove to be of different age, but contamination by modern forms cannot be ruled out entirely. The fauna is listed separately in Table 1. Material recovered from other areas, when treated as a single fauna, is most similar among southwestern U.S. faunas to mid-Wisconsinan assemblages from Dry Cave in southeastern New Mexico (Harris, 1985). However, the implied presence of sagebrush (*Artemisia tridentata* and related species), grasses, and woodland vegetation suggests cooler summers and a more pronounced emphasis on cool-season precipitation than in southeastern New Mexico. This vegetation represented a more xeric and warmer climate than characterized the full-glacial sagebrush steppe-woodland (Harris, 1985).

The mid-Wisconsinan, as opposed to the full glacial, aspect can be seen in the occurrence of an undescribed genus of rabbit, gray fox (*Urocyon cinereoargenteus*), rock squirrel (*Spermophilus variegatus*), cotton rat (*Sigmodon sp.*), tortoise (*Gopherus*), and vampire bat (*Desmodus stocki*). These appear absent from New Mexican full-glacial faunas, although most are present in the Dry Cave mid-Wisconsinan time and several reappear there during terminal Wisconsinan time.

On the other hand, presence of marmot (*Marmota flaviventris*), sagebrush vole (*Lagurus curtatus*), sage grouse (*Centrocercus urophasianus*), Conkling's roadrunner (*Geococcyx californianus conklingi*), Mexican vole (*Microtus mexicanus*), and both Mexican and Stephen's wood rats (*Neotoma mexicana*, *N. stephensi*) suggests cooler summers with more winter precipitation than in the mid-Wisconsinan of southeastern New Mexico. An increased emphasis on cool-weather precipitation is to be expected because winter precipitation tends to increase today from east to west across the region.

The relative rarity of specimens of marmots, long-tailed shrews (*Sorex spp.*), and, particularly, voles (*Lagurus*; *Microtus*) forms a strong contrast to most New Mexican full-glacial faunas. Noteworthy is the commonness of voles of several species at Howell's Ridge Cave, only about 34 mi to the north (Harris, 1985).

The extinct members of the fauna are of less value in climatic or ecologic reconstruction, but they are of biologic interest and are discussed briefly below.

Presence of a shelduck (*Anabernicula sp.*) is tentatively recognized by three partial or complete right tarsometatarsi, none found in situ. *Anabernicula gracilentia* is known from California, Nevada, and New Mexico, with the nearest occurrence at Howell's Ridge Cave (Howard, 1964).

The California condor (*Gymnogyps californianus amplus*) is widespread in southern New Mexican sites, including Howell's Ridge Cave.

TABLE 1—Tentative faunal list from U-Bar Cave, Hidalgo County, New Mexico; *, extralimital; +, extinct; A, not in situ; B, in situ exclusive of regions A and B; C, regions A and B.

