

TEXAS SPELEOLOGICAL SURVEY

Vol. 1, No. 8

THE CAVES OF NORTHWEST TEXAS

Edited by James R. Reddell and William H. Russell

A Publication of the
Texas Speleological Association

June, 1963

TEXAS SPELEOLOGICAL SURVEY

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THE CAVES OF NORTHWEST TEXAS

INTRODUCTION

AREA COVERED: For the purposes of this report Northwest Texas is considered as a narrow band of gypsum extending north from Nolan County, through Fisher, Stonewall, King, Cottle, Childress, Collingsworth, and Wheeler Counties. To the east it spreads to include a corner of Knox County and all or parts of Foard, Hardeman, and Wilbarger Counties. To the west it extends up Palo Duro Canyon to include Briscoe and Armstrong Counties. Randall, although containing no gypsum, is also included because of numerous caves in Triassic redbeds. Gypsum is also present in Hall and Donley Counties. All of the above counties, upon intensive investigation, should have caves. The most promising areas, with the possible exception of Collingsworth County, are covered by this report. Counties known to have caves are Stonewall, Cottle, Childress, Hardeman, King, Wheeler, Randall, Armstrong, and Hall. Although Lubbock County, which is known to have caves, is a part of the area it is so atypical both geologically and speleologically that it will be reserved for a future report.

PREVIOUS WORK: Many of the caves in the area are quite well known locally and have been the subject of frequent exploration by local people. Perhaps the best known of these are River Styx Cave, Walkup Cave, Big Mouth Cave, Black Hand Cave, and Dead Man's Cave. The caves in Palo Duro State Park are frequently visited by picnickers and local cave explorers. The first scientific investigation of the caves began in 1958 when Dr. Donald W. Tinkle of Texas Technological College began an intensive study of bats in the area. His studies and associated studies made by students under his direction included large-scale bat banding operations and a temperature study of River Styx Cave. Preliminary reports on these studies were published in 1959 and 1960. Collapse Cave was made the object of intensive geologic study by Dan McGregor, Eugene Pendery, and Don McGregor. A report and map of the cave were published in January 1963 in the Journal of Geology. Charles E. Stewart, a high school student from Amarillo, visited the caves in Palo Duro State Park and, in 1963, made careful sketch maps of nine of the caves. In May 1963 William H. Russell and James R. Reddell of the Texas Speleological Survey visited the area, exploring 37 and mapping 15 caves. They also made collections of invertebrate fauna in many caves. The results of this work, supplemented by the previous investigations, is published in this report.

GEOLOGY OF THE AREA: The area described in this report is located mainly in the North Central Plains, a minor division of the Great Plains Province, although the western portion of the area described lies on the dissected edge of the High Plains. The land surface slopes gently to the east away from the High Plains and is drained by several rivers that flow almost parallel east-west courses across the area. These streams, tributaries of the Brazos and Red Rivers are: the Double Mountain Fork of the Brazos River, the Salt Fork of the Brazos River, the South and North Forks of the Wichita River, the Pease River, the Prairie Dog Town Fork of the Red River, the Salt Fork of the Red River, and the North Fork of the Red River. In general the area has little local relief, as the rocks are composed mostly of easily eroded shales and sandstones. Where the harder and more resistant dolomites and gypsums outcrop, however, they form prominent east-facing escarpments with a gentle slope of about 100' per mile down the dip slope

to the west. These rugged areas supported by hard gypsum and dolomite ledges are specially pronounced near the larger rivers, where the weaker underlying rock is more easily removed. The most prominent of the escarpments is the one capped by the gypsums and dolomites of the upper Blaine Formation. This escarpment ranges from 50 to 200 feet in height. The chief cave-containing formation is the Blaine Formation, about 600 feet thick in the area described. This formation consists of massive beds of gypsum, vari-colored shales, dolomites, and some sandstone. The lower part of the formation is mostly shale with a few interbedded ledges of gypsum and dolomite. The upper portion of the formation contains a much larger percentage of gypsum; in some areas the upper 200 feet of the formation is over one-half gypsum. In the sub-surface this section is composed of salt and anhydrite, and the removal of the salt and the changing of anhydrite to gypsum has caused the gypsum to slump and crumple, especially the thinner layers. When the individual ledges of gypsum can be traced they are not constant, but lens out and are replaced by others. In many places the gypsum has a concretionary appearance with egg-sized lumps of gypsum outlined by dark areas. Interbedded with the gypsum is a varied sequence of red, gray, green, and blue shales. Many of these shales contain crystals, nodules, and veins of gypsum. Below the the Blaine Formation lies a large thickness of shales of no speleological interest, but the formation above the Blaine contain several cave-forming gypsums, but these are much thinner than the Blaine gypsums and do not form large caves. Immediately above the Blaine is the Glean Chief Formation, consisting mostly of brick red sandy shales, with a few ledges of gypsum and dolomite. Above this is the Quartermaster Formation, of variable thickness as the upper part has been removed by pre-Triassic erosion. This formation also contains a few ledges and lenses of gypsum. Above this a thick section of Triassic redbeds is exposed, but only in the western part of the area. This is easily eroded and contains many caves in the Palo Duro Canyon.

SPELEOGENESIS: The speleogenesis of gypsum caves is quite similar to that of limestone caves except that vadose enlargement by invading floodwaters is much more important in the gypsum caves. Gypsum caves have long been speleologically neglected and only recently have modern theories of cave origin been applied to gypsum areas. The first people to describe gypsum caves usually ascribed their origin to subsurface erosion without much effort to describe the exact method of formation. One of the first careful observers of gypsum caves was C. N. Gould (Gould, 1904) who described the gypsum areas of Oklahoma. His views, as summarized by L. C. Snider (Snider, p. 149) were as follows: "The gypsum of this region is selenitic and easily attacked and dissolved by ground water. They are cut by two sets of joints almost at right angles to each other. The crossings of these joints locate points where the ground water can effect its greatest solvent action, and funnel-shaped solution holes are formed. After a hole is formed, the water which flows down through the opening begins to work out through the soft sandy layers which lie immediately below the gypsums. At the canyon wall the water working out from this sand softens it and carries it away thus starting a channel under the gypsum ledge. The head of this channel works rapidly back until it comes under the solution hole or sink. Then if there is a second solution hole back farther from the edge of the hill the process will be repeated and so on, until considerable caves are formed if the conditions are favorable." A much later study (McGregor, et al, 1963) recognizes the existence of phreatically developed caves but still considers the effect of phreatic solution to be negligible in the case of most caves. In their description of Collapse Cave they state, "Surface water first descended into the

underlying gypsum along joints and fractures, the principle points of entry into the crystalline rock. The water was further dispersed along bedding planes marked by distinctive textural changes in the gypsum... As the vadose water dissolved small channels along the more accessible joints and bedding planes an escape route was developed by the water as it penetrated Shale 2." It seems likely, however, for several reasons that the small original passages that were invaded by the surface waters are actually phreatic in origin. First there is the existence of water circulation in the gypsum below the water table as is shown by numerous water wells drilled into the gypsum. That this water does dissolve phreatic passages is shown by the several gypsum caves whose origin is undoubtedly phreatic. And as most of the gypsum is very poorly jointed it is hard to see how the vadose channels could form through the low-porosity gypsum for distances of over a half-mile in the geologically short time available. It seems to be more likely that most gypsum caves are formed by surface water invading and enlarging pre-existing phreatic tubes. In passages that have not been modified greatly by the invading water signs of these original tubes are clearly evident. Thus we have the following picture emerging: first, phreatic solution dissolves a system of tubes under the water level; if conditions are favorable a complex array of large phreatic passages may result; then as the surface is dissected, streams invade those tubes and enlarge them to form the present, mostly vadose, caves.

BIOLOGY: Of the 57 caves included in this report 18 are known to be inhabited, at least for short periods of the year, by bats. The following six species have been reported from the caves of the area: Myotis velifer incautus (Allen), the Cave Bat or Little Brown Bat; Pipistrellus subclavus (Cuvier), the Eastern Pipistrelle; Pipistrellus hesperus (Allen), the Western Pipistrelle; Corynorhinus rafinesquii palliessens (Miller), the Lump-nosed Bat; Eptesicus fuscus pallidus Young, the Big Brown Bat; and Tadarida brasiliensis mexicana (Saussure), the Mexican Free-tail Bat. By far the most common species is Myotis velifer, which utilizes the caves for winter hibernation. In a few caves they number in the thousands, but in most they seldom exceed a few hundred. Since most of the caves are comparatively recent in origin and many are subject to violent floods, the possibility of finding troglobitic forms is poor. A few of the caves, which are less subject to severe flooding and may be older than most, may harbor true cave forms. What may be a troglobitic millipede, Nannoleus sp., is known from three caves in the area. The most common troglodyte from the area is a beetle, Agonum (Rhadini) sp. At least one species, Agonum (Rhadini) rukrum Barr, has been described, but there are probably undescribed species in the material not yet studied. Other common fauna includes spiders, epigeal isopods, cave crickets, harvestmen, and several species of beetle. In caves subject to flooding by rivers fish, crayfish, and semi-aquatic forms are occasionally found. In general the area is not a good one for cave collecting, but should troglobitic forms appear in the unstudied material they will doubtless be of great interest.

CAVING POTENTIAL: There appear to be two major types of caving areas in Northwest Texas, one along the major drainage of the large rivers, and another back from the rivers. Although numerous caves will be found in the latter area, perhaps even more than will be found along the rivers, they will almost certainly be small sinks or cracks blocked by silt. A few caves may be found with a few hundred feet of passage, but the lack of local relief and the amount of topsoil on the surface will probably prevent the development of any caves such as those found in areas of large run-off near the big rivers. The principal caving area,

therefore, is one which ranges along the drainage of all the major rivers that cross Northwest Texas. Along these rivers caves as large or larger, and possibly even longer, than Pothooks Cave, Needle-Eye Cavern, and Wallup Cave may be found. It is very doubtful if another cave as extensive as River Styx Cave will be found. Conditions are ideal for its development and they are not likely to be duplicated. Although caves may be found in Nolan and Fisher Counties they will probably be quite small since the gypsum is seldom more than a few feet thick. The greatest potential area not yet covered is along the Salt Fork of the Red River and along the Red River where it forms the boundary of Texas and Oklahoma in Hardeman and western Wilbarger Counties. Topographic maps show large concentrations of sinks on both sides of these rivers, so that the possibility of there being many caves is great. The gypsum extends northward through western Oklahoma and into southern Kansas, with the greatest thickness being in Oklahoma. The largest and possibly longest gypsum caves in the area should be found in Oklahoma, but to date far less work has been done there than even in Texas. Intensive study of the gypsum caves in Northwest Texas will probably prove what may be inferred from this preliminary survey, that for length and number of caves the area is probably one of the most important caving areas in the state.

ACKNOWLEDGEMENTS: Special thanks go to Dr. Donald W. Tinkle for much assistance in supplying locations and descriptions of caves not visited by the authors. His unpublished manuscript on the area was of great value in obtaining biological information on caves not included in the published reports. The authors also wish to thank the following people for permission to visit caves located on their land: Roy Ranson, Claude; J. N. Helm, Sr., Newlin; N. L. Brandon, Aspermont; Eddie Bateman, Knox City; Larry Campsey, Quanah; Mrs. Wallup, Quanah; Sam Vest, Childress; Frank Campbell, Childress; Floyd Richardson, Quanah; and the Buckle "I" Ranch, Paducah. Thanks are also due Buddie Stewart for use of his maps of caves in Palo Duro State Park and Dr. Nell B. Causey for her identification of millipedes collected in the area.

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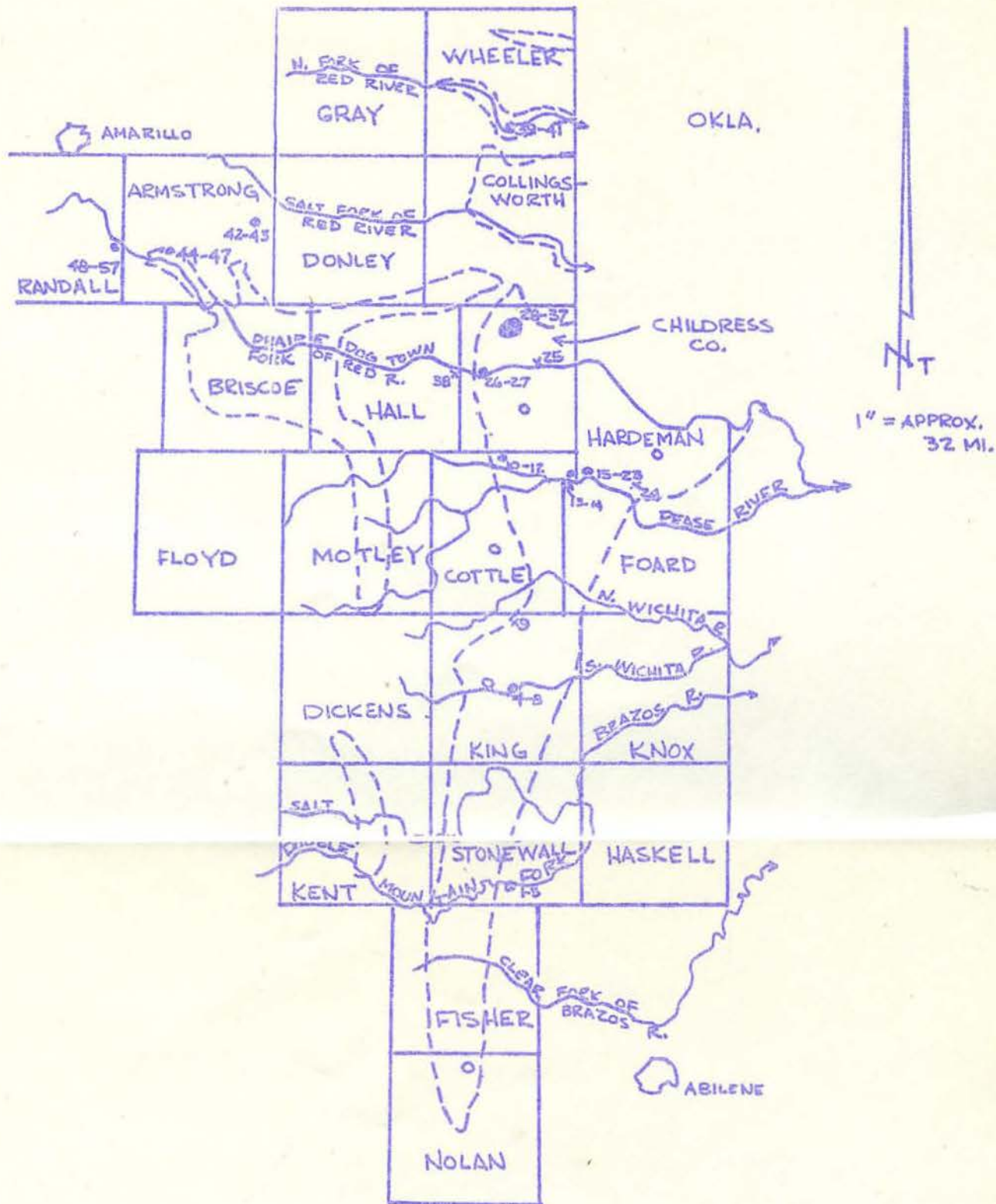
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ALTERNATE CAVE NAMES:

Bat Cave --- Aspermont Bat Cave; Buckle "L" Bat Cave
 Bateman Cave --- River Styx Cave
 Beasley Cave --- Walkup Cave
 Buchanan Cave --- Pothooks Cave
 Estelline Salt Spring --- Salt Hole
 Gregory Cave --- Walkup Cave
 Guthrie Cave --- River Styx Cave
 Lazare Cave --- Walkup Cave
 Styx Cave --- River Styx Cave



DASHED LINE INDICATES
GYPSUM OUTCROP

NUMBERED X'S AND DOTS ARE
CAVE LOCATIONS KEYED TO INDEX

LOCATION MAP OF THE
CAVES OF NORTHWEST TEXAS
TSS - 7-16-63

ARMSTRONG COUNTY

-7-

ALBA CAVE

Northwest Texas (# 47)

Owner: Roy Ransom

Description: This small cave is located about 100 yards past Drain Cave and carries the water of a small gully into the main canyon. It is about 70' long, with entrances at both ends.

Ref: TSS files

DRAIN CAVE

Northwest Texas (# 46)

Owner: Roy Ransom

Description: Drain Cave is located about 200 yards upstream from Ransom Cave on the north bank of the gully. Water from a large flat area has formed a small gully which drops into the north end of the cave. The cave extends 50' to the south opening in the side of the gully. Near the north entrance collapse has formed a small entrance, and from this point to the south entrance the cave is a narrow gully passage.

