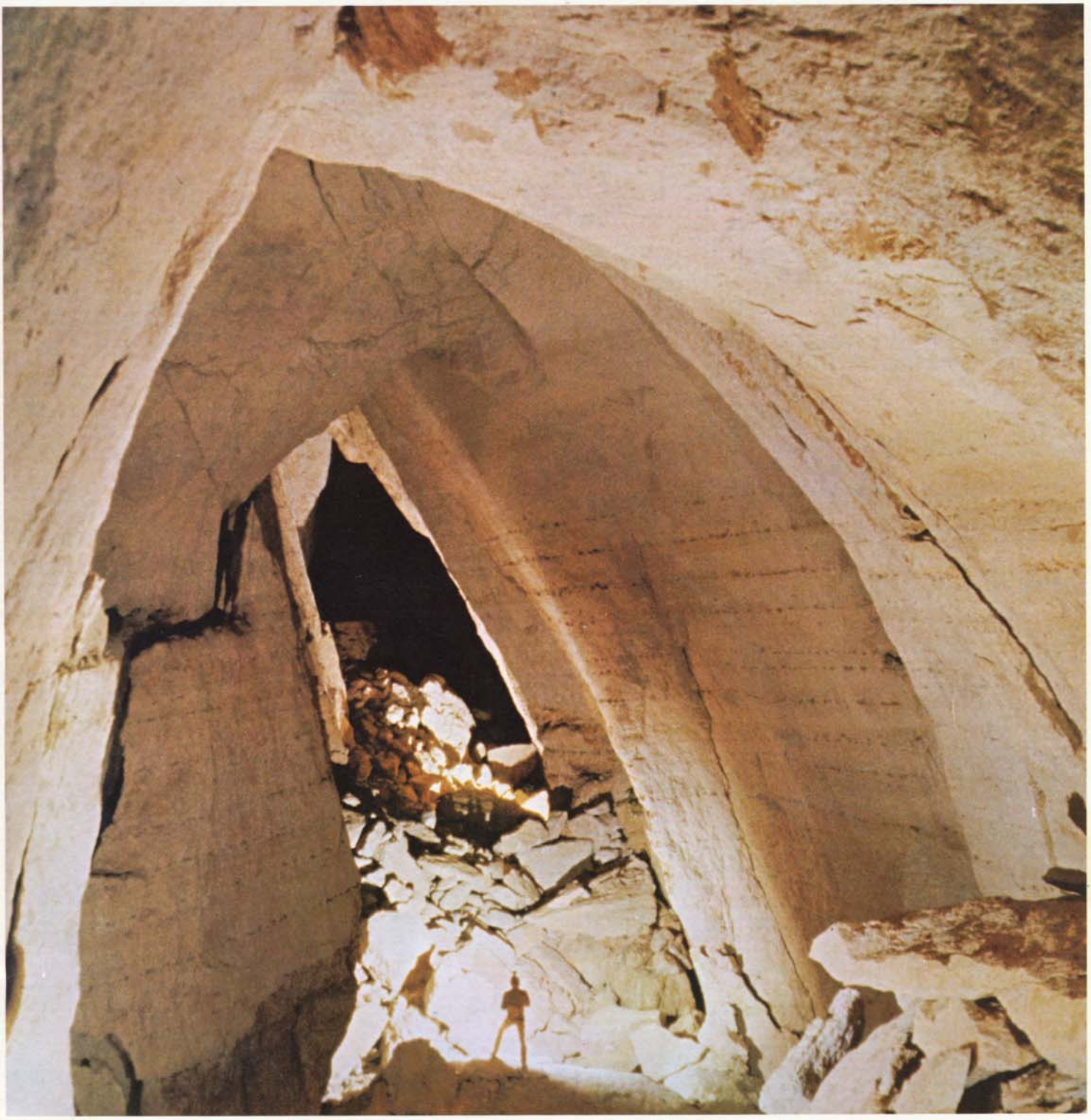

1984 NSS CONVENTION GUIDEBOOK

GUIDEBOOK OF THE

1984

NSS CONVENTION

by
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Things to See and Do in the Sheridan Area

Sheridan City

The Sheridan Inn is a National Historic Landmark that was built by the Burlington Railroad and Sheridan Land Co. in 1892/93. It has served such illustrious individuals as Buffalo Bill Cody, Will Rogers, Ernest Hemingway, and presidents Taft and Hoover. It contains beams hewn by hand locally as well as a bar custom made in England. Currently, the Inn serves as a restaurant, lounge, museum, and art gallery.

The Trail End Museum is a mansion built by the late U. S. Senator John B. Kendrick. The mansion is currently owned by the Sheridan County Chapter of the Wyoming State Historical Society. The museum features artifacts from the Indians, pioneers, and military as well as local art. There is a small admissions charge.

Sheridan is host to a number of events later in the summer for those staying in the area. The annual PRCA Rodeo will be held July 13th through 15th and includes a carnival as well as other events. The Willet Miller Antique show follows the rodeo (July 15th - 17th). The local Antique Car Club holds a show on July 23rd.

Sheridan County and Vicinity

The Bradford Brinton Memorial at the Quarter Circle A Ranch near Big Horn is a National Historic Site and a must see. The Brinton art collection contains over 600 paintings and sketches by many famous American artists including Charles Russell, Frederic Remington, and John James Audubon. The collection also includes bronzes and rare books. This working ranch is open from 9:30 a.m. to 5 p.m. during the summer. There is no admissions charge.

A number of battlefields are present in the area. The Connor and Sawyer Battlefields and the Battle of Tongue River site are a few miles north and west of Sheridan. These battles took place in 1865. In 1866 through 1868 the Indians fought for control of the Powder River Basin with the U.S. Cavalry station at Fort Phil Kearney in northern Johnson County. The Wagon Box Fight and the Fetterman Massacre are the two principle battlefields associated with the fort. The last major battle in the immediate area was the Little Big Horn just north of the Wyoming border in 1876. The blood shed continued in the Johnson County War. Cattle barons from southern Wyoming claimed that the Johnson County homesteaders and small ranchers were rustling cattle. The barons attempted to drive the settlers out with an invading army of hired guns from Texas in 1882. The invaders were ambushed at the TA Ranch south of Buffalo and eventually rescued by the U.S. Cavalry.

Natural Sites

Lake DeSmet is a major recreation site south of Sheridan along I-25. There is plenty of hiking and camping in the Bighorn National Forest and

Cloud Peak Wilderness to the west of Sheridan. Things to see in the National Forest include the Fallen City landslide along highway 14 on the east side of the mountains, Shell Falls in Shell Canyon on the west side of the mountains, and the Medicine Wheel along highway 14A. The Bighorn Canyon National Recreation Area and Pryor Mountain Wild Horse Range can be found north of Lovell, Wyoming and west of the Bighorn Mountains. Information can be had at the National Park Service Visitor Center in Lovell.

Geology Field Trip

Geologic Summary

The basement rocks of northern Wyoming are Early Precambrian (greater than 2500 million years old) granites and gneisses. They are usually exposed in the core of the present day mountain ranges such as the Bighorn Mountains. Younger Precambrian schists and granites are present in the Black Hills.

The Cambrian seas transgressed from west to east across the Wyoming part of the Craton. In this sea was deposited a basal sandstone (Flathead), followed by shale (Gros Ventre), and limestone (Gallatin). In the Black Hills all three sediment types are intermixed and referred to as the Deadwood Formation. The Cambrian limestones in western Wyoming are host to karst features but are largely barren in the Bighorn Mountains.

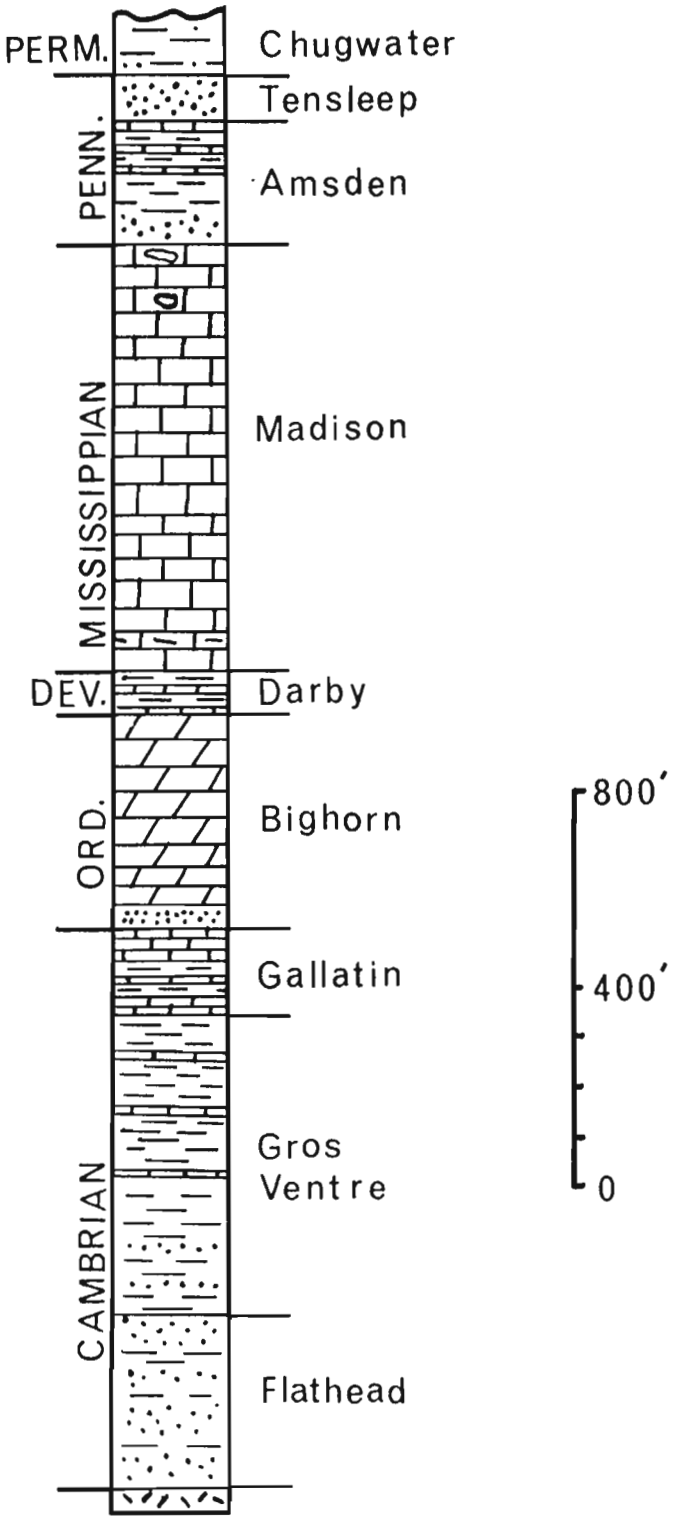
The Ordovician Bighorn Dolomite rests unconformably on the Cambrian sediments. This is a major cave forming unit in the Bighorn Mountains, but is largely void of caves in other mountain ranges. Locally, at the base of the Bighorn Dolomite is a quartz-rich sandstone up to 20 feet thick. This sandstone is exposed in Great-X Cave at several places. All of the stream caves in the Spanish Point area on the west flank of the Bighorn Mountains are in the Bighorn Dolomite.

The Devonian rocks along highway 14 on the east side of the Bighorn Mountains consist of massive brown, yellow, and gray dolomites and interbedded red, green, and purple shales (Koucky and Rhodes, 1963). In Devil Canyon near the Horsethief-Bighorn System, the Devonian strata are primarily limestone and dolomite with minor siltstone and shale (Richards, 1955). The Devonian rocks thin rapidly to the south and east where they are eroded off. In the Bighorn Mountains this unit has been correlated with the Darby Limestone of western Wyoming and the Jefferson Limestone and Three Forks Shale of Montana. There are no known significant caves in the Devonian rocks of Wyoming.

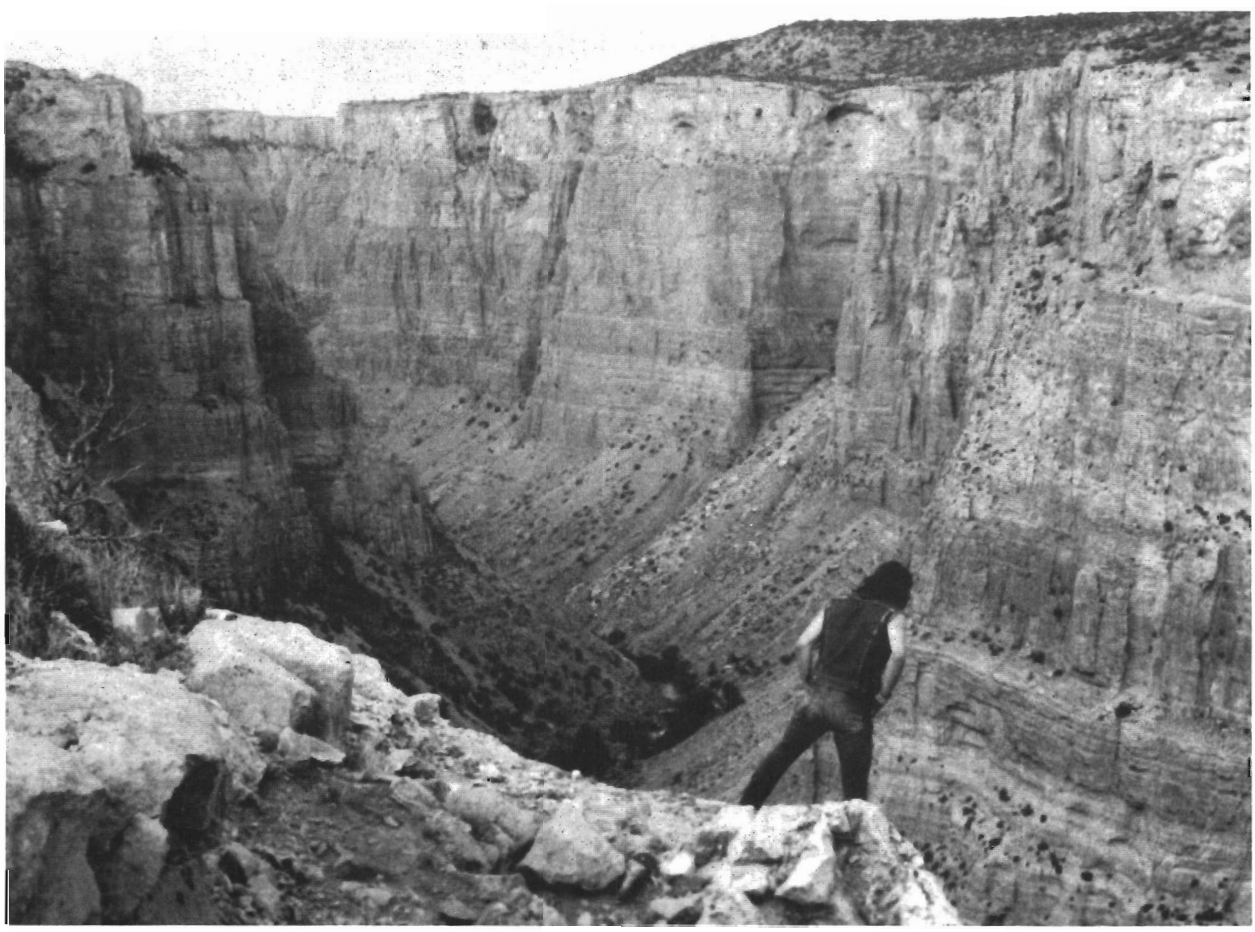
The Mississippian Madison Limestone is the priciple cave forming unit in the Central Rockies. In Colorado it is called the Leadville Limestone, in the Black Hills it is the Pahasapa Limestone. In Montana and western Wyoming, the Madison is commonly subdivided into a lower, thin-bedded Lodgepole Limestone and an upper, massive Mission Canyon Limestone. In the Bighorn Mountains the top of the Madison Limestone is commonly brecciated and contains a number of solution pockets that may be filled with clastic sediments similar to the overlying Amsden Formation. This zone is easily seen along the rim of Devil Canyon.

The Madison is unconformably overlain by the Pennsylvanian age Amsden Formation (called Minnelusa Formation in the Black Hills). The Amsden is commonly subdivided into a basal Darwin Sandstone, Horseshoe Shale, and Ranchester Limestone. This is a colorful unit with red shales and purple limestones. The limestones are too thin to host significant karst features. The equivalent Minnelusa Formation in eastern Wyoming contains abundant evaporites. Subsurface dissolution of some of these evaporites has produced breccia pipes in the Black Hills (Braddock, 1963).

The Amsden is overlain by the Pennsylvanian age Tensleep Sandstone.



Generalized Stratigraphic Column for Paleozoic Rocks Exposed along Highway 14, Sheridan County, Wyoming (After Koucky and Cygan, 1963)



Devil Canyon, Montana. Porcupine Creek has cut an 800 foot deep gorge through Paleozoic strata. The lower talus-covered slopes conceal Devonian carbonates and shale. The massive cliff is 600 feet of Mississippian Madison Limestone. Note the solution pockets in the top layer of the Madison. The sage-covered upper slope is in the Amsden Formation.

The Tensleep sands were deposited in an eolian sand sea over much of central Wyoming. Large-scale crossbeds are occassionally present in this sandstone.

In the Black Hills, the Minnelusa Formation is overlain by the thin, red shales of the Opeche Formation which, in turn, is overlain by the Minnekahta Limestone. This limestone is very thin bedded and finely crystalline. It is host to several sinkholes and some small caves.

The Permo-Triassic Chugwater Formation is a red-bed sequence found over most of Wyoming. Its equivalence in the Black Hills is the Spearfish Formation. This unit consists of red sandstone, shale, and siltstone. Gypsum is prsent in some areas in the lower part of the formation. Along the west side of the Black Hills, a number of karst features are present in this gypsum.

The Jurassic strata include thin limestone and gypsum beds of the Gypsum Springs Formation, green shales, thin limestones, and sandstones of the Sundance Formation, and multi-colored shales and sandstones of the Morrison Formation. The Gypsum Springs contains abundant oysters, the Sundance abundant cigar-shaped belemnites, while the Morrison is known for its dinosaurs.

During Jurassic times, the Rocky Mountains began to rise in Utah and Idaho, shedding clastic debris to the east. By the Early Cretaceous a deep marine seaway lay east of the mountains and stretched from the Artic to the Gulf of Mexico. The basal unit of this seaway is a sand and shale sequence called the Dakota over most of the Rockies. In the Bighorn Mountains it is referred to as the Cloverly Sandstone. The sands are resistant to erosion and form prominent hogbacks along many of the western mountain ranges. The marine black shales of the Thermopolis Formation and the siliceous, silvery shales of the Mowry Formation overly the Dakota sands. These shales contain abundant bentonites (altered volcanic ash). The Mowry is very organic rich and is one of the principle source rocks for many of the oil fields in the Powder River Basin. The Frontier Formation overlys these marine shales. This unit consists of deltaic sands and marine shales. The sands are a response to further mountain building just to the west of Wyoming.

Another marine transgression deposited the Cody (Pierre) Shale throughout the seaway. Two limestone members (Greenhorn and Niobrara) are present in the Great Plains but are represented by calcareous shales in the Powder River Basin. The deltaic sands of the Mesaverde Group are the result of another orogenic pulse in Utah and Idaho.

A final marine transgression is seen with the Lewis Shale. It is overlain by the deltaic Fox Hills Sandstone and the fluvial Lance Formation. The Lance Formation is witness to the end of the Cretaceous and the dinosaurs. The Rocky Mountains begin to rise throughout the region by the end of the Cretaceous.

The deep intermontane basins (such as the Powder River Basin) were formed by early Tertiary time and became completely filled with sediment by mid-Tertiary time. The thick coal seams that are being mined near Gilette, Wyoming are in the Paleocene Fort Union Formation. The coal is sub-bituminous to lignite in grade. Because of its low sulfur content it is being burned in many midwestern power plants. At times in the past this coal has ignited spontaneously upon contact with the atmosphere. The resulting underground fires baked the surrounding sediment producing the red rubble (called clinker) that can be seen in some of the bluffs around Sheridan.

By late Tertiary times, streams began eroding the Tertiary basin fill. In several instances where the streams encountered buried

mountains or anticlines they cut a spectacular gorge through the structure. Wind River Canyon and Bighorn Canyon are two of the more impressive of these gorges.

Road Log

Stop 1, Steamboat Point. The massive cliff above the highway on the north is called Steamboat Point and is in the Bighorn Dolomite. The grass covered slopes below the cliff are underlain by the Gallatin Limestone and the Gros Ventre Shale. The shales are prone to landslide and create problems for road engineers in the northern Rockies. The dirt road that runs south from highway 14 is in a strike valley along the contact between the Flathead Sandstone and the Precambrian granites.

Proceed east on highway 14, 2.6 miles to Sand Turn. Where space permits we will pull off of the road before Sand Turn to examine the Bighorn Dolomite and the Devonian sediments.

Stop 2, Sand Turn. The Madison Limestone is well exposed along the highway on either side of Sand Turn. The top of the Madison here contains a number of solution pockets, some containing secondary mineralization. From Sand Turn one can look back up the highway to see the large landslide called Fallen City. The slide is entirely in the Bighorn Dolomite. A second, perhaps younger landslide can be seen due south of Sand Turn along the same ridge. The two slides damed up Little Tongue River. The water from the river currently finds its way from the dams to Tongue River Cave some two and a half miles to the north.

Continue down the highway 1.7 miles to the next stop. Madison Limestone is exposed along the highway over most of this distance.

Stop 3. If we can pull the buses off the road here we will stop to examine the contact between the Madison Limestone and the Darwin Sandstone. The top of the Madison is very irregular with the suggestion of the development of a karst surface prior to deposition of the overlying Amsden (Sando, 1974). Breccias of limestone and red clay are common in many of the caves in the area and are interpreted to represent cave collapse during Amsden sedimentation.

Continue 1 mile down the highway. We will cross the Amsden-Madison contact six times in the next three miles.

Paleokarst (?) breccia near the top of the Madison Limestone. From an outcrop at the south end of the Natural Corrals on the Hillsboro, Montana quadrangle. The large limestone block is in a matrix of red silt and shale.

Stop 4, Hairpin Turn. From here one can get a good view of the Powder River Basin. Like most Laramide structures, the Powder River Basin is very asymmetric. The basin axis is ten to twenty miles east of the Bighorn Mountains while the east margin is another 100 miles further to the east. Dips on the east flank of the basin are less than one degree while west flank dips are usually 20 to 30 degrees or more.

Continue down the highway 1.3 miles to a large pull out along the north side of the road.

Stop 5 Amsden Fault. The red shales of the Horshoe Member of the Amsden Formation are in fault contact with the purple limestones of the Ranchester Member. Many of the faults bordering the Laramide structures are high-angle reverse faults. One school-of-thought suggests that these faults steepen with depth into the Precambrian basement. During the 1970's a considerable amount of evidence came forth suggesting that these faults flatten with depth into the Precambrian rocks.

Continue down the highway. Notice the tree-covered, triangular-shaped flat-irons along the highway. These are outcrops of Tensleep Sandstone. About 1.1 miles from stop 5 we will cross the contact with the Permo-Triassic redbeds. We will stop if road conditions permit.

Stop 6 , Redbeds. The Chugwater Formation is a distinctive unit throughout Wyoming. Some thin gypsum units are present in the lower part of these redbeds. In the Black Hills, small caves are known from thicker gypsum layers than are present in the Bighorn Mountains.

Continue down the road one and a half miles to a pull out on the north side of the highway.

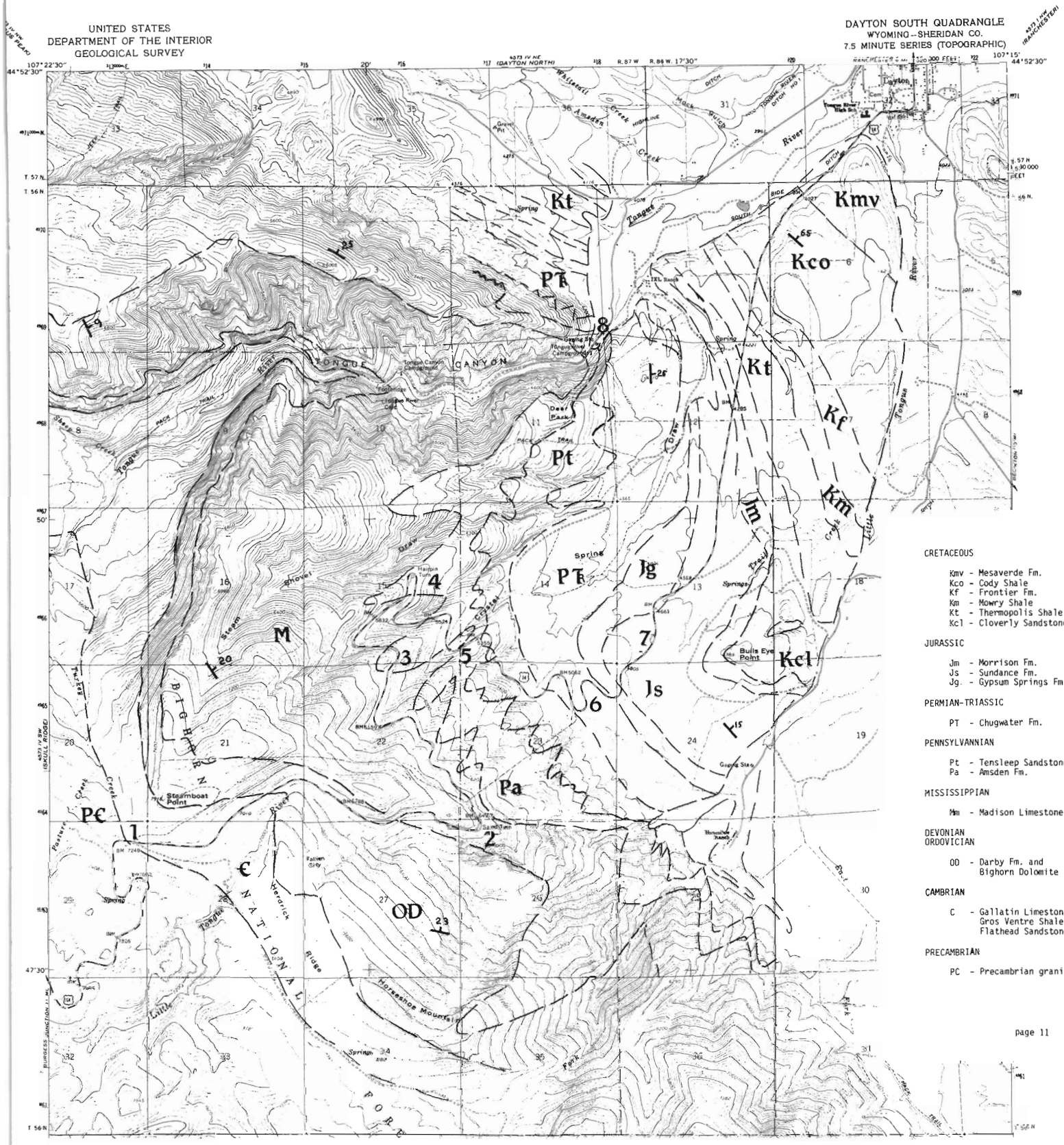
Stop 7. The Cretaceous strata are not well exposed along the highway so we will discuss them from this stop. The tree covered ridge across the road is Bulls Eye Point. The trees are growing on the Cloverly Sandstone. The sand is porous and retains enough moisture to allow tree growth. The moist sands are also cooler than surrounding rocks and a favored gathering place for reptiles. The outcrop a short distance back down the highway is Gypsum Springs Limestone.

Proceed down the road to Dayton. On the east side of town we will turn north and cross the river. We will then continue on a gravel road westward to Tongue Canyon along the north side of Tongue River.

Stop 8, Tongue Canyon. Tongue River Cave is a popular tourist attraction in the canyon. The springs by the campground at the mouth of the canyon may be the resurgence of the stream in Tongue River Cave. The large cave entrance visible from the end of the road in the canyon is Cliff Dwellers Cave.

Return to Sheridan. If time permits we will stop at some of the historical markers along the road.

"Too Long Inside" by Mike Kopriva



CRETACEOUS

Kmv - Mesaverde Fm.
Kco - Cody Shale
Kf - Frontier Fm.
Km - Mowry Shale
Kt - Thermopolis Shale
Kcl - Cloverly Sandstone

JURASSIC

Jm - Morrison Fm.
Js - Sundance Fm.
Jg - Gypsum Springs Fm.

PERMIAN-TRIASSIC

PT - Chugwater Fm.

PENNSYLVANNIAN

Pt - Tensleep Sandstone
Pa - Amsden Fm.

MISSISSIPPIAN

Mm - Madison Limestone

DEVONIAN
ORDOVICIAN

OD - Darby Fm. and
Bighorn Dolomite

CAMBRIAN

C - Gallatin Limestone
Gros Ventre Shale
Flathead Sandstone

PRECAMBRIAN

PC - Precambrian granites

Fauna of Wyoming

by Carol (Crickett) Uhl

Wyoming is one of the last areas with abundant wildlife habitat in North America. Because we have large natural areas, unpopulated and unspoiled by man, we have large populations of wildlife.

According to the Wyoming Game and Fish Department, Wyoming has 100 species of mammals of both game and nongame status. There are 322 species of birds, including upland game species, rapters, waterfowl, and songbirds. We also have 23 species of reptiles, 12 amphibian species, and 78 species of fish. Since it is impossible to deal with every animal, I will merely mention where some of the more interesting animals may be found.

Wyoming has eleven species of bats. Most of them occur statewide, although a few are restricted to small portions of the state. Keen's Myotis (Myotis Keenii) is found in the extreme northeastern part of the state. The Spotted bat (Euderma maculatum) is rare and known only in the Bighorn Basin. Typical cave-dwelling species are Townsend's Big-eared bat (Plecotus townsendii) and the Big Brown bat (Eptesicus fuscus).

Rocky alpine slopes in the Rocky Mountains are the home of the pika (Ochotona princeps). It is a small brown tailless animal in appearance to a vole and about the size of a rat. Pikas live in rockslides and talus slopes near timberline. They are difficult to see, but their squeaks and whistles are highly audible.

Species inhabiting mountain ponds and marshes include muskrats, beaver, and otter. Other animals associated with wet areas are mink, raccoons, and such waterfowl as teals, mergansers, and goldeneyes. Mountain lakes and streams produce several species of trout (rainbow, lake, golden, brook, brown, and cutthroat).