Taxon	Common name	A	B	C
Amphibia	Amphibians			
<i>Ambystoma cf. tigrinum</i>	Tiger salamander	X	X	
Cf. <i>Scaphiopus</i>	Spadefoot toad			X
* <i>Bufo alvarius</i>	Colorado River toad	X		X
Reptilia	Reptiles			
<i>Terrapene cf. ornata</i>	Western box turtle	X		
*Cf. <i>Gopherus</i>	Desert tortoise	X		
* <i>Phrynosoma douglassi</i>	Short-horned lizard	X		
<i>Crotaphytus collaris</i>	Collared lizard			X
? <i>Sceloporus</i>	Spiny lizard	X		
Cf. <i>Masticophis</i>	Coachwhip snake	X		
? <i>Salvadora</i>	Patch-nosed snake	X		
? <i>Pituophis</i>	Bull snake	X		
<i>Crotalus sp.</i>	Rattlesnake	X	X	X
Aves	Birds			
+ <i>Anabernicula sp.</i>	Extinct shelduck	X		
<i>Anas cf. platyrhynchos</i>	Mallard	X		X
<i>Anas ? cyanoptera</i>	Cinnamon teal	X		
? <i>Cathartes aura</i>	Turkey vulture	X		
? <i>Coragyps</i>	Black vulture	X		
+ <i>Gymnogyps californianus amplus</i>	California condor	X		X
<i>Accipiter cooperi</i>	Cooper's hawk			X
Cf. <i>Aquila chrysaetos</i>	Golden eagle		X	
<i>Falco sparverius</i>	American kestrel			X
*? <i>Centrocercus urophasianus</i>	Sage grouse		X	
*? <i>Tympanuchus</i>	Prairie chicken			X
<i>Zenaidura macroura</i>	Mourning dove	X		
+ <i>Geococcyx californianus conklingi</i>	Conkling's roadrunner	X		
* <i>Strix cf. occidentalis</i>	Spotted owl		X	
Cf. <i>Colaptes auratus</i>	Flicker	X		
*? <i>Cyanocitta stelleri</i>	Stellar's jay	X		
<i>Corvus corax</i>	Common raven	X		
Mammalia	Mammals			
* <i>Sorex sp.</i>	Long-tailed shrew		X	
* <i>Sorex merriami</i>	Merriam's shrew	X		
<i>Notiosorex crawfordi</i>	Desert shrew	X	X	X
+ <i>Desmodus stocki</i>	Stock's vampire bat	X		
<i>Myotis sp.</i>	Mouse-eared bat	X	X	
<i>Myotis ? lucifugus</i>	Little brown bat	X		
<i>Myotis velifer</i>	Cave myotis	X	X	
<i>Eptesicus fuscus</i>	Big brown bat	X		
<i>Plecotus sp.</i>	Big-eared bat		X	
<i>Antrozous pallidus</i>	Pallid bat	X		
<i>Tadarida brasiliensis</i>	Brazilian freetail bat	X	X	X
<i>Homo sapiens</i>	Man	X		
+ <i>Nothotheriops shastensis</i>	Shasta ground sloth	X	X	
+ Undescribed Leporid	Extinct rabbit	X	X	X
<i>Sylvilagus auduboni/floridanus</i>	Desert or eastern cottontail	X	X	
<i>Sylvilagus auduboni</i>	Desert cottontail			X
<i>Sylvilagus floridanus</i>	Eastern cottontail			X
* <i>Sylvilagus nuttalli</i>	Nuttall's cottontail	X	X	
<i>Lepus sp.</i>	Jack rabbit	X	X	
* <i>Tamias ? dorsalis</i>	Cliff chipmunk	X		
* <i>Marmota flaviventris</i>	Yellow-bellied marmot	X		X
<i>Spermophilus ? pilosoma</i>	Spotted ground squirrel		X	X
<i>Spermophilus variegatus</i>	Rock squirrel	X	X	X
<i>Cynomys sp.</i>	Prairie dog	X	X	X
<i>Thomomys bottae</i>	Botta's pocket gopher	X	X	X
* <i>Pappogeomys castanops</i>	Yellow-faced pocket gopher	X		X
<i>Perognathus cf. flavus</i>	Silky pocket mouse	X	X	X
<i>Perognathus (Chaetodipus) sp.</i>	Spiny pocket mouse	X	X	
<i>Dipodomys spectabilis</i>	Bannertail kangaroo rat	X		X
<i>Dipodomys merriami</i>	Merriam's kangaroo rat			X
<i>Reithrodontomys megalotis/montanus</i>	Western or montane harvest mouse	X	X	X
<i>Peromyscus spp.</i>	White-footed mouse	X	X	X
<i>Peromyscus ? eremicus</i>	Cactus mouse	X		
<i>Peromyscus cf. difficilis</i>	Rock mouse	X		
<i>Onychomys leucogaster</i>	Northern grasshopper mouse	X	X	
<i>Onychomys torridus</i>	Southern grasshopper mouse			X
<i>Sigmodon sp.</i>	Cotton rat	X	X	X
<i>Neotoma albigula</i>	White-throated woodrat	X	X	X
* <i>Neotoma stephensi</i>	Stephen's woodrat	X	X	X
* <i>Neotoma mexicana</i>	Mexican woodrat	X	X	X