Ref: TSS files

FALLEN ROCK CAVE

Northwest Texas (# 45)

Owner: Roy Ransom

Description: A small gully drains into the cave which begins as a 3' wide, 3' high crawl. It continues this size for about 40', passing under a small entrance, to a third entrance. Beyond this vertical entrance the cave becomes 6' high and 1' wide for a short distance to a fourth entrance. At this point a large fallen rock about 10' long must be crawled under to a fifth entrance. Here a narrow winding gully leads to the main creek bed.

Ref: TSS files

FISSURE CAVE

Northwest Texas (# 42)

Owner: J. A. Hedgecocks Ranch

Description: A narrow winding fissure-like passage extends from a bluff-face about 300 yards to an entrance. Here an intermittent stream enters the cave. It ranges in size from walking to crawling, with more of the latter. The entrance is arch-shaped.

Biology: It is inhabited by Myotis velifer incautus (Allen). The cave is considered with the Sinkhole Cave - Crawlsky Cave System as one population in the ecology studies being conducted by Dr. Donald Tinkle. On February 22, 1958, a Pipistrellus subflavus (Cuvier) was collected from the cave. This is the westernmost record of the species.

Bibliography: See references # 9, 11, and 14.

Ref: Donald W. Tinkle

RANSOM CAVE

-8-
Northwest Texas (# 14)

Owner: Roy Ransom

Description: The main entrance to Ransom Cave is a 15' high, 5' wide opening at the head of a short draw draining into a large creek which eventually empties into the Prairie Dog Town Fork of the Red River. The cave may be divided into two main parts, a large breakdown area three to four hundred feet long and a shallow narrow gully-like passage about 600' long. The first fifty feet of the cave is a 10' high, narrow passage with a ceiling of breakdown. The passage then widens and a second entrance may be reached by climbing up through the breakdown. The floor of the cave, when not of breakdown, is of silt and gravel over which a stream runs in time of rain. A passage to the left leads up to a hole in breakdown too small to get through. After an additional 50' a short crawl to the left leads up to two entrances a few feet apart. The main passage here is from 5'-10' wide and 3'-6' high. After about 50' the cave widens to 20' and is floored with large flat slabs of breakdown. A colony of Cave Bats, Myotis velifer incantus (Allen), inhabits this room. A crawl to the left over the breakdown leads to a fifth entrance, while by crawling under the breakdown it is possible to go about 30' to sixth and seventh entrances. From here a complex breakdown area leads to entrances eight and nine, which are the last of the entrances leading up through the breakdown of the first part of the cave. The second part of the cave is a 3'-4' wide passage ranging from 1'-6' high. It lies about 15' below the surface where it leaves the breakdown area, but upstream it becomes shallower and shallower until finally it comes out into a 3'-4' deep gully. The cave passage is a succession of 25 entrances, one directly after the other, 1'-20' long, with rock bridges over the cave passage 1'-40' long and never more than a few feet thick. Two small side passages lead to the left and account for five more entrances, making a total of 39 entrances for the cave. The cave was visited by Dr. Donald Tinkle during his bat banding operations. It was explored in May 1965 by James Reddell and Bill Russell.

Ref: TSS files

SINKHOLE CAVE - CRAWLWAY CAVE SYSTEM

Northwest Texas (# 13)

Owner: J. A. Hedgecocke Ranch

Description: The entrance to the cave is a 50' deep sinkhole dropping into a large room. The cave is on two levels, the lower passage being floored with water up to 5' deep. One passage from the room leads for about one-fourth mile to an entrance. Another passage extends as a walking passage with occasional short crawls to an area of recent collapse. It is possible to crawl through this rock and enter Crawlway Cave. A 100' long crawl leads to a narrow chimney to the surface. Straight ahead the crawl enters a 10' high room. Beyond this room a short crawl leads to another entrance. The cave was visited by Dr. Donald Tinkle and his associates.

Biology: This cave is considered with Fissure Cave as one bat population for the purposes of Dr. Tinkle's bat banding operations. The cave is inhabited by a colony of Myotis velifer incantus (Allen), a large number of which have been banded. On December 13, 1958, 20 individuals of the Lamp-nosed Bat, Corynorhinus rafinesquii pallascens (Miller) were banded in the cave.

Bibliography: See references # 9, 11, 14, and 15.

Ref: Donald W. Tinkle

BLACK HAND CAVE

Northwest Texas (# 24)

Owner: J. N. Helm, Sr.

Description: The main entrance to Black Hand Cave is at the north end of a 50' wide, 200' long, 20'-30' deep collapse sink. Several small holes at the south end of the sink lead down to small breakdown-choked rooms, through which it might be possible to crawl. Much silt, however, has washed into the holes so it is doubtful if they will extend for more than a few feet. About 250' to the south of the sink, cliffs drop sheer to the bed of the Prairie Dog Town Fork of the Red River. A small passage near the bottom of the cliff is probably the resurgence for the flood-waters which run through the cave. The first 50' of the cave is a wide, low crawl over large slabs of breakdown. A black handprint near the ceiling about 20' from the entrance gives the cave its name. The owner says that it has been there as long as people in the area can remember. Near the end of the breakdown area it is possible to climb down to the floor of the cave, which is a stream passage floored with gravel. From here the cave extends as a walking and crawling passage for several hundred feet. A passage to the left about 100' from the upstream entrance of the stream passage, extends as a small crawlway for about 100' to a 10' high, 20' long, 8' wide room, inhabited by a small bat colony. This part of the cave is quite damp and muddy. At the end of the room a 5' climb leads to a crawl which extends about 50' to a 40' long, 20' wide, 12' deep sink entrance. The main cave passage continues past the side crawl to a 40' long, 10' wide, 15' deep sink. The stream passage follows the right side of the sink, issuing from a low crawl which leads under one small entrance and, after about 40', to another entrance. A gently sloping draw drains into the cave. The cave does not take great quantities of water at any time. The origin of the cave is almost entirely vadose, although small phreatic tubes may have been present in its earliest stage of development. The cave is well known locally and visited frequently. It was visited by Dr. Tinkle during his study of bats, and was mapped by James Reddell and Bill Russell in May 1963. (See map, page 10)

Biology: A nursery colony of Corynorhinus rafinesquii pallascens (Miller) was found in the cave in April-June 1960. It is also inhabited by Myotis velifer incertus (Allen). A collection of invertebrate fauna was made by Bill Russell and James Reddell in May 1963. At that time the following animals were found: beetles, including Agonum (Rhadin) sp., spiders, a centipede, ticks, and epigean isopods. Bones of a cow (Bos sp.) and a coyote (Canis latrans) were found in the stream passage. They had obviously washed in, but were cemented to breakdown and partially mineralized.

Bibliography: See references # 8, 11, and 14.

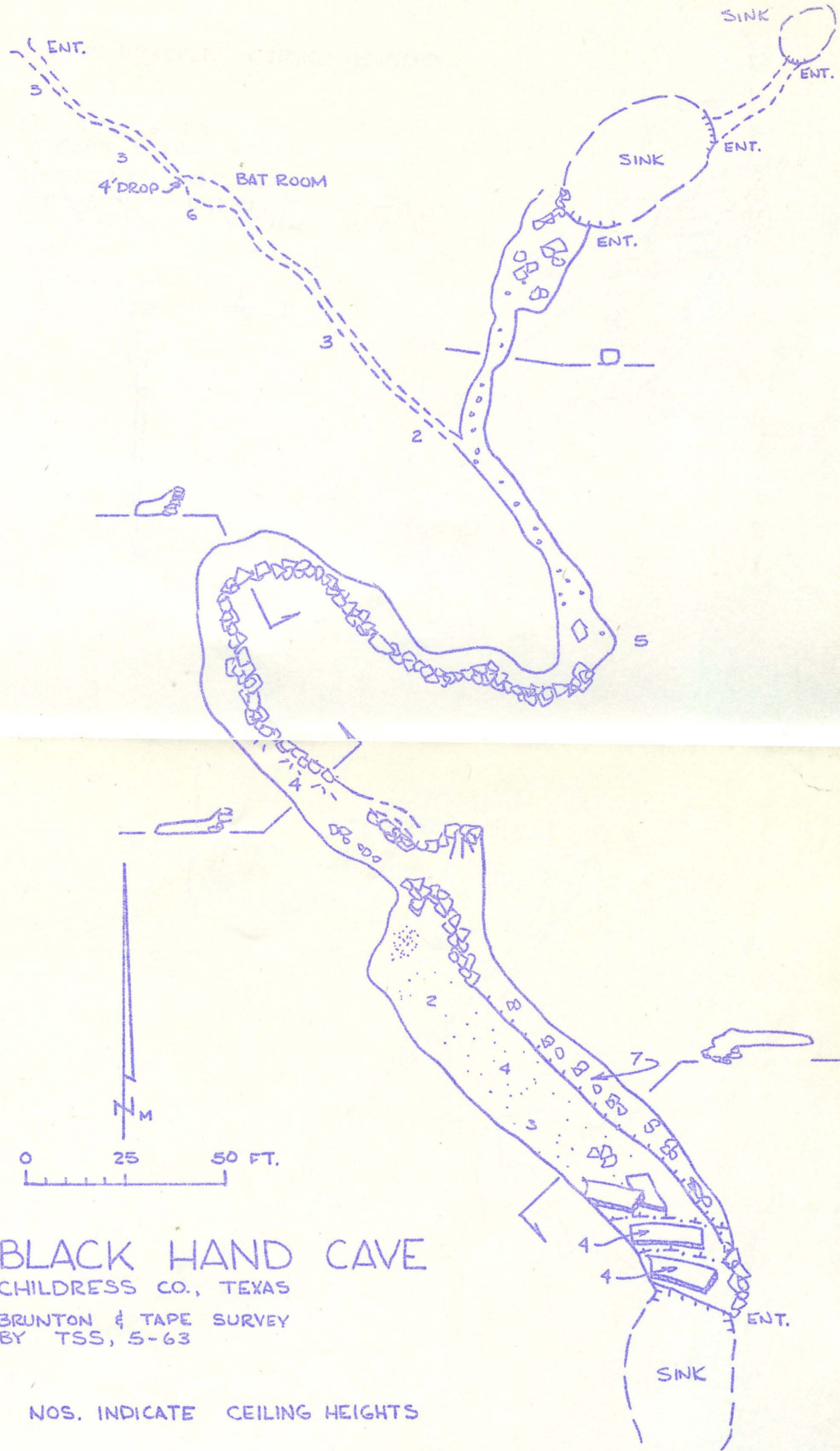
Ref: TSS files

BUZZARD WALL CAVE

Northwest Texas (# 34)

Owner: Frank Campbell

Description: The entrance to Buzzard Wall Cave is at the bottom of a small sink developed in what appears to be a thin-bedded limestone or dolomite. The entrance is a low crawlway that leads to a small low room. The north end of this room connects with another shallow sink through a hole too small to pass



BLACK HAND CAVE
 CHILDRESS CO., TEXAS
 BRUNTON & TAPE SURVEY
 BY TSS, 5-63

NOS. INDICATE CEILING HEIGHTS

through. From this low room it is possible to squeeze over thin, slab breakdown and crawl down a breakdown slope for about 15' to a very small room. The cave continues from this room as a small tube in gypsum about 10" in diameter.

Biology: A hazzard was observed in the first room of the cave. In May 1963 a small collection of spiders and beetles of the subgenus Rhadine, genus Agonum was made.
Ref: TSS files

FLUTE CAVE

Northwest Texas (# 35)

Owner: Frank Campbell

Description: Flute Cave lies under a small area of concentrated solution. In an area about 100' long and 30' wide there are nineteen strongly fluted pits between 10 and 15 feet deep and from about 1'-5' in diameter. There is, perhaps, about 200' of cays at the bottom of the pits. The cave begins at the southeast end of the area of pits and runs generally northward connecting with all of the shafts as it passes under them. It averages 4'-5' high and about the same width. At the north end of the pit area the cave changes to a small crawlway that leads downward for about 25' before becoming blocked by gravel.

Ref: TSS files

LONESOME CAVE

Northwest Texas (# 30)

Owner: Sam Vest

Description: The cave is about 100' long and is a crawlway for most of its length. It is inhabited by Myotis velifer incantus (Allen).

Bibliography: See reference # 14.

Ref: Donald W. Tinkle

LOST CAVE

Northwest Texas (# 29)

Owner: Sam Vest

Description: The cave is a complex joint-maze of walking and crawling passages, and is about 1/2 mile long. The entrance is a very small hole on top of a hill and drops vertically into the cave passage. A lower level passage contains water over its entire extent. This passage eventually siphons. The cave takes some water in this lower level during rains. Squat Cave may be the downstream outlet for the stream.

Geology: "Lost Cave is deemed a near-perfect example of a phreatic cave. It has remained essentially unaltered by vadose action since the evacuation of its phreatic water fill. Networks, exceptionally well developed where bedding planes and joints intersect, produce linear channels intersecting each other almost at right angles. Joint-determined wall, ceiling, and floor cavities enlarged in the form of slots are a common feature of the cave. Abundant wall, ceiling, and floor pockets are situated in places impossible for a free-surface stream to have made them. Continuous rock spans are present but are not common. Spongework is locally developed; however, the massive alabaster from which the cave is formed tends to be dissolved uniformly, a condition unfavorable for sponge-work or boxwork development. Although bedding-plane anastomoses, ceiling

through. From this low room it is possible to squeeze over thin, slab breakdown and crawl down a breakdown slope for about 15' to a very small room. The cave continues from this room as a small tube in gypsum about 10" in diameter.

Biology: A buzzard was observed in the first room of the cave. In May 1963 a small collection of spiders and beetles of the subgenus Rhadine, genus Agrosum was made.
Ref: TSS files

FLUTE CAVE

Northwest Texas (# 35)

Owner: Frank Campbell

Description: Flute Cave lies under a small area of concentrated solution. In an area about 100' long and 30' wide there are nineteen strongly fluted pits between 10 and 15 feet deep and from about 1'-5' in diameter. There is, perhaps, about 200' of cave at the bottom of the pits. The cave begins at the southeast end of the area of pits and runs generally northward connecting with all of the shafts as it passes under them. It averages 4'-5' high and about the same width. At the north end of the pit area the cave changes to a small crawlway that leads downward for about 25' before becoming blocked by gravel.

Ref: TSS files

LONESOME CAVE

Northwest Texas (# 30)

Owner: Sam Vest

Description: The cave is about 100' long and is a crawlway for most of its length. It is inhabited by Myotis velifer incantus (Allen).

Bibliography: See reference # 14.

Ref: Donald W. Tinkle

LOST CAVE

Northwest Texas (# 29)

Owner: Sam Vest

Description: The cave is a complex joint-maze of walking and crawling passages, and is about 1/2 mile long. The entrance is a very small hole on top of a hill and drops vertically into the cave passage. A lower level passage contains water over its entire extent. This passage eventually siphons. The cave takes some water in this lower level during rains. Squat Cave may be the downstream outlet for the stream.

Geology: "Lost Cave is deemed a near-perfect example of a phreatic cave. It has remained essentially unaltered by vadose action since the evacuation of its phreatic water fill. Networks, exceptionally well developed where bedding planes and joints intersect, produce linear channels intersecting each other almost at right angles. Joint-determined wall, ceiling, and floor cavities enlarged in the form of slots are a common feature of the cave. Abundant wall, ceiling, and floor pockets are situated in places impossible for a free-surface stream to have made them. Continuous rock spans are present but are not common. Spongework is locally developed; however, the massive alabaster from which the cave is formed tends to be dissolved uniformly, a condition unfavorable for sponge-work or boxwork development. Although bedding-plane anastomoses, ceiling

tubes, half-tubes, and joint-plane anastomoses were not observed, their absence does not conflict with a phreatic origin, for they are uncommon even in carbonate caverns. Two vadose features were observed in Lost Cave. One, the present vadose channel, occupies a lower passageway and is the only part of the cave exhibiting meander scars. Vadose water tends to produce pronounced meandering in many of the caves in this area. The other vadose feature, fluting of the walls, ceiling, and floor, is encountered throughout most of the cave. Were it not for the directional quality (i.e., most of the flute marks are steeper in a preferred direction along the chamber), the writers would have attributed the feature to an attempt at phreatic spongework in the massive homogeneous gypsum. Whatever the reason, the markings are attributed to either the action of seeping vadose water or to shallow phreatic movement with a velocity toward some outlet such as nearby springs or rivers. The latter interpretation is similar to that postulated by Swinnerton." (McGregor, et al, 1963)

Biology: In late July the cave had a nursery colony of Myotis velifer incautus (Allen), but the young were flying so 100% banding was impossible.