Forested areas are inhabited by large mammals such as mule deer, whitetail deer, elk, lynx, mountain lions, black bears, and grizzly bears. Small mammals include chipmunks, skunks, marten, fisher, weasels, and cottontails. Marmots are associated with rock piles. Although they are seldom seen, Bighorn sheep occupy steep cliffed areas on mountain slopes and in canyons.

Birds associated with coniferous forests include chickadees, woodpeckers, gray jays, bluebirds, owls, and blue grouse. Ravens, Bald and American eagles and red-tailed and sharp-shinned hawks are associated with both woodlands and open country.

Occupants of the grasslands, shrublands, and foothills country include jackrabbits, badgers, gophers, cottontails, and praire rattlesnakes. Praire dogs and black-footed ferrets occur in association with each other on the prairie. Larger mammals associated with shrub and prairie country include coyotes, foxes, bobcats, and deer. Probably the most obvious prairie inhabitant is the pronghorn antelope.

Lowland birds include mourning doves, blackbirds, vultures, sage grouse, chukar, several hawk species, bald eagles, and prairie falcons. Various species of ducks can be found in the lakes, ponds, and potholes of the prairie and foothills.These include pintail, teal, shoveler, mallard, and gadwall. Also associated with watered areas are geese, swans, and shorebirds such as killdeer, willets, avocets, gulls, herons, and sandhill cranes. The rivers in the basins are inhabited by brown and rainbow trout while the reservoirs are stocked with pike, bass, walleye, bullheads, and bluegill.

Vegetation of North Central Wyoming

by Carol (Crickett) Uhl

Many factors influence the type of vegetation found on the landscape including geology and soils, topography, and climate (precipitation and temperature). Generally, vegetation is correlated with altitude in the Rocky Mountains. Vegetation zones are stratified from high elevation to basins. Some species are limited to a certain zone while others are present in several zones.

The Bighorn Mountains range in elevation from 6500 feet to 13,165 feet (Cloud Peak). The Powder River Basin to the east and the Bighorn Basin to the west average about 4500 feet. The following is a short description of the vegetation likely to be encountered in northern Wyoming.

Alpine zone

The highest and generally wettest vegetation zone occurs from timberline to the mountain crests. In Wyoming, this alpine zone ranges above 10,500 feet in elevation. It is characterized by rocky summits, scree slopes, alpine lakes and meadows, streams, snowbanks, glaciers, alpine tundra, and krumholz. Krumholz is the upper limit of tree survival. These trees are weirdly shaped, stunted, and gnarled by the wind. Generally, the tree species are same as the subalpine zone, usually Limber Pine (Pinus flexilis), Engelmann Spruce (Picea Engelmannii), and Subalpine Fir (Abies lasiocarpa). Tundra vegetation is uaually composed of small, mat-forming plants with some low growing shrubs.

There are rushes and sedges, and aquatic grasses in the very wettest spots, with willows, currant, and shrubby cinquefoil (Potentilla fruticosa) along streams and marshy areas. In the drier, exposed areas are low growing cushion plants with tiny flowers, such as phlox, alpine forget-me-nots (Eritrichium elongatum), and clover. The protected meadows also exhibit beautiful arrays of wildflowers beginning in late June. Some of these include bluebells (Mertensia sp.), gentians, and elephanthead (Pedicularis sp.) Plants associated with rocky areas include mosses, stonecrops (Sedum sp.), and the Parry primrose (Primula parryi). Another interesting alpine aspect are the species associated with receding snowbanks. The snow-lily or dogtooth violet (Erythronium grandiflorum) is a small bright yellow lily with drooping flowers. Also found is the snow buttercup (Ranunculus adoneus). Both are generally found in the meltwater area bordering melting snowbanks and glaciers.

Subalpine Zone

The subalpine zone extends from about 10,000 feet to timberline. It is an area of dense forests of Subalpine fir and Engelmann spruce, interspersed with high meadows of asters, larkspur, and lupine. Very wet areas produce shooting stars (Dodecatheon sp.), marsh marigolds (Caltha leptosepala), globeflowers (Trollius sp.), and fairy slippers (Calypso bubosa).

ELEVATION (in feet)	VEGETATION ZONE	VEGETATION COMMUNITY
10,500	Alpine	Tundra
10,000	Subalpine	Spruce-Fir Lodgepole Pine Douglas Fir Ponderosa Pine
8,000	Montane	
6,000	Foothills	Shrub-grass
4,000	Grassland and Salt Desert Shrub	Short-Mixed grasses Saltbush

Montane Zone

The montane zone extends from 8000 feet to 10,000 feet. It includes timbered slopes and grassy parks. The upper level has spruce-fir forests typical of the subalpine zone. The middle level has stands of lodgepole pine (*Pinus contorta*). At the lowest level, Douglas fir (*Pseudotsuga manziesii*) grows on moist north slopes, and Ponderosa pine inhabits the sunnier slopes. Aspen (*Populus tremuloides*) groves intersperse with the conifers in moist areas and valleys.

The montane forest understory varies greatly. The spruce-fir community may be undergrown by whortleberry (*Vaccinium scoparium*), junipers, buffaloberry (*Shepherdia sp.*), and kinnickinnick. Lodgepole pine may have whortleberry, buffaloberry, or heartleaf arnica (*Arnica cordifolia*) beneath it, or may have only a layer of pine needles and a few scattered grasses. The Ponderosa pine-Douglas fir community may have an understory of juniper, buffaloberry, sagebrush (*Artemisia sp.*), and bitterbrush (*Purshia tridentata*). Aspen groves are often lush with wildflowers - columbines (*Aquilegia sp.*), geraniums, paintbrush (*Castilleja sp.*), asters, and woodlilies (*Lilium umbellatum*).

Foothills Zone

The foothills are the lowest slopes of the mountains. The elevation is usually from 6000 to 8000 feet. This zone is covered by grass and shrub growth and small trees. Some Ponderosa pine and Douglas fir may be found scattered about. Aspen, willows, and currant may be found in moister areas. The shrub-grassland community dominates the landscape. Sagebrush grows in areas of good soil development, while bitterbrush grows in shallow soils. Mountain mahogany grows in limestone areas. In Wyoming, true mountain mahogany (*Cercocarpus montanus*) is found in the east, while curlleaf mountain mahogany (*C. ledifolius*) grows in the west. The major grasses associated with the foothills are similar to those found on the prairie - wheatgrasses (*Agropyron sp.*), needlegrasses (*Stipa sp.*), bluegrasses (*Poa sp.*), and fescues (*Festuca sp.*).

Grassland Zone

Interspersed with and occurring below the foothills are the grasslands. The range of elevation lies between 4000 and 6000 feet. Grasslands, or in Wyoming, high plains, are characterized by rolling grassy expanses with few shrubs or trees. This is "cattle country", the area where the deer and antelope and the buffalo roamed, followed later by cowboys and cattle.

Prairie is usually categorized by height of the grass species. The predominant grassland types are mixed-height grasses and shortgrasses. Mixed grasslands are composed of intermediate height grasses such as wheatgrasses and needlegrasses. The shortgrass prairie is composed of buffalograsses (*Buchloe dactyloides*) and gramagrasses (*Bouteluoa sp.*). Also present on the grasslands are forbs such as phlox, larkspur, locoweeds, evening primrose (*Oenothera sp.*), and daisies.

In an effort to understand high plains grassland ecology, an area has been set aside to study it. The Thunder Basin National Grassland, located in the Powder River Basin, is administered by the Medicine Bow National Forest. The National Grassland is managed for both livestock and wildlife resources, as well as energy interests and recreational activity.

Salt Desert Shrub Zone

Occurring at the same elevation as the grasslands, is the salt desert shrub country. This area is characterized by alkaline soils and their associated vegetation. Saline lowlands are comprised of greasewood (*Sarcobatus vermiculatus*) and alkali grasses, while the uplands are composed or various species of saltbush (*Atriplex sp.*) and woody aster (*Machaeranthera sp.*)

This is by no means a complete discussion of the vegetation of north central Wyoming. If you would like more information, contact the U.S. Forest Service, Bureau of Land Management, or National Park Service, or consult the following books:

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A Brief Synopsis of the Paleontology of Natural Trap Cave

By B. Miles Gilbert

This breached cavern in the Madison Limestone has been open and trapping animals since at least somewhat before 107,000 (USGS date) to 110,000 (University of Nebraska date) years ago. Bones of horse, hare, and sheep have been recovered from below a volcanic ash so dated.

Thus, Natural Trap Cave contains the longest sequence of stratified late Pleistocene deposits yet recognized. It contains many of the same fauna as Rancho La Brea and some not found there. More importantly, the deposits are clearly stratified, unlike the colloidal tar matrix of La Brea, and they also contain pollen and phytoliths.

Togeather, these data sets have yielded dated, complementary sequential records of climactic change. The environments represented at any given time by a fauna have been mirrored by the proper and expected environments represented by plant remains.

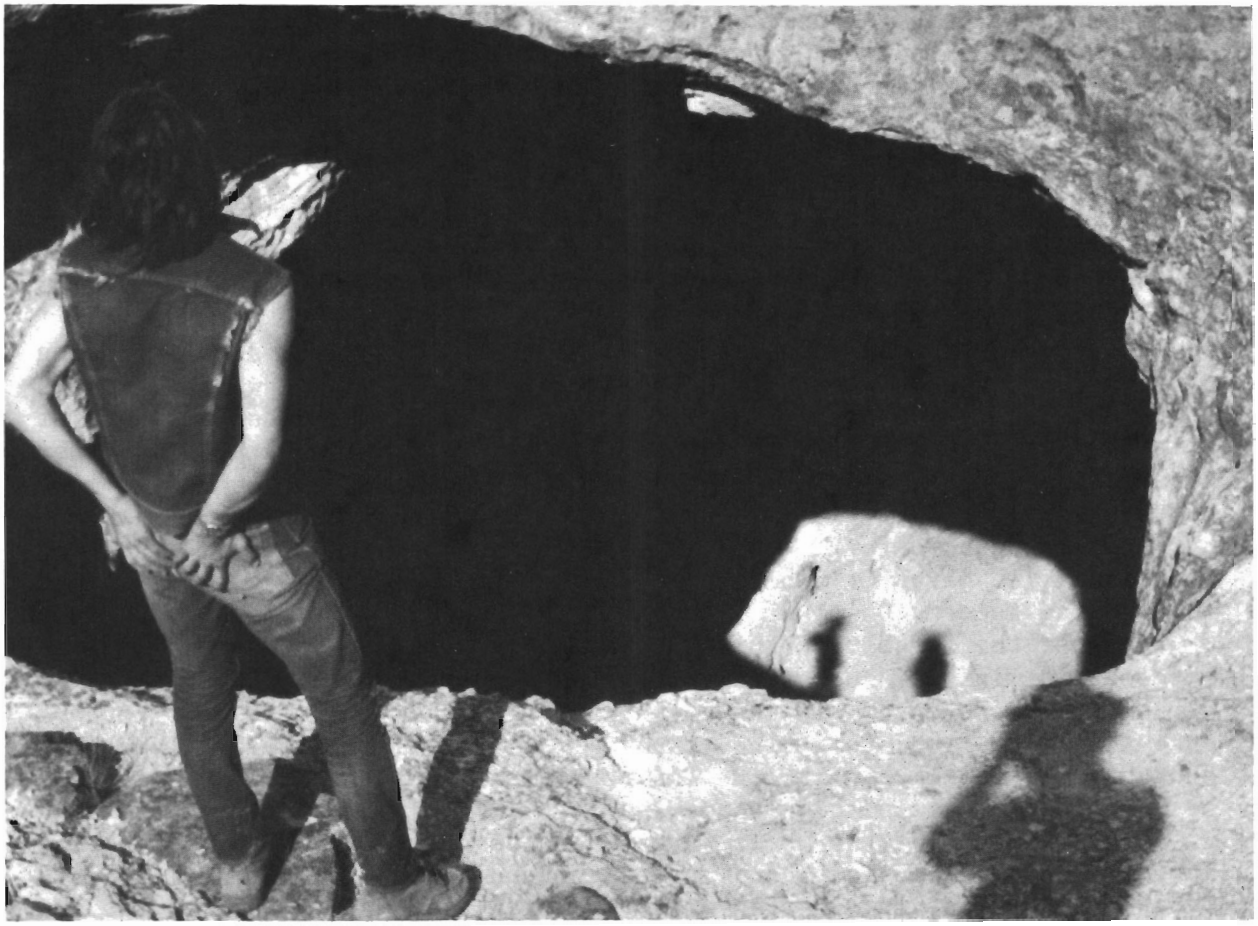
The cave deposits have produced an incredibly rich fauna including six kinds of horses; two of these are new taxa, and one will be called "trapensis". Also new to science, and twice featured on the cover of Science, is the American cheetah Miracinonyx trumani. Although not new to science, the Trap has produced enough musk ox material to clarify musk ox taxonomy.

Another tundra-form, the collared lemming (as featured in a cast of thousands in Never Cry Wolf) was found to be present, and represented a new Wyoming record.

By far the largest pursuit predator of the Ice Age, and only scantly represented in any other site, the enormous short-faced bear Arctodus simus is represented in the cave by several animals. They, or perhaps the American lion (six individuals in Natural Trap Cave) lived long enough after falling in, to chew on remains of bighorn sheep as evidenced by large punctures in sheep bones.

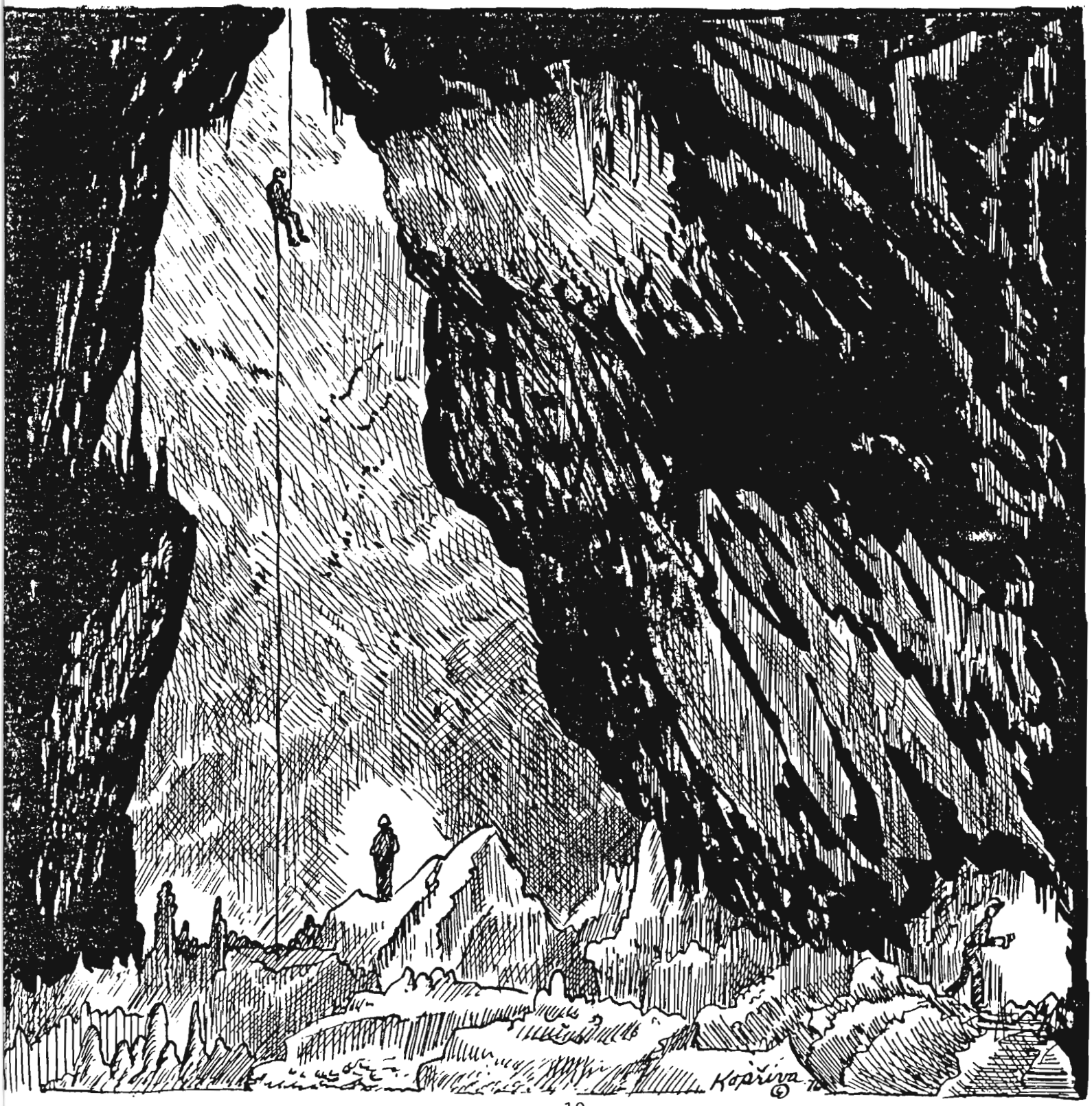
The majority of the sheep were adult rams, an extinct form about 15% larger than modern sheep, and any one of them would qualify as a Boone & Crocket trophy by modern standards. Natural Trap Cave is one of the few sites where modern wolf Canis lupus and Dire wolf Canis dirus occur in the same strata. Clearly the larger form was not ancestral to the modern wolf.

Because the Trap has been open so long, during various climactic regimes, it contains a fossil record of all of them and enables paleontologists to measure the length of each period, to ascertain the floral and faunal content of each period, and to test some hypotheses about climactic change and megafaunal extinction. It is therefore one of the most informative caves in North America.



Mark Stock is looking down the 75 foot entrance drop of Natural Trap Cave. This entrance is currently gated! A number of late Quaternary animal remains have been found in the sediment beneath the pit.

CAVE DESCRIPTIONS



Little Mountain Caves

The caves in this area of the Bighorn Mountains are all in the upper part of the Madison Limestone. The caves are presently 1000 to 1400 feet above the Yellowtail Reservoir. Bighorn Canyon to the west and Devil Canyon to the north of the caves offer spectacular views.

Devil Canyon Cave

The entrance of Devil Canyon Cave is along the north wall of a shallow sink-hole north of the Horsethief-Bighorn system. The cave is developed near the top of the Madison Limestone. This small cave consists of two large rooms connected by a short crawl in breakdown. The entrance room has a flat, sediment-covered floor while the back room is full of breakdown. Numerous rattlesnakes have been noticed in the entrance area in some years.

Natural Trap Cave

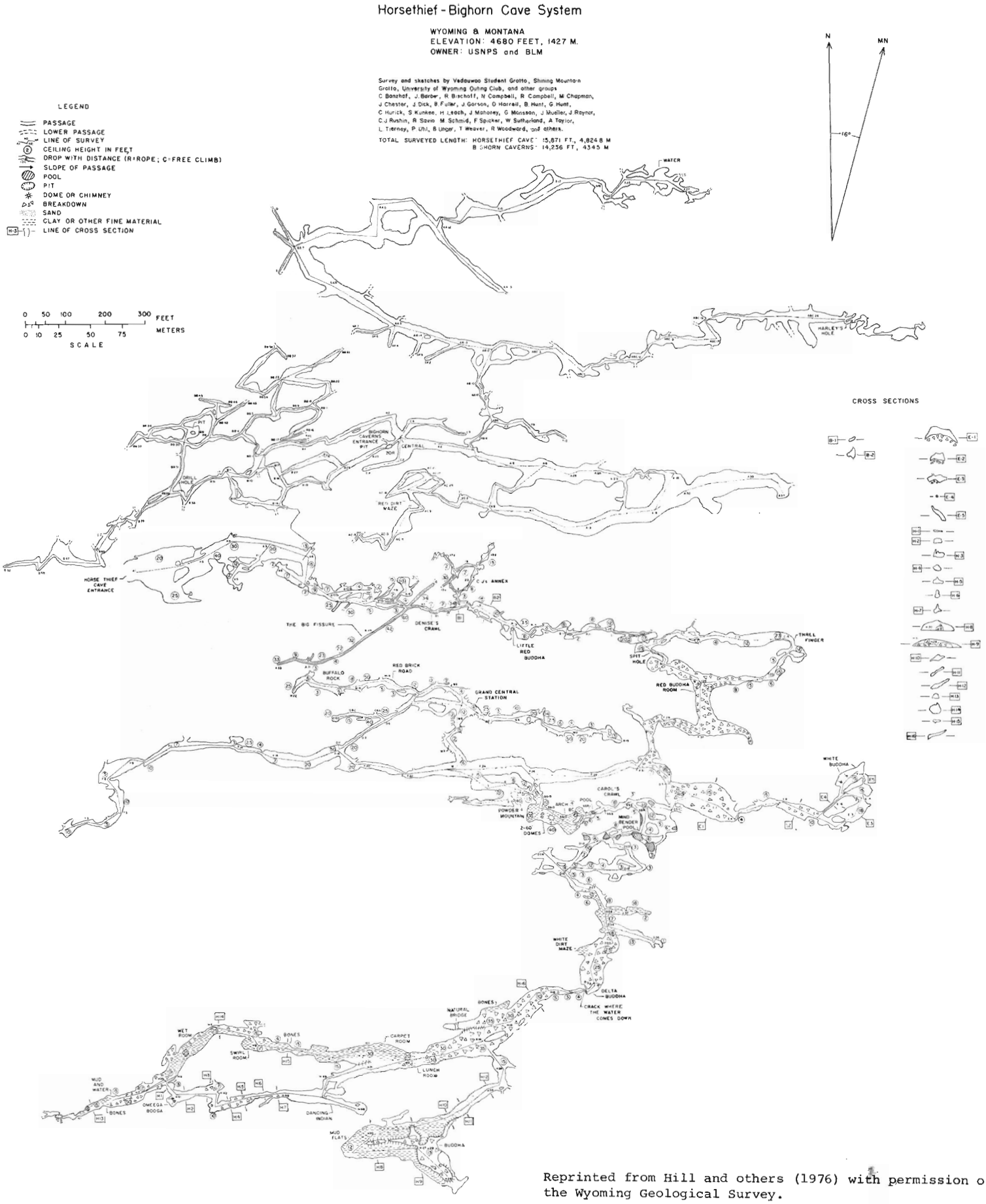
Natural Trap Cave has a spectacular entrance 15 feet wide at the top with a 75 foot drop into a large room 100 by 150 feet across. A number of late Pleistocene to recent animal remains have been found in the sediment beneath the drop. A small hole along the east wall of the room leads to a series of crawls and low rooms and eventually to another large, breakdown chamber. Several hundred feet of small rooms and crawls are known beyond this second chamber. Entry to the Trap is controlled by the Bureau of Land Management in Cody.

Horsethief-Bighorn System

With more than 53,000 feet (16 kilometers) of mapped passage, the Horsethief-Bighorn system is the longest cave in Wyoming and Montana. It is also the prettiest. The Bighorn Caverns entrance pit is gated with access controlled by the National Park Service in Lovell, Wyoming. The gate in Horsethief is in a crawlway a short distance past the entrance room. The key may be obtained from the Bureau of Land Management in Cody, Wyoming.

The entrance to Horsethief Cave has been known for many years. In 1970, Denise's Crystal Crawl and other long, dusty crawls were pushed, eventually to come out at the top of the Gypsum Wall. From here one goes through the Spit Hole to the Red Buddha Room (a buddha in Horsethief Cave is a collapsed pile of paleokarst sediment) and onwards to Mind-bender. The cave changes character radically at Mind-bender pool. Prior to this section, the cave is dry and dusty with a few interesting gypsum speleothems. Here in the Mind-bender area is a tremendous variety of calcite speleothems and rimstone pools. Several particularly delicate areas have been ropped off with plastic tape. In the little more than a decade since this area was discovered, wear and tear of the formations has become obvious. More care is needed in traversing this section.

Beyond Mind-bender is a large room with dry and decaying speleothems. In the back of this room the Crack Where the Water Comes Down is a very tight crack leading up to the Lunch Room. Once again Horsethief changes character from its typical small passageways to a trunk passage thirty feet high by fifty feet wide. Unfortunately, it is not well decorated. A small side passage leads to the Mud Flats where a hard-to-find



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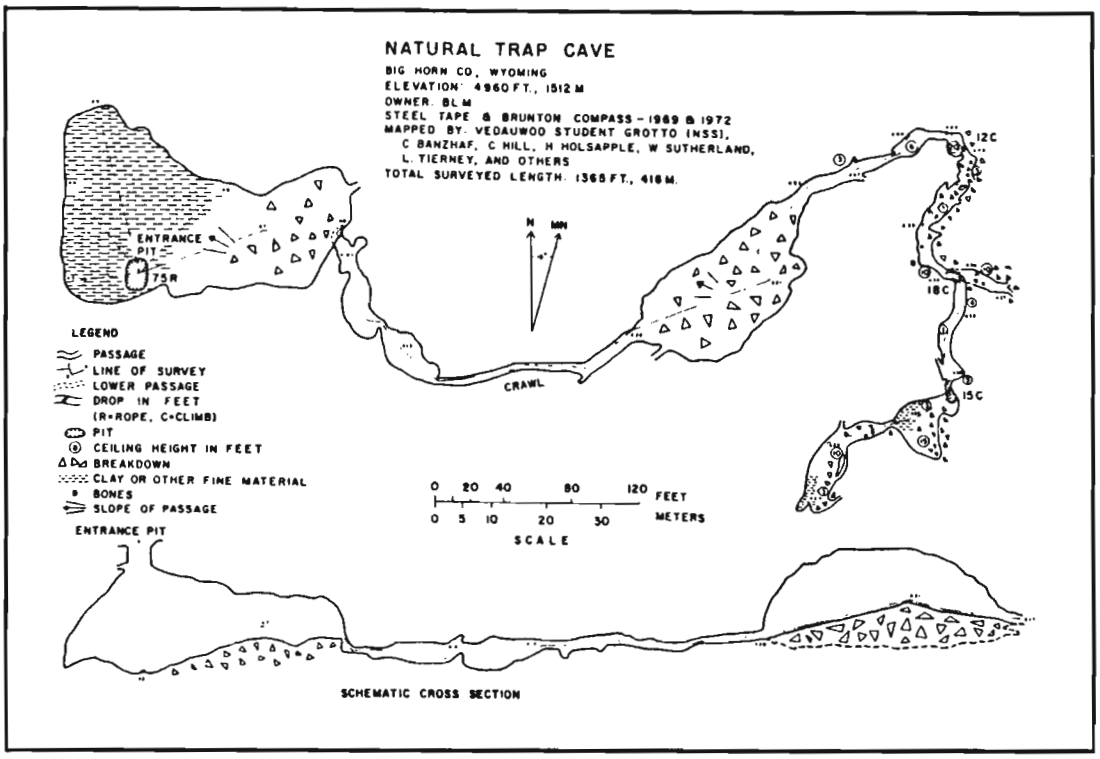
Gypsum flower in Bighorn Caverns. Photo taken by Eric Liebes.



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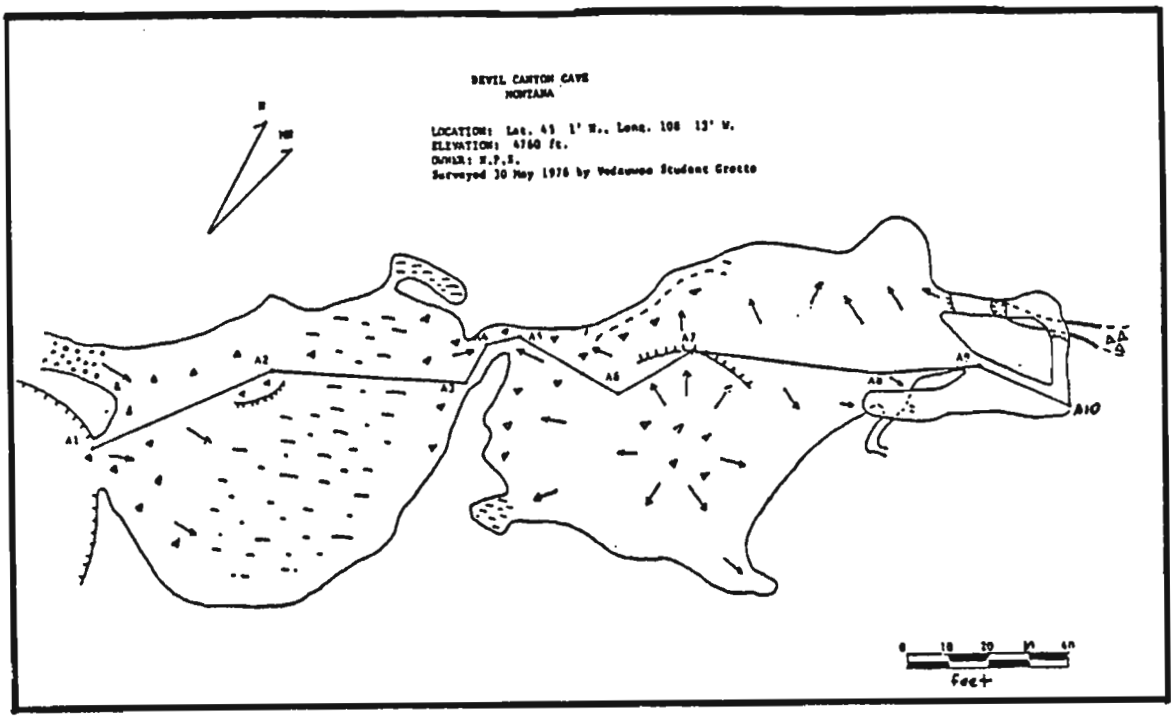


breakdown crawl leads to more large but sparsely decorated rooms.

Other trips in the cave are possible. For those who like to get lost there is the Montana Maze for instance. Some sections of the cave are considered closed because of their scientific value. For this reason and the obvious safety value, it is important that the BLM know where you are going in this large cave.

The Bighorn Caverns entrance to this system is a sixty foot drop to the top of a sediment pile where the mortal remains of small, unwary mammals can occasionally by seen. To the west of the large entrance room is a maze of mostly walking passages and small rooms. Several side passages in this area contain small gypsum speleothems. The small crawlway in this area that connects Bighorn and Horsethief is plugged with concrete therby restricting access to Bighorn Caverns to cavers with vertical gear.

To the north of the main entrance room, a series of small crawls leads through a crawlway maze to the huge trunk passage of Bighorn Caverns. This huge trunk goes northwest for several hundred feet where, in a large breakdown chanber, an equally impressive passage comes in from the northeast. Many of the small rooms and alcoves off of these trunk passages contain calcite or gypsum speleothems. The black "velvet" speleothems in this area are particularly unusual. A long dusty crawl northwest of the large breakdown chamber leads to some small rooms where calcite speleothems have grown through a gypsum crust.