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Taxon	Common name	A	B	C
* <i>Neotoma cinerea</i>	Bushy-tailed woodrat	X	X	X
* <i>Microtus mexicanus</i>	Mexican vole	X	X	X
* <i>Microtus pennsylvanicus</i>	Meadow vole			X
* <i>Lagurus curtatus</i>	Sagebrush vole	X	X	
<i>Erethizon dorsatum</i>	Porcupine	X		
<i>Canis</i> sp.	Dogs, coyotes, wolves	X	X	
+ <i>Canis dirus</i>	Dire wolf			X
<i>Canis latrans</i>	Coyote			X
<i>Urocyon cinereoargenteus</i>	Gray fox		X	X
<i>Ursus americanus</i>	Black bear	X	X	
+ <i>Arctodus simus</i>	Giant short-faced bear	X	X	
<i>Bassariscus astutus</i>	Ringtail	X		X
<i>Mustela frenata</i>	Long-tailed weasel	X		
<i>Taxidea taxus</i>	Badger	X	X	X
<i>Spilogale</i> sp.	Spotted skunk	X		X
<i>Mephitis mephitis</i>	Striped skunk	X	X	X
? <i>Panthera onca</i>	Jaguar			X
<i>Felis concolor</i>	Mountain lion			X
<i>Lynx rufus</i>	Bobcat	X	X	X
+ <i>Equus</i> sp.	Horse			X
+ <i>Equus</i> cf. <i>occidentalis</i>	Western horse	X	X	
+ <i>Equus</i> cf. <i>conversidens</i>	Mexican horse	X	X	
+ <i>Equus</i> cf. <i>niobrarensis</i>	Niobrara horse	X	X	
<i>Odocoileus</i> sp.	Deer	X	X	X
<i>Odocoileus</i> cf. <i>hemionus</i>	Mule deer	X		
+ <i>Navahoceros fricki</i>	Mountain deer	X	X	X
+ <i>Capromeryx</i> sp.	Diminutive pronghorn		X	X
+ <i>Stockoceros onusrosagris</i>	Quentin's pronghorn	X	X	X
? <i>Oreamnos</i> sp.	Mountain goat	X		
+ <i>Euceratherium collinum</i>	Shrub ox	X	X	X
+ <i>Bison</i> sp.	Extinct bison	X	X	

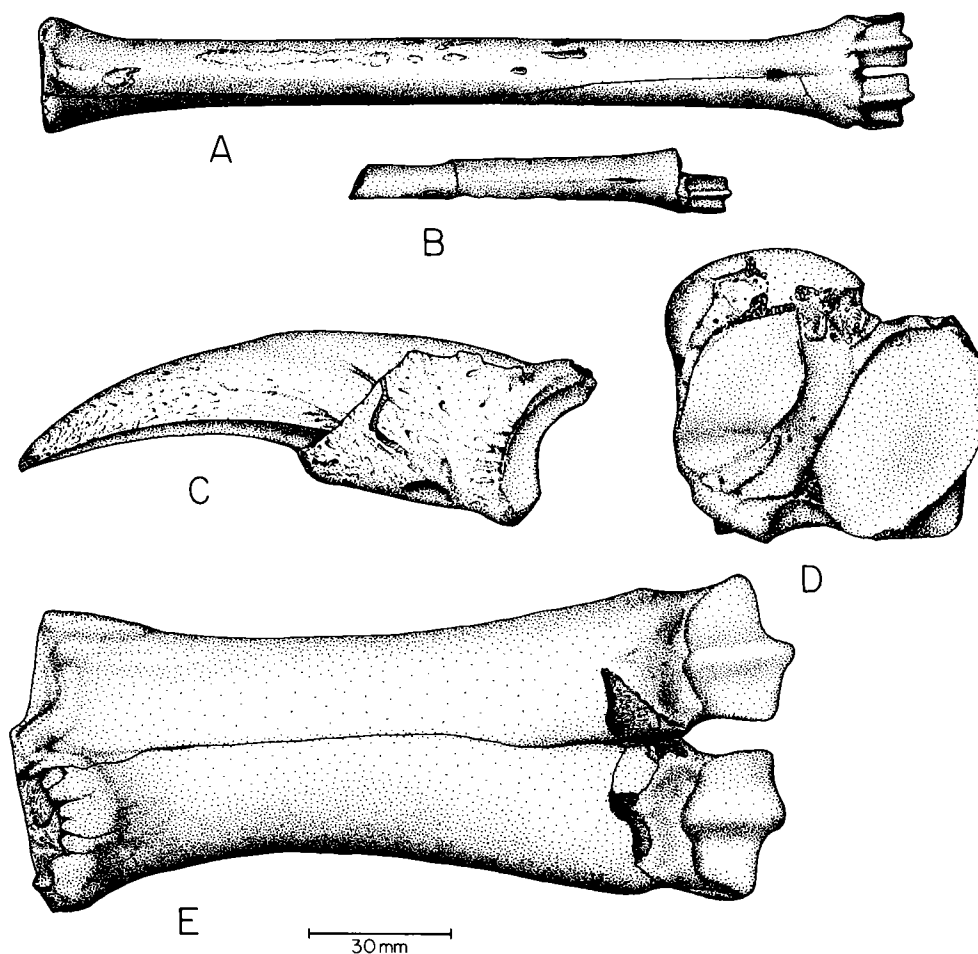


FIGURE 2—A, Museum of New Mexico (MNM) 5689-59-1, *Stockoceros onusrosagris*, dorsal view right metacarpal; B, MNM 5689-67-10, *Capromeryx* sp., dorsal view, partial metapodial; C, MNM 5689-1-61, *Nothrotheriops shastensis*, lateral view, phalanx III, digit II, manis; D, MNM 5689-1-4, *Arctodus simus*, distal surface left astragalus; E, MNM 5689-2-3, *Euceratherium collinum*, dorsal view, left metacarpal.