Bibliography: See references # 8, 11, and 14.

Ref: Donald W. Tinkle

MESQUITE ROOT CAVE

Northwest Texas (# 36)

Owner: Frank Campbell

Description: The entrance to Mesquite Root Cave is a 10' deep, 8' in diameter dirt sink at the base of a mesquite tree. It is quite recent in origin. The cave extends in two directions from the entrance. One way a crawl leads to a low breakdown-floored room about 20' in diameter. Beyond this room a squeeze over breakdown leads to a smaller room with a hole in breakdown too small to negotiate. In the other direction from the entrance a tubular crawlway leads for about 40' past several cross passages too narrow to follow to another entrance in a 5'-10' deep, 40' long, 15' wide sink. A rattlesnake could be heard but not seen in this sink.

Ref: TSS files

NEEDLE-EYE CAVERN

Northwest Texas (# 31)

Owner: Sam Vest

Description: The cave is one long stream passage through which water flows in time of flood. There are entrances at both ends of the cave. The passage is usually about 6'-8' high, but there are occasionally points at which it is necessary to crawl for short distances. It is $\frac{1}{2}$ mile long. It is inhabited by Myotis velifer incautus (Allen).

Bibliography: See references # 8, 11, and 14.

Ref: TSS files

POTHOOKS CAVE (BUCHANAN CAVE)

Northwest Texas (# 28)

Owner: Sam Vest

Description: Pothooks Cave is a large tunnel-like cave used by Salt Creek to shorten its course by several hundred feet. The creek enters the cave through a 10' high, 12' wide entrance. Above this entrance the creek has entrenched its channel about 8' below its old level. This old channel is now used only during the largest floods. Near the entrance there are several minor passages, one 4'-6' high and

COTTLIE COUNTY

BUCKLE "L" BAT CAVE (BAT CAVE)

Northwest Texas (# 10)

Owner: Buckle "L" Ranch

Description: The cave resembles a Central Texas bat cave. A sloping sink leads into a 25' high, 50' in diameter room covered with much guano. Immediately past the room a 4'-5' deep hole leads into a passage about 150 yards long. This passage is blocked by breakdown.

Biology: The first visit to the cave was on October 11, 1958, by Dr. Donald W. Tinkle. At that time the cave contained several thousand Mexican Freetail Bats. A week later, no bats were found in the cave. Over a hundred Tadarida brasiliensis mexicana (Saussure), or Mexican Freetail Bat, have been banded in the cave.

Bibliography: See reference # 9.

Ref. Dr. Donald W. Tinkle

BUZZARD CAVE

Northwest Texas (# 9)

Owner: JY Ranch (?)

Description: This is reported to be a small limestone cave. It is quite warm and since only two small piles of guano were found it is probably used only during migration.

Bibliography: See reference # 14.

Ref: Donald W. Tinkle

COLLAPSE CAVE

Northwest Texas (# 13)

Owner: Floyd Richardson

Description: The entrance to Collapse Cave is at the head of a small gully. It is necessary to climb among large blocks of breakdown both before and for several hundred feet after entering the cave. It is hard to determine the actual dimensions of the cave at this point because of the extensive breakdown, but it is about 15' wide and 20' high. There are few places, however, where crawling is not necessary for the first few hundred feet. Beyond this first Collapse Room the cave opens into a fairly breakdown free area, the Bat Room; but after a short distance the second Collapse Room is reached where it is again necessary to crawl and climb among large breakdown blocks. About 1,000' from the entrance a junction is reached, with one passage being a low crawl through which the stream utilizing the cave now runs, while the other passage is winding and narrow but about 20' high. These join in the Big Room after several hundred feet. The Big room is about 100' long, 50' wide, and 50' high. A small crawl may be seen at the far end and at the top of the Big Room. It is almost certain to connect to a surface sinkhole. (See map, page 19)

Geology: Although the opinion of the authors with respect to the earliest stages of the development of gypsum caves such as Collapse Cave differs somewhat from the following, it is, nonetheless, a carefully worked out explanation of the origin of the cave and so is given in its entirety: "The entrance to Collapse

8'-10' wide leading to the northeast for about 600' to several sinks that receive the flow of a small gully, another minor passage forming a loop to the west where it intersects the old creek channel to form a small entrance. The main passage trends south from the stream entrance as a 10' high, 10' wide passage floored with silt. About 800' from the entrance the passage makes a jog to the right and encounters a pool of water up to 3' deep and about 100' long. For the next 200' there are several shallow pools and about 400' from the first pool there is a 4' waterfall into a deep pool. From this waterfall the passage is more irregular, passing by several alcoves and under three major domes. About 800' from the waterfall the cave reaches the breakdown area near the lower south entrance. Here several comparatively open passages lead to a short gully that carries the cave water back to the original creek channel. From the westernmost of these entrances a crawlway leads to the north, but soon becomes too low to traverse. The cave is fairly well-known locally and was visited by Dr. Donald Tinkle during his bat banding operations. It was mapped in May 1963 by Bill Russell and James Reddell. (See map, page 14)

Geology: Pothooks Cave was formed when Salt Creek invaded a pre-existing phreatic channel that formed a short-cut for the creek water. This water has now greatly enlarged the original channel as is evidenced by the large fluting or scalloping on the insides of the bands. These concave downstream scallops usually extend about 5'-8' into the wall and show that the floodwater has certainly enlarged the original passage this much. Other evidence of enlargement is the entrenched channel upstream from the cave and the waterfall 800' above the lower entrance. The original pre-invasion passage was probably about the size of the passage leading northeast from the upstream entrance. This passage shows no signs of vadose enlargement and is probable much as it was before the small surface gully broke into it.

Biology: The cave is inhabited by Myotis velifer incautus (Allen). A small collection of invertebrate fauna was made by James Reddell and Bill Russell in May 1963. This included cave crickets and several species of beetles, including Agonum (Rhadine) sp.

Bibliography: See references #11 and 14.

Ref: TSS files

RED RIVER CAVE

Northwest Texas (# 25)

Owner:

Description: The cave is a short tunnel through which water runs after a large rain. There are entrances both above the cliff and on the cliff-face overlooking the north bank of the Red River.

Bibliography: See references #8, 11, and 14.

Ref: Donald W. Tinkle

SQUAT CAVE

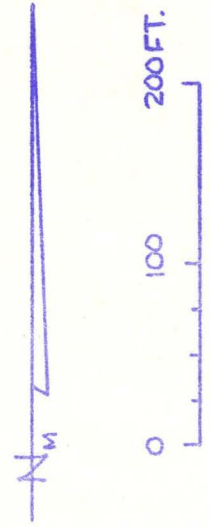
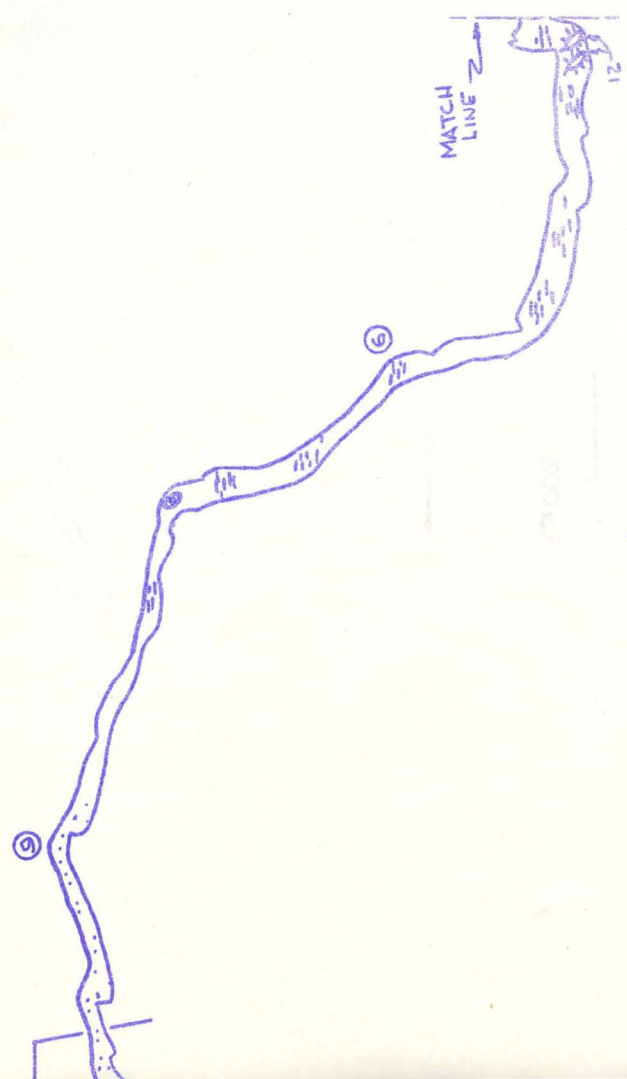
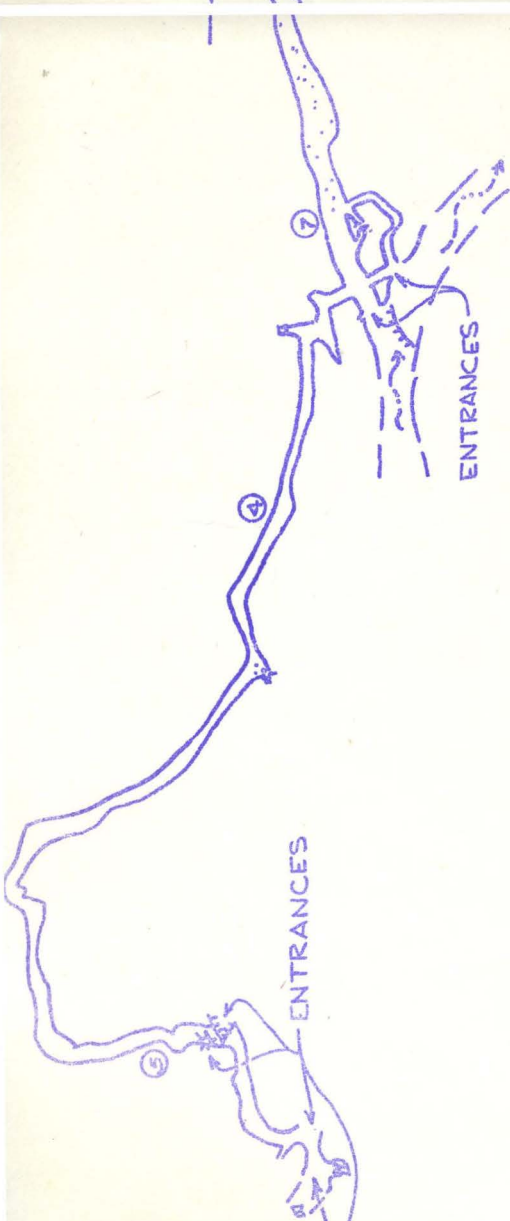
Northwest Texas (# 32)

Owner: Sam Vest

Description: This appears to be the downstream outlet for the lower level stream passage of Lost Cave. It is inhabited by Myotis velifer incautus (Allen).

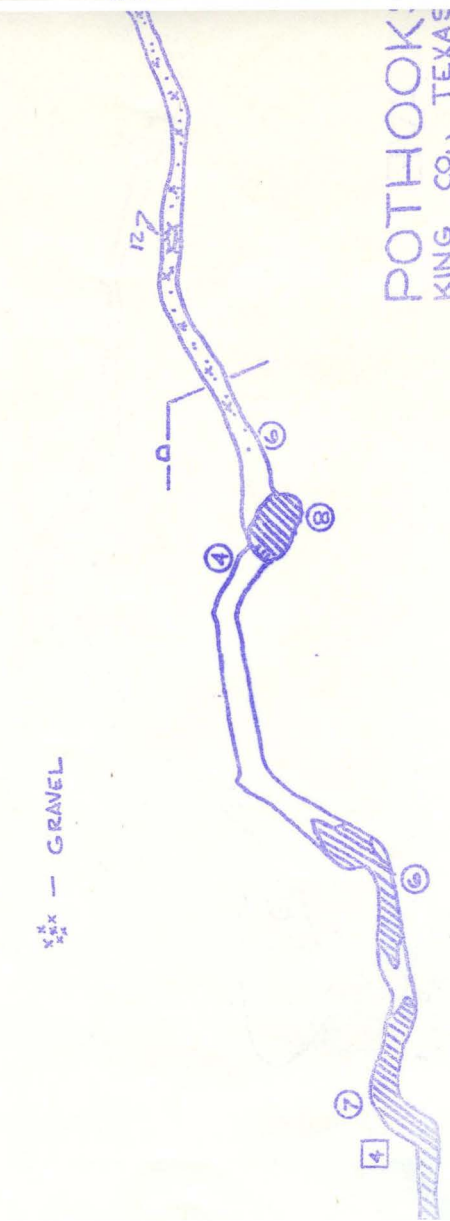
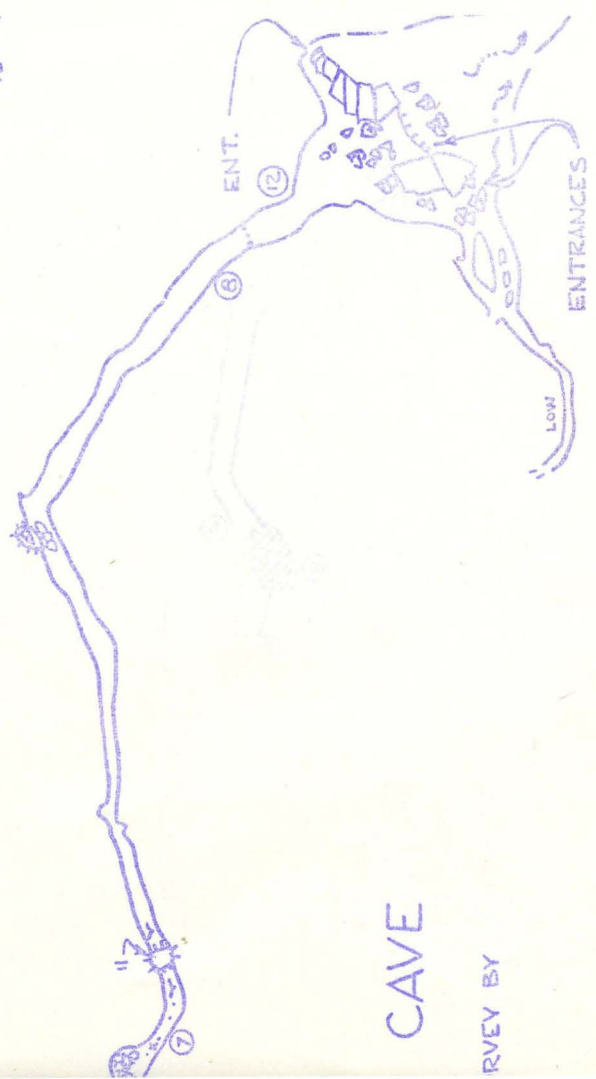
Bibliography: See references # 8 and 14.