Jayhawk Pit

This small cave is about a mile southeast of Natural Trap. A short entrance pit drops into a large room. Much of the cave is a maze of small passages off of the entrance room. A few speleothems are present. This cave is also managed by the BLM in Cody.

Northern Bighorn Mountains

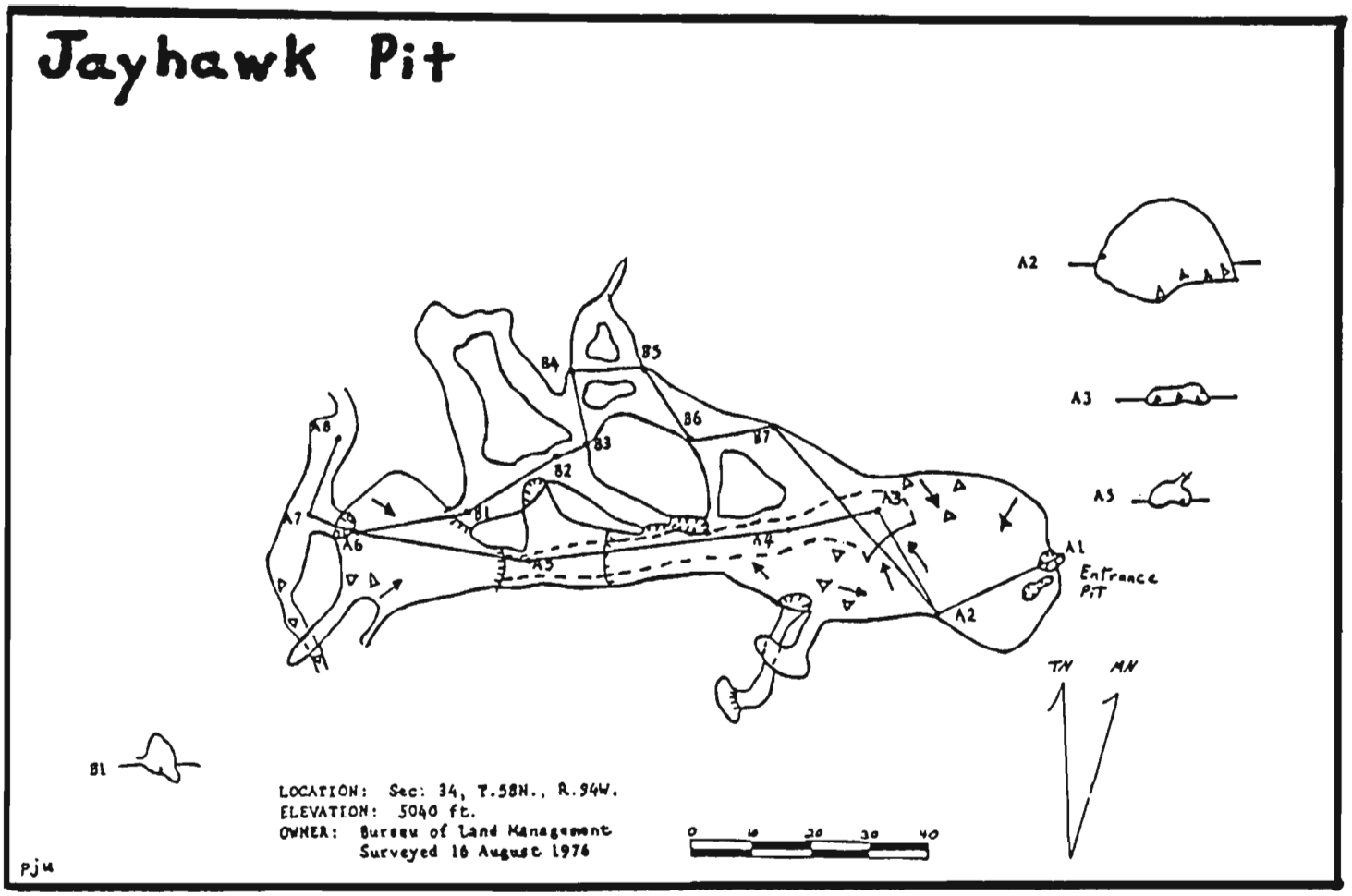
Many alpine karst features are developed in the flat-lying Bighorn Dolomite in the northern part of the Bighorns. Of particular interest are the innumerable fissure cracks north of highway 14A. Most of these caves are very small and impossible to tell apart on the flat, featureless alpine tundra. A few of the more accessible or interesting ones will be described here.

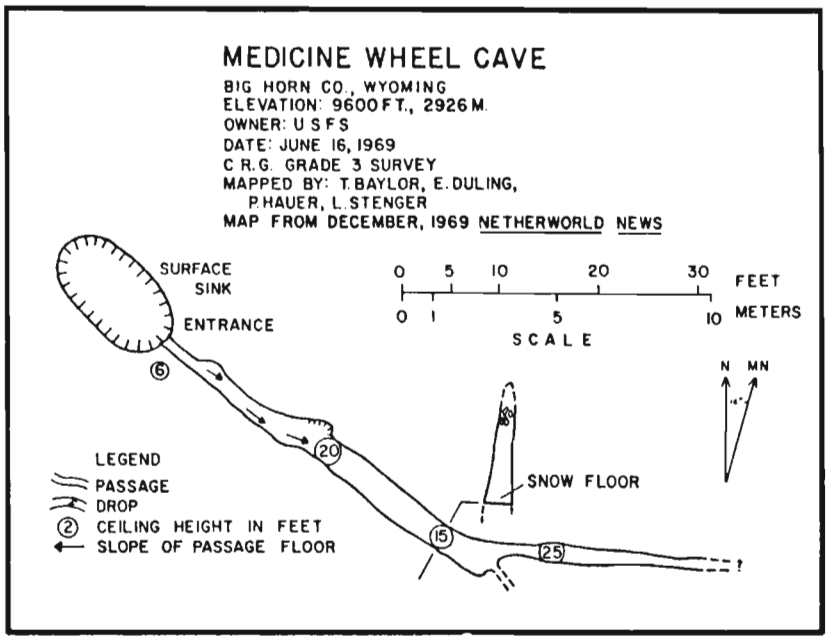
Medicine Wheel Area

The Medicine Wheel is an Indian artifact on the northwest edge of the Bighorn plateau. It is easily accessible in the summer months from highway 14A. Medicine Wheel Cave is 300 feet west of the artifact. A surface sink leads to a fissure about 50 feet long and up to 25 feet high. Other caves are present in the area; most are short, narrow, high fissures.

About one mile northwest of the Medicine Wheel is the deep MacCaskey Bottomless Pit. This cave contains two 65 foot drops in very narrow fissure passages. The lowest surveyed point is 178 feet below the surface but a very narrow fissure continues downward.

Several miles northwest of and 2000 feet below the Medicine Wheel is South Fork Ice Cave (or Poachers Cave). This is one of the few caves in the area developed in the Madison Limestone. As such, its morphology is entirely different. This small cave consists of one large room 50 feet





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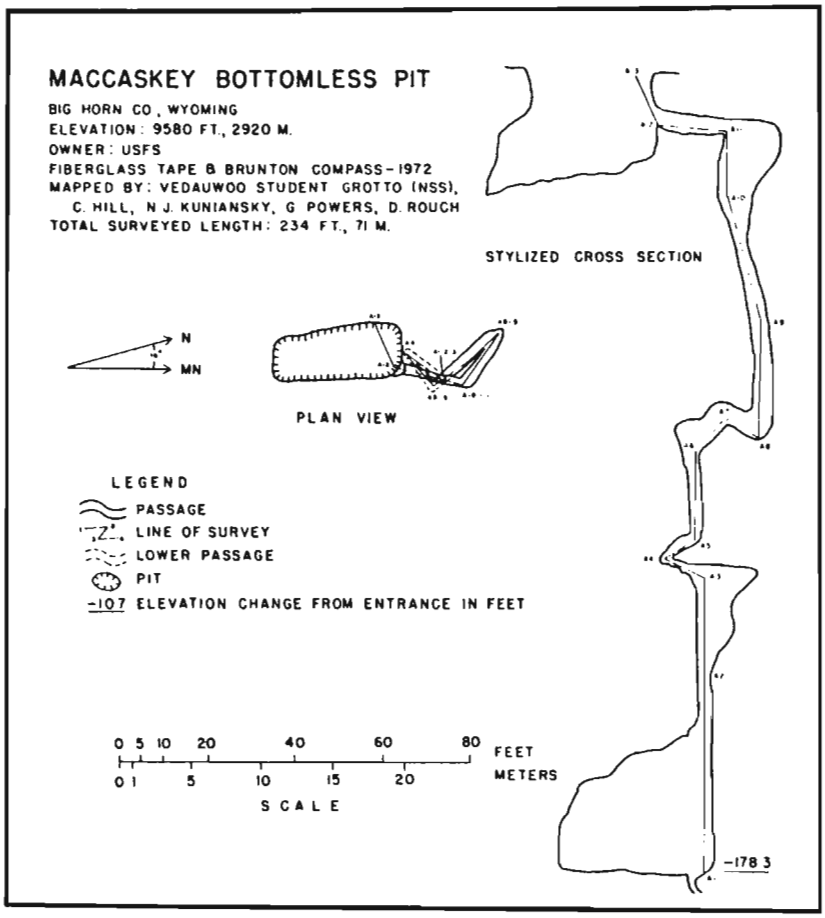

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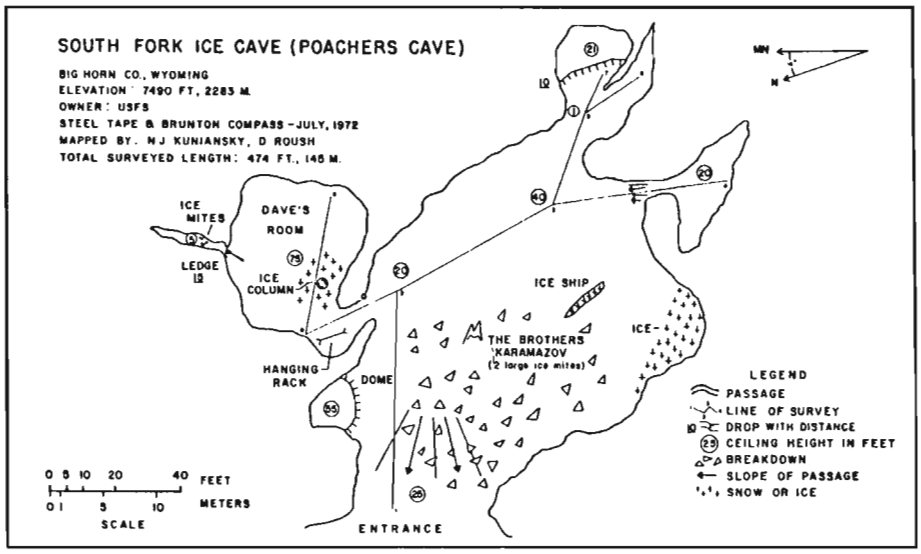

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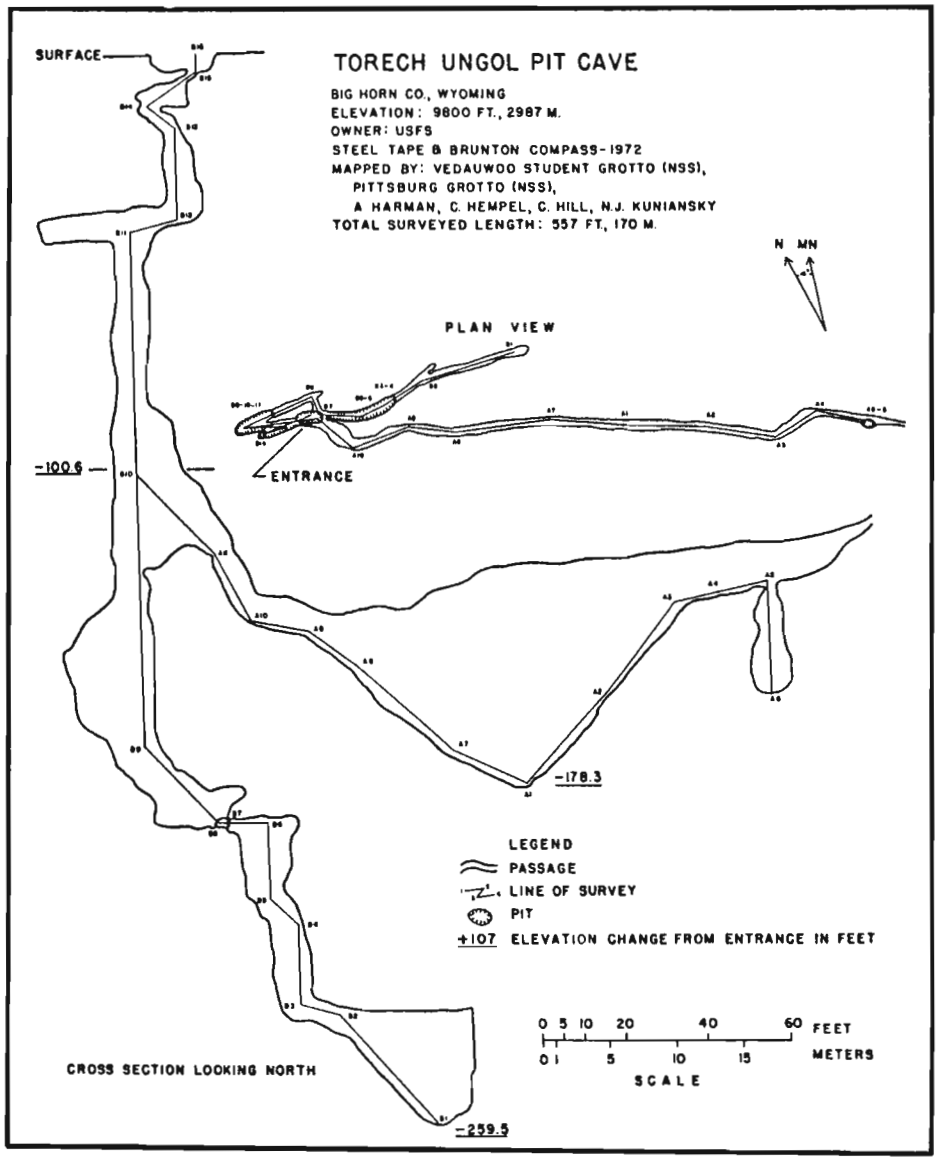
John Scheltens, Lee Tierney, Mark Stock, and Chris Hill examining one of the countless fissure pits in the northern Bighorn Mountains.



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high with several small rooms off to the side. A number of large ice speleothems are present. Several rock shelters and small caves are present in the area.

Another cluster of fissure pits is present in the area of Duncum Mountain along the Bighorn-Sheridan County line. All are narrow fissures in the Bighorn Dolomite; a few are quite deep. Torech Ungol Pit Cave contains the deepest drop in Wyoming; a 220 foot rappel in a fissure only a few feet wide. It is not a pleasant cave to visit. At an altitude of 9800 feet, the cave is cold.

Spanish Point Area

The Paleozoic strata along the west side of the Bighorn Mountains dip five to fifteen degrees to the west. For several miles to the north and south of Spanish Point, a small reverse fault (Trapper Fault) is present near the contact of the Cambrian sediments and the Bighorn Dolomite (Tomes, 1977). All of the streams between Battle Creek and Paint Rock Creek (a distance of about 11 miles) sink in the Bighorn Dolomite. Jack Creek, Mill Creek, and some unnamed creeks do not have any known caves at present. All of the stream caves in this area are very cold (less than 40 degrees) and are at high altitude (7000 to 8500 feet above sea level). Hypothermia and altitude sickness are a constant threat to cavers in this area. A period of time to adjust to the altitude is necessary for those coming up from near sea level for all of the caves while wet suits are required for the major stream passages.

Sinks of Johnny Creek Cave

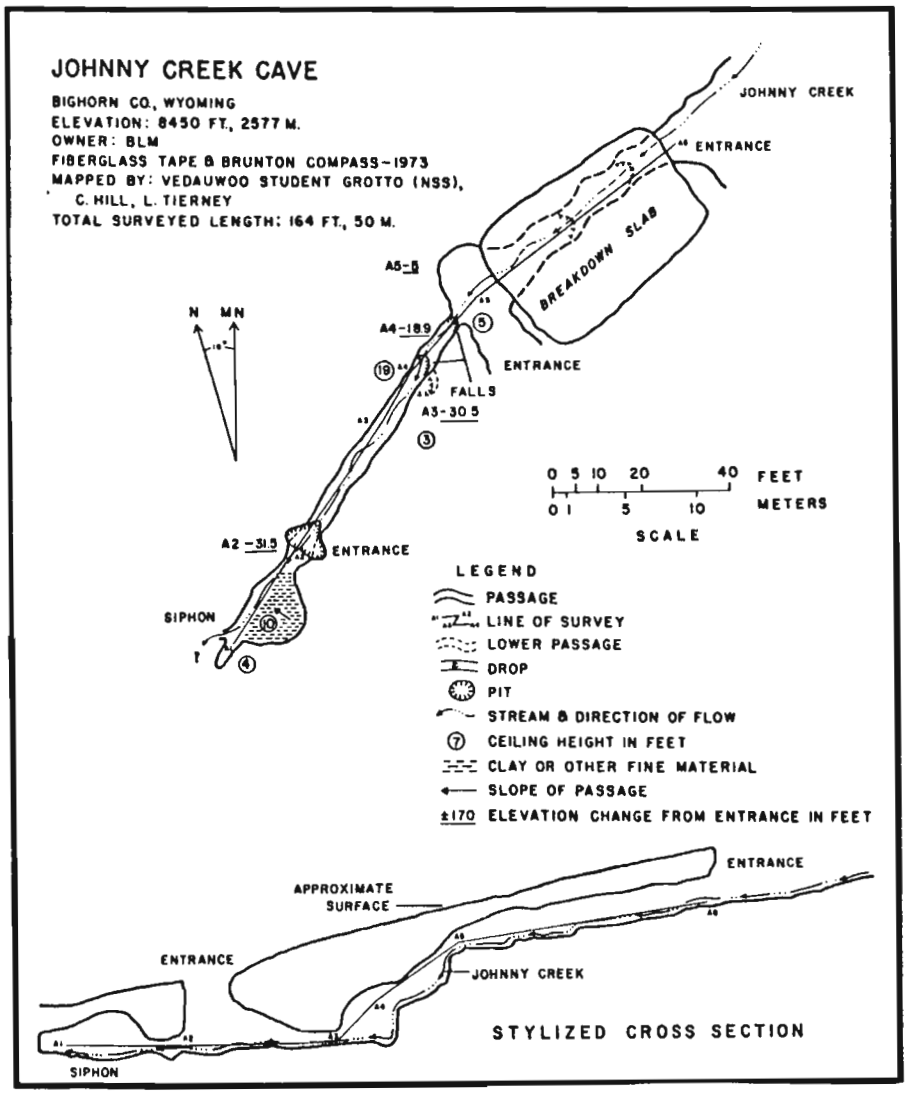
Johnny Creek sinks a short distance past its junction with the dry bed of Trapper Creek. A small cave with three entrances is present before the creek sumps. Several waterfalls are associated with the cave.

Great Expectations (Great-X, Sinks of Trapper Creek Cave)

Trapper Creek sinks just west of the Bighorn National Forest Boundary near a major dirt road. The upper entrance is on private land and is currently gated with access through the Hole-in-the-Wall Grotto. The lower entrance (The Great Exit) is on BLM land.

Trapper Creek sinks in a classic blind valley about 100 feet west of the outcrop of Trapper Fault. A small rock shelter behind the sinks was mapped in 1972 (Hill and others, 1976). In 1977, Sheridan cavers opened the Crisco Crack and explored a half mile of cave. A small part of the entrance area was mapped by the Vedauwoo Student Grotto later that year. During an attempt to finish mapping in September, 1978, John Scheltens and Dave Springhetti climbed up a previously overlooked dome and discovered the Great Hall. Later that year they discovered a huge canyon passage with a thundering river; the dry part of the cave came to an end. In 1979 several thousand feet of river passage had been surveyed by wet-suited teams with no end in sight. The 39 degree temperature and constant wind were beginning to take their toll.

A warm dry winter lured a number of cavers back for Memorial Day in 1980. A late Spring blizzard kept them there three days more than they had planned. As the storm was building, Rick Rigg discovered a major resurgence seven miles from and 1800 feet below the entrance to Great-X. Later that Summer, Paul Schuele discovered a small cave (later shown to be the Great Exit) about 1400 feet below the Great-X entrance. In the meantime, another 4500 feet of river passage was mapped in Great-X. On August 17, 1980, Peter Shifflett and Tom Miller made a second attempt to force their way upstream in the Great Exit. Early the next morning, cold, wet, and weary they emerged from the Crisco Crack; Great Expectations was now the deepest cave in the U. S. A surface survey later showed the total depth of the cave to be 1403 feet.



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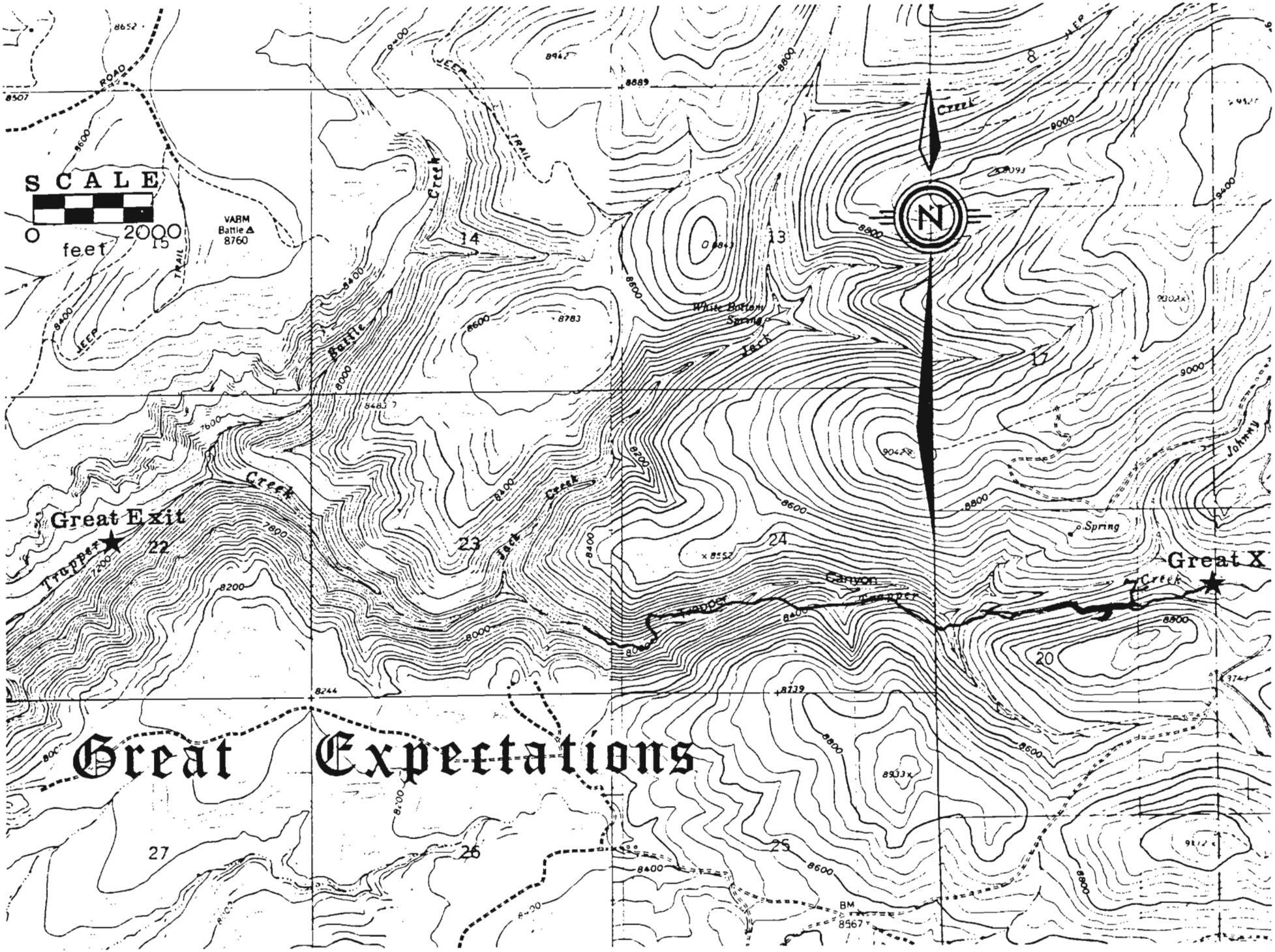
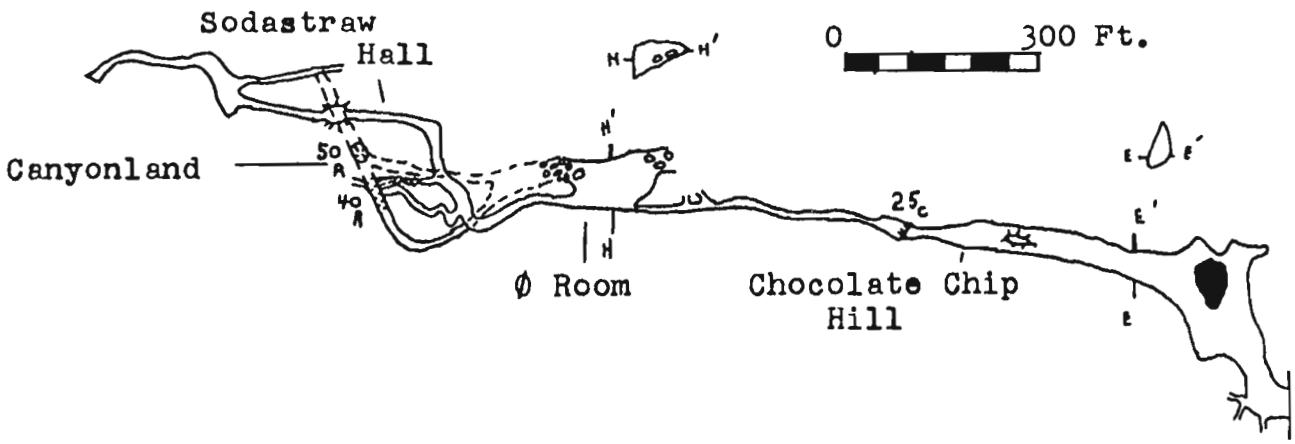
In October, 1980 a number of cavers assembled for more mapping and to do the first through trip from the top. As a party of five cavers negotiated the lower crawl (the Grim Crawl of Death) in the Great Exit, they were reduced to a single working light, all others having been temporarily or permanently put out of action. The stream ripped off entire packs and helmets. They were fortunate to make it out of the cave.

The total surveyed length of Great-X stands at 19,928 feet, about two-thirds of what's known. No survey parties have been back since 1980; Great-X is not a pleasant cave to work in. Further history of Great-X exploration can be found in the NSS News (May, 1981, v. 39, #5 and the Canadian Caver, v. 10, #2 and v. 12, #2).