The roadrunners are represented by four elements recovered from mining spoil. All appear to represent the large, extinct Conkling's roadrunner rather than the living subspecies (*G. c. californianus*). This form is believed to imply relatively cool summer conditions (Harris and Crews, 1983) and is the common full-glacial form in the southwestern U.S.

Stock's vampire bat is a larger form than the related, living *Desmodus rotundus*, but presumably likewise limited ecologically by temperature. Its presence indicates relatively warm winters (Kurten and Anderson, 1980). Several wing elements from mining spoil and disturbed cave fill (region D) have been identified. This is the first known occurrence in New Mexico. Several sites in California and a deposit in the Big Bend area of Texas are the nearest known Pleistocene occurrences (Harris, 1985).

Nothrotheriops shastensis, the Shasta ground sloth, is widespread in cave deposits of the southwestern U.S. At least three individuals are represented at U-Bar Cave. Most specimens were recovered during the original archaeological excavations or from mining spoil, but some were recovered from gravels in regions B and H and in grid P-300.

The extinct, undescribed rabbit (species A of Harris, 1985) is a very small, gracile form otherwise known from the mid-Wisconsinan of Dry Cave and from the undated Pleistocene faunas of Anthony's Cave in south-central New Mexico and Jimenez Cave in southern Chihuahua. The genus is not closely related to other known Pleistocene or Holocene North American taxa. It is being described currently by B. D. Russell and A. H. Harris. A number of specimens are available from spoil and disturbed areas, and several have been recovered in situ.

Canis dirus has been recovered from carbonate-bonded deposits near the mouth of the cave (region B). Distribution was widespread in Wisconsinan time.

The giant short-faced bear (*Arctodus simus*) is represented by a number of elements from spoil and from disturbed areas in region D. A few elements seem to have been in place. All recovered specimens probably represent a single mature individual.

Probably three species of horses are represented by dental and skeletal elements. These tentatively are assigned to *Equus occidentalis*, *E. niobrarensis*, and *E. conversidens* (sensu Harris and Porter, 1980). The former is a large species common west of the site, but relatively rare to the east. *E. niobrarensis* is medium in size and widespread in the southwestern U.S., as is the smaller *E. conversidens*. At least two of the horse bones recovered by Lambert and Ambler in 1960 had been burned; this may have happened when Indians built fires on the cave floor (1300-1400 A.D.) or may represent contemporaneity with paleo-Indians.

Mountain deer (*Navahoceros fricki*) is represented by a metacarpal (region B) and possibly by scanty limb fragments (region H).

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In the southwestern U.S., records of mountain deer are limited to central and southeastern New Mexico.

Two pronghorns (*Antilocapridae*) were recognized from the cave. The distal end of a cannon bone recovered in 1960 and another recovered during the current excavations (Fig. 2) are too small to represent any known late Pleistocene pronghorn other than *Capromeryx*. Other pronghorn material (1960 excavations, spoil, disturbed fill, and in situ) is consistent with *Stockoceros onusrosagris*. Material includes partial frontals and horn cores of an immature individual and both anterior and posterior metapodials of adults. Measurable material is consistent with this species rather than the smaller *S. conklingi* (but see Furlong, 1943).

A single first phalanx from disturbed sediments is tentatively assigned to mountain goat (*Oreamnos*). Until comparative material can be examined, the identification is uncertain. The small, extinct *O. harringtoni* is known from several sites in Arizona and New Mexico.

Johnson (1961) recorded "Muskox (genus undetermined)" on the basis of a "metacarpal" (actually, a metatarsal). That specimen plus a number of dental and skeletal elements from spoil and a metacarpal in situ in region B are referable to *Euceratherium collinum*. Several individuals, from very young to fully mature and probably of both sexes, are represented. Only very small fragments of horn cores have been recovered, and the present material does not clarify the systematic position of the possibly conspecific *Preptoceras*. Known occurrences are from California and Nevada east to Trans-Pecos Texas and south into Mexico (San Josecito Cave; Harris, 1985). The remains appear exclusively in foothill and low mountain terrains, and they are from a very limited elevational range, which is consistent with the present site.