Ref: Donald W. Tinkle



$\frac{1}{4} \times \frac{1}{4}$ - GRAVEL

POTHOOK CAVE
 KING CO., TEXAS
 BRUNTON & TAPE SURVEY BY
 TSS, 5-63



Cave is in an escarpment above the floodplain of the Pease River. The floor plan of the cave is essentially that of a long joint-controlled channel that bifurcates approximately 1,000 feet from the entrance. The northwest-trending fork of the Y enters the Big Room near the top of the Acme Gypsum, whereas the other fork is the present drainage channel near the bottom of the Acme. These two channels terminate in the large chamber located 1,200 feet from the entrance. A system of joints trending N-S, N35°W, N60°W, N75°W, E-W, and N25°E may be observed throughout the main passageways. The trend of the channel often changes abruptly at major joint intersections. Smaller joints produce minor changes in the direction of the channel. At several points along the main channel 'meander cones' sculptured by a meandering vadose stream jut upward from the floor. These remnants became isolated when an original incised meander was filled with debris during periods of intermittent flow, thus forcing the water to select another route. The downcutting continued along the new route until the volume and velocity of the stream became great enough to remove the debris, allow the stream to resume its original course. Clay and gravel fill in Collapse Cave is of vadose origin. It is well stratified and is found in association with flutes and small potholes that record the direction of current flow. Much of the gravel is composed of dolomite fragments washed in from the surface. Pendants, reported by Bretz as vadose solutional forms, are present in portions of Bat Room and Collapse Room 2 where the clay and gravel fill lie directly beneath gypsum ledges which overlie the sapped portions of Shale 1. Secondary deposits of gypsum crystals adorn the walls and ceiling along most of the elongate channel. The deposition results from the evaporation of vadose seepage. Thousands of tiny droplets of water hang suspended at the tips of the small crystals and are presently enlarging the secondary deposit. Along surfaces of greater water penetration larger masses of dripstone and flowstone are present. Some of the dripstone is calcareous, the calcium carbonate having been obtained from the Shiner Dolomite at the surface. A very thin layer of dripstone has been deposited on recently broken remnants of numerous crystal clusters. Bretz proposed the deposition of selenite deposits in Alabaster Gaverns, Oklahoma, by an intermediate phreatic epoch of quiet water occupying a previously formed chamber, a condition unnecessary for the development of secondary deposits in Collapse Cave. Several laterals are present where minor joints intersect the major passageways. They have been developed and subsequently enlarged by the seepage of vadose water. Most of the laterals are filled with sediment washed in from above that commonly extends several feet into the main channel. Several features postulated as indicative of a phreatic origin are absent in Collapse Cave. There is no spongework in any portion of the cave. Aside from chamber enlargement by vadose shale sapping and subsequent collapse, the cave channel narrows in the direction of the Big Room with no local widening produced by older solution chambers developed during a phreatic epoch. The walls and ceiling have been carved along joints previously unopened by phreatic water. The following history is presented for Collapse Cave. Surface water first descended into the underlying gypsum along joints and fractures, the principal points of entry into the crystalline rock. The water was further dispersed along bedding planes marked by distinctive textural changes in the gypsum. In the area now occupied by the Big Room small sinuous passages began to develop in Gypsum 2, particularly at joint-bedding plane intersections. As the vadose water dissolved small channels along the more accessible joints and bedding planes, an escape route was developed by the water as it penetrated Shale 2. A sloping passageway was thus formed along a series of intersecting joints in the upper portions of the Acme Gypsum that lead to an outlet along the escarpment of the Pease River Valley. It is impossible to locate the exact position of the vertical slot that drained the upper portion of the Big Room. The exit may have been present where the two largest ceiling tubes intersect, a position approximately 20' from the

Owner: Sam Vest

Description: The entrance to the cave is at the lower end of a 15' deep, 4' wide, 30' long gully which drains a small draw. A 1' high, 3' wide crawl leads a short distance to a point where a 6' high, 1' wide crevice has formed along the right side of the crawl. After about 25' the crawl ends in a 10' drop into a 15' long, 10' high, 3' wide passage, floored with silt and small breakdown. A small crawl from this room fills with silt.

Biology: Numerous beetles, Agonum (Rhadine) sp., and a number of roaches were collected in the twilight zone under rocks.

Ref: TSS files

UPSTREAM CAVE

Northwest Texas (# 27)

Owner: J.N. Helm, Sr.

Description: Upstream Cave is located about 200 yards west and upstream of Black Hand Cave. Its main entrance is near the level of the river. From this entrance a 20' wide, 6' high passage extends to the north for 40' to a surface sink. From this sink a small crawlway extends for 20' to receive a small gully. There is considerable slab breakdown in the cave and the main part of the passage appears to be much larger than would be expected from so small a surface drainage.

Ref: TSS files

WINDMILL CRACK

Northwest Texas (# 37)

Owner: Frank Campbell

Description: The entrance to the cave is a 2' in diameter hole dropping about 10'. Several cracks and small holes south of this hole connect at the bottom through a crawl too small to negotiate. To the north a 4' high, 1' wide crack leads about 10' before turning to the left as a 1' high, 2' wide crawl for about 10' where it drops about 5' into a 10' high, 5' wide, 10' long room floored with breakdown and silt. A crawl at the top of the room to the right leads into a 4' high, 8' in diameter room. A low, wide crawl from this room fills with silt after about 15'.

Biology: James Reddell and Bill Russell made a small collection of invertebrates from the cave in May 1963. This collection included spiders, a surface beetle, and a new species of milliped of the genus Nannolene.

Ref: TSS files

entrance to the upper channel leading to the Y. The smaller anastomoses were drained as the vadose water developed in integrated channel into the underlying Acme Gypsum. The major route of escape for the surface water now underwent both lateral and vertical enlargement by solution along joints as the vadose stream cut downward to reach local base level. Steep gradients at the mouth of the cave and along the vertical slot draining what is now the Big Room allowed headward entrenchment by the vadose stream. Extensive portions of Shale 2 were removed by lateral sapping. Concurrently, a long narrow meandering channelway was being made in the underlying Acme Gypsum. Channel widening along joints is strikingly revealed by perfectly developed meander niches alternately cutting into one wall and then the other. Continued headward cutting of the channel resulted in the removal of Shale 2 in lateral extent exceeding the present outline of the Big Room. Major collapse of the terminal chamber occurred after removal by solution of approximately 15 feet of the Acme Gypsum. Near the cave entrance entrenchment proceeded to penetrate the thick Acme section. Upon reaching Shale 1, lateral sapping and widening of Bat Room and Collapse Rooms 1 and 2 occurred in exactly the same manner as outlined for the Big Room area. Enlargement near the mouth of the cave was accompanied by further solution in the Big Room. Collapse of the gypsum in the Big Room completely blocked the upper passageway. A new channelway was thereupon developed along joint widenings of a previously minor network of joints, rerouting the drainage until it intercepted the old channel to form the Y. The new channel is now incised 4 feet below the older channel. Headward entrenching of the stream resulted in the formation of the present waterfall along the northwest wall of the Big Room. Lateral sapping of Shale 2 and subsequent collapse of the overlying gypsum produced the major enlargement of the Big Room. The present waterfall exhibits spectacular vertical lapies and flute marks. Fluting, a result of flowing water, can be observed throughout most of the cave. A relatively uniform gradient of approximately 175 feet per mile from the waterfall to the mouth of the cave, coupled with extensive collapse near the latter portion reflects the present cave profile. The channel from the sinkhole to the waterfall is inaccessible; however, surface reconnaissance indicates that this sinkhole is the present entrance for most of the surface water entering Collapse Cave. Ample evidence for chamber enlargement by lateral shale removal was observed in the uncollapsed portion of the cave. Bedding-plane anastomoses, described by Bretz as a definite phreatic solution form, were observed in the ceiling of the Big Room. The diameter of the tubes varies from 1/2 inch to feet. Solution by vadose seepage along bedding planes and joints, explained in preceding paragraphs, is considered more plausible for the development of this solution feature. (McGregor, et al., 1963)

Biology: The cave is inhabited by a colony of *Myotis velifer incautus* (Allen). Many of the bats from the cave were banded by Dr. Donald W. Finkle in the bat banding operations that he conducted in the area.

Bibliography: See references # 8, 11, and 14.

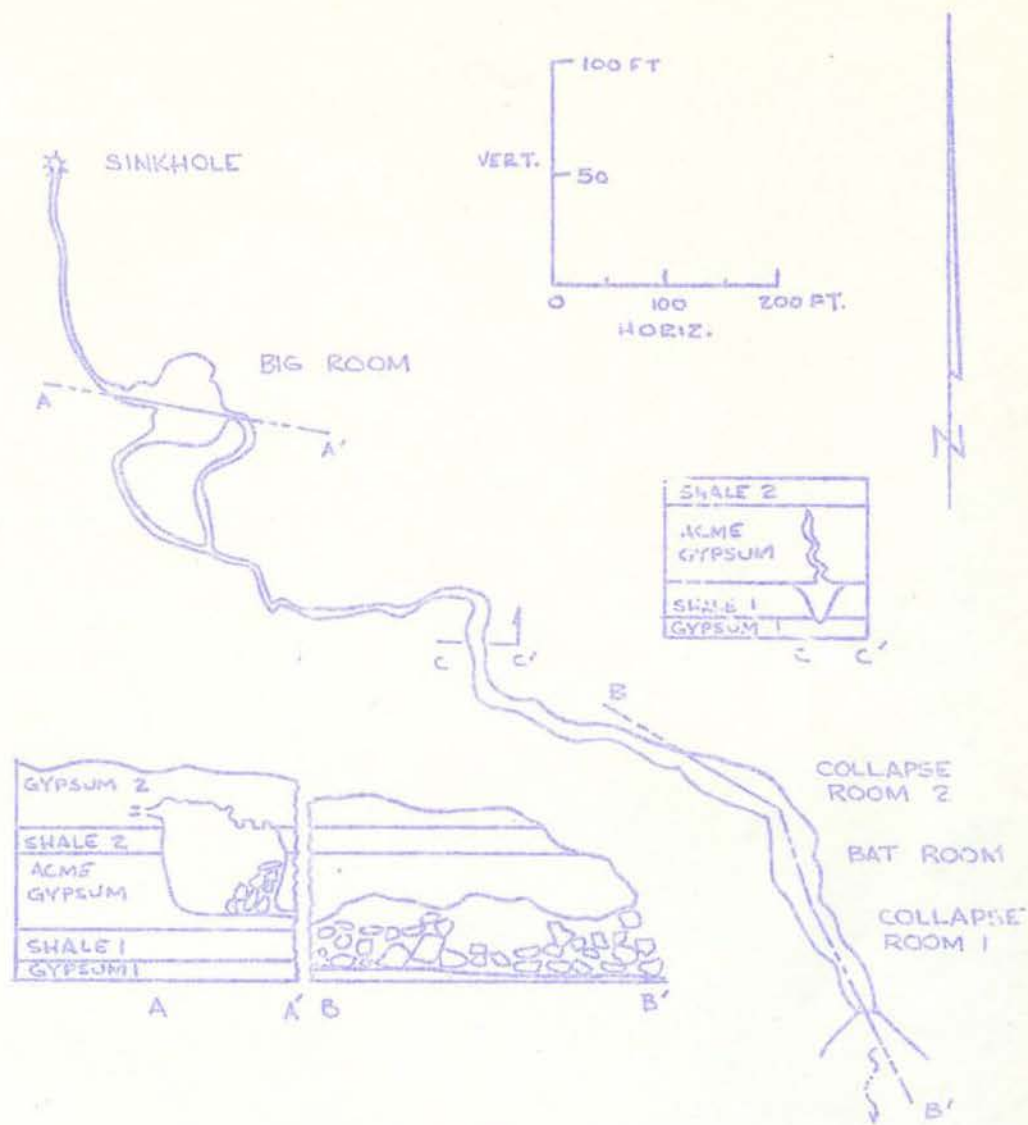
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DEAD MAN'S CAVE

Northwest Texas (# 11)

Owner: Buckle "L" Ranch

Description: The entrance to Dead Man's Cave is a 10' high, 15' wide opening at the head of a short gully training into Shores Creek. Several large boulders have fallen in and around the mouth of the cave. A small crawl to the left



COLLAPSE CAVE

COTTLE CO., TEXAS

SURVEYED BY D. R. MCGREGOR, ET AL.
1962

Just inside the entrance leads about 15' to a large breakdown area. It is possible to go through the breakdown but the crawl ends after an additional 30'. A little water runs out of the crawl after rains. The main passage of the cave leads from the back of the entrance room and extends as a 2'-4' high, 3'-5' wide passage in a fairly straight line for about 150'. At this point much large breakdown from the ceiling has occurred. The breakdown, which appears to extend up to the surface, effectively blocks the passage so that it is not possible to continue beyond it. A report of another entrance was not verified, but the highly unstable condition of the breakdown indicates that collapse may have occurred since the last visit to the cave by the person who reported the entrance. The cave is an obvious example of formation by vadose action. Water running in sinks on the top of the hill now drain through the cave and run out of the entrance. The gypsum in which the cave is formed is very thin-bedded and inner-layered with much shale and clay. The cave is in the last stage of its development, with erosion at the cave's mouth causing collapse of the overlying gypsum as it cuts back, accompanied by collapse into the back portions of the cave as the hill overhead erodes away. Numerous names in and around the entrance indicate that it is locally well-known. The cave is named after an outlaw who was reportedly killed in the cave. It was explored in May 1963 by James Reddell and Bill Russell.

Ref: TSS files

PANTHER CAVE

Northwest Texas (# 14)

Owner: Floyd Richardson

Description: Panther Cave lies on the west side of a deep canyon draining south into the Pease River. The cave entrance, 20' wide and 25' high, is almost filled with massive breakdown. This breakdown is quite recent, having fallen during late 1954 or early 1955. From the entrance a large passage leads through angular boulders for about 100' to a 5' wide, 3' high crawlway. Water from this crawlway is undermining soft green shale beneath the gypsum, causing the collapse. The main cave is most easily reached through a passage leading from above the breakdown about 50' from the entrance. This passage, averaging 6'-10' high and 10'-15' wide, has a narrow winding canyon about 1' wide and up to 15' deep incised in its floor. This canyon-floored passage leads for about 400' to a bat room 30' high, 20' wide, and 50' long. From this room the lower canyon decreases in depth until it finally disappears. The passage continues walking-size for about 250'. From this point a gravel-floored crawlway 6'-8' wide and 1'-3' high leads for several hundred feet to a small entrance at the bottom of a surface sink. An attempt to squeeze through this entrance was aborted by several rattlesnakes encountered about 30' before the entrance. The sink entrance receives a surface gully, runoff from this gully flowing through the crawlway, down the walking passage where it is deepening and extending the narrow canyon, and eventually into the crawlway that leads into the end of the entrance breakdown area. The cave has been almost entirely formed by vadose water, the different passage types being created by different stages of headward erosion. The cave has been visited by Dr. Donald Tinkle a number of times during his bat banding work. It was visited by Bill Russell and James Reddell in May 1963.

Biology: Four species of bats have been captured in the cave: Myotis velifer incautus (Allen), the Cave Bat; Eptesicus fuscus pallidus Young, the Big Brown Bat; Corynorhinus rafinesquii pallescens (Miller), The Lamp-nosed Bat; and Pipistrellus hesperus (Allen), the Western Pipistrelle. From February, 1958, until May 1960 Dr. Tinkle banded several thousand Myotis velifer incautus in the Panther-Walkup

Cave area. The Pipistrellus hesperus, which was taken on February 8, 1959, is the easternmost record of the species in Texas. A small series of beetles of the subgenus Rhadine, genus Agonum were taken in the cave by James Reddall in May 1963. Rattlesnakes were found in the sinkhole entrance on the same date.

Bibliography: See references #2, 8, 9, 11, 14, and 15.

Ref: TSS files

SHORES CREEK TALUS CAVE

Northwest Texas (# 12)

Owner: Buckle "L" Ranch

Description: The cave is located downstream from Dead Man's Cave and near the top of a high bluff overlooking Shores Creek. A 5' deep, 30' long, 4' high overhang has been covered by breakdown to form a talus cave. A solution crawl, however, leads from the far end of this talus zone straight back into the cliff-face for about 30' before ending in breakdown. Slumping of the breakdown above the cave has formed a pocket about 15' in diameter and 5' high.

Ref: TSS files

U-CAVE

Northwest Texas (# 15)

Owner: Floyd Richardson

Description: This cave is a short U-shaped tunnel leading off to the left side of a natural bridge.

Bibliography: See reference # 14.

Ref: Donald W. Tinkle

HALL COUNTY

SALT HOLE (ESTELLINE SALT SPRING)

Northwest Texas (# 38)

Owner:

Description: The Salt Hole is a large salt spring located near the Prairie Dog Town Fork of the Red River. From the surface the spring appears as a lake about 30' in diameter with a sizable stream running from it. This stream, one and a half times as salty as sea water, runs 2,600,000 gallons of water per day and puts out about 400 tons of salt every day. This stream runs into the Prairie Dog Town Fork of the Red River and eventually into Lake Texoma where the salt is polluting the water. The Corps of Engineers is trying to stop the flow of the spring by building a dam around the lake. This has alarmed the local people who fear that the dam will back salt water into their water supply. The apparently shallow lake from which the water comes is actually quite deep. From the surface the lake narrows slightly until it is about 25' in diameter and continues this size through shale for a depth of 30' where it reaches gypsum and begins to enlarge. At a depth of 100' the cave is almost 100' in diameter, but it soon narrows to a four foot wide slot at a depth of 125'. This is as far as the spring has been explored by the Corps of Engineers, but local skindivers report a horizontal cavern at 200' below the surface.