Great Expectations
Great Exit
Great X
SCALE
0
2000
feet
VABM
Battle
8760
Trapper
Creek
Jack
Creek
Battle
Creek
Canyon
Trapper
Creek
Johnny
Creek
White Bottom
Spring
Spring
JEEP
TRAIL
ROAD
N
13
14
15
20
22
23
24
25
26
27
BM
8567



GREAT - EX CAVE

surveyed by:

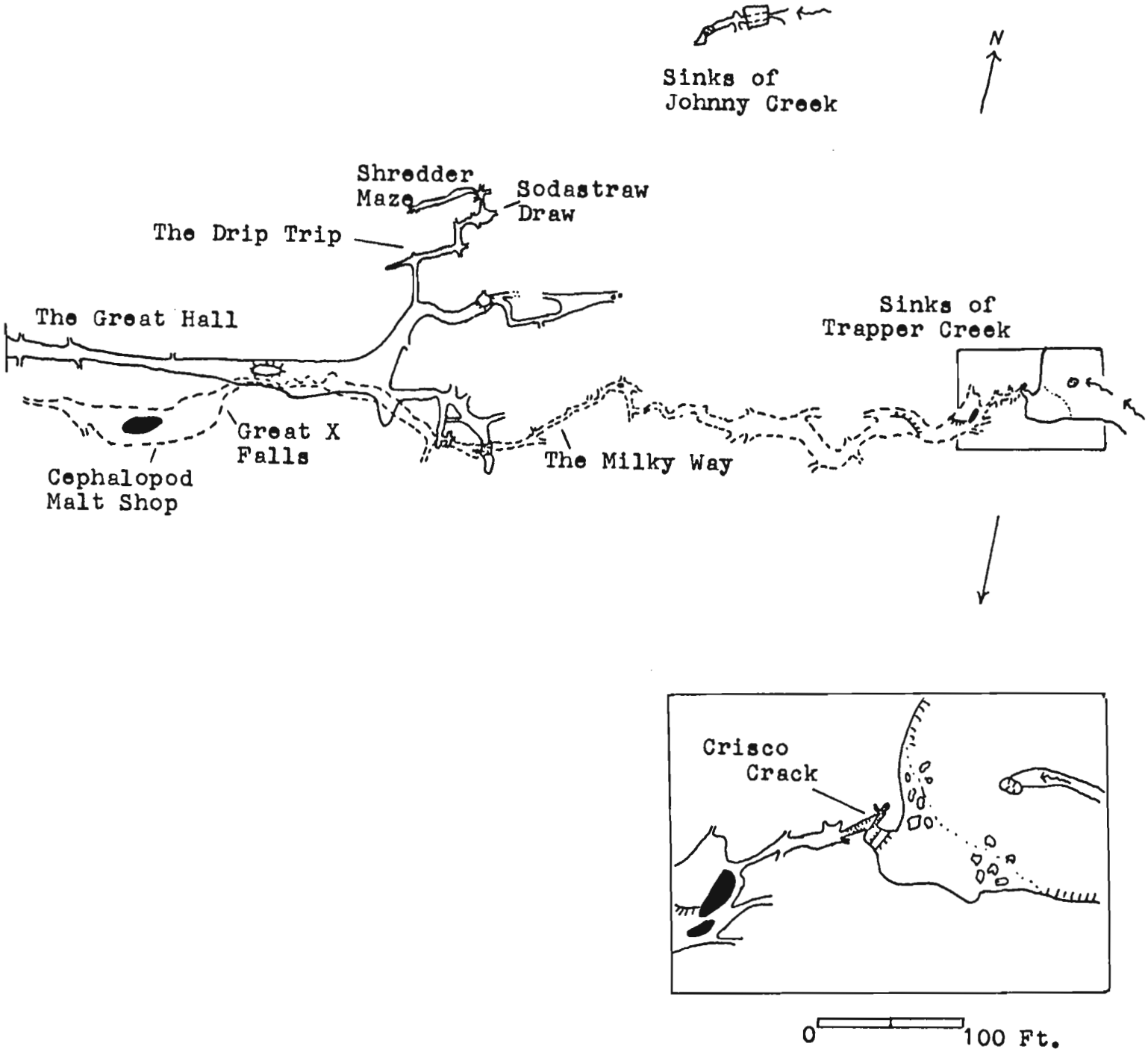
A. Flurkey	J. Scheltens
B. Johnston	P. Scheltens
S. Kopriva	C. Springhetti
E. Liebes	D. Springhetti
S. Lydy	J. Sutherland
P. Melvin	W. Sutherland

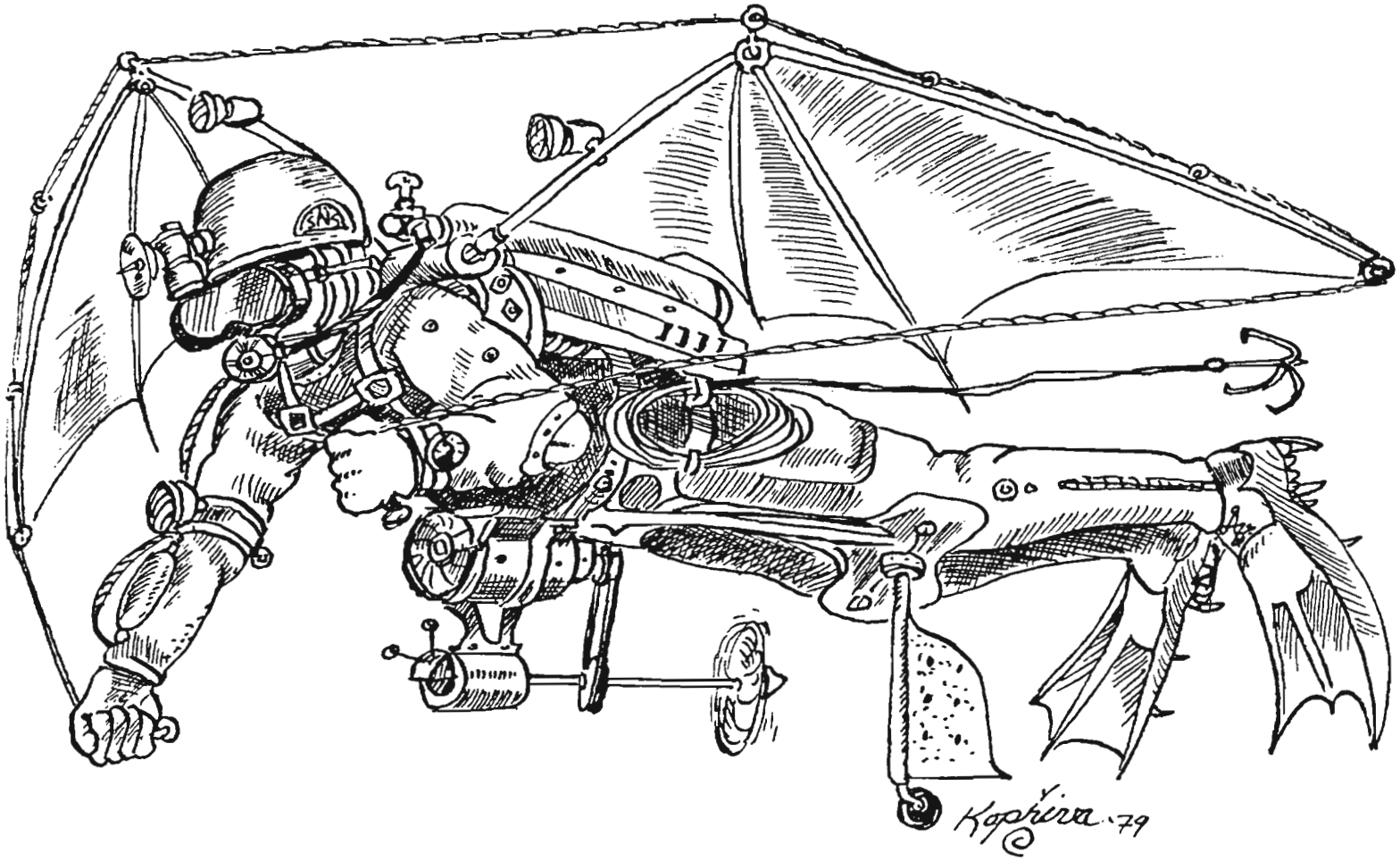
1977 - 1978

drafted by: J. Scheltens

Bighorn County, Wyoming

Map of the dry portion of Great Expectations Cave. The Lost Worland River and the remainder of the cave takes off from the 50 foot pit into Canyonland.


Sinks of
Johnny Creek
N
Shredder
Maze
Sodastraw
Draw
The Drip Trip
The Great Hall
Sinks of
Trapper Creek
Great X
Falls
Cephalopod
Malt Shop
The Milky Way
Crisco
Crack
0
100 Ft.



"Ready for Great X" by Mike Kopriva

Description

Trapper Creek sinks in a swallow-hole in front of a large rock shelter. The Crisco Crack entrance is off to the west side of the shelter. Three short, climbable drops follow in rapid succession. The third drop is tight and lined with "velcro" (eroded dolomite with sharp teeth pointing downstream) and is particulary obnoxious on the way out. After a short walk in the stream one pops into the Depot, a wide, boulder choked passage with a few small soda straws and stalactites. The next few hundred feet of cave consists of tight squeezes and one small room. Shortly after rejoining the stream one can continue along the stream passage or climb up into the Great Hall. The stream passage continues a few hundred feet only to plunge over a short but noisy waterfall into a sump at the entrance of the Cephalopod Malt Shop. This low, wide room contains many white soda straws and fossil Cephalopods in the floor.

The climb up from the stream takes you into walking-height passage that suddenly opens up into the bore-hole known as the Great Hall. This arch-shaped passage is typically 30 to 50 feet wide and up to 100 feet in height. It is 2000 feet long. Old, partially decayed flowstone is present at some places along the wall. North of the entrance area is a small passage that leads into the Shredder Maze. Here, tight, "velcro" lined crawls join a small stream passage that may connect up with Sinks of Johnny Creek.

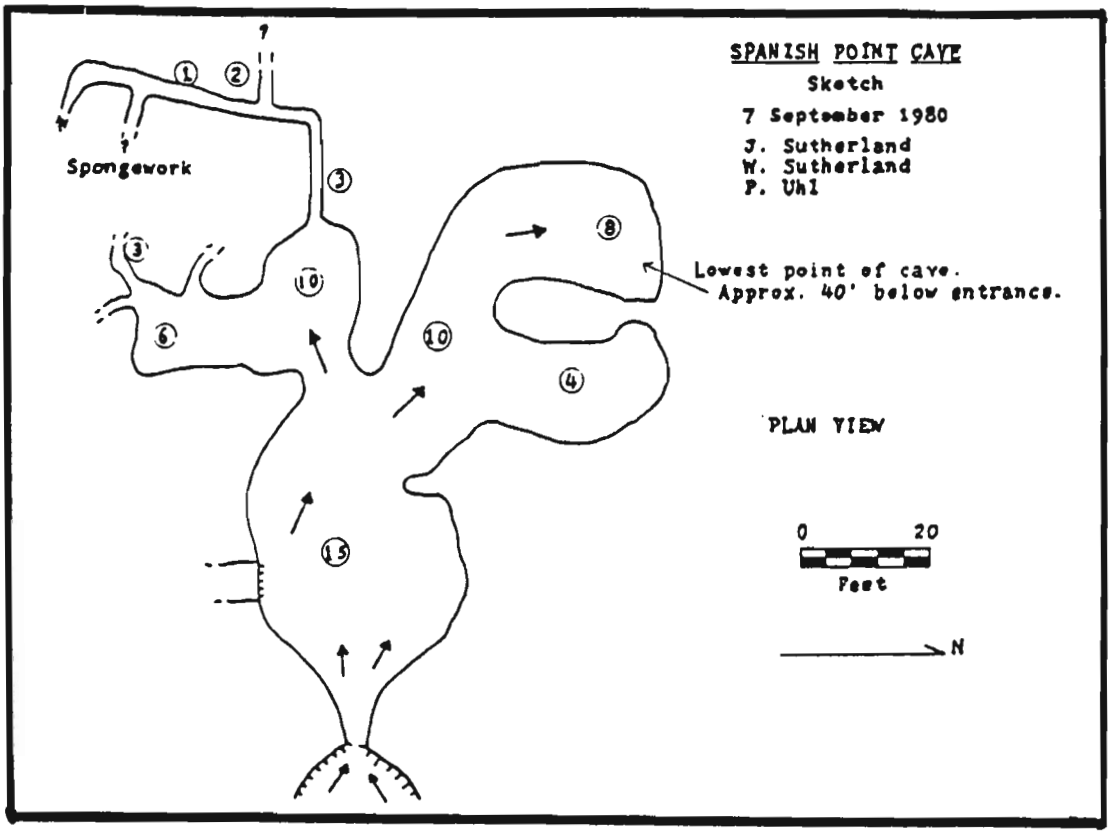
The Great Hall ends at a short, slippery downclimb into the Flowstone Gallery. After a large breakdown chamber (the Phi Room) the rest of the dry portion of the cave consists of a few hundred feet of locally well decorated walking-height passage. The Kitty Combs is a meandering passage connecting the dry cave to the canyon containing the Lost Worland River. Rope drops of forty and fifty feet must be negotiated in order to get to the river.

The Lost Worland River passage continues several miles to the Great Exit. A few dry by-passes are present where the stream sumps along the way. Occassionally, the stream is floored by the quartz-rich sandstone at the base of the Bighorn Dolomite. The stream plunges over a number of waterfalls, several of which require rope.

The principle obstacle to through trips in Great-X is a thousand foot long crawlway near the Great Exit that includes the Grim Crawl of Death. The low, 39 degree, stream-filled, velcro-lined crawl requires low water conditions, a full wet suit, electric light (with several backups) and masochistic tendencies to be traversed. This passage has eaten a considerable amount of caving gear and turned back several strong cavers. For those contemplating this part of the cave I recommend first reading the May, 1981 NSS News.

Spanish Point Cave

This small cave is located in the saddle north of Spanish Point. It is the only known cave in the area that does not contain a large stream. It has a large entrance room with little else. The cave is probably developed in the Bighorn Dolomite.



Dry Medicine Lodge Creek Cave

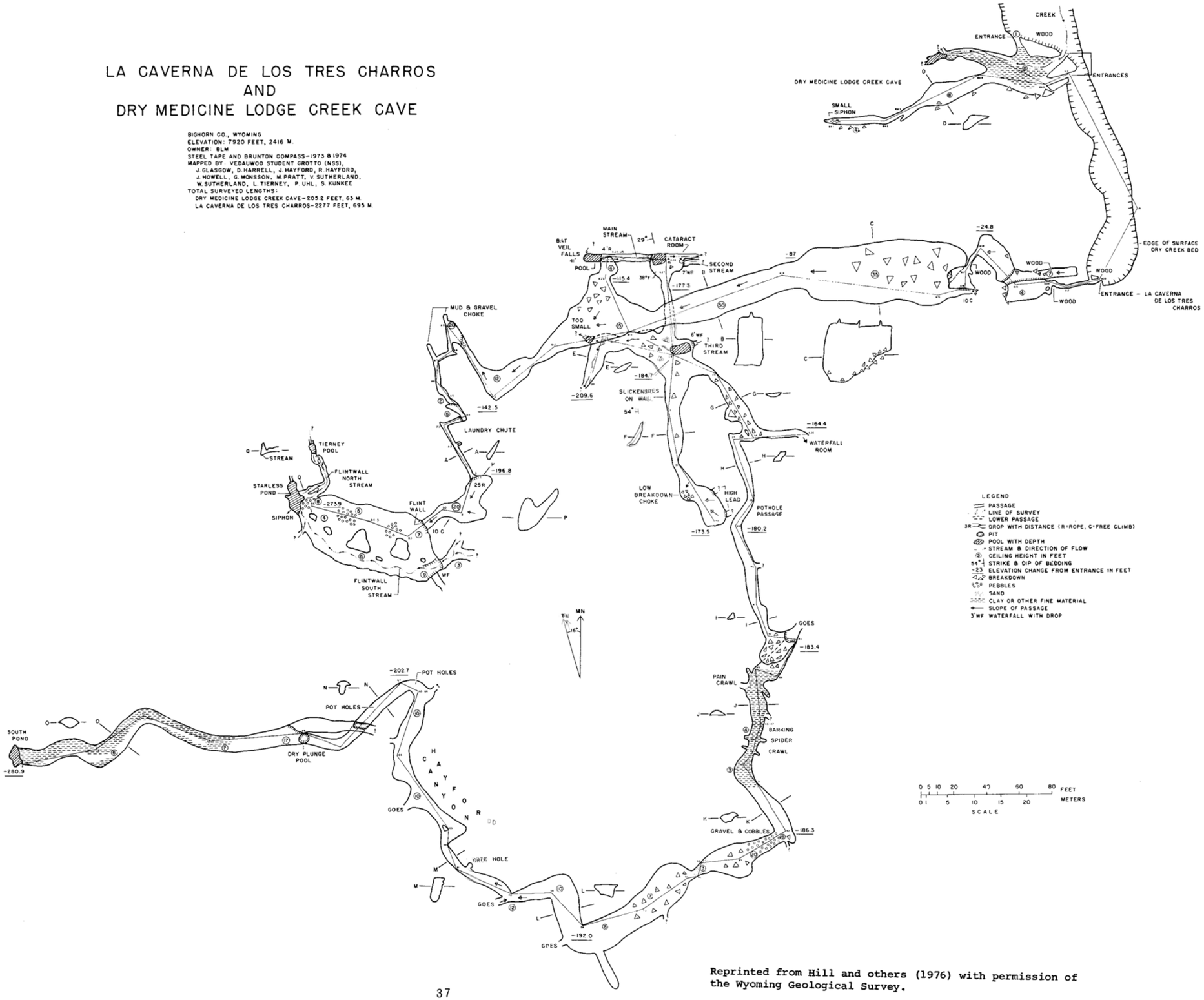
This short cave takes water year round from Dry Medicine Lodge Creek. The stream sumps at two places in muddy passages in the back of the cave. Because of flooding, the cave is best entered only in late summer or early fall.

La Caverna de los Tres Charros

The entrance to Tres Charros is through a narrow crack in the wall of a blind stream bed, behind a large pile of debris. Large tree trunks jammed in the cave passage attest to the annual flooding from Dry Medicine Lodge Creek. After some short entrance crawls one enters the largest room in the cave, 20 to 40 feet across, up to 35 feet high, and 300 feet long. At the back of this room, a series of chutes and fissures (the Laundry Chute) leads down into a small room with two small streams and a terminal sump. The Laundry Chute was plugged with stream sediment

LA CAVERNA DE LOS TRES CHARROS AND DRY MEDICINE LODGE CREEK CAVE

BIGHORN CO., WYOMING
ELEVATION: 7920 FEET, 2416 M.
OWNER: BLM
STEEL TAPE AND BRUNTON COMPASS-1973 & 1974
MAPPED BY VEDAUWOO STUDENT GROTTO (NSS),
J. GLASGOW, D. HARRELL, J. HAYFORD, R. HAYFORD,
J. HOWELL, G. MONSSON, M. PRATT, V. SUTHERLAND,
W. SUTHERLAND, L. TIERNEY, P. UHL, S. KUNKEE
TOTAL SURVEYED LENGTHS:
DRY MEDICINE LODGE CREEK CAVE-205.2 FEET, 63 M.
LA CAVERNA DE LOS TRES CHARROS-2277 FEET, 695 M.



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shortly after its discovery and has not been entered since. North of the large room, a crawl leads to Bat Veil Falls, a 41 foot rope drop alongside (and occassionally in) a cold water fall. The passage and stream drop steeply into the Cataract Room where a second stream comes in. Both streams then disappear down a tight passage. The remainder of the cave consists of canyon passage and occassional crawls. Several streams are present in the cave. The furthest point is at a muddy pool at the end of Hayford Canyon, 281 feet below the entrance.

Bad Medicine Cave

by Peter Shifflett

Bad Medicine Cave is located in the bottom of Dry Medicine Lodge Canyon (Spanish Point, Wyoming quadrangle) at an altitude of 6900 feet. This is approximately two miles down-canyon from La Caverna de los Tres Charros, and about 800 feet up-canyon from a small BLM cabin which is marked on the quad. The entrance is obvious, being just across the canyon from the trail in an outcrop joint.

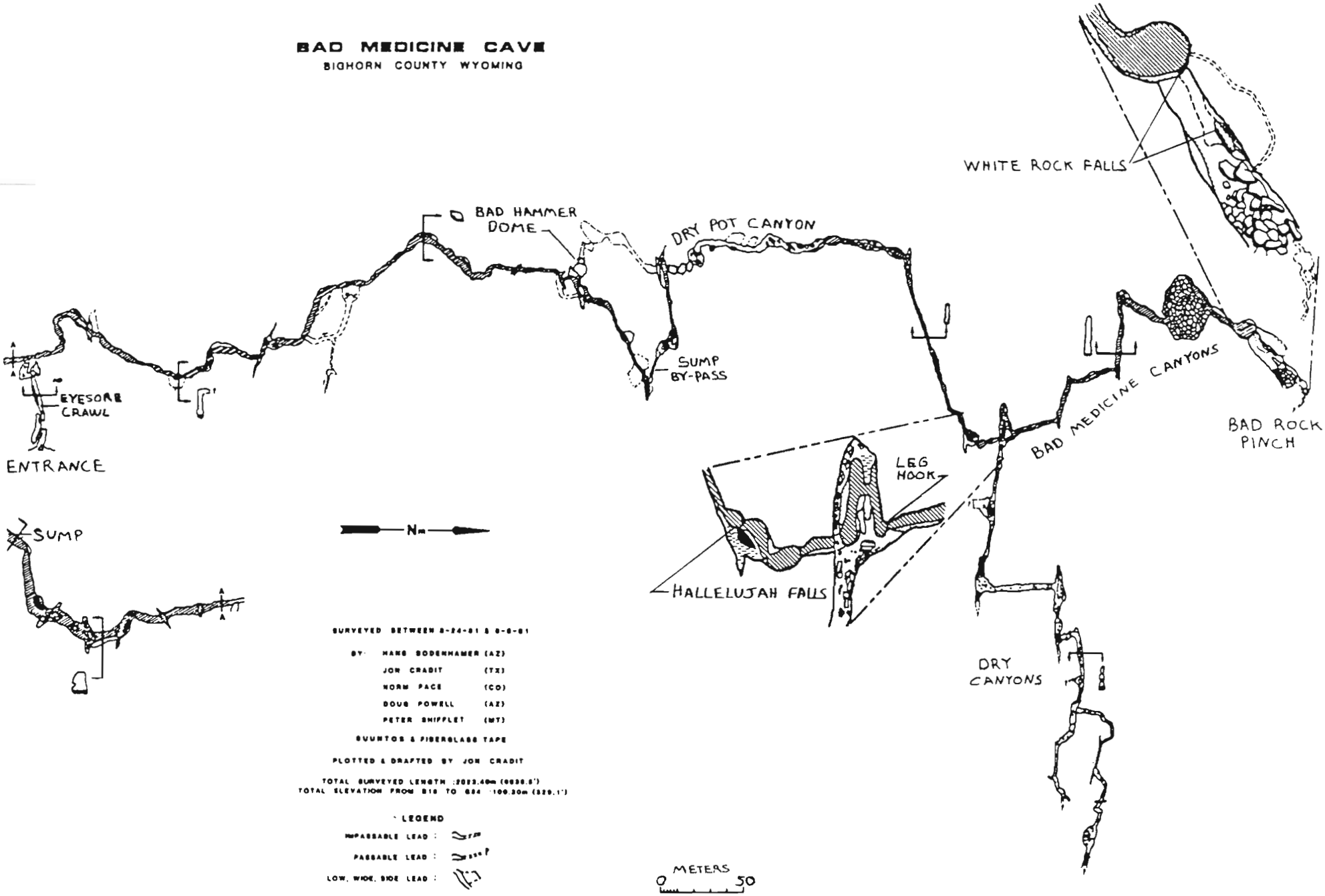
Bad Medicine consists primarily of active canyon passage developed in Bighorn Dolomite and is geologically similar in many respects to Great-X Cave, five miles north. The source of the water is probably Tres Charros but this has not been proved. A strong draught issuses from the cave in the summer, suggesting a possible up-stream entrance, but progess in this direction has been impeded by a complex breakdown at the present terminous.

From the entrance, seventy meters of tight and dusty crawls lead to a short pitch which can be negotiated with a seven meter handline. At the bottom of the pit, a low rocky crawl intersects the active streamway. Two hundred meters down-stream the passage ends in a sump. Up-stream, is a series of sporting cascades and falls which comprise the majority of this two kilometer surveyed cave. Some swimming may be necessary and wet-suits are necessary for even the shortest trip, the temperature being 42 degrees (F). Although route finding is not a great problem, a guide would be advisible. A 20 meter belay rope is recommended at the Hallelujah Falls chimmney and at the short climb into Dry Pot Canyon. The passage dimensions become impressive in the Bad Medicine Canyon area which includes a 40 meter diameter breakdown room and the most beautiful falls in the cave: White Rock Falls. Just beyond this falls is the present terminous, Badrock Pinch, located at whatever distance into the breakdown you are willing to push. Effort here may one day pay off with many more miles of fine cave.

This is an excellent cave, and is representative of the best of the sporting caves in the Bighorns. It can probably be entered year-round, although one must always be aware of flood danger. Bad Medicine is not quite as isolating as its big brother, Great-X, but it would never-the-less present great rescue difficulties in case of serious injury. Explorers should not take this cave too lightly.

BAD MEDICINE CAVE

BIGHORN COUNTY WYOMING



SURVEYED BETWEEN 8-24-81 & 8-8-81

BY: HANS BODENHAMER (AZ)
JON CRADIT (TX)
NORM PACE (CO)
DOUG POWELL (AZ)
PETER SHIFFLET (MT)

SUUNTOS & FIBERGLASS TAPE

PLOTTED & DRAFTED BY JON CRADIT

TOTAL SURVEYED LENGTH: 2023.40m (6636.6')
TOTAL ELEVATION FROM B18 TO B24: 100.30m (329.1')

LEGEND

IMPASSABLE LEAD:
PASSABLE LEAD:
LOW, WIDE, SIDE LEAD:

P-Bar (Pebar) Cave

P-Bar Cave is named for its discoverors, Peter Huntoon and Barbara Tomes (Tomes, 1977). The cave is at the bottom of the 900 foot deep Medicine Lodge Canyon. The cave entrance is at 7000 feet above sea level. Access to the cave is strictly by foot from a jeep trail along the rim of the canyon.

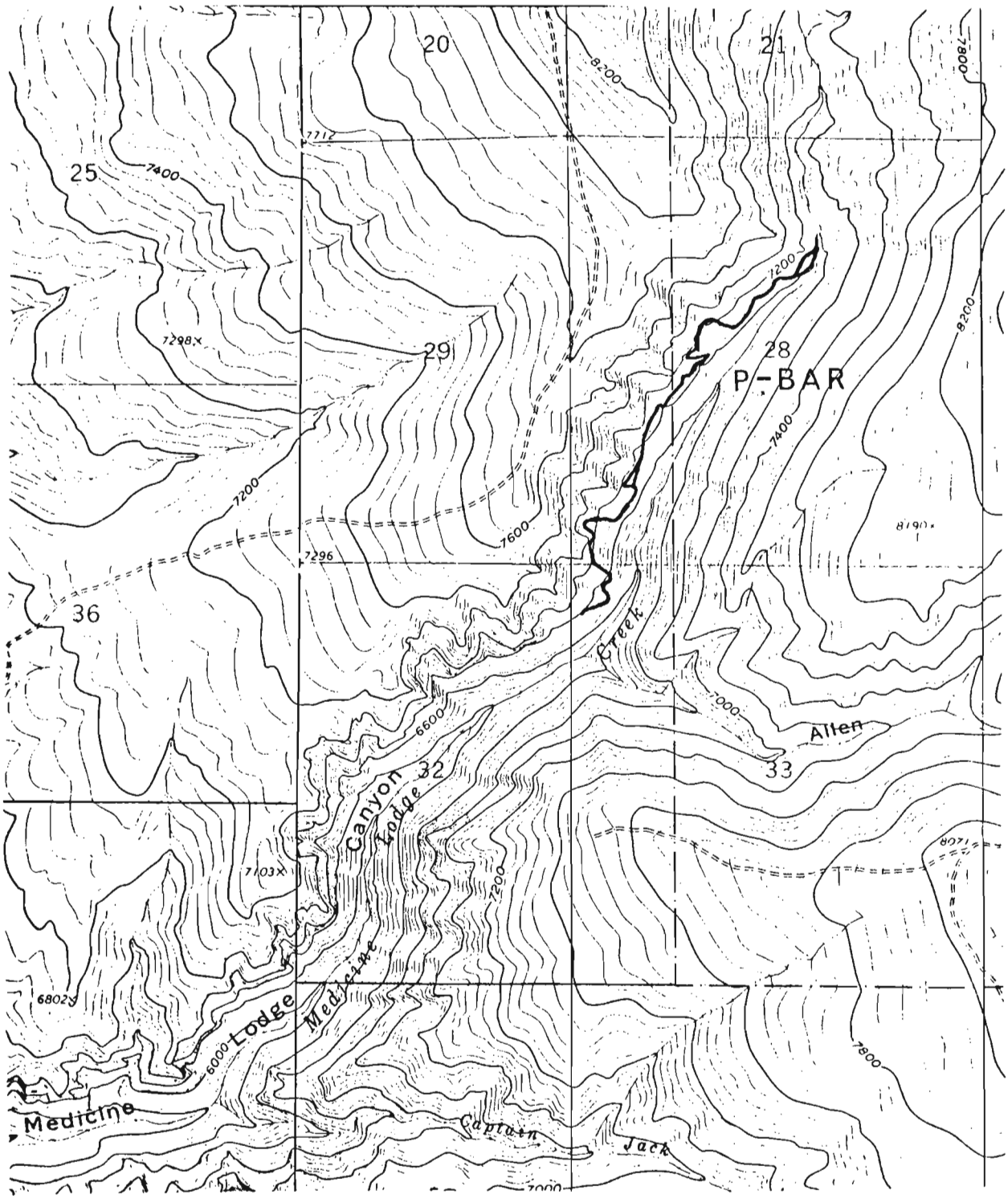
P-Bar has three entrances. The first two are usually plugged with debris from Medicine Lodge Creek. The third entrance (Skylight Entrance) is usually high and dry. Medicine Lodge Creek sumps a short distance in the cave and is not seen again. A minor resurgence is present a few hundred feet down canyon which gradually disappears again in the canyon floor. A major resurgence is present nearly six miles down canyon from the cave entrance (Tomes, 1977).

Most of P-Bar Cave is a unitary passage parallal to Medicine Lodge Canyon. The passage walls are commonly coated with "velcro" which can hinder movement in the narrow passage. Just beyond the entrance area a number of pools are encountered that make staying dry a little challenging. The remainder of the known cave is usually dry (except after a major storm). For the next 3500 feet, the passage zigs and zags from one joint to another, giving it the name Zorro Way. Flood waters have scoured this passage of any interesting features or obstacles. The flood route goes down a short drop at the junction of the Zorro Way and the Velcro Strip.

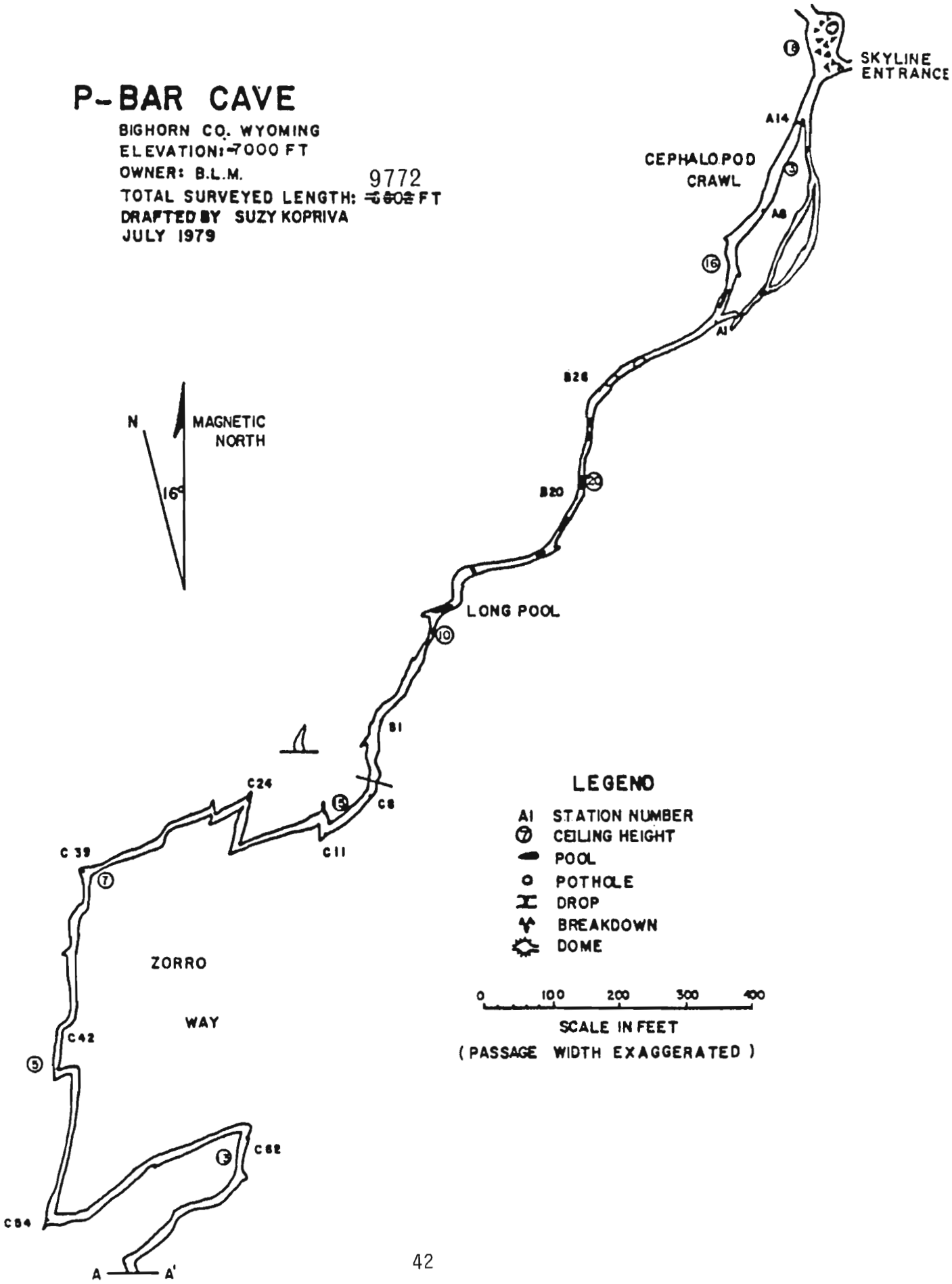
Much of the Velcro Strip is a nasty, narrow, high fissure with extremely rough walls. The fissure gradually narrows downwards forcing the caver to chimney part of the passage at a slow pace. A few orange speleothems are present in the fissure.