Summary and conclusions

About 94 different taxa of vertebrates have been identified tentatively from U-Bar Cave. Sixteen (17%) of these represent extinct forms and 18 (19%) are extant forms whose present ranges do not include U-Bar Cave or its immediate vicinity.

Many of the extralimital taxa now occur only in cooler and more mesic habitats, particularly habitats characterized by a notable pulse of cool-season precipitation and limited warm-season moisture.

Considered as a single fauna (which may prove to be an error), the best age interpretation is mid-Wisconsinan. This is consistent with the radiocarbon dates obtained thus far.

The geologic history of the cave sediments is complex because sediments and biotic elements had access to the cave through several different openings, possibly at significantly different times.

Continued excavation and study of biotic elements should not only clarify depositional history and chronologic relationships, but should also produce material that will sig-

nificantly enlarge our knowledge of the systematics and morphology of several extinct animals and our understanding of the complex biogeographical and paleontological changes that occurred during Wisconsinan time.

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MINING REGISTRATIONS (MAY 13, 1985, THROUGH SEPTEMBER 10, 1985)		
Bureau of Mine Inspection	Energy & Minerals Dept.	2825-E Broadbent Pkwy. NE Albuquerque, NM 87107
Date and operation	Operators and owners	Location
5-13-85 turquoise	Operator—Thursday Morning Mine, Thursday Morning Mining Co., 1812 Mesquite, Lordsburg, NM; Gen. Mgr.—Harold Jorgenson, 980 Motel Blvd., Lordsburg, NM, phone: 542-3724; Person in charge—LeRoy Jonis, same address; Gen. Supt.—Jack Staples, P.O. Box 366, Lordsburg, NM. Property owner—Earl Anderson, Lordsburg, NM	Grant County; sec. 11, T28S, R15W; federal land; directions to mine: 6 mi south-west of Hachita
5-13-85 copper	Operator—Nacimiento Copper Mine, NCP Company, P.O. Box 220, Cuba, NM 87103; Gen. Mgr.—Donald V. Galbiati, same address; Person in charge—Alan R. Jager, same address; Gen. Supt.—Donald V. Galbiati. Property owner—Leaching Technology Inc., Cuba, NM	Sandoval County; sec. 1, T20N, R1W; private land; directions to mine: 5.7 mi east of Cuba, NM, on NM-126
5-21-85 gold, silver	Operator—Ladder One Mill, Jenny Mining, 7000 Phoenix NE, #509, Albuquerque, NM 87110; Gen. Mgr.—Peter Olsen, same address. Property owner—Golden Gulch Mining, 910 Juniper, T or C, NM 87904	Sierra County; sec. 24, T15S, R7W; private, state, and federal land; no custom milling; mill capacity—360 tons/hr; directions to mill: 26 mi south and west of T or C, NM, 7.2 mi west of I-25 on NM-90, then north on dirt road to Ladder airstrip, then west 1.25 mi
6-11-85 scoria	Operator—T O Number One—Big Chief Stone, Inc., 900 No. Morton Ln., Las Cruces, NM 88005; Gen. Mgr.—J. E. Wells, same address, phone: 523-5750; Productions Supt.—Jack Garrett, P.O. Box 9045, Santa Fe, NM 87504, phone: 982-2624, unit 3174; Partner Pres.—Royce C. Morton, company address and phone. Property owner—Whittenburg T O Ranch, Amarillo, TX	Colfax County; sec. 22, T30N, R26E; private land; directions to pit: 16.5 mi east on NM-87 and approximately 3 mi north on private road to mine
6-24-85 mill	Operator—Molycorp Mill, Mountain States Mineral Enterprises, Inc., 4370 South Fremont, Tucson, AZ 85714; Supt.—Richard Staton, P.O. Box 865, Questa, NM 87556; Gen. Mgr.—Harry McNeil, company address. Property owner—MolyCorp, Questa, NM	Taos County; directions to mill: 7 mi east of Questa, NM
6-28-85 gold, silver	Operator—San Pedro Mine, Silver Bar Mining Co., Alto Rt., Capitan, NM 88316; Gen. Mgr.—Ira Young, same address, phone: 281-5340. Property owner—The Goldfield Corp., Box 1899, Melbourne, Florida 32901	Santa Fe County; sec. 27, T12N, R7E; private land; directions to mine: 35 mi north-east of Albuquerque via I-40 to NM-14, north to NM-344, and east 2 mi to mine road on left

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