Geology: A water analysis of the water of the spring has been made. The sample was taken at a depth of 75' below the lake surface and the temperature of the water was 67°F. The sample was collected on April 30, 1960. The results of the analysis follow:

Hardness as CaCO ₃ _____	4,740	Ca_____	1,430 ppm
N.C. hardness_____	4,600	Mg_____	285 ppm
% Na_____	88	Na_____	16,400 ppm
Specific conductance		HCO ₃ _____	168 ppm
(micromhos at 25°C)_____	60,500	CO ₃ _____	0 ppm
pH_____	6.5	SO ₄ _____	4,140 ppm
Density_____	1.032	Cl_____	25,200 ppm

Ref: TSS files

HARDEMAN COUNTY

BOULDER CAVE

Northwest Texas (# 17)

Owner: R. W. Walkup Ranch

Description: The upstream entrance to the cave is a climb down through breakdown from the same sink as the downstream entrances of Short Cave and Walkup Cave. A 10'-15' climb admits one into a breakdown-ceilinged crawl which extends about 100'. Here the crawl becomes ceilinged with breakdown and conglomerate and leads an additional 75'-100' to a climb up through breakdown to the surface. Water entering the cave issues from the breakdown slope on the outside. The cave probably was a part of the main Walkup Cave system, but has been separated by collapse. It was mapped in May 1963 by James Reddell and Bill Russell.

Ref: TSS files

CAMPSEY CAVE

Northwest Texas (# 18)

Owner: Larry Campsey

Description: Campsey Cave is unusual among gypsum caves in that it is a large passage that extends for a comparatively short distance. The entrance to the cave is a 20' deep, 30' long, 20' wide vertical sink at the end of a long surface gully. Equipment is required to enter the cave. From the west end of the sink the cave extends as a 20' wide, 3' high passage almost blocked by breakdown. Beyond the breakdown the cave passage enlarges until at 100' from the entrance it is 25' wide and 10' high. Here the passage makes a bend to the right and continues the same size for 100 more feet to a sharp left turn. The passage goes south from this turn for 20' to where it enlarges to form a room 40' wide, 40' long, and 15' high. From this room a passage 2'-3' high and 15' wide leads for 20' to a low room. This low room or passage is 3'-4' high and 15'-20' wide, and about 80' long. At the end of this room there is a narrow pool into which all of the water entering the cave finally runs. At the time of the visit by the authors in May 1963 the water in the pool extended to the ceiling completely blocking any possible passage. Local people report that at times the water is lower and exploration beyond this pool possible. A careful search was made along the Pease River, which approaches to within 200 yards of the cave, but no hole was found near the cave that could be the exit for the cave's floodwaters. It is possible that the lower end of the cave passage is below river level and covered with sand, but it seems more likely that the waters emerge from an underwater channel located about 1/2 mile to the north of the cave at the edge of the Pease River where it makes a bend to the west. The cave was mapped by James Reddell and Bill Russell in May 1963. (See map, page 24)

Geology: The present form of the cave is probably geologically quite recent. The gully that drains into the cave has not had time to cut the waterfall back from the original sink more than a few feet, and in the cave it has greatly enlarged the section near the entrance where erosion was very effective in the soft shale layers, while it has had little effect on the sections farther back in the cave that were developed in more massive gypsum.

Biology: Because of drastic floods to which the cave is subject, little life was found in the cave. A small collection of beetles, spiders, and ants was made in May 1963 by James Reddell and Bill Russell.

Ref: TSS files

CAPTURE CAVE

Northwest Texas (# 20)

Owner: Larry Campsey

Description: A 5'-15' deep, 3' wide gully runs about 400' before being captured by a cave. The first part of the cave is about 6' high and 2'-3' wide. There are several short drops and a few pools of water. After about 75' a low gravel and rock floored crawl extends an additional 125' before dropping 10' into a 20' wide, 15' high, 40' long room formed by backward cutting of the stream as it runs down into the Pease River. The cave is entirely vadose in origin. The only fauna observed were cave crickets and harvestmen. It was mapped in May 1963 by James Reddell and Bill Russell. (See map, page 25)

Ref: TSS files

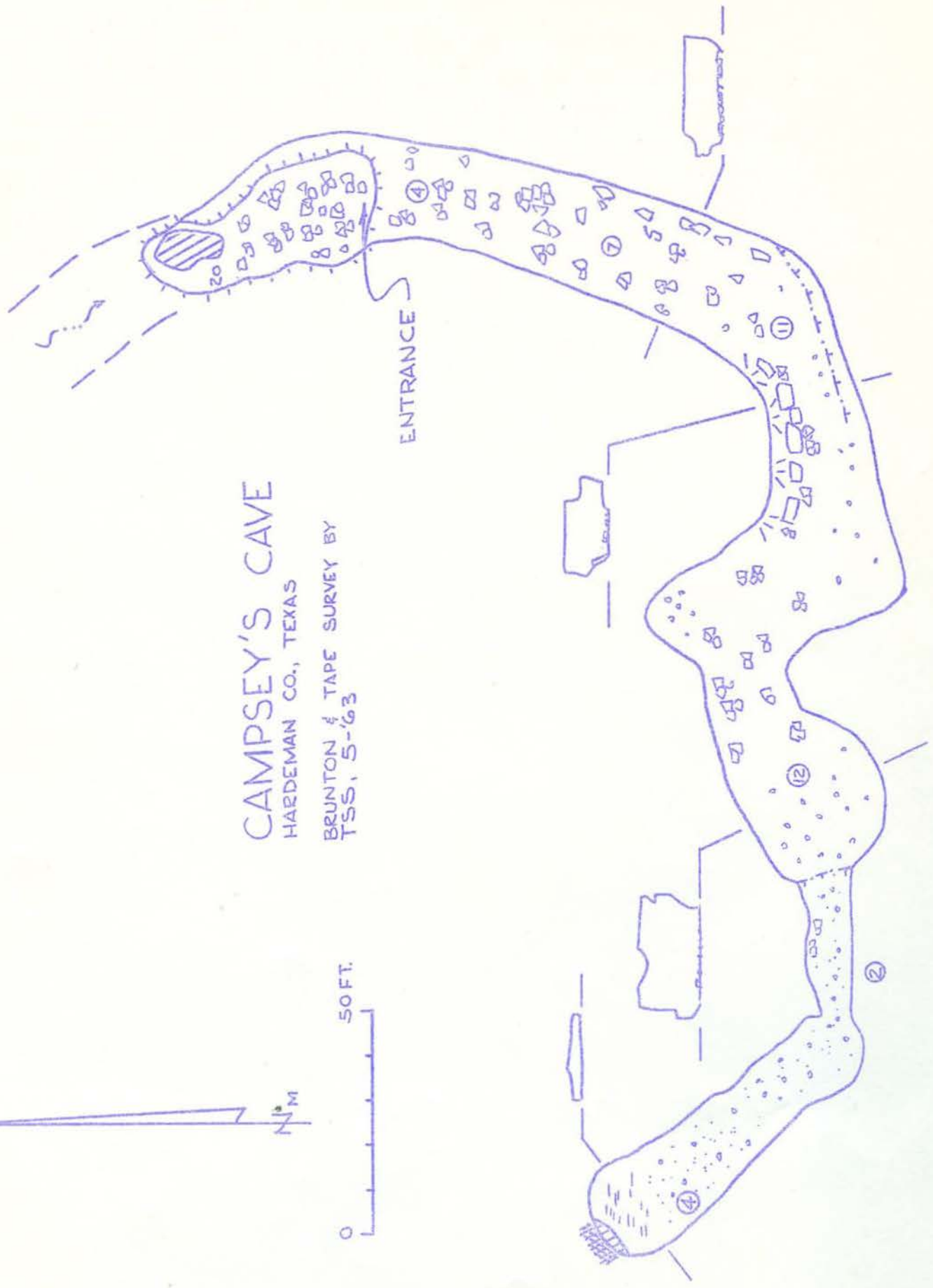
CEDAR CAVE

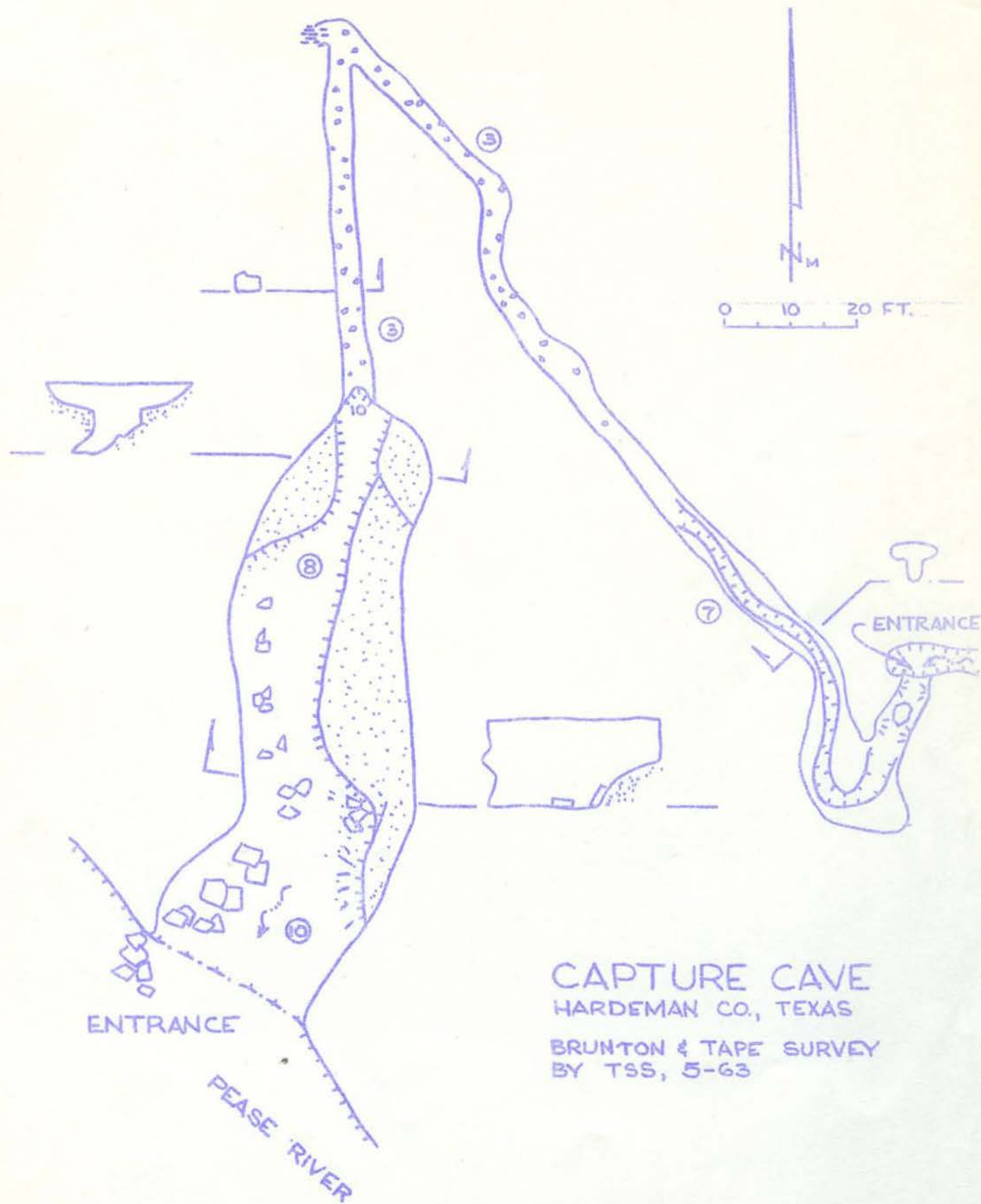
Northwest Texas (# 21)

Owner: Larry Campsey

Description: Cedar Cave is, in general, a low wide crawlway connecting several surface sinks with a deep canyon draining west into the Pease River. The uppermost of these sinks receives the waters of a large, though normally dry, creek. From this upper sink the stream passes under a 30' long natural bridge and then filters through a breakdown-filled sink into the cave proper. At the beginning of the stream crawl several pits connect with a short upper level that soon pinches out in slab breakdown. From these pits the stream crawl extends to the south, at first 3'-4' high and 10'-12' wide and bounded by breakdown on the east. Several small upper rooms can be reached by climbing through the breakdown. Beyond the breakdown the crawlway widens, being 20' wide and 4' high when it reaches the breakdown cone at the base of the next sink. The water follows a small passage around the left edge of the breakdown, but the cave can also be followed by climbing up the breakdown pile and out of the cave through a small entrance, and then re-entering the cave through an entrance on the downstream side of the breakdown. On this side of the breakdown there is a room 30' long, 20' wide, and 12' high. From this room the crawlway continues 12' wide and 3'-4' high, enlarging to 4' high and 25' wide 200' past the breakdown room. Then the passage narrows, passes around a breakdown mound, and reaches a pool 2' deep and 40' long. Beyond this pool the passage again widens and, after passing a sink entrance on the left, connects to another large sink where a surface gully enters the cave. About 100' beyond this last sink the cave enters a breakdown area. The main cave continues to the lower canyon entrance through

CAMPSEY'S CAVE
HARDEMAN CO., TEXAS
BRUNTON & TAPE SURVEY BY
TSS, 5-'63





CAPTURE CAVE
 HARDEMAN CO., TEXAS

BRUNTON & TAPE SURVEY
 BY TSS, 5-63

Massive breakdown, while above the first part of the breakdown a room has developed. The cave is almost entirely vadose in origin, and has been heavily modified by collapse. It is inhabited by a few bats and cave crickets. It was mapped in May 1963 by James Reddell and Bill Russell. (See map, page 27)

Ref: TSS files

CRUMPLING CAVE

Northwest Texas (# 22)

Owner: Larry Campsey

Description: The cave is located at the head of a small draw and is a 30' long, 2' high, 4' wide crawl among very unstable breakdown. A large breakdown slope about 20' long extends down to the bed of the draw in front of the cave. Water runs out from among the breakdown after rains.

Ref: TSS files

GULLY CAVE

Northwest Texas (# 23)

Owner: Larry Campsey

Description: Gully Cave is a small cave that is located at the lower end of the abandoned channel of the creek that now runs through Cedar Cave. The water from this channel and several small tributaries has now been captured by the cave and runs underground for about 200' through a cave containing much breakdown. Collapse has reached the surface in one area and formed an upper entrance near the lower end of the cave.

Ref: TSS files

PHILLIPS CAVE

Northwest Texas (# 24)

Owner: Jack Phillips

Description: The entrance is by way of a small sink in the center of a cultivated field. A passage out of the bottom of the sink leads to a 20' drop into a 20' high room. A passage from the ceiling of this room leads to an end in breakdown. The total length of the cave is about 100 yards.

Bibliography: See references # 8 and 11.

Ref: TSS files

SHORT CAVE

Northwest Texas (# 18)

Owner: R.W. Walkup Ranch

Description: A small gully, running southwest, enters the cave. A short crawl opens into a 5'-6' high, 3' wide passage which extends about 100'. Here much breakdown has occurred, so that the last 50'-75' must be negotiated by crawling over and through breakdown. The cave opens into the same sink that Boulder and Walkup Caves enter. At one time it was probably connected to the two other caves. Spiders were collected in the cave by James Reddell and Bill Russell in May 1963.

Ref: TSS files

WALKUP CAVE (BEASLEY CAVE) (GREGORY CAVE) (LAZARE CAVE) Northwest Texas (# 16)

Owner: R. W. Walkup Ranch

Description: Walkup Cave, one of the larger gypsum caves, has been developed by a stream that drains an area about a half-mile north of the cave. This stream invaded pre-existing, probably phreatic, openings in the gypsum, and has since scoured them into large passages. The stream has also cut a long valley about 30' deep upstream from the cave, all of the valley material being carried by flood-waters through the cave. The upper entrance to the cave opens into a passage 4 to 5 feet high and averaging 15' in width. This passage leads to the southwest under a collapsed sink entrance and to the Division Room, where the passage divides. The right branch is, for the most part, a low crawlway with a narrow slot in the ceiling. This crawlway emerges in a sink that connects three caves. Downstream is Boulder Cave, which is about 200' long. The first part of Boulder Cave is a low crawlway with a ceiling of conglomerate, while the last part of the cave is developed in massive breakdown. The third cave entering the sink is Short Cave. It extends to the northeast and receives a small gully. It is probable that all three caves were at one time connected. From the Division Room the main cave passage continues as a 10'-12' wide, 6'-10' high passage. This passage is scoured clean, there being no gravel or other sediment present. About 200' from the Division Room a deep channel has been cut into the floor. This channel soon widens and occupies the whole passage for the next 500'. At the end of the channel there is a strong joint trending S25°W. The passage follows this for about 100' until the joint splits into several small (3') branches and fades out. Here the cave enters a complex area that gives strong indication that the original openings were phreatic. The passage makes a loop and crosses under itself. This loop is about 300' long and the lower part of the loop is about 12 feet below the upper. Stream action has lowered the floor of the upper passage until it cut into the lower, the water now dropping over a waterfall and into the lower level. From this loop, a low, wide passage leads west to the main lower entrance. As is usual with gypsum caves there is an extensive breakdown area near the entrance, but solution must have been quite small, and most of the phreatic openings have been removed by the vigorous vadose enlargement. The cave, however, crosses several clay-filled passages one to two feet in diameter which may be filled phreatic tubes. The ceiling slot in the right hand crawlway is also probably partly phreatic in origin. It is unlikely, however, that over 10% of the cave is phreatic.