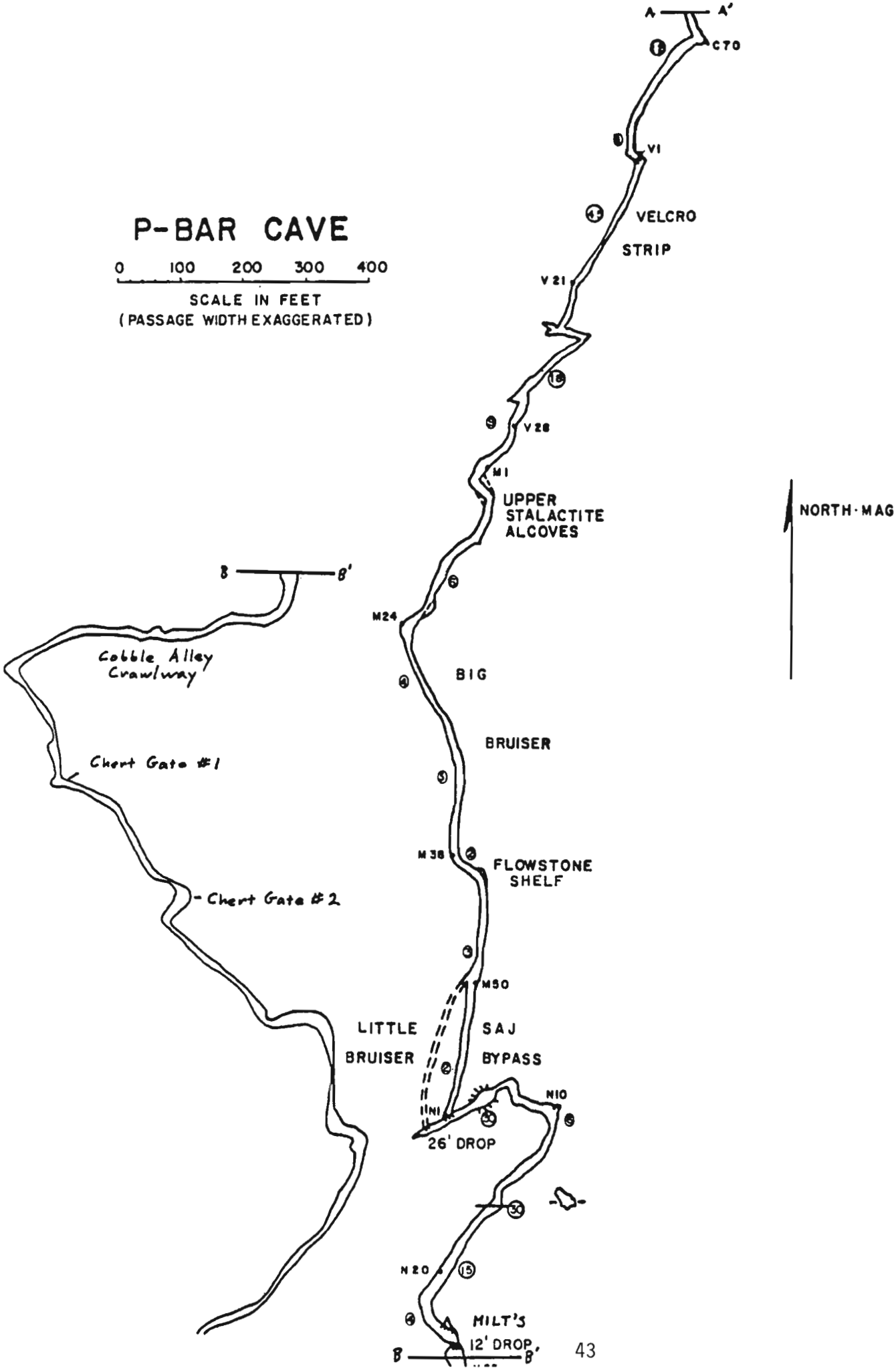
The Velcro Strip is followed by the Big Bruiser, a long, low passage that most cavers would just-as-soon forget. Two pleasant speleothem alcoves interrupt the agony of this passage. After a thousand feet, the Big Bruiser forks into the Little Bruiser and the SAJ By-Pass. The Little Bruiser is a bedding-plane, velcro-lined belly crawl interrupted by an occassional pothole. The By-Pass is a hands-and-knees velcro crawl with potholes. Both passages end at a 26 foot drop into Hoxie Canyon.

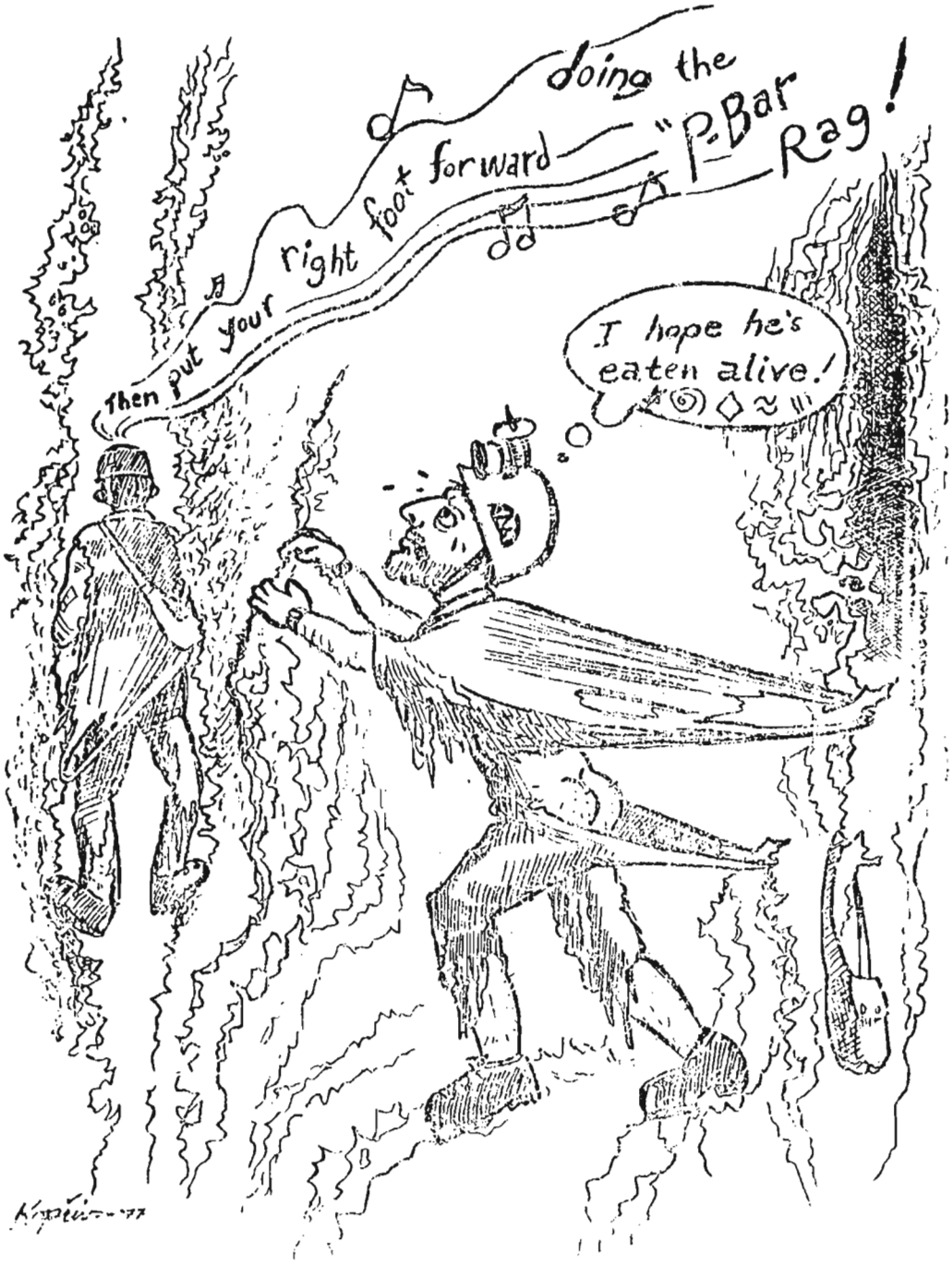
The remainder of the cave is a long, high canyon passage interrupted by a short down-climb (Milt's Drop) and the 400 foot long Cobble Alley Crawlway. The canyon ends in a rectangular-shaped passage that suddenly fills with sand. The passage continues as a tight sand crawl with a strong cold wind. This crawl is currently the limits of exploration and is three to four hours from the entrance of the cave. The cave is currently 486 feet deep and 9772 feet long.



Map showing the relationship of P-Bar cave to Medicine Lodge Canyon. The base map is from the U.S.G.S Allen Draw 7½' quadrangle.


P-BAR CAVE
BIGHORN CO. WYOMING
ELEVATION: 7000 FT
OWNER: B.L.M.
TOTAL SURVEYED LENGTH: 9772 FT
DRAFTED BY SUZY KOPRIVA
JULY 1979
SKYLINE ENTRANCE
A14
CEPHALOPOD CRAWL
A8
A1
B26
B20
LONG POOL
B1
C24
C8
C11
C39
ZORRO WAY
C42
C62
C84
A
A'
N
MAGNETIC NORTH
16°
LEGEND
A1 STATION NUMBER
CEILING HEIGHT
POOL
POTHOLE
DROP
BREAKDOWN
DOME
0 100 200 300 400
SCALE IN FEET
(PASSAGE WIDTH EXAGGERATED)


P-BAR CAVE
0 100 200 300 400
SCALE IN FEET
(PASSAGE WIDTH EXAGGERATED)
A
A'
C70
V1
VELCRO
STRIP
V21
V28
M1
UPPER
STALACTITE
ALCOVES
NORTH·MAG
B
B'
M24
Cobble Alley
Crawlway
BIG
BRUISER
Chert Gate #1
M38
FLOWSTONE
SHELF
Chert Gate #2
M50
LITTLE
BRUISER
SAJ
BYPASS
N10
N1
26' DROP
N20
MILT'S
12' DROP



Sketch of the Velcro Strip in P-Bar Cave by Mike Kopriva

Eastern Bighorn Mountains

Tongue River Cave

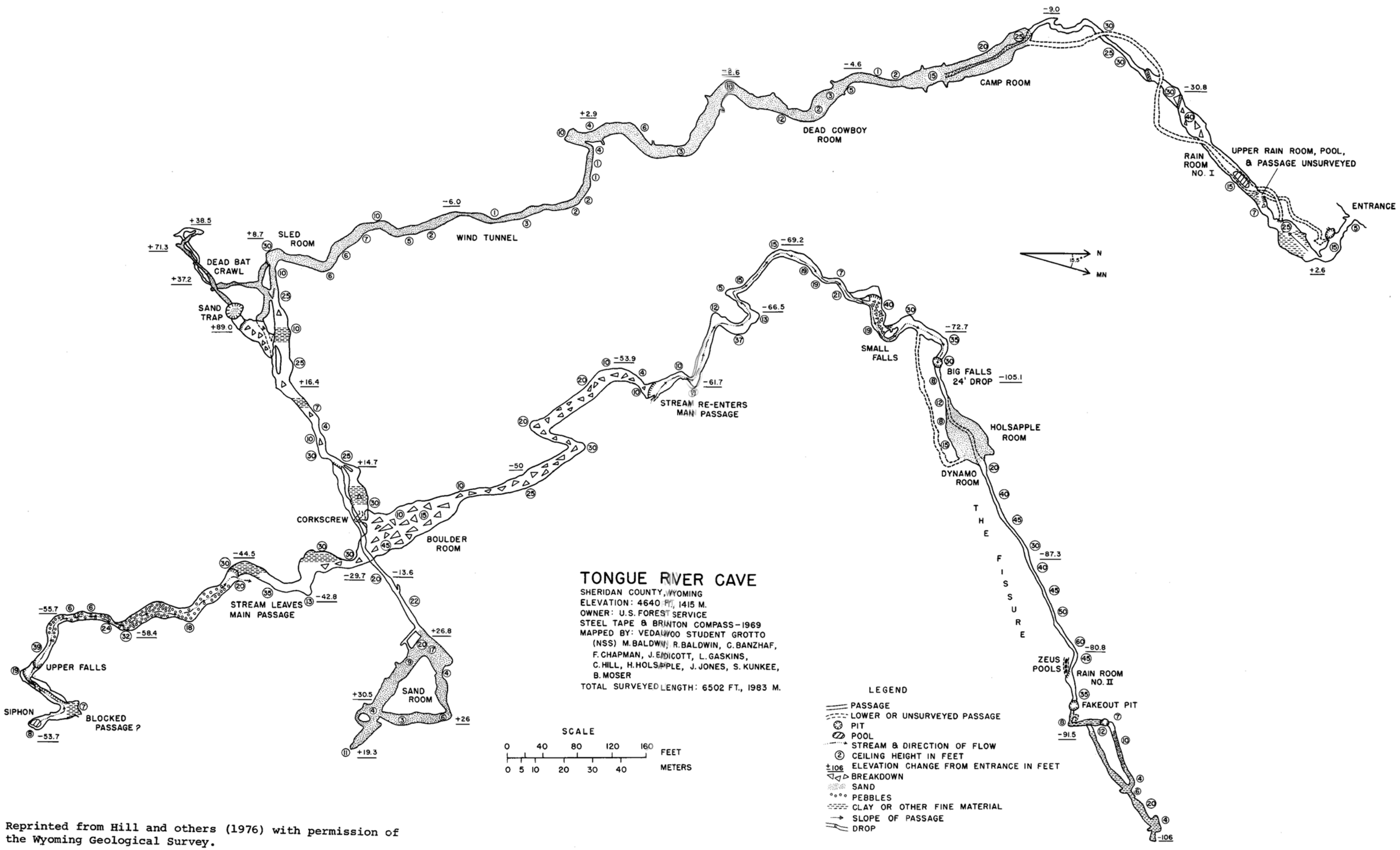
Tongue River Cave is the most visited and vandalized cave in the Northern Rockies. Graffitti and trash abound. Most of the cave rescues in the Rocky Mountain Region take place here and usually involve finding lost cavers who had inadequate light. The cave has been gated on several occassions but the gate has always had a short life span.

Tongue River Cave is developed in the Bighorn Dolomite (Hill and others, 1976) or the Madison Limestone (Langenheim and others, 1976) about 400 feet above the end of the road in Tongue Canyon. The cave consists of two sets of passages. The upper part of the cave is the older and dryer part. The lower part contains the stream passage.

The upper part of Tongue River Cave consists primarily of a single sand-floored passage that trends (from the entrance) first west, then south, and finally east to its termination in the Sand Room. Few side passages are present. The upper cave connects to the Boulder Room in the lower cave through the tight, twisting Corkscrew. The Boulder Room is a large passage containing large breakdown blocks. To the south of the Boulder Room the passage continues with a few hundred feet of stream passage until one comes upon the upstream sump. Cave divers have gone a short distance past the sump. The source of the water is Little Tongue River nearly two and a half miles to the south. The stream by-passes the Boulder Room and re-enters the cave a couple of hundred feet north of the room. The stream flows in a canyon passage over some small falls and finally thunders over the 24 foot Big Falls. The stream disappears down a small crawl shortly thereafter. A spring at the entrance to Tongue Canyon is thought to be the resurgence. The cave passage continues a few hundred feet past the Big Falls.

Cliff Dwellers Cave

Cliff Dwellers Cave is the large entrance visible from the parking area at the end of the road in Tongue Canyon. The cave is developed in the Madison Limestone. The cave is a little above and several hundred feet to the east of Tongue River Cave. The two caves may have been connected at one time. The large entrance ends at a six foot overhang. A one inch rat-gnawed rope has been used in the past to climb the overhang but should not be considered safe. The overhang leads to a short, dusty guano crawl (the dust contains the fungus Histoplasma capsulatum). The crawl ends in a T-junction. The passage to the right goes 200 feet to a 50 foot rope drop into a short fissure passage. The left fork is a joint-controlled, generally high canyon passage that goes for about 1000 feet. There is evidence that the cave once contained a stream.



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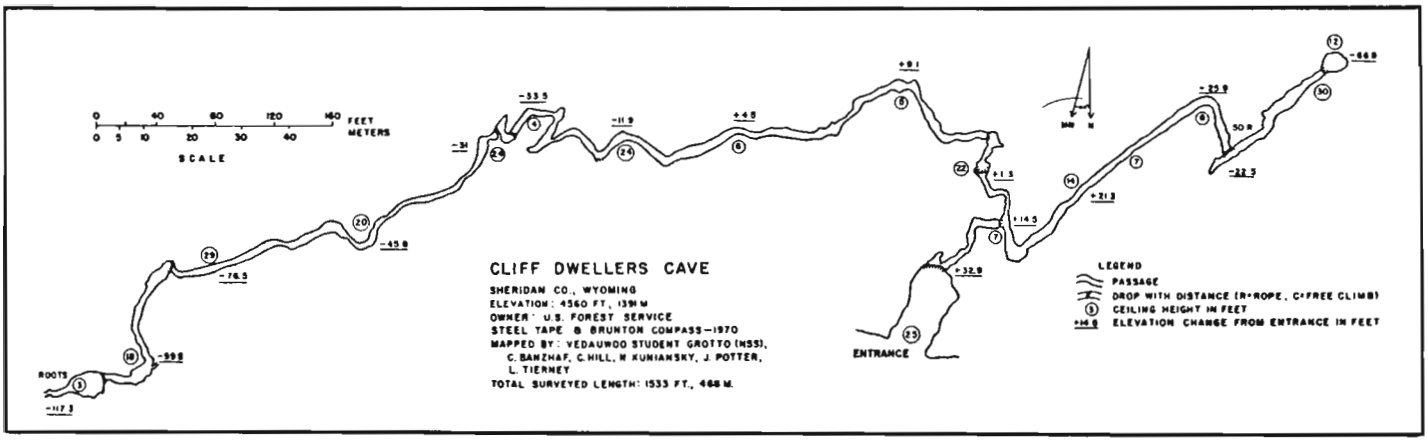

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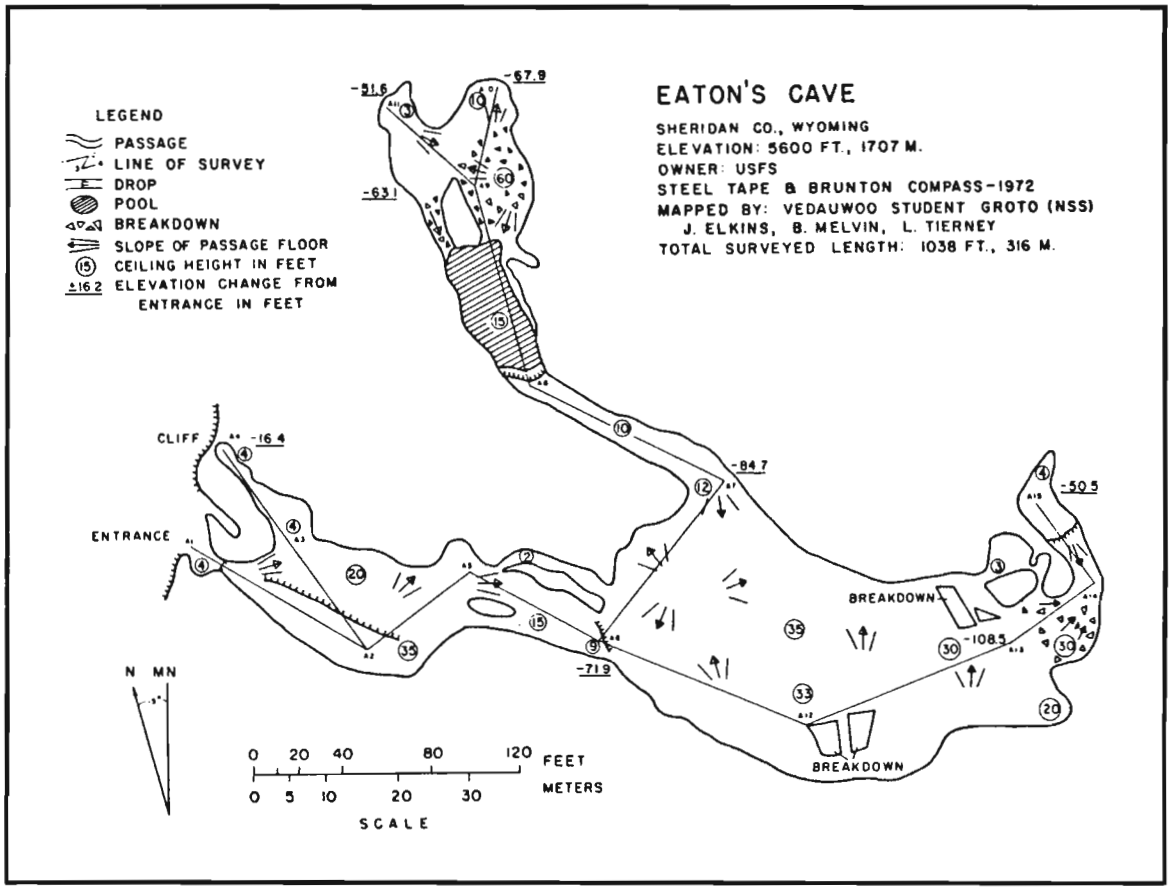

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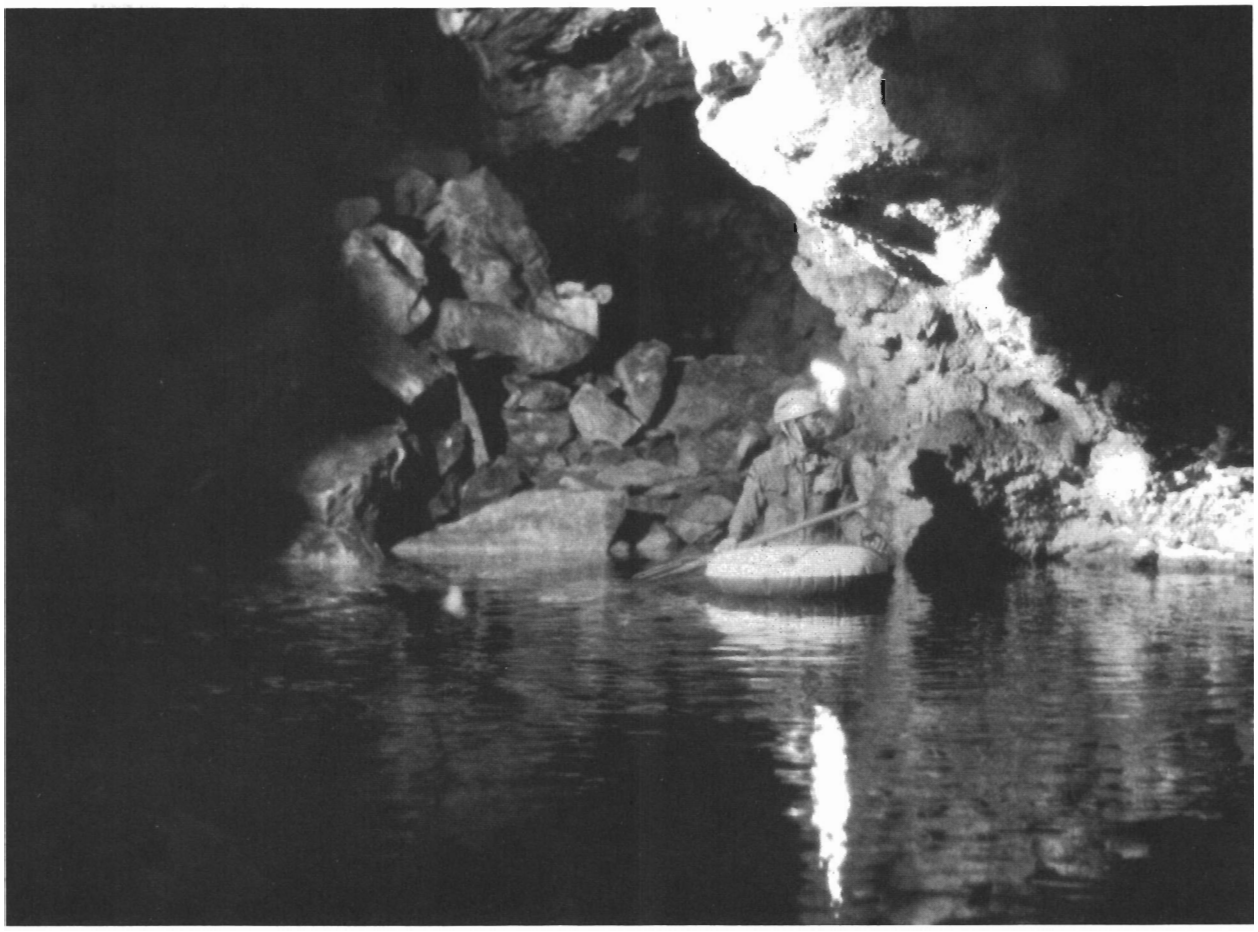


Peter Uhl rafting on the lake in Eaton's Cave

Eaton's Cave

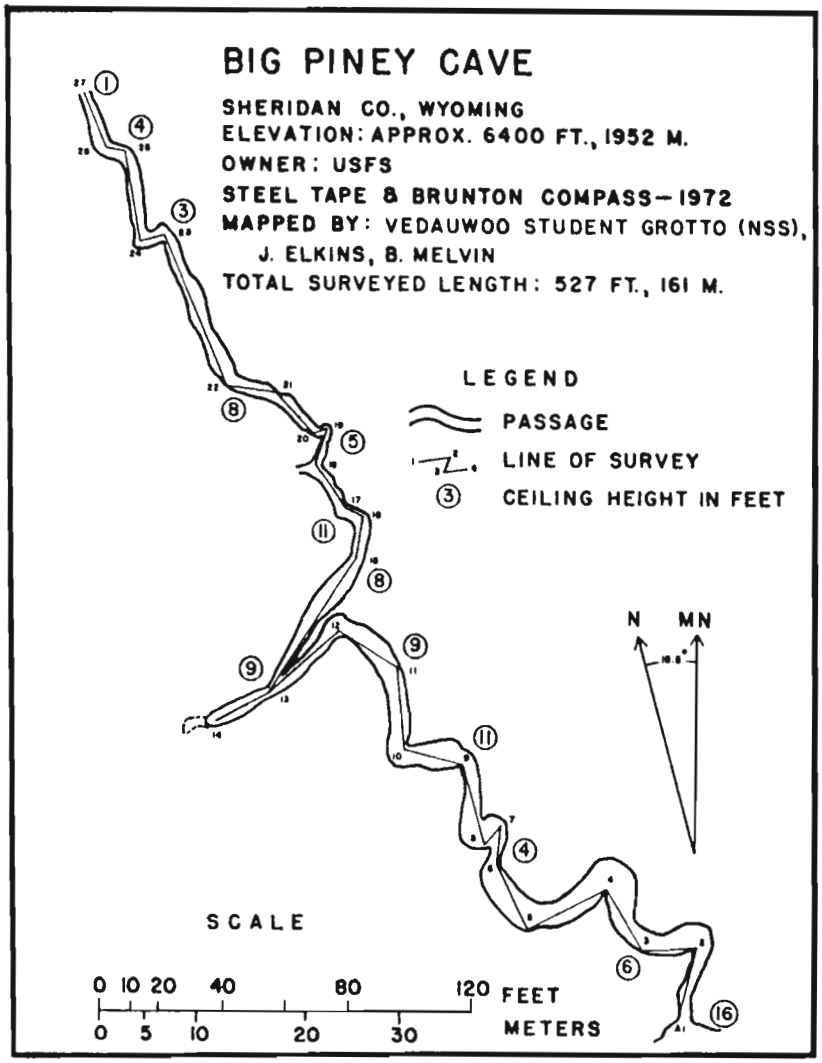
Eaton's Cave is in the Madison Limestone in the cliffs along the east side of Red Canyon Creek. Although the cave is on the Forest Service land, the only reasonable access is across Eaton's Dude Ranch from which advance permission is necessary. This access involves a two mile hike that ends 1400 feet above the parking area at the ranch headquarters.

Eaton's Cave consists of one very large room and two passages. One passage trends west off of the room to the entrance, the lake passage goes north a short distance from the room. The entrance passage and the room are largely lined with mud-covered spar. A few, mostly dry speleothems are present in the cave.

Big Piney Cave

(From Hill and others, 1976)

Big Piney Cave is in southern Sheridan County on U.S. Forest Service land near Story, Wyoming. This small cave is in a large cliff of Bighorn Dolomite. The cave is muddy and appears to be strongly joint controlled. Some small speleothems are in the back of the cave.



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Southern Bighorn Mountains

Snow Cave

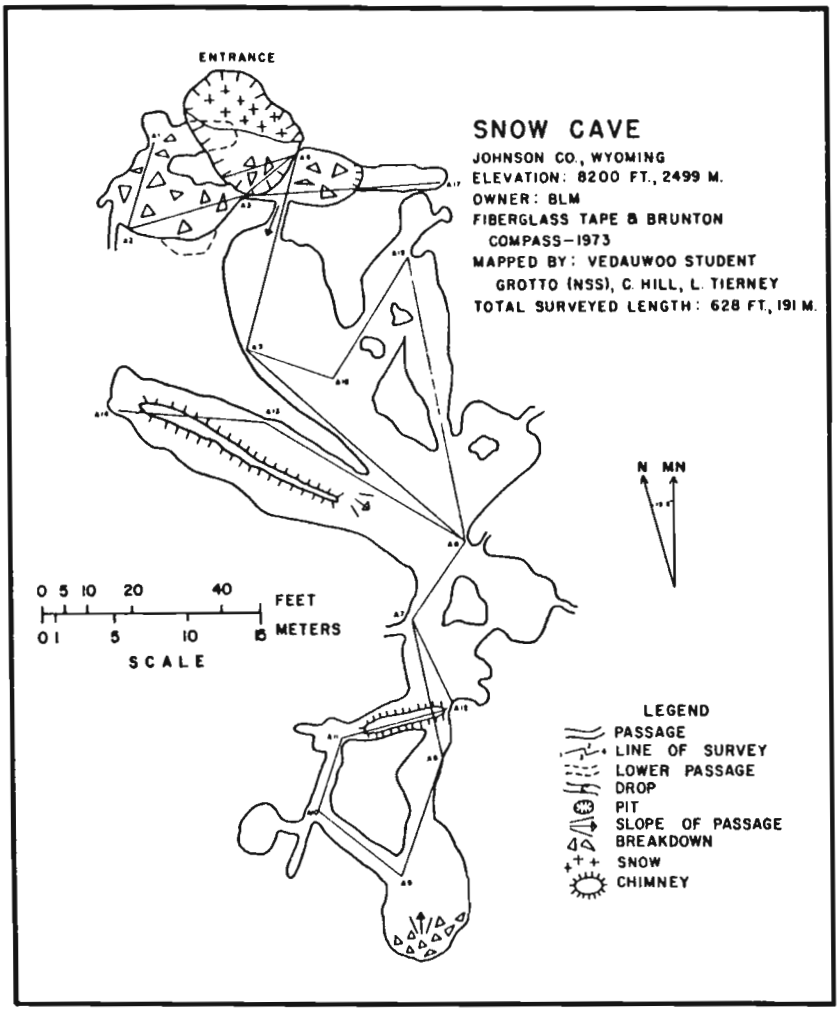
(From Hill and others, 1976)

This cave is in the Madison Limestone on BLM land. The entrance pit is 35 feet deep into a room 20 by 40 feet across. A permanent snow bank is present in the room below the pit. This small cave has another large room with several passages coming off of it. The far end of the cave ends in breakdown.

Ridiculous Ice Cave

(From Hill and others, 1976)

This small cave has three entrances in a cliff of Bighorn Dolomite. The cave is developed parallal to the cliff face. The entrance is 70 feet high and 10 feet wide. Some minor climbing is required in the icy passages.



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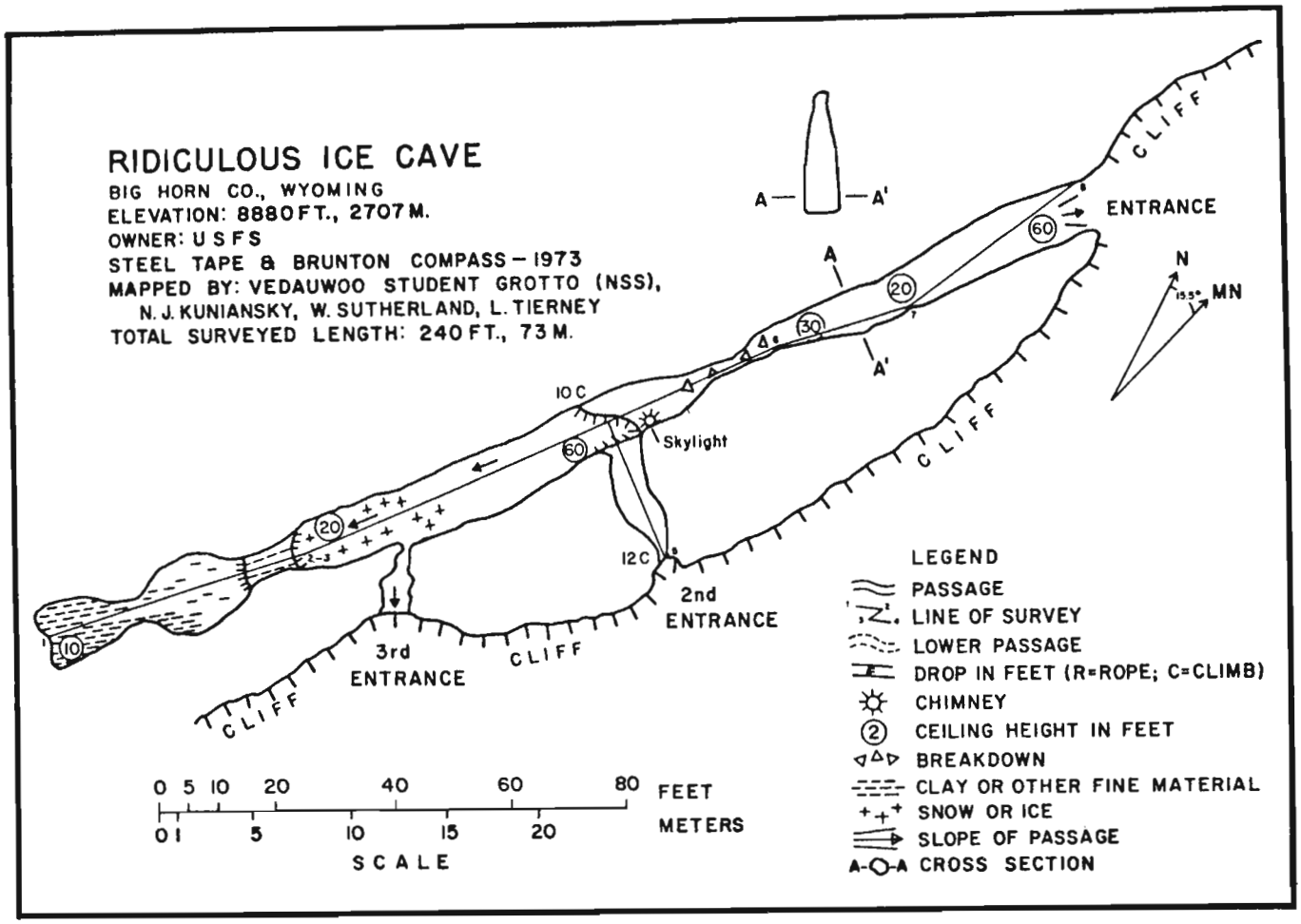

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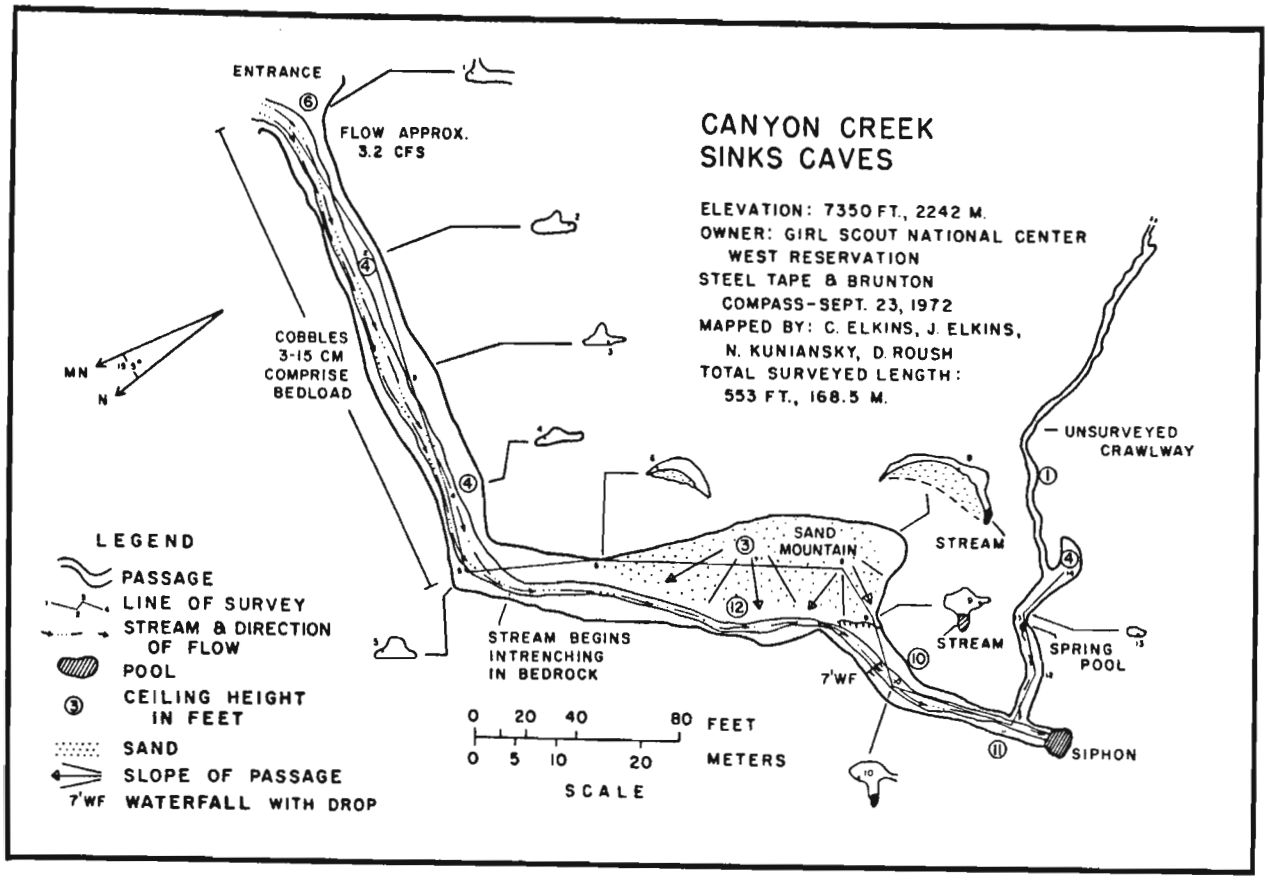
Canyon Creek Sinks Cave

(From Hill and others, 1976)

This small cave is on the Girl Scout National Center West Reservation. The stream flows through 400 feet of cave before entering a sump. A small side passage trends south off of the main passage just before the sump. Canyon Creek resurges a short distance down valley only to disappear again.



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Bighorn Basin Caves

Kane Caves

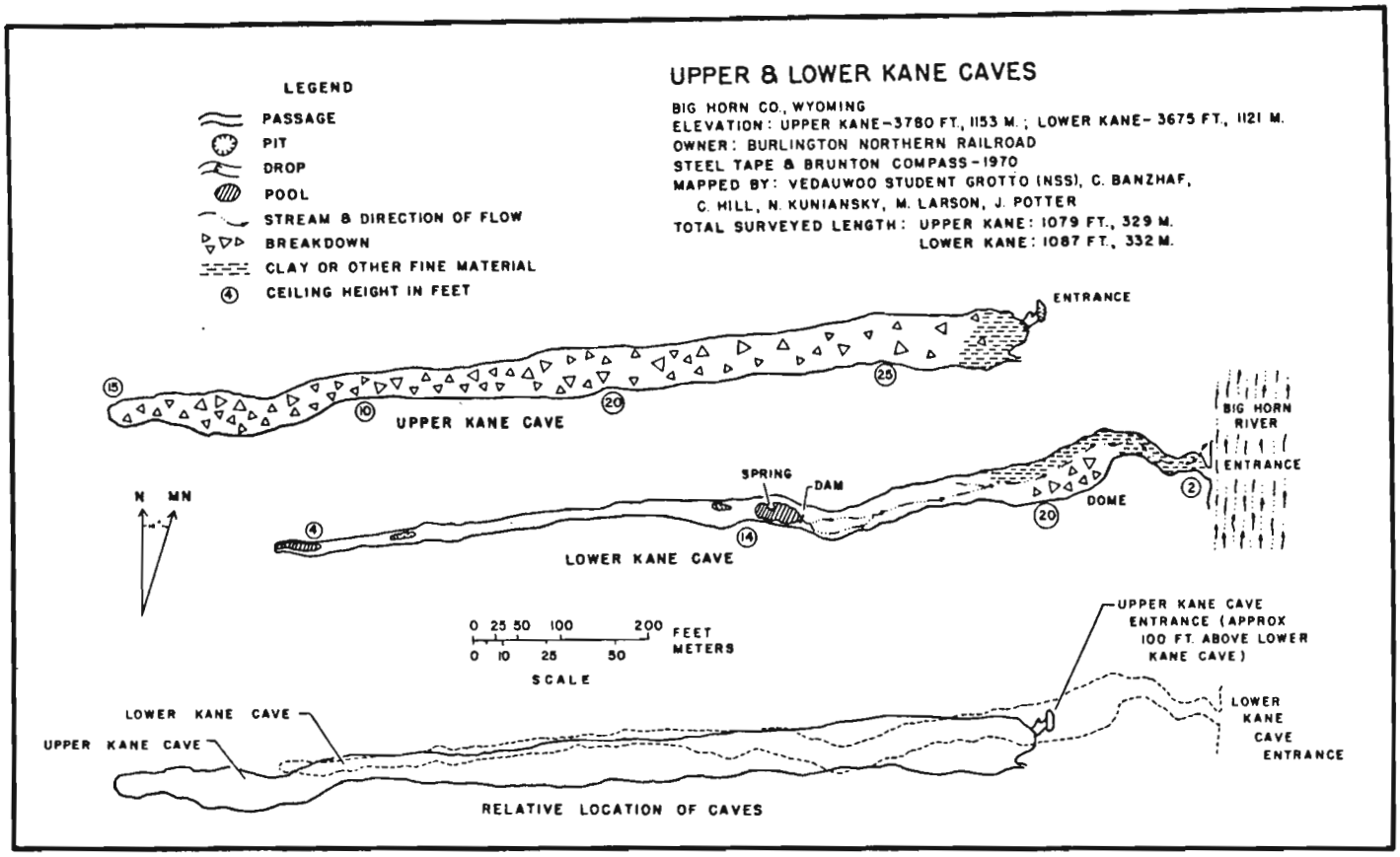
Coon Odor Cave and Upper and Lower Kane Caves are developed in the Madison Limestone where the Bighorn River has cut a gorge through Little Sheep Mountain. Access is via the gravel road along the west side of the Bighorn River, south from highway 14A. One has to walk the last mile along the railroad tracks.

The caves are a straight single passage about 1100 feet long (except for the small Coon Odor Cave). Sulfurous warm water flows in Lower Kane Cave and Coon Odor Cave and is probably involved in their development. Upper Kane Cave and the nearby Spence Cave are dry but most likely also formed by thermal waters (Egemeier, 1973).

The entrance to Upper Kane Cave is in a steep gully about 100 feet above the river. The narrow slot entrance leads down a mud slope to a passage 20 feet high, 30 feet wide, and nearly 1100 feet long. A few calcite speleothems are present in the ceiling. Abundant gypsum crystals are present in cracks in the walls of the passage. Much of the wall rock may have spalled off due to gypsum crystal growth. The cave is warm and usually has a few bats in it.

The entrance to Lower Kane Cave is directly below Upper Kane Cave and only a few feet above the river. Although this cave is the same length as Upper Kane Cave, the passage dimensions are smaller. A spring feeds the cave stream about halfway into the cave. A number of dry trenches in the back of the cave are probably part of an older spring system.

Coon Odor Cave is a short, muddy, wet cave a few hundred feet north of Lower Kane Cave. Because the entrance is at river level, the cave may be completely flooded in spring.



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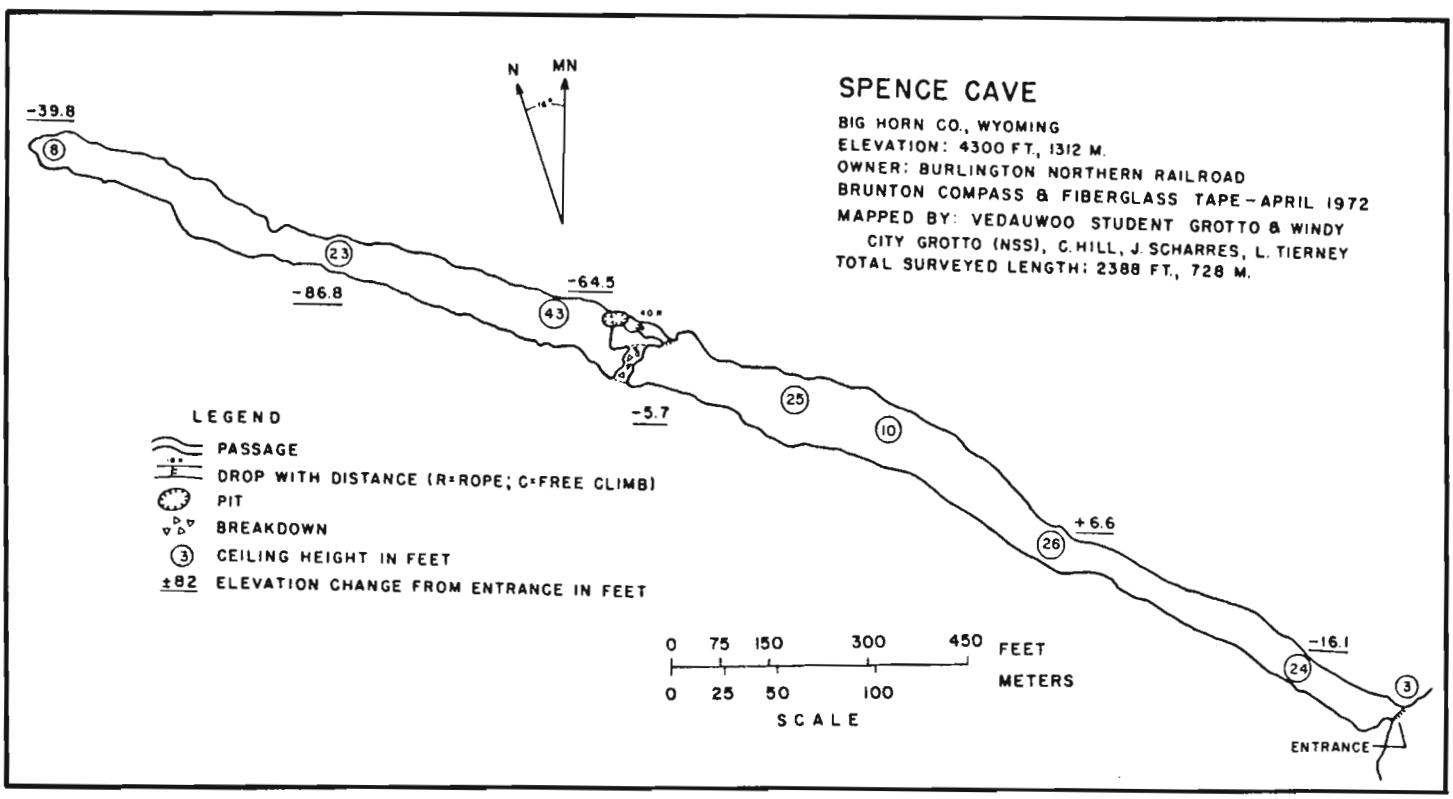

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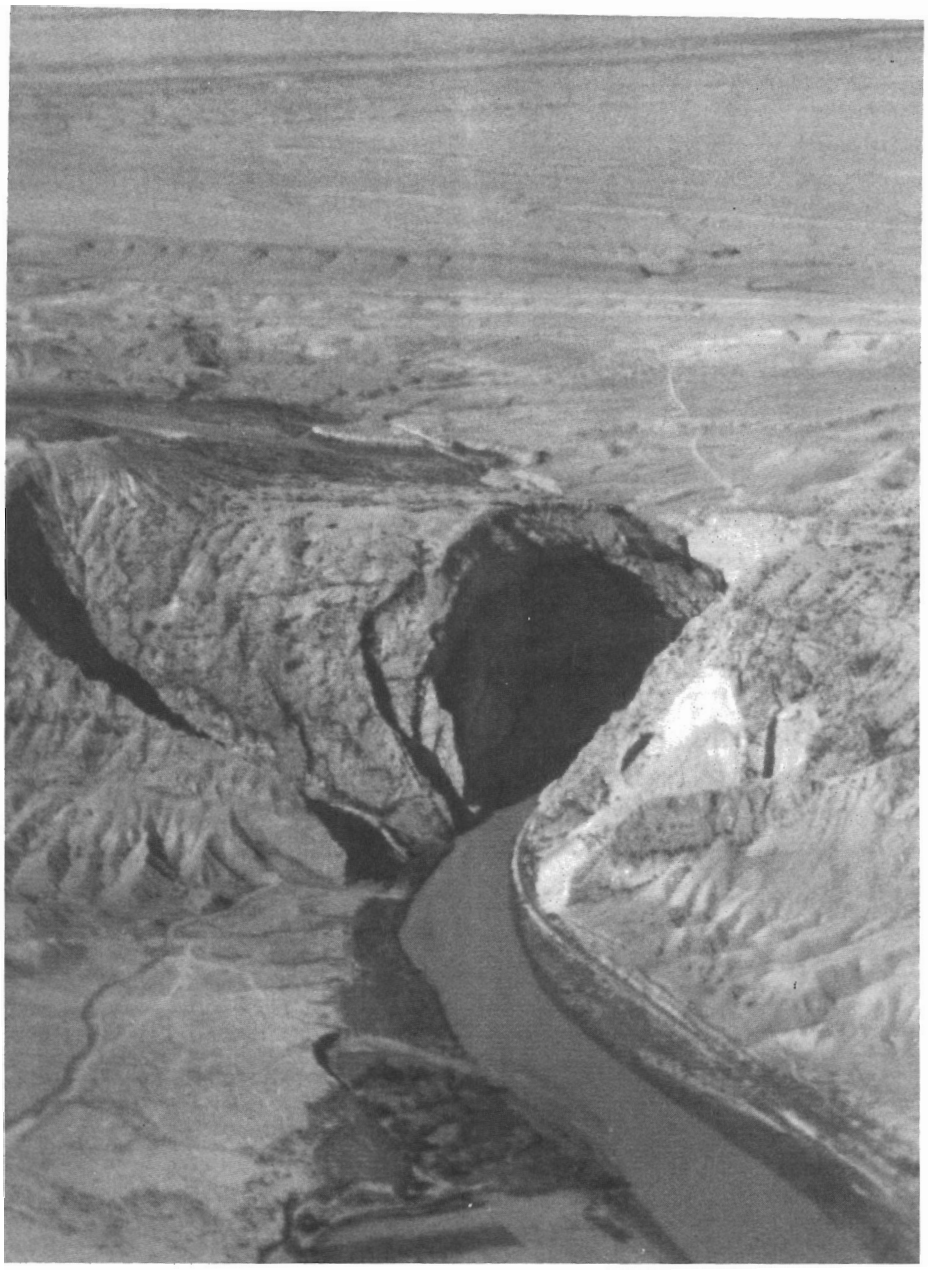


Air photo of Sheep Mountain Anticline in the Bighorn Basin. The core rocks of the Anticline are the Madison Limestone. Spence Cave is in the right wall of the canyon cut by the Bighorn River.

Spence Cave

Spence Cave is developed near the crest of Sheep Mountain anticline about ten miles south of Little Sheep Mountain. Access, again, is by the railroad tracks that parallal the river gorge in the mountain. The low, arched cave entrance is about 600 feet above the river. The main passage is 75 by 50 feet in dimension and 1300 feet long. Daylight from the entrance is visible a good 1000 feet into the cave. The main passage ends in breakdown but a small crawl leads to a forty foot rope drop. The cave continues with the same large dimensions for another 1000 feet beyond the drop. The cave has been vandalized for some years and contains no speleothems.

Spirit Mountain Caverns

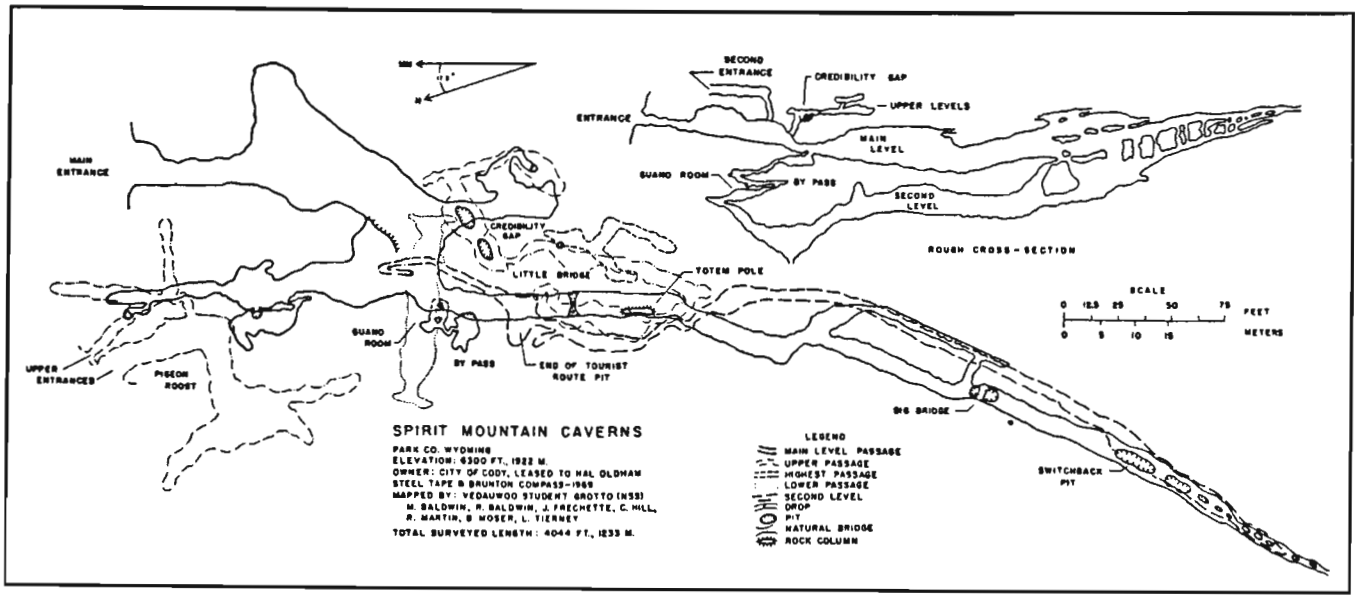
Spirit Mountain Caverns has had a number of owners since its discovery in 1908. For about forty years the cave was in federal government hands as Shoshoni Caverns National Monument. The cave received its present name while being operated as a private commercial cave in the 1950's. The city of Cody controlled the cave for many years. Currently it is under BLM management.

The cave is the subject of some controversy. During the 1950's, Francis Nelson of Billings, Montana drew a rough map and cross section indicating eight levels of passage down to the level of the Shoshoni River. The indicated vertical relief of the cave is 1100 feet. Currently, only the upper three levels are known (Hill and others, 1976). Has commercial development of the cave blocked off the lower levels or was Nelson's map a case of overzealous promotion?

The cave has two entrances, a modified main entrance and another entrance high on the cliff face. The cave consists primarily of two levels, one slightly offset from the other. Several 50 to 60 foot pits at the back of the cave connect the levels while the By-Pass passage and Guano Room connect the levels near the entrance. Histoplasma capsulatum was discovered in guano samples from the cave in 1979. Mineral deposits on the cavern walls suggest that the cave was modified or developed by mineral-rich thermal waters. A recently extinct hot spring system is present in the area. In addition, during construction of a water diversion project along the Shoshoni River, some solution pockets in the Madison Limestone were encountered. Reportedly some of the workmen were killed when they encountered some hydrogen sulfide in one of the pockets.

Caves of the Pryor Mountains

The Pryor Mountains lie just northwest of the Bighorn Mountains in southern Montana. Access from Wyoming is primarily by jeep trails while some good gravel roads are present from the west side. The Pryor Mountains are home to a herd of wild horses (mustangs) as well as many small, alpine caves. All of the caves listed here are in the Madison Limestone. They range in elevation from 5000 to 8700 feet and are shown on the USGS topographic maps covering the Pryor Mountains. More information can be found in Campbell, 1978.



Reprinted from Hill and others (1976) with permission of the Wyoming Geological Survey.

Big Ice Cave

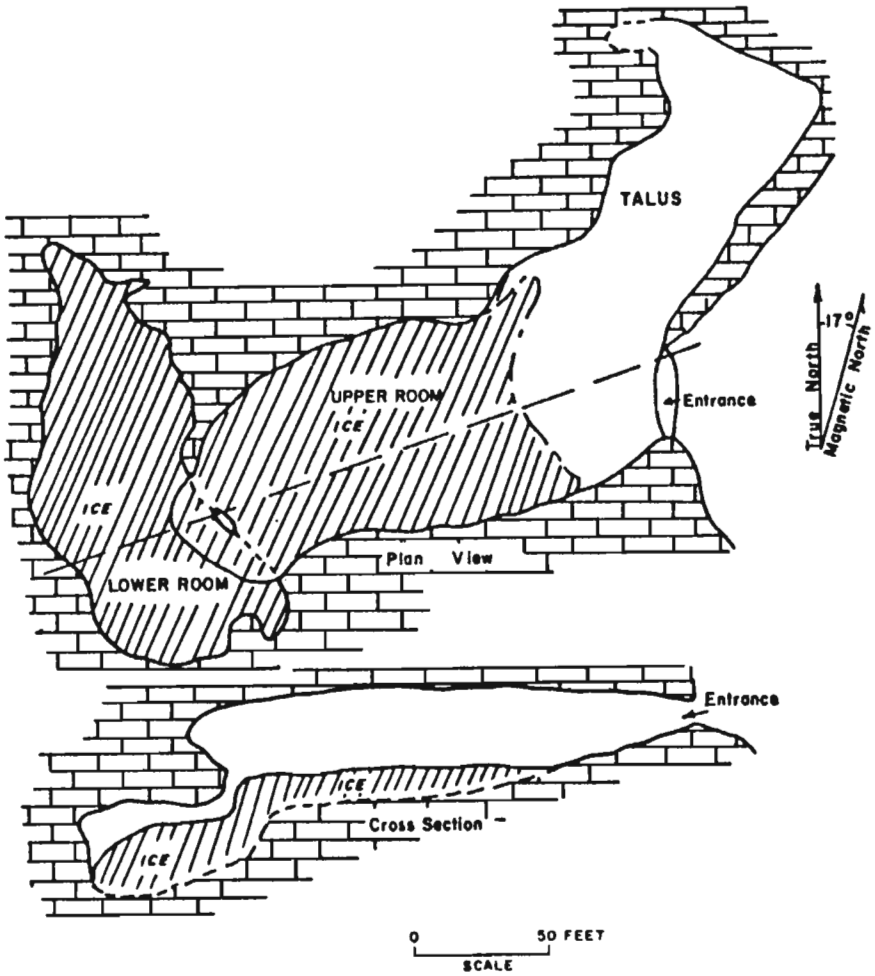
Big Ice Cave is on Cave Ridge and overlooks Cave Canyon. This cave consists of two ice-floored rooms with a rumored third room now buried under the ice. The largest room is 150 feet long. The cave is gated and the Forest Service in years past has conducted tours on summer weekends.