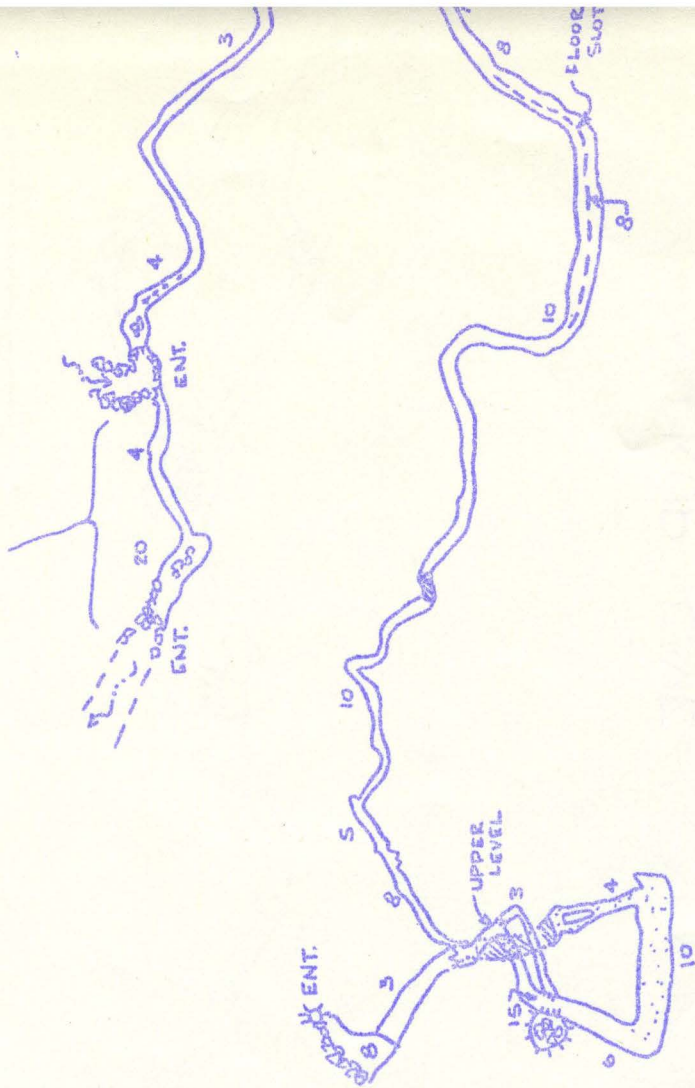
Biology: Three species of bats have been caught and banded in the cave. These are Myotis velifer incautus (Allen), the Cave Bat or Little Brown Bat; Eptesicus fuscus pallidus Young, the Big Brown Bat; and Corynorhinus rafinesquii pallascens (Miller), the Lump-nosed Bat. A nursery colony of the latter species was found in the cave in April-June 1960.

History: The cave is frequently visited by local people and has been known for many years. It was visited by David K. Jameson prior to 1954 and from 1958 until 1962 the bat population of the cave has been intensively studied by Dr. Donald W. Tinkle and his assistants. The cave was mapped in May 1963 by James Reddell and Bill Russell. (See map, page 29)

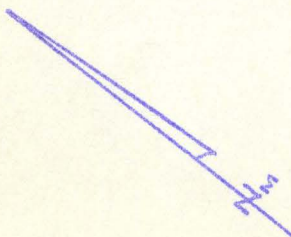
Bibliography: See references # 2, 8, 9, 11, 14, and 15.

Ref: TSS files

BOULDER CAVE
HARDEMAN CO., TEXAS



2 1/4" - GRAVEL
NOS. ARE CEILING HEIGHTS



WALKUP CAVE
HARDEMAN CO., TEXAS
BRUNTON & TAPE SURVEYS
BY TSS, 5-63

KING COUNTY

AVERNUS SINK

Northwest Texas (# 7)

Owner: Bateman Ranch

Description: This is a 100'-200' in diameter funnel-shaped sink dropping 40'-50'. At one end of the sink it is possible to climb down through large blocks of breakdown for an least 20'. Lack of light prevented its exploration, but the possibility of the cave's being very long is poor. Water running into the sink will exit through River Styx Cave and, in fact, they may enter that cave through one of the unexplored crawlways.

Ref: TSS files

BATEMAN RANCH SINK

Northwest Texas (# 8)

Owner: Bateman Ranch

Description: A 150' in diameter, 40' deep sink funnels inward until it is about 30' in diameter at the bottom. At one side of the sink a 12' in diameter hole drops vertically through very loose rocks for 20'-30'. At the bottom a crawl through breakdown extends for 40'-50'. It is blocked by small rocks which have been washed in from the sink. Water draining into the sink doubtless runs into River Styx Cave. It was explored and reported by Ron Griffith of Benjamin, a member of the Sul Ross Speleological Society.

Ref: TSS files

RIVER STYX CAVE (BATEMAN CAVE) (GUTHRIE CAVE) (STYX CAVE) Northwest Texas (# 4)

Owner: Bateman Ranch

Description: River Styx Cave, which is as far as is known to the authors the longest surveyed gypsum cave in the world, is located under a gypsum plateau dissected by the South Wichita River. The main entrance to the cave is a 25' wide, 10' high opening located on the bank of the river underneath a high gypsum bluff. When visited in May, 1963, following a two inch rain, a medium-sized stream issued from the cave. After about 200', a 1,000' long lake covers the passage floor, broken only occasionally by gravel bars. Crawls to the sides along the lake have not been explored. About 200' beyond the lake a 6' high, 10' wide passage extends northwards for 200' where it intersects the Bat Passage, which parallels the main passage. The Bat Passage leads to the west through two 30' high, 30' wide bat rooms to its end after about 500'. To the east the Bat Passage extends through several smaller bat rooms floored with extensive breakdown, finally splitting into several unexplored crawlways. Large gravel bars in both the Main Passage and the Bat Passage indicate that both passages carried large amounts of floodwater in the direction of the river; but since only the Main Passage opens onto the river, the gravel bars in the Bat Passage were probably produced before it was blocked by collapse. Beyond the side passage the main cave passage extends as a 7' high, 15' wide tunnel floored with large angular gravel. After about 800' the Dome Room is reached. A passage to the right extends about 150' before ending. By climbing over the large mound of breakdown in the Dome Room it is possible to enter the main passage again. After about 80' a passage to the left makes a loop and re-enters the main passage after about 200'. From this Junction Room five passages extend, the most important of which are the Gypsum Blister Passage to the south and a passage to the east.

the eastern passage extends as an alternating walking and crawling passage for several hundred feet to the base of a breakdown-filled sink. It is barely possible to squeeze through the breakdown and reach the surface. The Gypsum Blister Passage is a 5' high, 20' wide, 250' long passage. In general the area from the Dome Room to about 300' beyond the Gypsum Blister Passage is a complex of passages, many of which are drains from surface sinks. These drains are frequently round tubes in solid gypsum, commonly ending in breakdown from above. Many side passages in this area remain unexplored. The plateau above the cave contains numerous sinks and extends for over a half-mile to the south and beyond the mapped part of the cave in all directions. If all of these sinks connect with the cave, which seems likely as no other water exit is known, there will be several additional miles of passage.

Geology: The mapped part of River Styx Cave is developed along the crest of a small local anticline. This anticline, probably produced by the removal of salt from the subsurface or by the conversion of anhydrite to gypsum, is exposed in the cliffs downstream from the cave where it is about 800' wide with dips of 10 to 15 degrees away from the axis. Though the main passages of the cave tend to follow the axis of the anticline the reason for this is not readily apparent as there is no strong joint control. Most of the joints observed, however, did run parallel to the axis of the anticline, and as gypsum in general has few joints the concentration of joints in the deformed rocks along the anticline was probably the controlling factor in the orientation of the large passages. Since only crawlway size passages were left unchecked, it seems likely that the passages connecting sinks off the anticlinal axis with the main cave are small passages that did not develop into large passages because of their poor orientation with regard to joints. The fact that passages oriented along joints are larger than those unfavorably located indicates a phreatic origin for a large portion of the cave, as vadose enlargement by gravel-bearing floodwaters would be effective whether or not there was a joint present. This tends to agree with other evidence, such as solutionally formed pockets, level horizontal ledges projecting up to three feet into the passage in areas of dipping rocks, and the maze character of some sections of the cave; all of which indicates that the cave has not been greatly modified after solution by slowly moving water. The Gypsum Blister Passage, the roof of which is composed of thin hanging slabs of gypsum that tend to form circular clusters, and its extension past the Hatchet Room are almost entirely unmodified phreatic passages; whereas some of the tubular passages leading from surface sinkholes are almost wholly vadose in origin. Most of the passages of the cave have been modified to some extent by the gravel-carrying floodwater that runs through the cave following heavy rains. This gravel is derived from a thin overlying dolomite, and retains its angular shape throughout most of the cave. The individual passages seem to vary from about 10% phreatic in surface drains to over 90% phreatic in the Gypsum Blister Passage. In general the main passages of the cave tend to be about 40% to 60% phreatic in origin.

Metecology: In association with the study of bat hibernation three temperature recorders were placed in or near the cave. One recorder was placed at the entrance of the cavern in a well-ventilated box three feet above the ground. This recorder graphed the outside temperature and was far enough away from the entrance to the cavern not to be influenced by currents of air coming out of the cavern. The second recorder was placed in the passage five feet above the floor, near a crevice in which bats were clustered. This recorder was subjected to the wind currents in the cavern. The third recorder was placed on the ceiling of the main cluster room

and was not directly in any current of air." (Patterson, pp. 26-27) (See chart, page 33) "...The cavern has no main obstruction to air currents. It has been found that on days in which the outside temperature exceeded the inside temperature, the air moved out of the mouth of the cavern. If the outside temperature was lower than that inside, air moved into the cavern. This was caused by the warmer air rising out of the natural vents that were of higher elevation than the main entrance. In the latter cave, the air was of greater velocity since warm air would escape faster than if the conditions were reversed." (Patterson, p. 28)

Biology: During the winter months a large population of Myotis velifer incautus (Allen) inhabits the cave. Dr. Donald W. Tinkle and his associates have banded a large number of bats in the cave. It was chosen also for the study of the hibernation quarters and the activities of bats during the winter season. The results of this study have been presented in an M.S. thesis by I.G. Patterson (1961). In May 1963 James Reddell and Bill Russell made a collection of invertebrates. Unfortunately it was not possible to make a collection of vertebrates found in the cave, all of which appeared to have been washed in by recent floods of the South Wichita River. The invertebrate material awaits study, but a faunal list is as follows: Crayfish, spiders, terrestrial isopods, cave crickets, and several species of beetles /including Agonum (Rhadinus) sp./. Vertebrate life includes the Cave Bat, Myotis velifer incautus, frogs, turtles, fish, and tiger salamanders.

History: The cave is one of the best known caves in Northwest Texas and has been visited frequently by high school students for over thirty years. Their explorations have probably included most of the cave, with the exception of some of the more difficult crawls and breakdown areas. Dr. Donald W. Tinkle and his associates visited the cave sporadically from 1958 to the present. The meteorology of the cave was studied during the winter of 1961. In May 1963 James Reddell and Bill Russell mapped the cave and opened the sinkhole entrance. (See map, page 34)

Bibliography: See references # 7, 8, 9, 11, and 14.

Ref: TSS files

SALINAS SINK

Northwest Texas (# 6)

Owner: Bateman Ranch

Description: Salinas Sink is a large sink located about 1/2 mile west of the entrance to Salt Spring Cave. From the bottom of a large sink a cave extends into massive breakdown. This cave was not checked but it may connect with the water channel feeding Salt Spring Cave beyond the breakdown now blocking it.

Ref: TSS files

SALT SPRING CAVE

Northwest Texas (# 5)

Owner: Bateman Ranch

Description: The entrance to Salt Spring Cave is located on the west bank of the South Fork of the Wichita River about 3/4 mile below River Styx Cave. The entrance to the cave has recently been cleared by the Corps of Engineers in preparation for building a dam. The entrance is now 3' high and 6' wide. A stream of water flowing about one cubic foot per second leaves the cave, carrying 300 tons of salt per day into the river and thence into Lake Tawhoma. From the entrance the cave extends as a winding irregular crawlway for 700' where it is blocked by water reaching almost

— OUTSIDE HIGH AND LOW TEMP.

— PASSAGE TEMP.

— CEILING TEMP.

°C
30—

20—

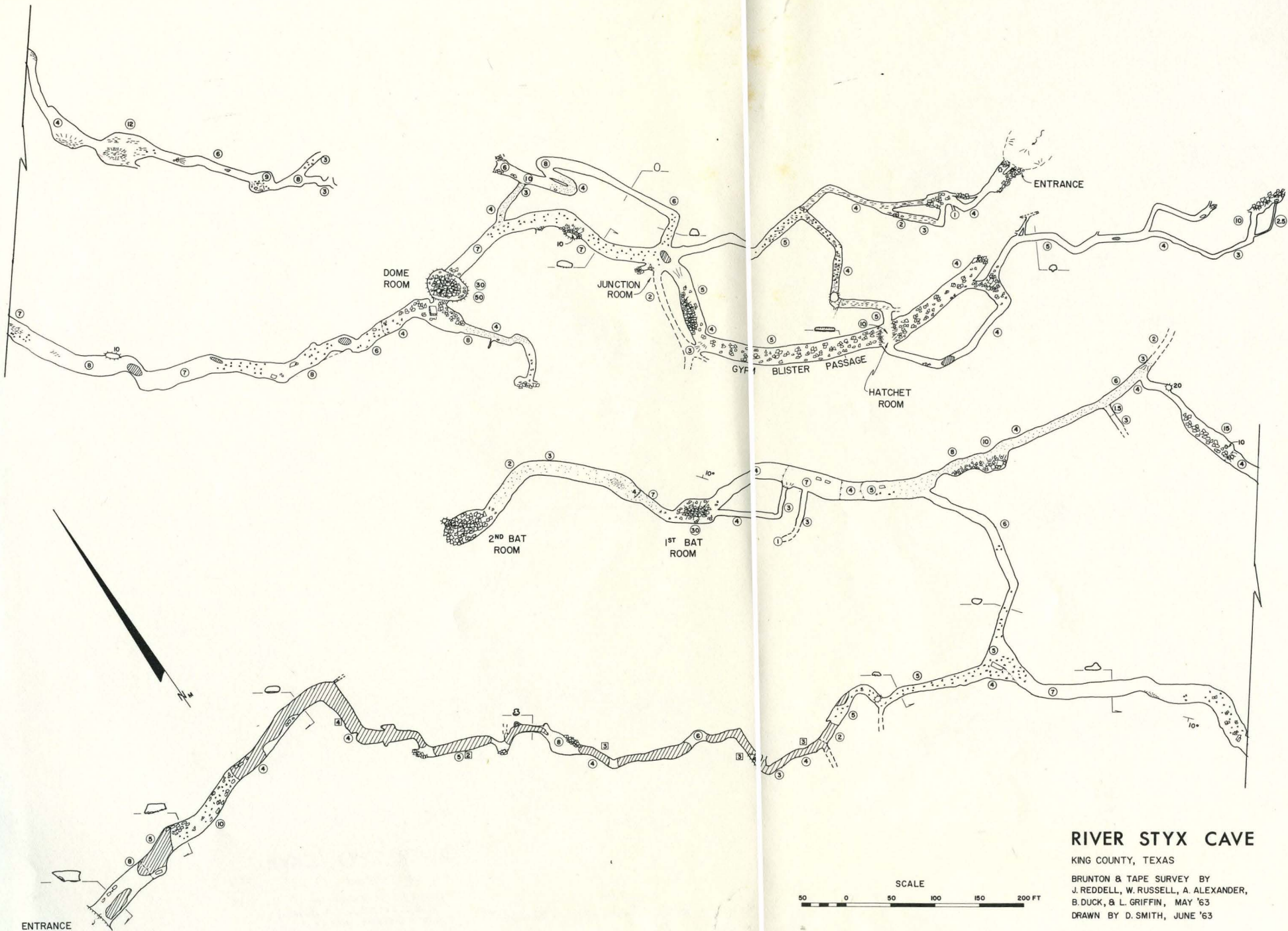
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7 14 21 28 7 14 21 28 7 14
JAN FEB MAR



to the ceiling. This cave is in an area of extensive solution, the cave passing through many breakdown areas and the surface above the cave containing many large sinks. It seems likely that the dam being built across the cave entrance will only force the water to find a new exit. In any case the work being done by the Corps of Engineers will add to our knowledge of the effects of solution on gypsum. The only fauna observed in the cave were small fish and collembola. The latter were collected from breakdown above the cave stream. The cave was mapped in May 1963 by James Reddell and Bill Russell. (See map, page 36)

Ref: TSS files

RANDALL COUNTY

ARCH CAVE

Northwest Texas (# 50)

Owner: Palo Duro State Park

Description: A gully runs into the main entrance to the cave. After a few feet there is a second entrance in the ceiling and two small dead-end side passages. The entire cave is a steep crawling descent. There are two rooms where it is not necessary to crawl. Just before the second room there is a small drop and then a narrow turn through which it is necessary to turn sideways and arch the body. This narrow passage is about 15' long. Two small passages lead out of the room. The one to the right becomes too narrow, while that to the left forks, both branches soon becoming too narrow to negotiate. A sketch map of the cave was made by Charles B. Stewart in 1963. (See map, page 37)

Ref: Charles B. Stewart

CATARINA CAVE

Northwest Texas (# 48)

Owner: Palo Duro State Park

Description: The main entrance to the cave is about 20' high and 7' wide. A few feet inside the cave entrance several steps have been cut in the steeply ascending passage. The passage averages 5' wide and 7' high for 27 yards where a 10' climb leads up through a 5' in diameter entrance. A short, small crawl leads to a third entrance. From the upper entrances to the lower entrance the total depth of the cave is about 30'. The entire cave is formed in a clayey sandstone of the Tecovas and Quartermaster formations of Triassic and Permian ages. It was mapped in 1963 by Charles B. Stewart. (See map, page 38)

Bibliography: See references # 10, 16, and 17.

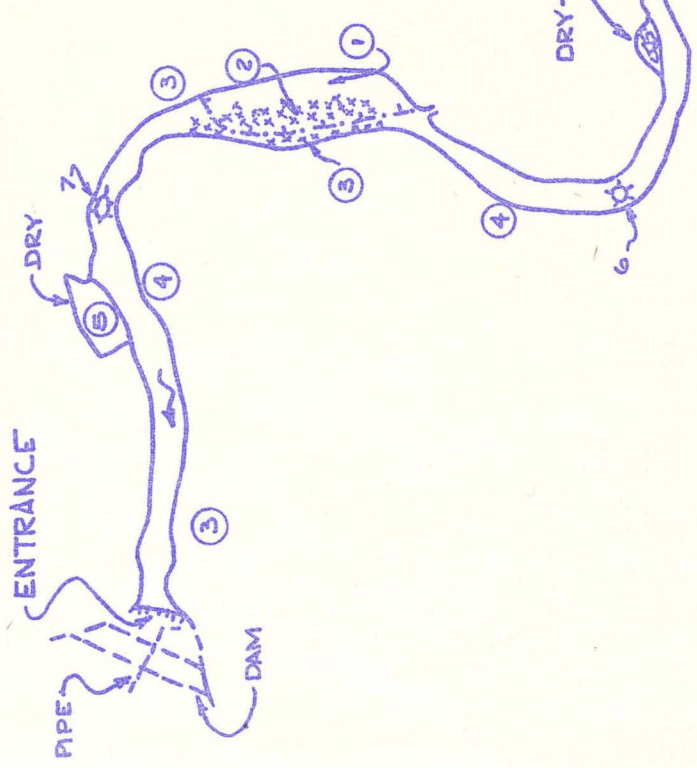
Ref: Charles B. Stewart

CONFUSION CAVE

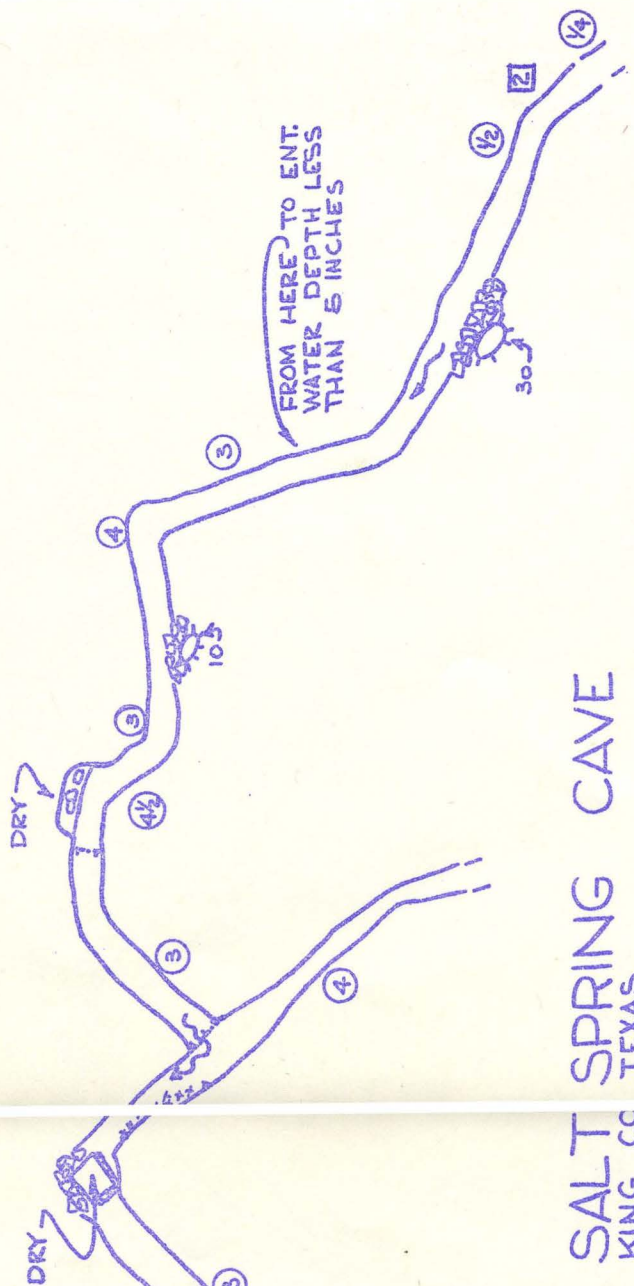
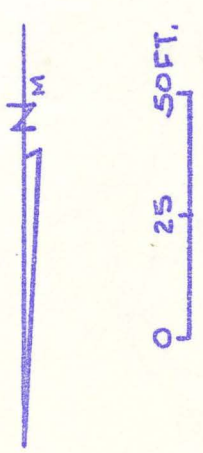
Northwest Texas (# 51)

Owner: Palo Duro State Park

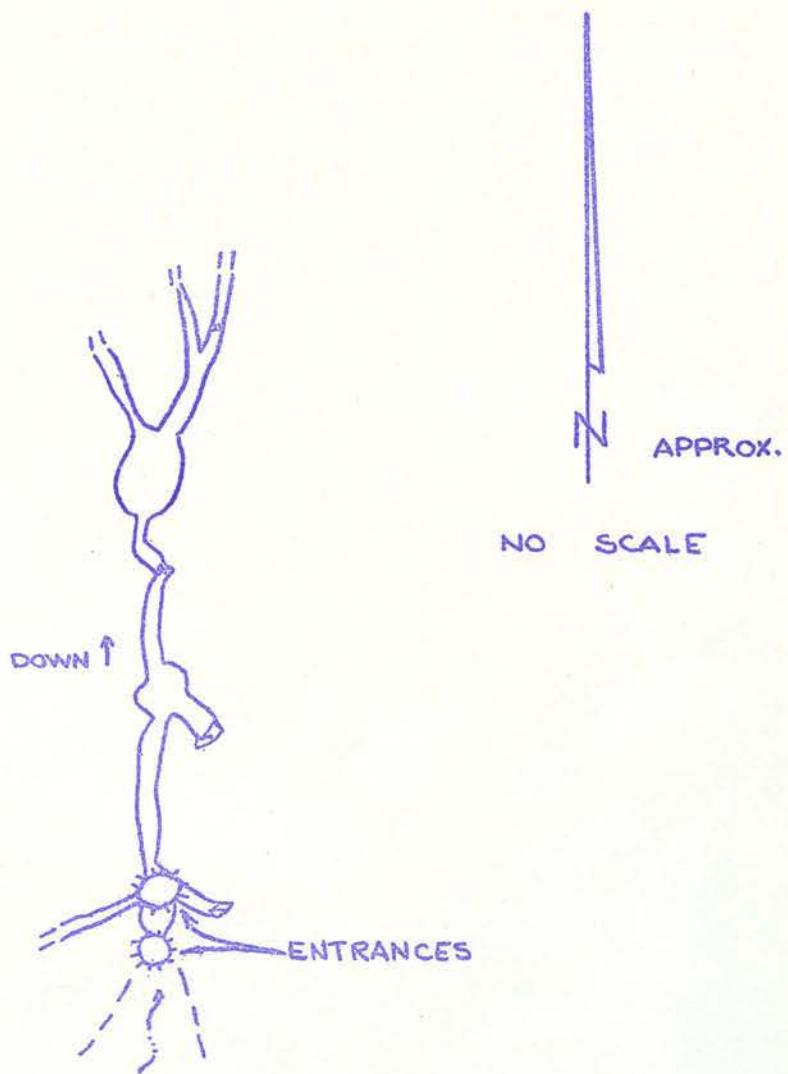
Description: There are at least nine entrances to this cave. The two lowest on the hill are connected by a small natural bridge. From these entrances to the north a small passage leads to a dead-end. To the south it extends past two entrances, also connected by a narrow natural bridge, for about 16 yards to a fifth entrance. At this entrance two passages lead for short distances, one past a large boulder



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 WATER ON FLOOR EXCEPT
 WHERE MARKED 'DRY'.



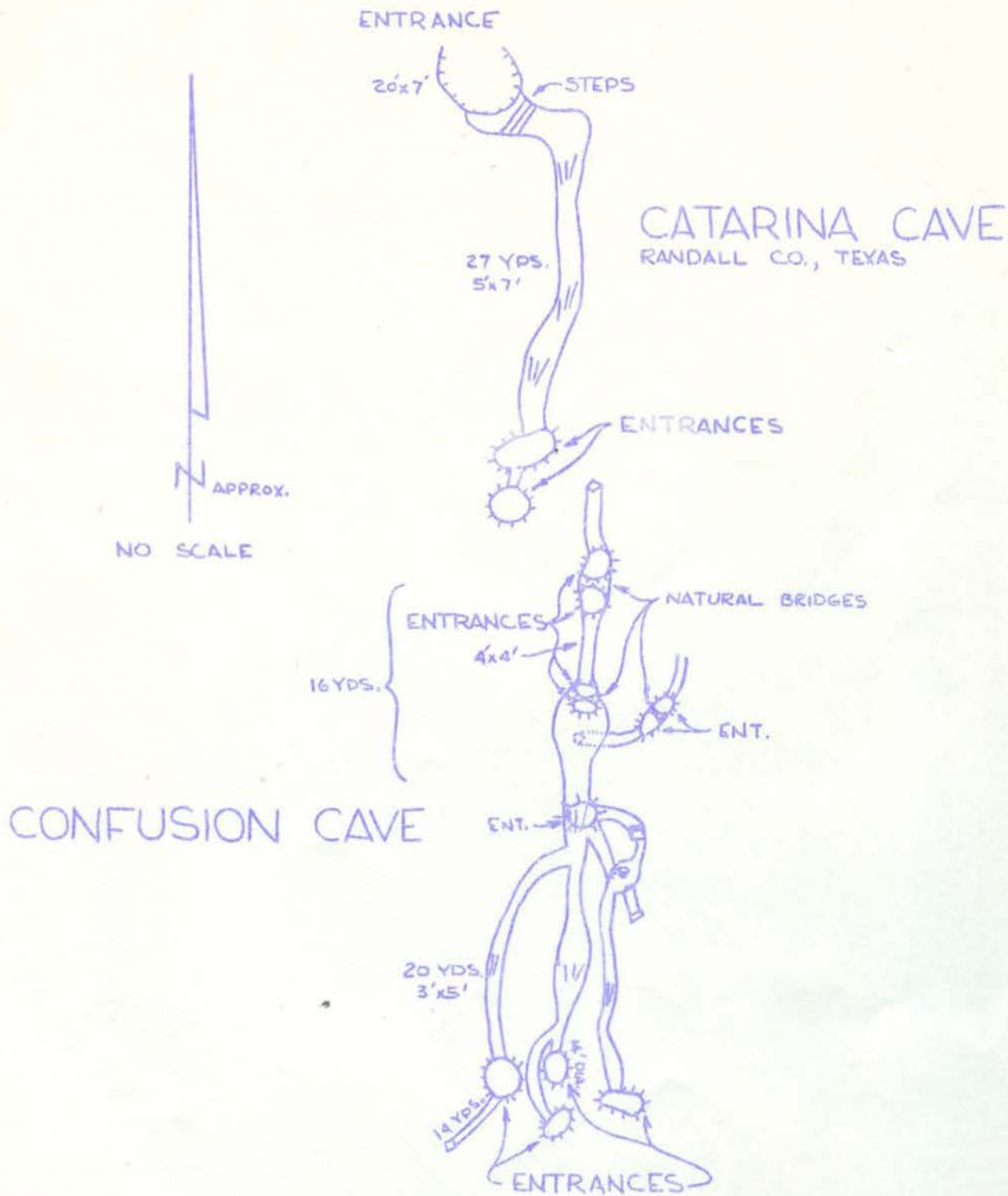
SALT SPRING CAVE
 KING CO TEXAS
 BRUNTON TAPE SURVEY BY
 TSS, 6-3



ARCH CAVE

RANDALL CO., TEXAS

SKETCH MAP BY C. STEWART
APRIL, 1963



SKETCH MAPS BY
C.B. STEWART, 4-63

and to a small room at which the other passage intersects eight feet up on the wall. Two passages lead from this small room. One dead-ends after a few feet while the other leads to an entrance in the ceiling. The main passage of the cave leads past the entrance for a few feet to a junction. The right-hand branch leads as a 3'-4' wide, 4'-6' high passage up to a vertical exit, after about 20 yards. A passage from the bottom of this exit leads about 14 yards to a dead-end. The main passage continues up a steep slope and through a narrow passage to an entrance. A small side passage off of this passage leads to another entrance. The cave was explored and a sketch map made by Charles B. Stewart in 1963. (See map, page 38)

Ref: Charles B. Stewart

DEAD TREE CAVE

Northwest Texas (# 52)

Owner: Palo Duro State Park

Description: The entrance to the cave is a crawlway opening onto the wall of a gully. An ascent leads from the side of the gully as a 3' x 3' passage to a large room open to the surface. A dead tree allows one to climb down into the sink, but a side passage is an easier method of entrance. From this sink a rise leads to another entrance. Total length of the cave is about 50 yards. It was sketch mapped by Charles B. Stewart in 1963. (See map, page 40)

Ref: Charles B. Stewart

DUAL CAVE

Northwest Texas (# 53)

Owner: Palo Duro State Park

Description: The cave is formed in sandstone, but is quite solid. One entrance is a hole dropping vertically into a small passage. This in turn connects to a passage perpendicular to the first. From here a 3' wide, 4' high crawlway extends for 66' to a 5' drop. After about 20' more a passage to the right, leading from a second entrance about 50' away and 15 yards below the first entrance, intersects the main entrance. A few feet past this intersection there is a hole leading 15'-20' up to the surface. A steady descent occurs from the first entrance to the bottom of the cave about 15 yards past the 15'-20' deep entrance sink. At the end of the cave a circular funnel-shaped hole leads to the surface and a few feet past this one a very narrow opening leads to the surface. The cave was explored and a sketch map made by Charles B. Stewart in 1963. (See map, page 40)