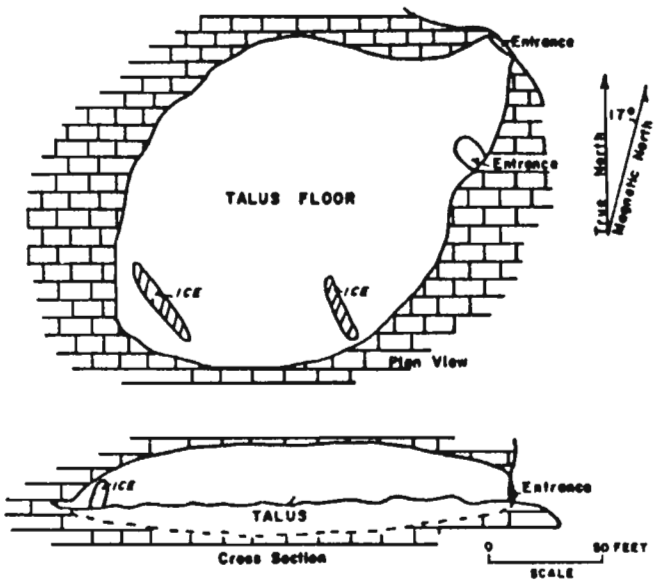
Crater Ice Cave

This cave consists of a single 150 foot circular room with a 20 foot entrance pit and a small walk-in entrance. The pit entrance is full of snow for much of the year. The USGS Big Ice Cave quadrangle shows several unnamed caves near Crater Ice Cave on Big Pryor Mountain. All are probably very small.

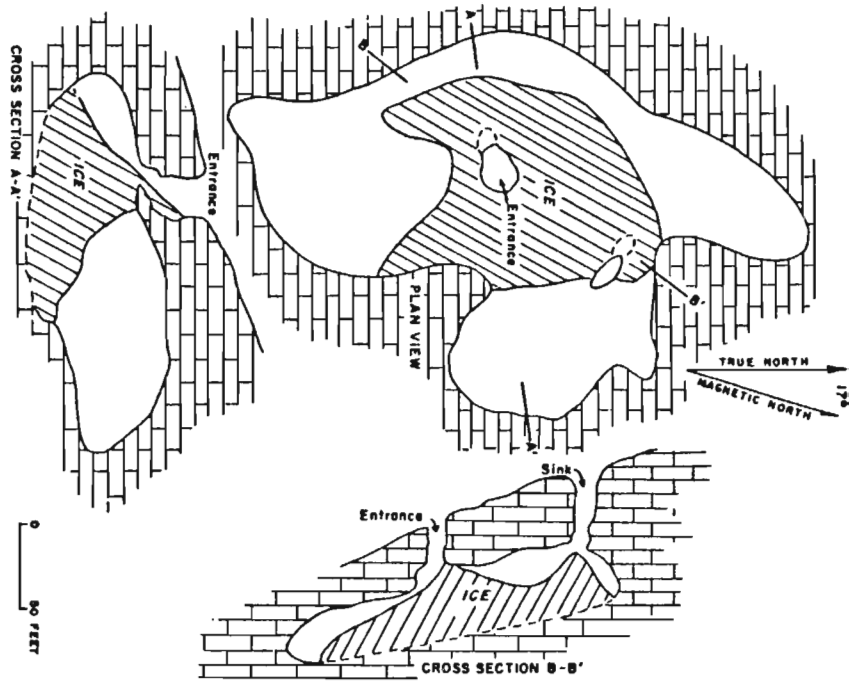
Red Pryor Ice Cave

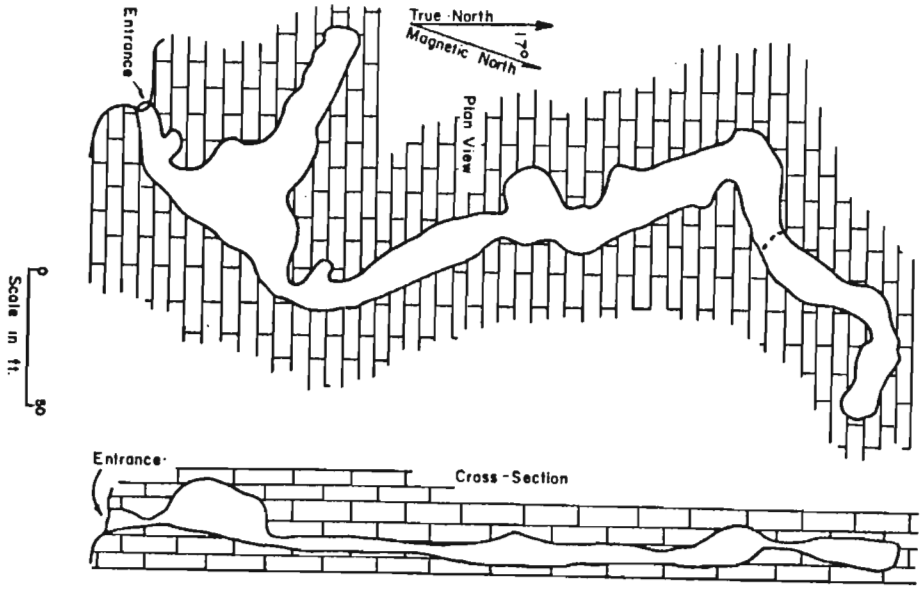
This cave is similar to Crater Ice Cave. It has two pit entrances into a large room 200 by 350 feet. Snow cones develop during winter beneath the pits. The cave is on Red Pryor Mountain a little south of Crater Ice Cave.



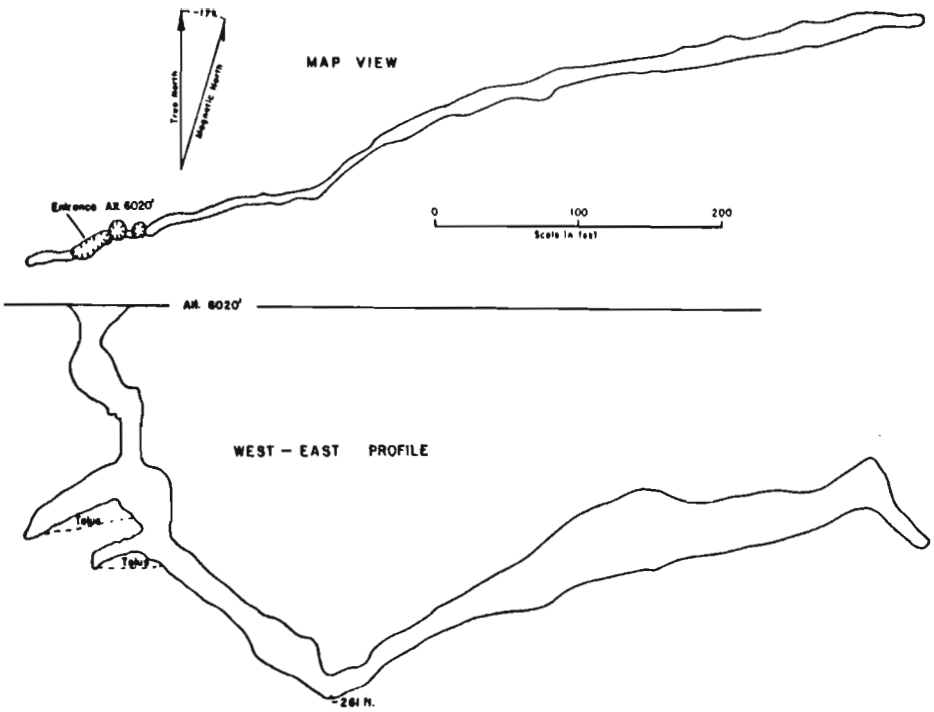


Big Ice Cave (top) and Crater Ice Cave (bottom), from the 1969 NSS convention guidebook.





Red Pryor Ice Cave (above) and Sykes Cave (below), from the guidebook of the 1969 NSS convention.



Frogg's Fault Cave, reprinted from Campbell (1978) with permission of the Montana Bureau of Mines and Geology

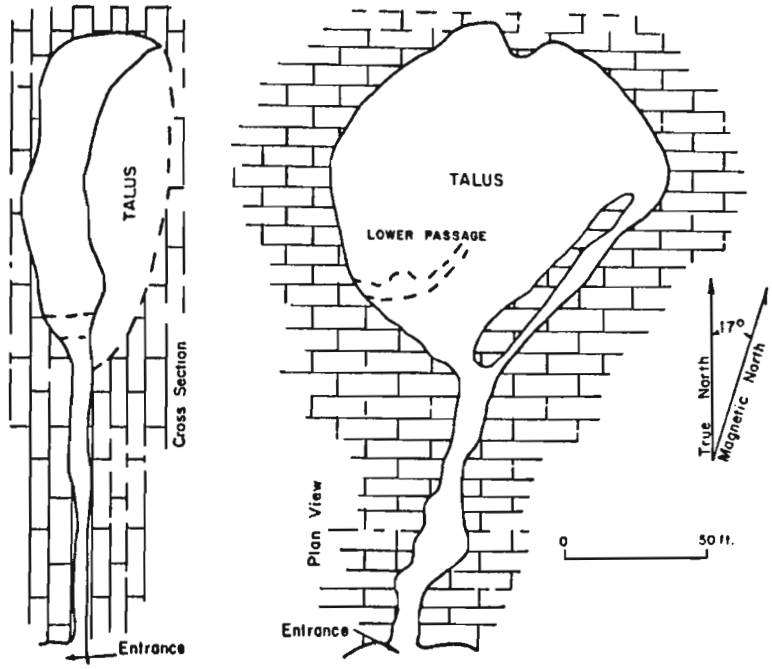
Keyhole Cave

Keyhole Cave is a huge, keyhole-shaped rock shelter overlooking the impressive Crooked Creek Canyon. Climbing equipment is useful in reaching this shelter.

Three small caves are on the southwest side of a knife-edged ridge in the southern part of the Pryor Mountains. Four-eared Bat Cave has a small colony of California Lump-nosed Bats. The cave consists of two rooms. Four-by-four Cave has a 20 foot pit entrance into a single room. Sykes Cave has about 500 feet of mostly low passage.

Frogg's Fault Cave

This cave is about a mile north of Sykes Cave. It is a multiple-pitch entrance drop with a total depth of 261 feet. The remainder of the cave is a high, narrow fissure for several hundred feet It is the deepest cave in the Pryor Mountains.



Royce Cave, from the guidebook of the 1969 NSS convention

Royce Cave

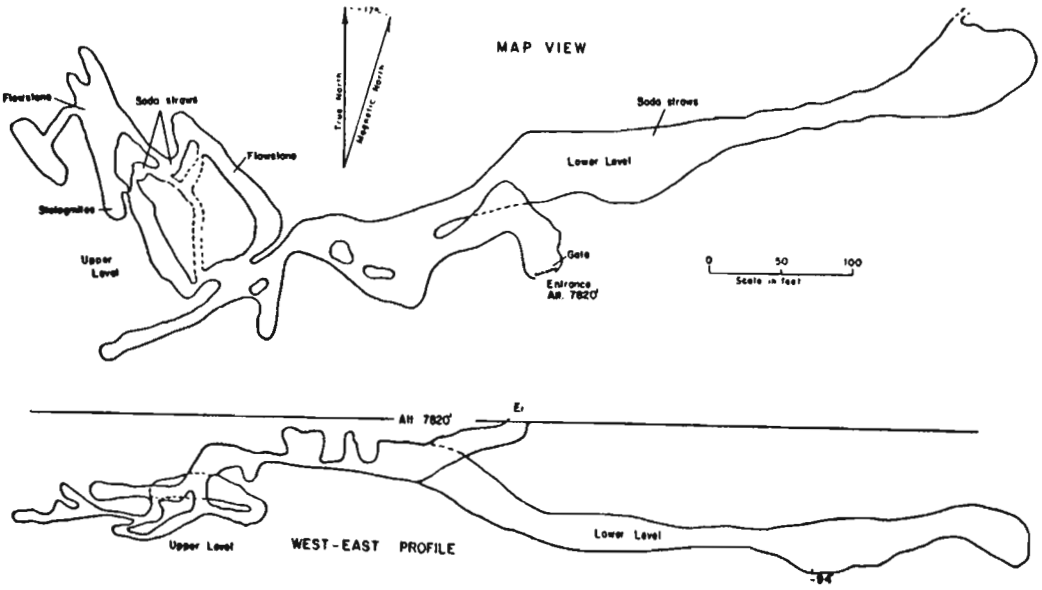
This small cave is a few miles north of Frogg's Fault Cave. It consists of a 100 foot crawlway into a room 40 feet in diameter. A small passage is under the room.

Mystery Cave

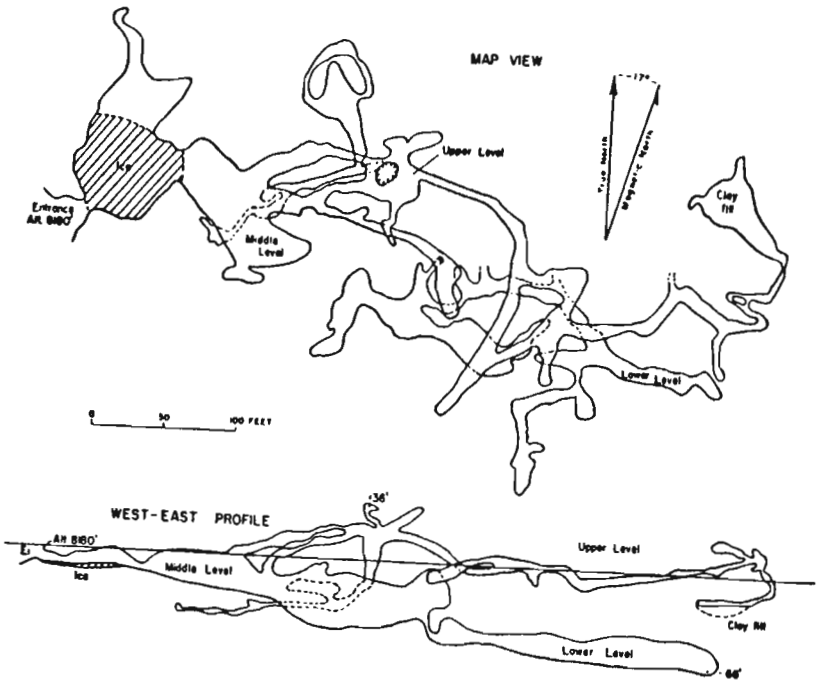
Mystery Cave is on the south end of East Pryor Mountain. It has 1646 feet of mapped passage and is the best decorated cave in the Pryor Mountains. The cave is gated with access through the Bureau of Land Management office in Billings, Montana. East from the entrance, the cave passage is about 30 feet in diameter and 400 feet long. To the west of the entrance the cave consists of several small rooms and passages. Most of the speleothems are on the west side.

Salt Lick Cave

This large rock shelter (or small cave) is about one mile north of Mystery Cave. It is less than 100 feet long with daylight visible all the way to the back.



Mystery Cave, reprinted from Campbell (1978) with permission of the Montana Bureau of Mines and Geology



Little Ice Cave, reprinted from Campbell (1978) with permission of the Montana Bureau of Mines and Geology

Little Ice Cave

Little Ice Cave is about one mile west of Salt Lick Cave. It has about 3500 feet of known passage and is the longest cave in the Pryor Mountains. Significant additions to the cave were discovered during the 1969 NSS Convention in Lovell, Wyoming. The entrance is a large low room with an ice floor and several ice speleothems. The remainder of the cave is dry and consists essentially of three levels with small rooms and low passages.

Black Hills Caves

Jewel Cave and Wind Cave are the first and second longest caves in the western U.S. Jewel Cave has about 70 miles of mapped passage while Wind Cave has 40 miles. Both are managed by the National Park Service. Reed's Cave is located between the two giants and has three miles of mapped cave. There are a number of much smaller caves scattered around the Black Hills. Most of the caves are in the Pahasapa Limestone (Madison equivalent). A few small gypsum caves are present in the Spearfish Formation on the west side of the Black Hills while some karst features are developed in the Minnekahta Limestone in the southern part of the Black Hills.

Jewel Cave

With approximately seventy miles of mapped passages, Jewel Cave is the second longest cave in the western hemisphere. Unlike Wind Cave where most of the mapping was done over a number of decades by various groups, Jewel Cave was largely mapped by Herb and Jan Conn and friends. For a proper appreciation of the fun and adventure these people had, I recommend Herb and Jan Conn's book The Jewel Cave Adventure (1977, Zephyrus Press).

Depending on who you believe, Jewel Cave was discovered about 1895. The Michaud brothers (whether they actually discovered the cave or not) were the first explorers. Their attempt at commercializing and mining the cave proved ultimately to be unprofitable but it was not until several years after Jewel Cave National Monument was created (1908) that the mining claim was finally relinquished. There seemed to be little interest in pushing Jewel Cave passages for many years. As recently as 1959 less than two miles of cave passage was known. The better publicized Wind Cave was getting all of the attention.

In 1959, Dwight Deal introduced the Conn's to Jewel Cave. As one story goes, the park management asked them to find passage connecting the two ends of the tour route so tourists would not have to see the same passage twice. After exploring more than sixty miles of cave they have failed to find the connection. By 1963 the cave had nearly 15 miles of known passage and the Park Service decided to add a new tour. Exploration ceased for two and a half years while an access tunnel and vertical shaft were dug for this new tour. The new tour and visitor center were opened to the public in 1972. After two decades of exploration, Herb and Jan Conn are largely retired and have handed their legacy to the Pahasapa Grotto.

Jewel Cave is a multi-level, three dimensional maze cave. The Conn's have identified four levels on their map; loft level, chert level, main passage level, and lower level. Jewel Cave is especially noted for the thick deposit of calcite crystals that line the passages in many parts of the cave. Flowstone and dripstone deposits are a little better developed here than in most other Black Hills Caves. Anthodites (frostwork), helectites, popcorn, and gypsum flowers, needles, and angels hair are delightfully present. Jewel Cave also contains some rare speleothems such as hydromagnesite ballons, bottle brushes (clusters of macroscopic calcite crystals on the tip of stalactites), logomites (hollow stalagmites), and scintillites (helectites of tiny quartz crystals). On the unpleasant side of the coin there are numerous deposits of slimy black manganese dioxide that coat everything that comes in contact with it.

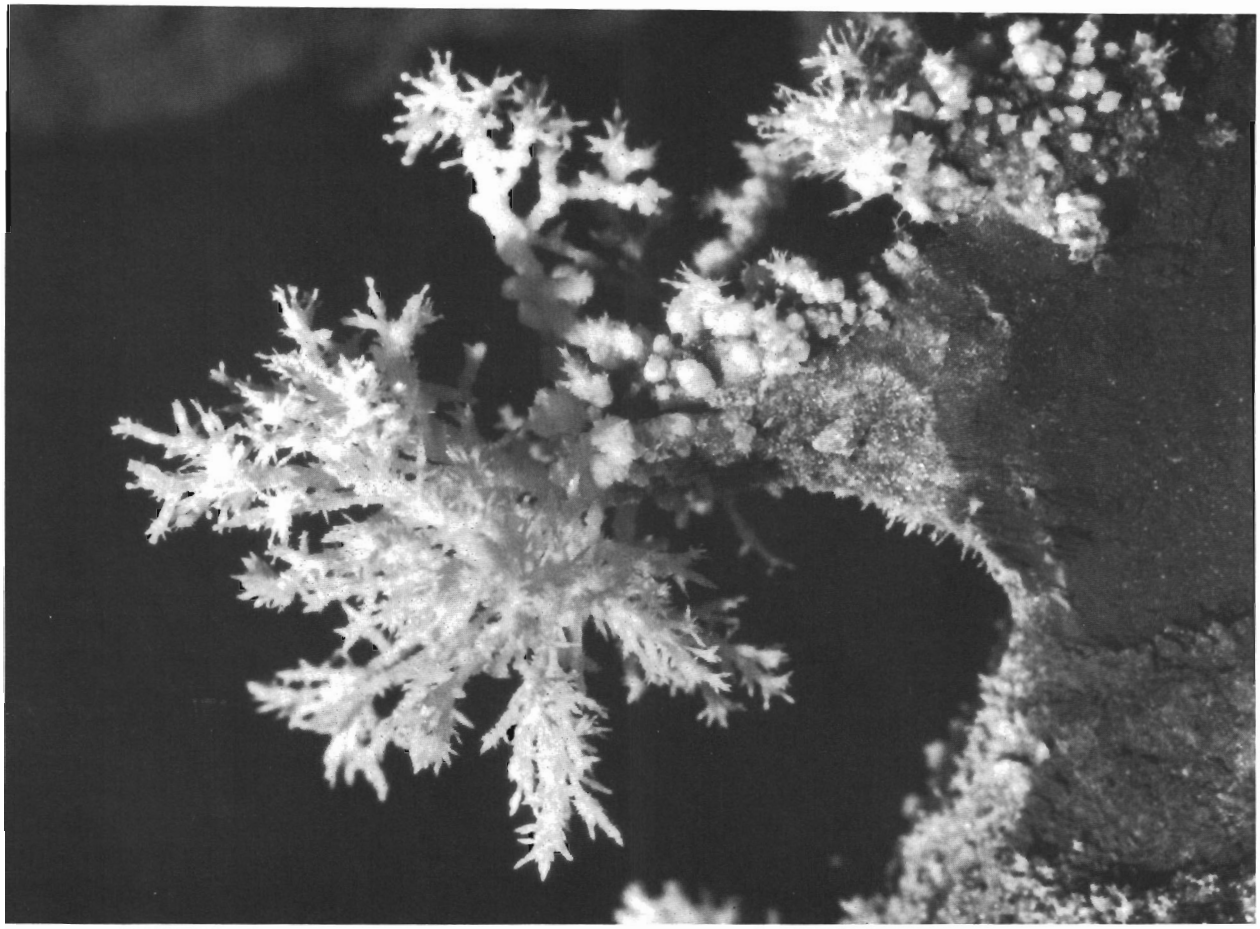
Wind Cave

Wind Cave was discovered in 1881 by deer hunter Tom bingham. As the story goes, Tom heard a whistling noise and, upon investigating, his hat was blown off of his head by a strong wind coming out of the ground. On another occassion, his hat was suppossedly sucked into the cave by the wind never to be seen again. Sometime later, the McDonald family filed a homestead claim for the area around the cave entrance while the Stabler family filed a mining claim for the cave. The resulting feud between the two families was bitter with guns drawn on more than one occassion. When a final effort at compromise collapsed, the government stepped in and withdrew the land from the public domain. In 1903, the Congress set up Wind Cave National Park, the first such park devoted to a cave.

A number of parties have explored and mapped in Wind Cave since the 1880's. Much of the earliest exploration was done by Alvin McDonald, especially in the area around the tour route. Following his premature death in the 1890's little exploration was done for several decades. In 1959 an NSS expedition mapped several miles of cave passage and concluded that little else would be discovered. In the early 1960's, Herb and Jan Conn and companions pushed a breakthrough into Omnibus Hall and several miles of cave beyond. Some sporadic mapping was done by the Colorado Grotto in the late 1960's.

From 1970 to 1973, the Windy City Grotto pushed the known length of the cave from 12 miles to about 26 miles. A base camp was set up deep in the cave in 1972 but proved to be unnecessary. A well organized, smaller party in 1973 mapped more cave without the clumsy base camp. Organized mapping resumed in 1979 with a special use permit issued to John Scheltens. Currently, the cave has 39.5 miles of mapped passage with a vertical extent of approximately 650 feet.

Wind Cave consists of two distinct levels. The upper level is a true three-dimensional maze with passages going in any direction. The passages range from tight crawls to large breakdown chambers. A considerable amount of sediment is present in the upper level and contributes to the variable coloration. The boxwork for which Wind Cave is well known is best seen in the upper level. What little flowstone and dripstone is present in the cave is concentrated in the upper level.



Anthodite (Frost Work) from the Polar Ice Cap in Wind Cave.
This aragonite flower is about 10 inches across.

Anthodites (frostwork) and popcorn are found sporadically throughout the upper level but are most abundant in the northern (highest) reaches of the cave. They are also found where the upper and lower levels connect. Rare logomites (hollow frostwork stalagmites) are also known from the upper level. Gypsum needles are present in Selenite Avenue and a few other locations.

THe lower level (known as the Calcite Jungle) is composed of interconnecting narrow, straight, high fissures. The passages are strongly joint controlled. Everything in this level is usually coated with minute crystals of dogtooth spar. In many areas a false floor has developed, one to two inches thick, at some level in the fissures. The Calcite Jungle is usually bright white to gray in color with little cave sediment exposed. Because of the calcite coating, boxwork is seldom seen in this level. Flowstone is rare with the best development at the Crystal River. Beautiful helectite bushes (up to 6 feet across) are present in several areas of the lower level. Star-like clusters of gypsum ("gypsum splatters") are locally abundant while gypsum angel's hair is present in Shelob's Lair. The water table has been encountered along the southern limits of the cave at several localities. Rafts of "calcite ice" float on several of the lakes and can be found in other, presently dry areas of the Calcite Jungle. The connection between the upper and lower levels invariably involves climbing a pit or fissure for about 100 feet. Most of these connections do not require rope.

Reeds Cave

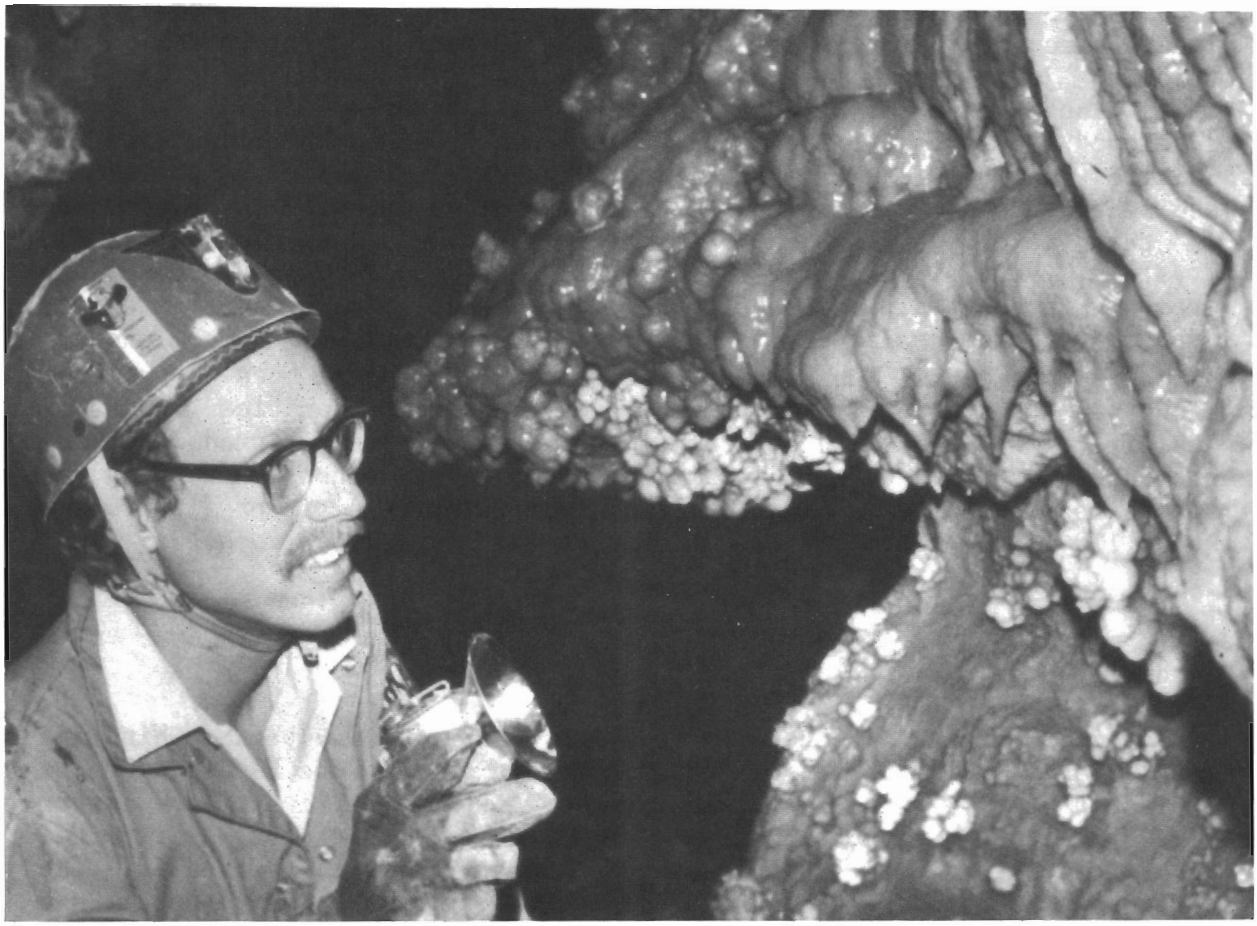
Reeds Cave is located in a quarry about halfway between Wind and Jewel Caves. The cave is gated with access through the Pahasapa Grotto in Rapid City. The cave was discovered when a portion of the quarry floor collapsed into the cave. A heavy equipment operator was reported to have driven across the collapse site moments before it caved in. The cave now has several entrances and the one currently in use requires a cable ladder.

Reeds Cave is noted for its long crawls. It has two very pleasant formation rooms. The cave has many similarities with both Wind and Jewel caves. Boxwork, gypsum, and frostwork are present sporadically.

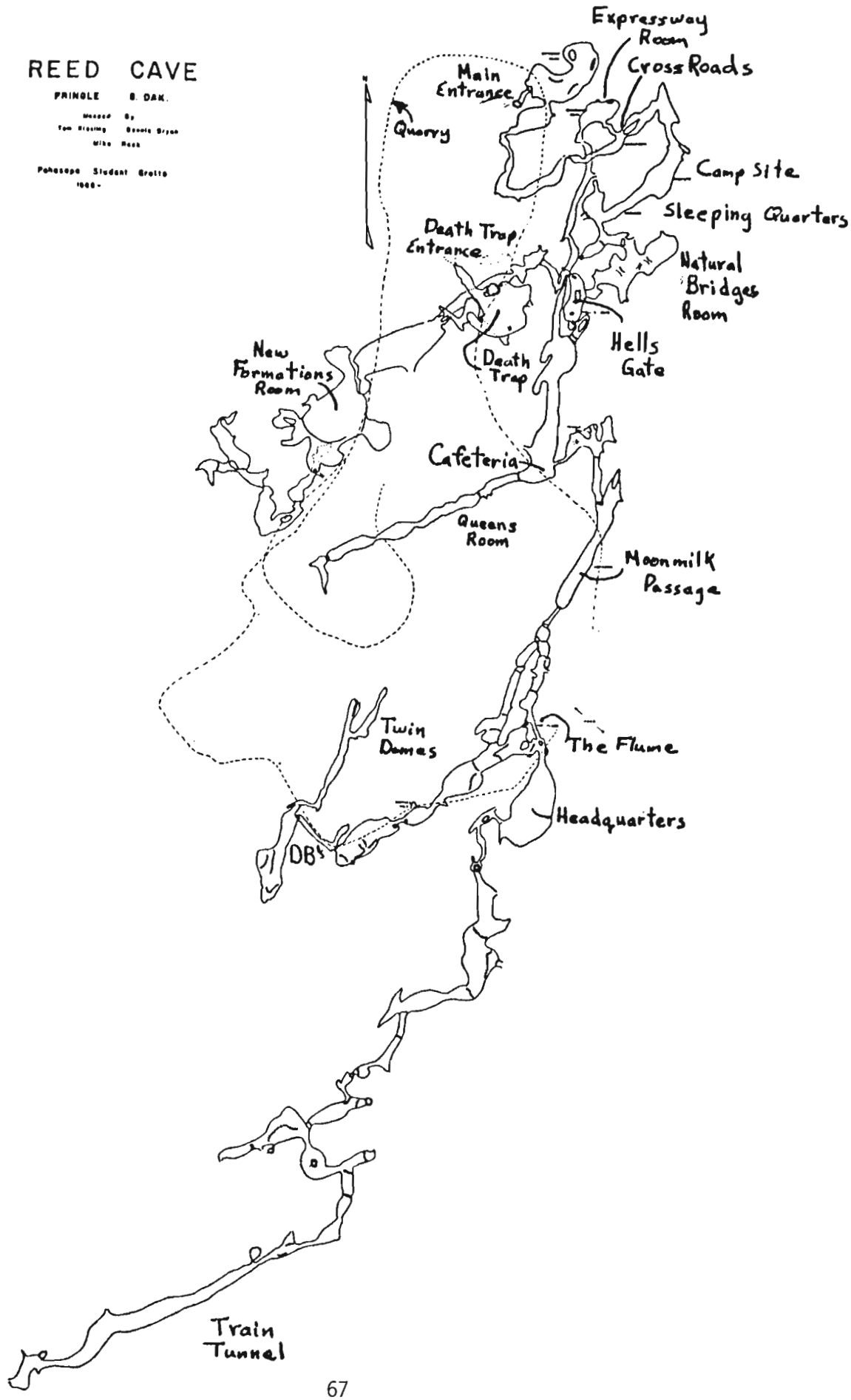
Southern Black Hills

A number of small caves are present on National Forest land in the southern part of the Black Hills. Because of scattered private in-holdings in the forest, many of the caves can be difficult to get to. Any one interested in these caves should contact members of the Pahasapa Grotto. Some of the descriptions are supplied by Dave Springhetti or are from the guidebook from the 1962 NSS Convention.

Rainbow Cave is about one mile west of Wind Cave National Park. The entrance is a short rope drop. The cave has one fair sized room with several crawlways. Some colorful speleothems are present.



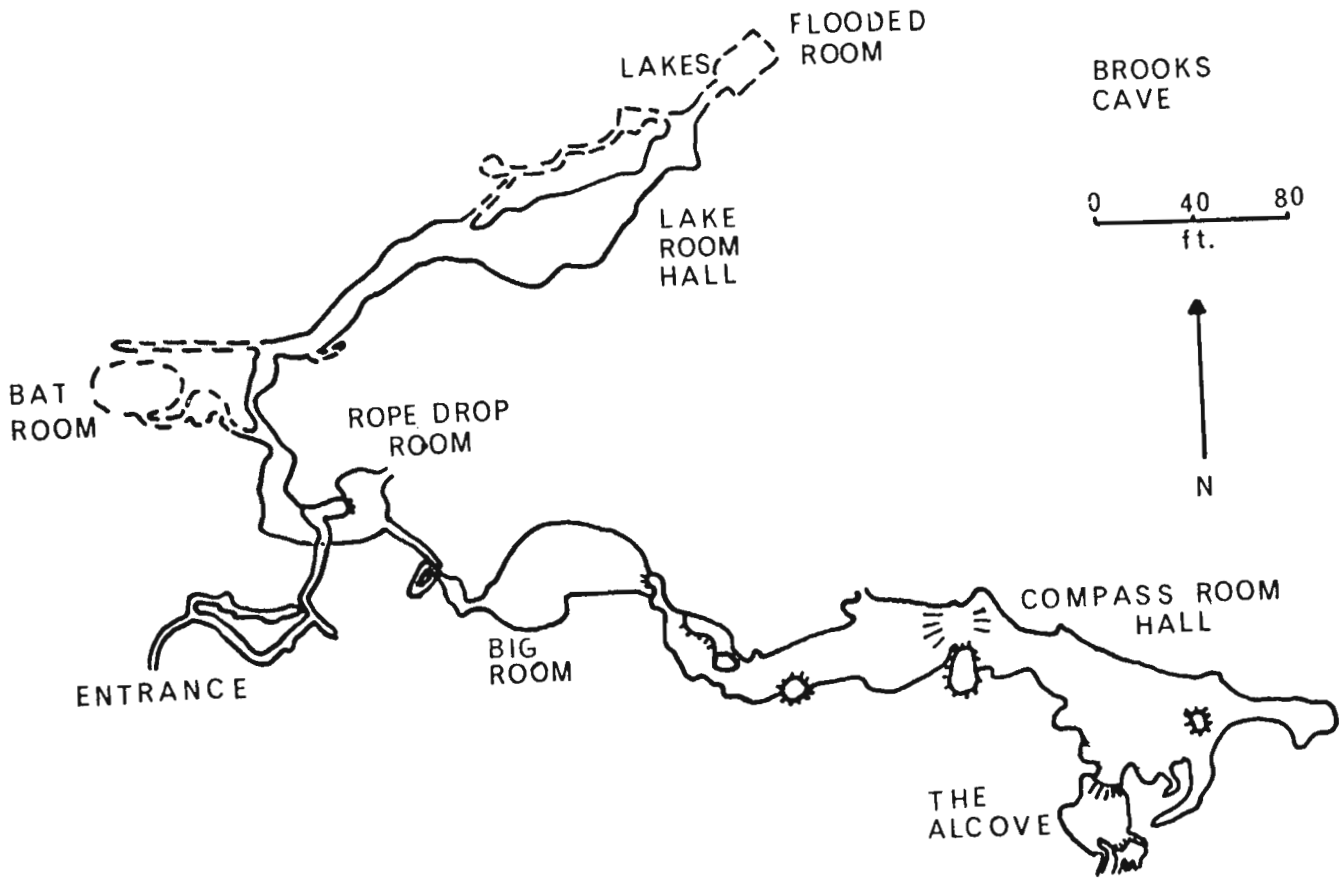
Roy Hayford examining flowstone and popcorn in the Queen's Room in Reeds Cave. Photo by Eric Liebes.


REED CAVE
PRINGLE S. DAK.
Expressway Room
Cross Roads
Main Entrance
Quarry
Camp Site
Sleeping Quarters
Death Trap Entrance
Natural Bridges Room
Hells Gate
New Formations Room
Death Trap
Cafeteria
Queens Room
Moonmilk Passage
Twin Domes
The Flume
Headquarters
DB's
Train Tunnel

The entrance to Onyx Cave is a six foot by three foot hole in the north side of Cold Brook Canyon. The cave consist of a single passage that parallals the canyon wall. Some rope work is required in the short drops in the cave. The lowest level of the cave is very muddy but contains many soda straws.

King Tut Cave is about three miles east of Jewel Cave National Monument. This short, vertical cave is very sporting but is devoid of speleothems. The entrance is in a short cliff of limestone. One tight chimney just in from the entrance leads to a rubble strewn slope that ends at the top of another, wider chimney. A side passage at the bottom of this chimney leads to a fifty foot rope drop to the lower level of the cave. A mine once intersected the lower level of the cave.

Jasper Cave is one mile north of Jewel Cave National Monument. This short caves has a number of tight crawls with a good wind.



Northeast Black Hills

Brooks Cave

Brooks Cave is privately owned with access through the Pahasapa Grotto. The cave is short and dusty with a small lake at the back. Some vertical work is necessary. The cave has been vandalized but some speleothems are still present.

Bitch-to-find-Cave

The description is from Alan Williams (Rocky Mountain Caving, 1984, vol. 1, #1). Bitch-to-Find-Cave is developed in steeply dipping Pahasapa Limestone on the eastern flank of the Black Hills, near Piedmont, South Dakota. With an average slope of fifty degrees, the cave reaches a depth of 113 feet in 401 feet of surveyed passage. The cave can be traversed without rope, although a handline is useful for the drop at -50 feet.

The cave consists of a series of rooms stacked stepwise one below the other and connected by short passage segments. The cave development closely follows the dip of the limestone strata. Breakdown has modified the passage shape in some parts of the cave, particularly in the lower rooms. The lowest passages of the cave are filled with clay, halting downward exploration.

Bethlehem Cave

This commercial cave is about twenty miles northwest of Rapid City. This short cave is largely lined with dog-tooth spar. Dripstone, flowstone, boxwork, frostwork, and popcorn are also present in the cave. A number of pools are present in the lowest part of the cave.

Rushmore Cave

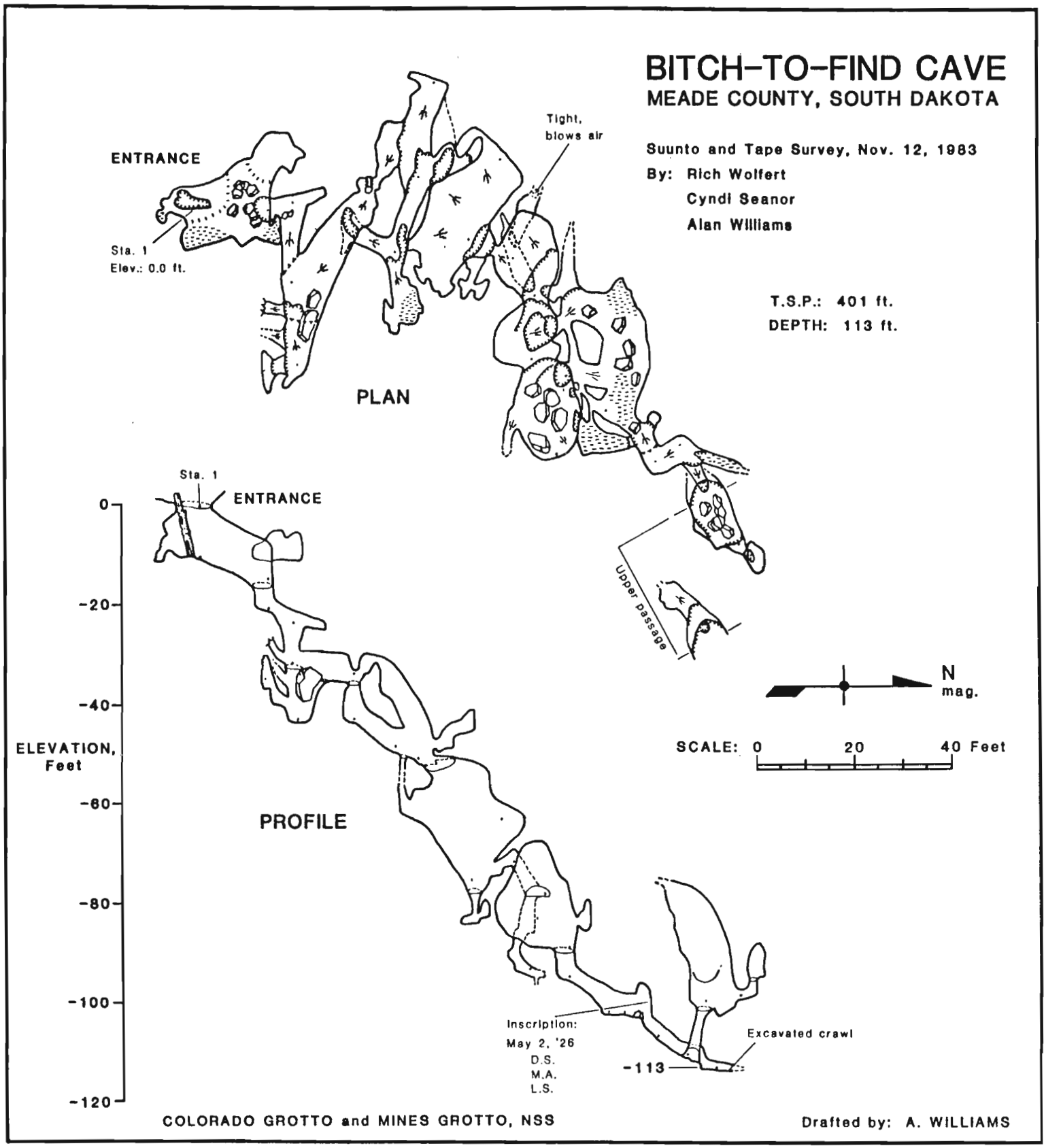
This short commercial cave is about 15 miles southwest of Rapid City. This cave contains abundant dripstone and flowstone but is devoid of crystal speleothems so common in other Black Hills caves. Near by is another commercial cave, Sitting Bull Crystal Cavern. This small cave is noted for its large dog-tooth spar crystals. Several layers of the spar can be seen seperated by a layer of mud.

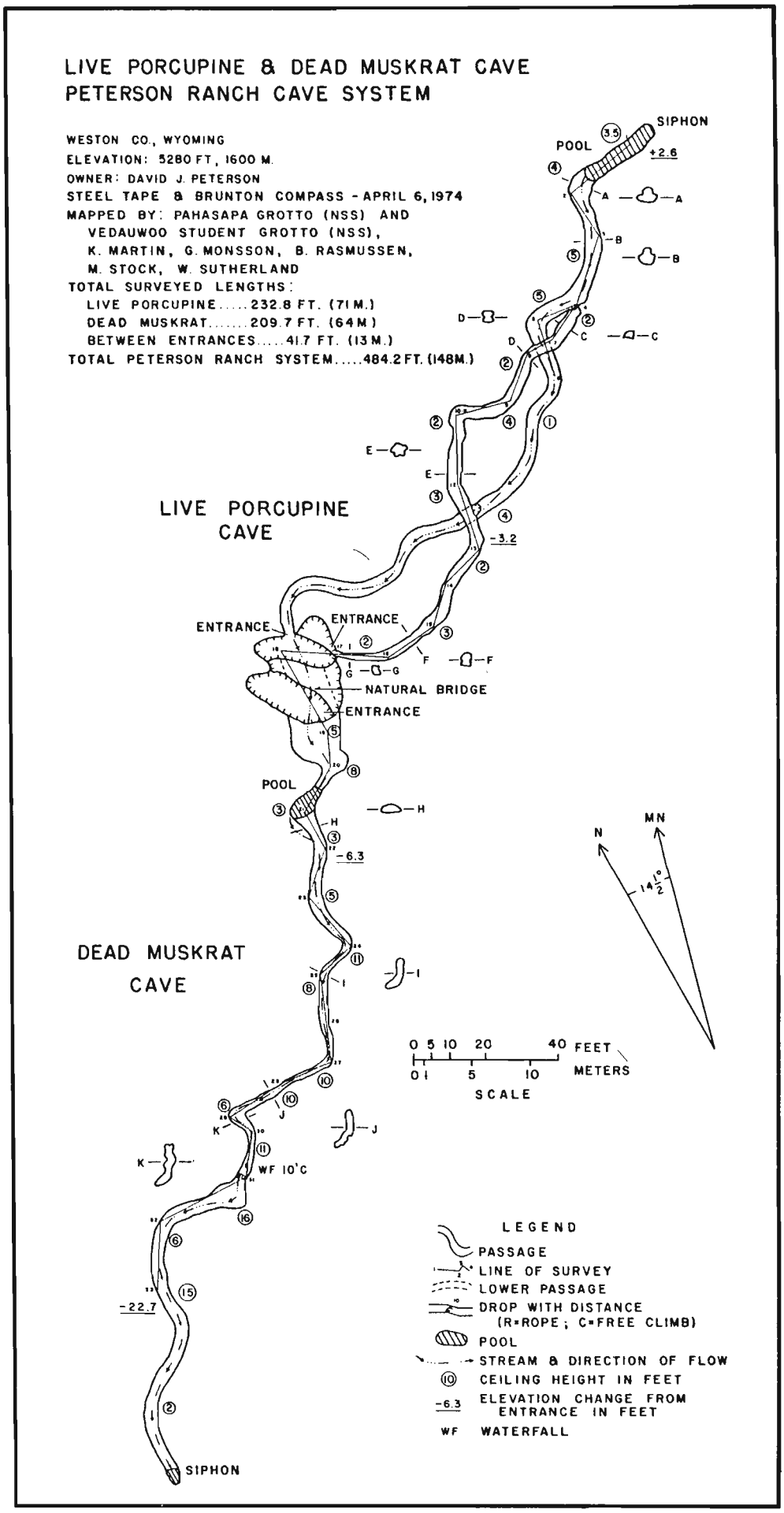
Western Black Hills

Darton's Cave

(Description from Hill and others, 1976)

This privately owned cave is in gypsum of the Spearfish Formation. A crawl at the bottom of a sinkhole leads to a walking-height stream passage. The stream sumps shortly in a small side passage. A small crawl parallals the main passage which ends in a pool.


BITCH-TO-FIND CAVE
MEADE COUNTY, SOUTH DAKOTA
Suunto and Tape Survey, Nov. 12, 1983
By: Rich Wolfert
Cyndi Seanor
Alan Williams
T.S.P.: 401 ft.
DEPTH: 113 ft.
ENTRANCE
Sta. 1
Elev.: 0.0 ft.
Tight, blows air
PLAN
Upper passage
N
mag.
SCALE: 0 20 40 Feet
Sta. 1
ENTRANCE
0
-20
-40
-60
-80
-100
-120
ELEVATION, Feet
PROFILE
Inscription:
May 2, '26
D.S.
M.A.
L.S.
-113
Excavated crawl
COLORADO GROTTO and MINES GROTTO, NSS
Drafted by: A. WILLIAMS



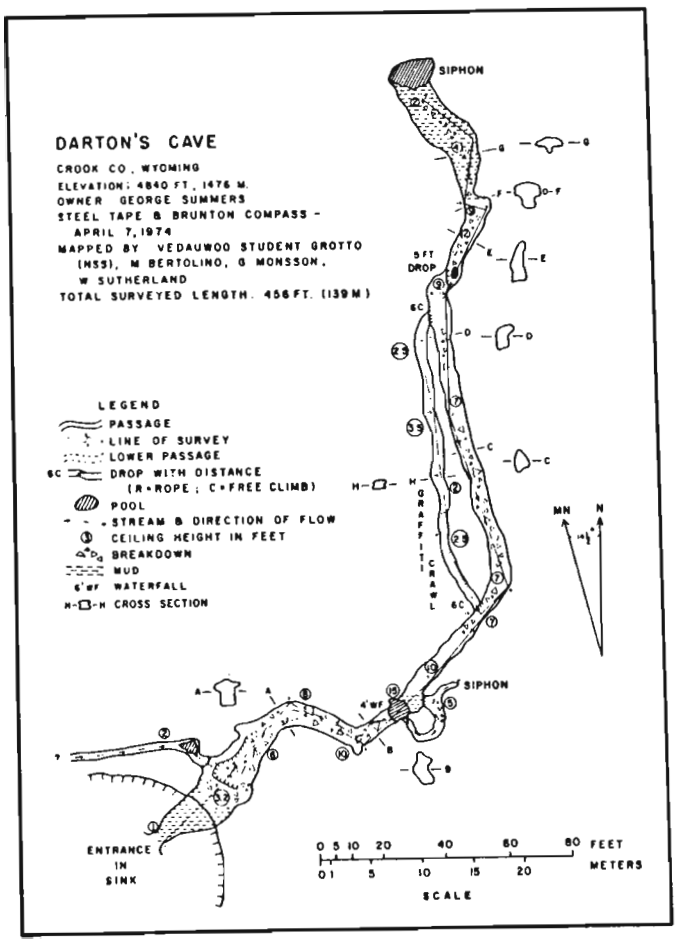
Reprinted from Hill and others (1976) with permission of the Wyoming Geological Survey.

Peterson Ranch Caves

Six caves are known on the Peterson Ranch with a number of other sinkholes present. All of the karst features are developed in the thin gypsum beds in the lower part of the Spearfish Formation.

In a small west drainage on the ranch, two small caves were recently discovered. Jeanie's Ice Cave has two muddy walk-in entrances and one short pit entrance. Most of the cave is rectangular in shape, about 3 feet on a side. Some seasonal ice is present near the entrances. Several pools with rotting vegetation and a small stream are present near the back of the cave. The next sink downstream of Jeanie's Ice Cave is the main entrance of Peterson Ranch Cave. This cave contains abundant mammal droppings. About half of the cave contains a very tight, unsurveyed, meandering crawl that branches off from the main passage and has a seperate entrance.

Further south in a seperate drainage lie four more caves along the same stream. The stream issues from a muddy pool at the back of Grand Hypothermia Caverns, flows across a sinkhole and enters Pepsi's Cave. Unlike most of the caves in this area, Pepsi's Cave contains walking-height passage for most of its short length and is not particularly muddy. The stream that sumps in Pepsi's Cave arises in the back of Live Porcupine Cave. This cave consists of two crawlways, the lower one contains the stream. The upper crawl contains Porcupine droppings and on at least one occassion, a porcupine. The stream flows out of the cave and into Dead Muskrat Cave. After a short entrance crawl, much of the passage is of walking height. A ten foot waterfall is present about halfway through the cave.



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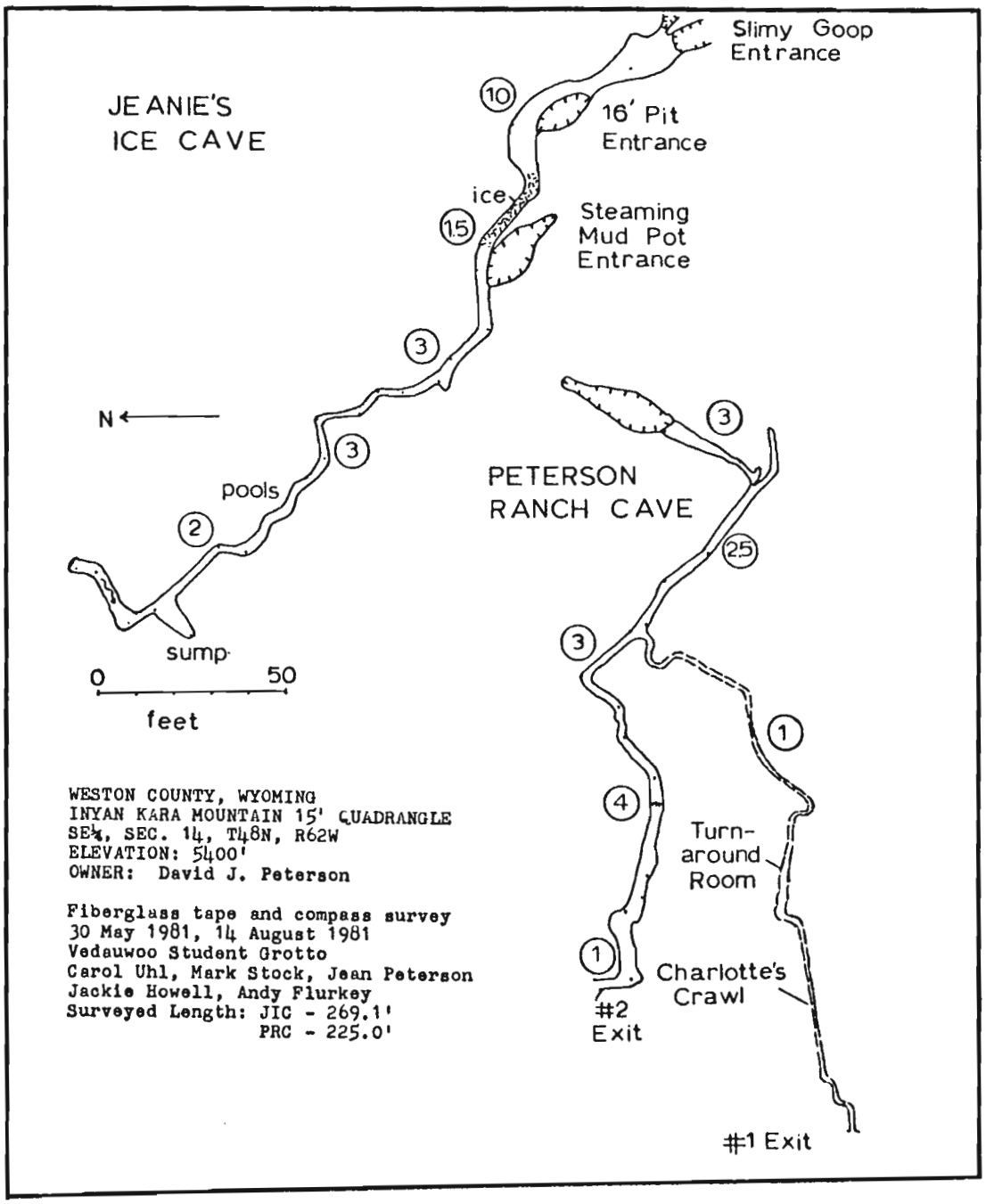
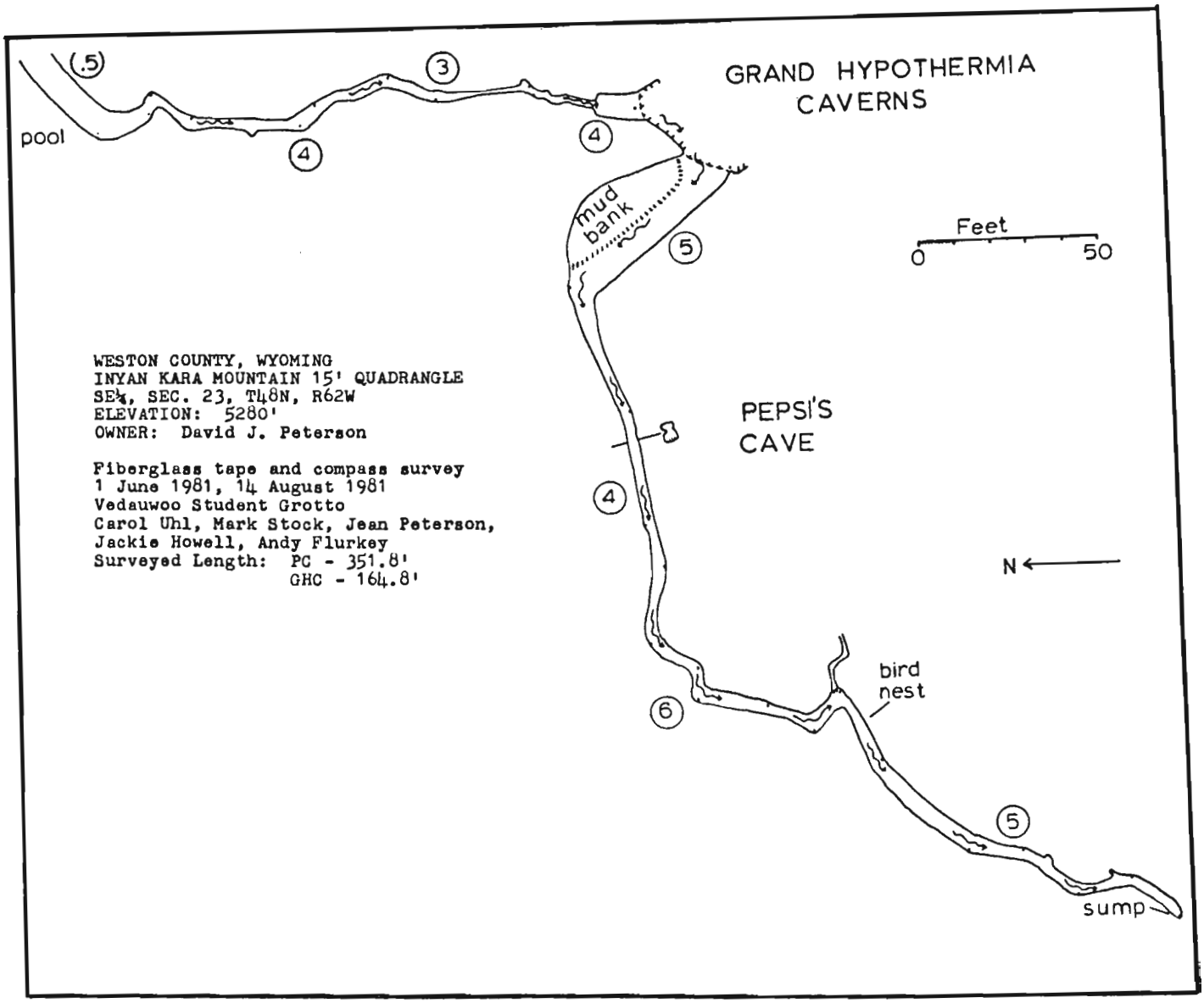

JEANIE'S
ICE CAVE
Slimy Goop
Entrance
10
16' Pit
Entrance
ice
15
Steaming
Mud Pot
Entrance
3
N
3
pools
2
sump
0
50
feet
PETERSON
RANCH CAVE
3
25
3
1
4
Turn-
around
Room
1
Charlotte's
Crawl
#2
Exit
#1 Exit
WESTON COUNTY, WYOMING
INYAN KARA MOUNTAIN 15' QUADRANGLE
SE¼, SEC. 14, T48N, R62W
ELEVATION: 5400'
OWNER: David J. Peterson
Fiberglass tape and compass survey
30 May 1981, 14 August 1981
Vedauwoo Student Grotto
Carol Uhl, Mark Stock, Jean Peterson
Jackie Howell, Andy Flurkey
Surveyed Length: JIC - 269.1'
PRC - 225.0'


GRAND HYPOTHERMIA CAVERNS
pool
mud bank
Feet
0
50
PEPSI'S CAVE
N
bird nest
sump
(.5)
(3)
(4)
(5)
(6)
WESTON COUNTY, WYOMING
INYAN KARA MOUNTAIN 15' QUADRANGLE
SE¼, SEC. 23, T48N, R62W
ELEVATION: 5280'
OWNER: David J. Peterson
Fiberglass tape and compass survey
1 June 1981, 14 August 1981
Vedauwoo Student Grotto
Carol Uhl, Mark Stock, Jean Peterson,
Jackie Howell, Andy Flurkey
Surveyed Length: PC - 351.8'
GHC - 164.8'

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Sponge Warp by Mike Kopriva

1984 NSS CONVENTION

CAVE THE WILD WEST

SHERIDAN, WYOMING