Ref: Charles B. Stewart

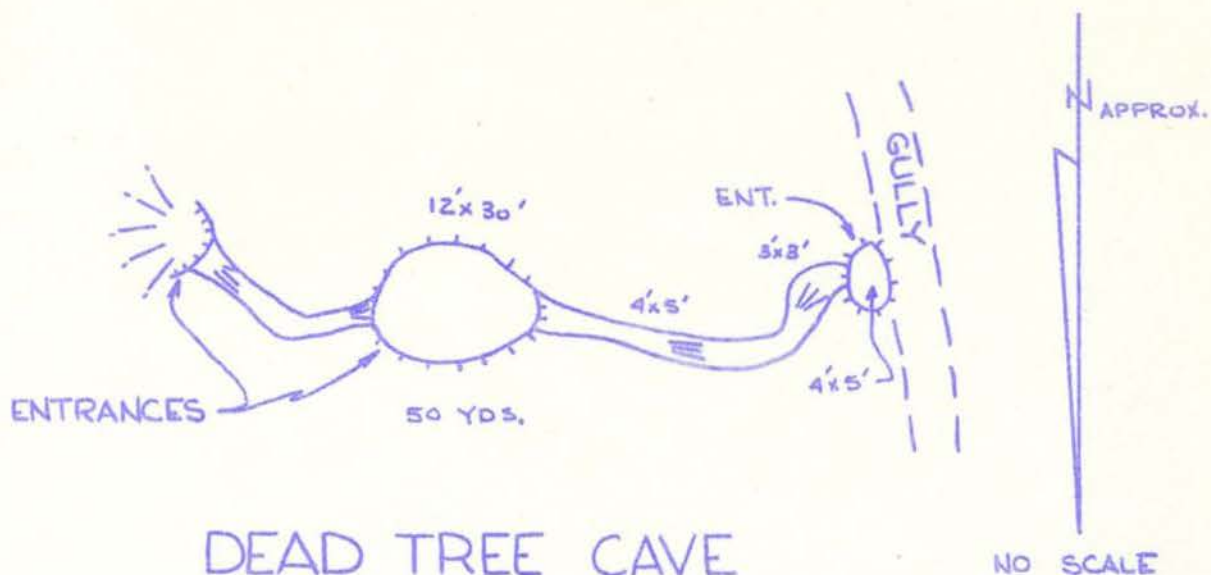
LEDGE CAVE

Northwest Texas (# 54)

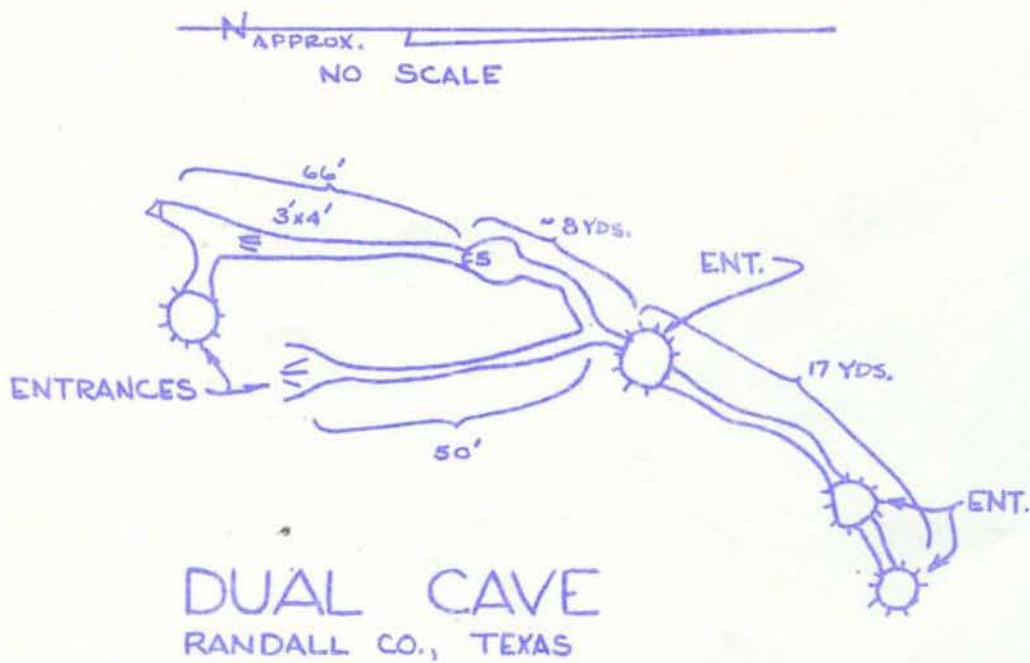
Owner: Palo Duro State Park

Description: From the entrance to Tunnel Cave continue up the gully, past two large rock slabs and the entrance to Ledge Cave is reached. It lies just above the gully and drops straight down. A small passage downhill from this entrance is impassible. The main passage extends up a slope to a 12' x 30' room with an opening to the surface. Total length of this passage is about 20 yards. A ledge on one side of this room leads to two holes on the wall about 30' above the floor of the room. These connect after a short distance. After a few feet three passages extend, one a narrow descent to a dead-end, the other two go to exits, one passing over the other. Total length of the passage from the room to the exits is about 15 yards. It was sketch mapped in 1963 by Charles B. Stewart. (See map, page 41)

Ref: Charles B. Stewart

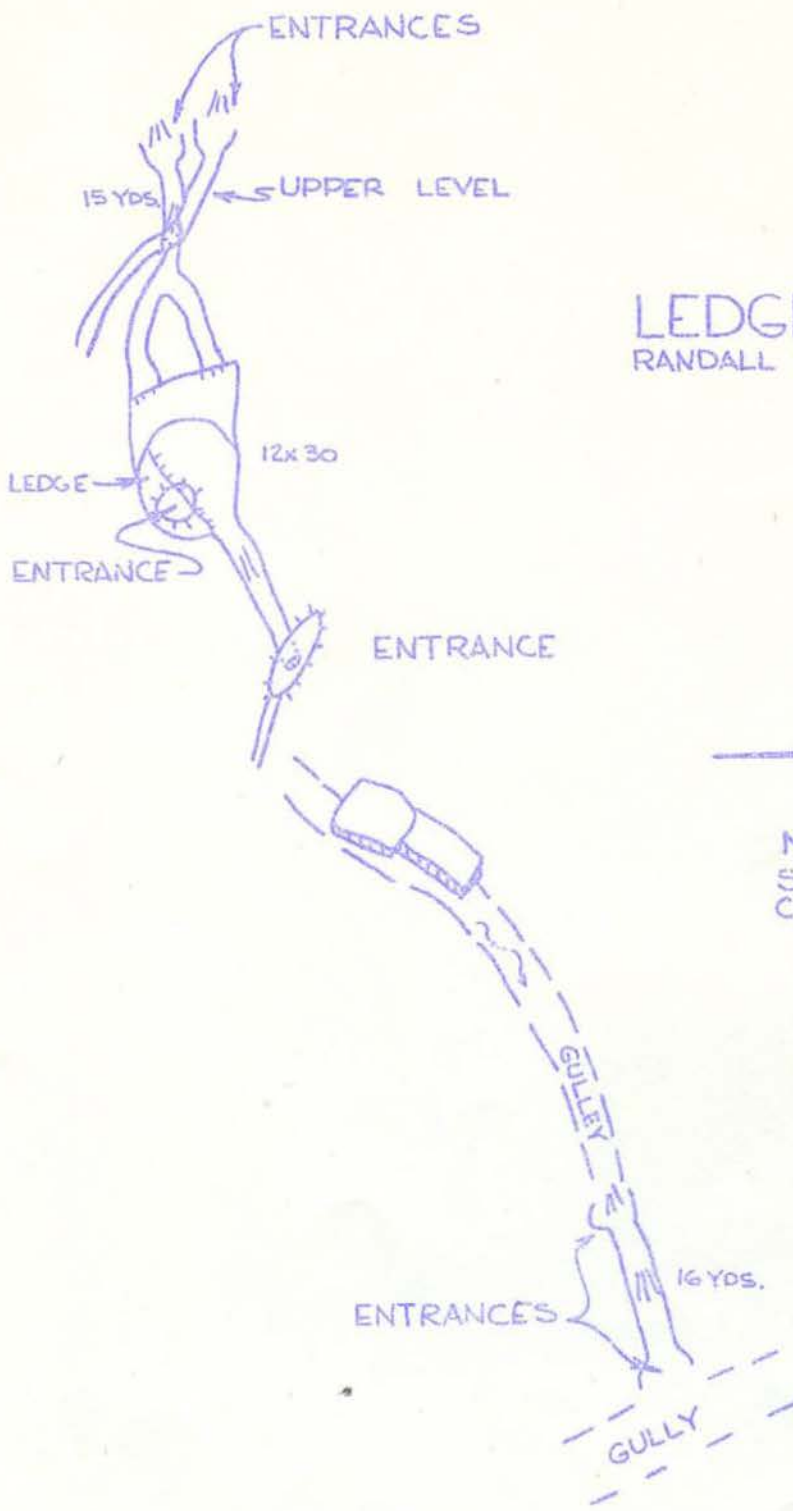


DEAD TREE CAVE
RANDALL CO., TEXAS



DUAL CAVE
RANDALL CO., TEXAS

SKETCH MAPS BY
C.B. STEWART, 4-63



LEDGE CAVE

RANDALL CO., TEXAS

NO SCALE
SKETCH MAPS BY
C.B. STEWART, 4-63

TUNNEL CAVE

SIMPLE CAVE

Northwest Texas (# 55)

Owner: Palo Duro State Park

Description: The entrance to the cave opens onto the side of a gully and just upstream from two large rocks. A 5' wide, 3' high crawl leads for a short distance to a 7' x 15' room, through which it is possible to walk. A crawl from this room leads to an 8' x 15' room. Beyond this room a crawl leads to a vertical entrance. Total length of the cave is about 60 yards. A sketch map of the cave was made by Charles B. Stewart in 1963. (See map, page 43)

Ref: Charles B. Stewart

SPANISH SKIRTS CAVE

Northwest Texas (# 49)

Owner: Palo Duro State Park

Description: The cave is located on the face of the cliffs known as the Spanish Skirts. It consists of a series of nine entrances connected together by short crawls and drops. Total length of the cave is 75'-100' and the total depth from the top to bottom entrances is about 30'. At no point are you out of daylight.

Ref: TSS files

TUNNEL CAVE

Northwest Texas (# 56)

Owner: Palo Duro State Park

Description: This cave is a 50' long tunnel-like cave through which a gully runs. It is easy to negotiate and opens into the side of another gully. Ledge Cave is located up the gully that enters Tunnel Cave. A sketch map was made by Charles B. Stewart in 1963. (See map, page 41)

Ref: Charles B. Stewart

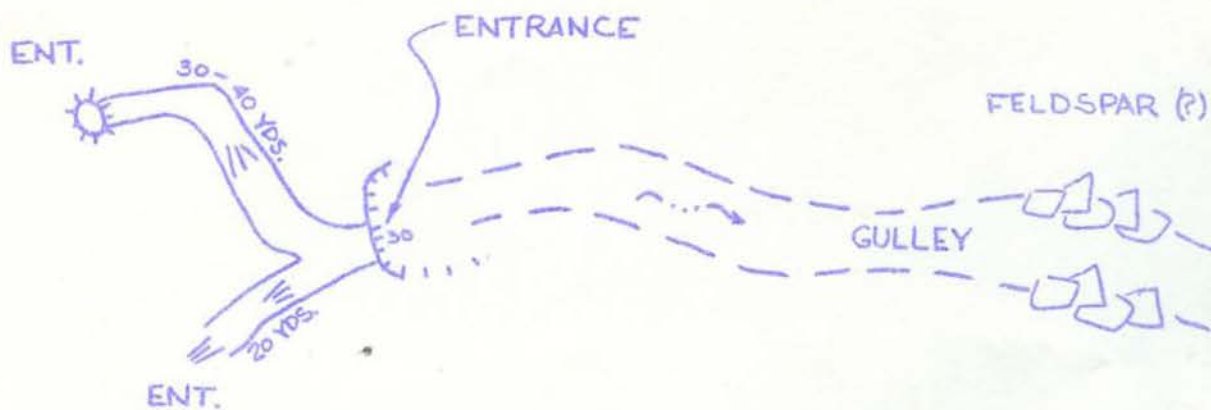
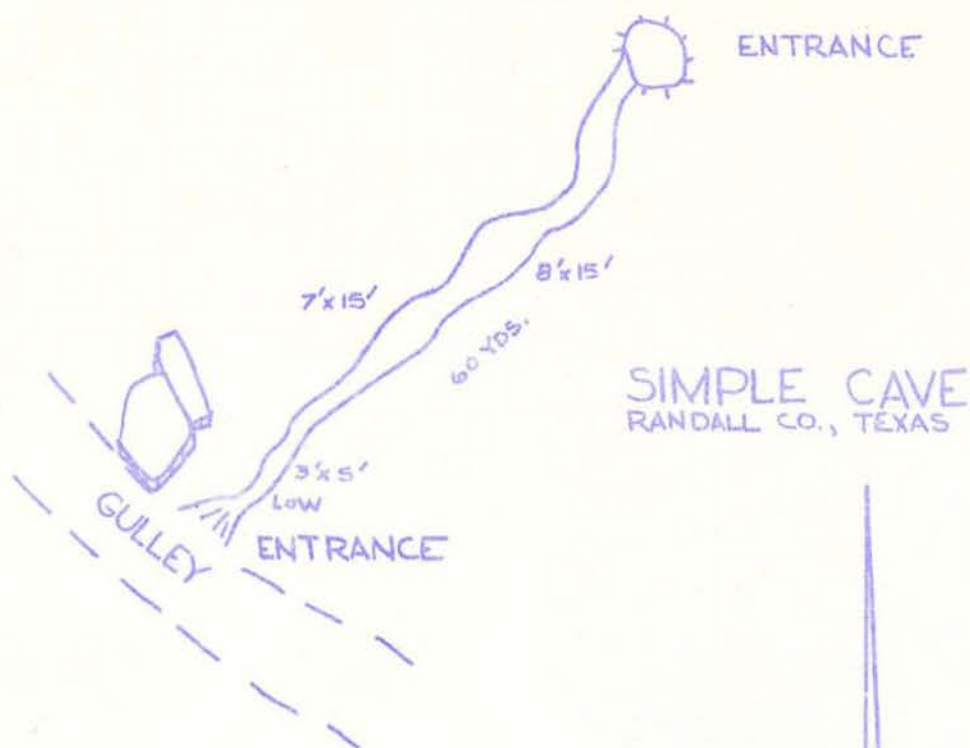
VINE CAVE

Northwest Texas (# 57)

Owner: Palo Duro State Park

Description: The entrance is at the head of a steep gully and is a hole on the face of a vertical cliff 30' above the gully floor. Many vines hang over the entrance. The entrance to the cave is over 6' high and about 10' wide. After about 15' a junction occurs, with the left-hand passage leading about 20 yards to a sloping entrance. The right-hand passage extends about 30 to 40 yards to a large open pit. The cave is in sandstone. A sketch map was made by Charles B. Stewart in 1963. (See map, page 43)

Ref: Charles B. Stewart



VINE CAVE
RANDALL CO., TEXAS

SKETCH MAPS BY
C.B. STEWART, 4-63

ASPERMONT BAT CAVE (BAT CAVE)

Northwest Texas (# 1)

Owner: W. F. Martin

Description: Aspermont Bat Cave, locally known as Bat Cave, is a phreatic joint-maze that has been invaded by a surface stream. This stream enters the system through several entrances, the largest being the 5' high, 7' wide entrance that receives the main flow of the stream. From this entrance a passage leads south for 60' to a four-way junction. To the right a passage extends 20' to an entrance, a triangular crawlway extends straight ahead for 45' to a silt block, and a 10' x 10' passage extends to the left for 50' to an almost breakdown-filled entrance. The main cave passage leads south from this entrance through a breakdown area, past a crawlway that connects to another entrance, and to a low junction room. To the west several low passages extend toward the entrance and to the north and east a complex of low gravel-floored crawls interconnect with the main passage. From this room the passage leads over a large slab of breakdown and continues south as a 5' high, 8' wide passage. Fifty feet past the breakdown block the passage skirts a low gravel-floored area to the east and continues south as a 10' high, 10' wide passage paralleled on the west by a 3' in diameter tube. After 70' this passage turns west and leads 95' to the lower entrance. Originally reported by Dr. Donald Tinkle, it was mapped in May 1963 by James Reddell and Bill Russell. (See map, page 45)

Geology: The creek that flows through the cave has shortened its course by several hundred feet through use of the cave. Most of the cave lies under a steep narrow ridge formed by the meandering of the creek. The unused old channel is now about six feet above the channel leading into the cave.

Biology: The cave is utilized by Myotis velifer incautus (Allen) as a temporary resting site. Very few bats have ever been observed in the cave. A collection of invertebrate fauna was made by James Reddell and Bill Russell in May 1963. This included: epigeal isopods, ants, spiders, and beetles, including Agonum (Rhadine) sp.

Bibliography: See references # 8, 11, and 14.

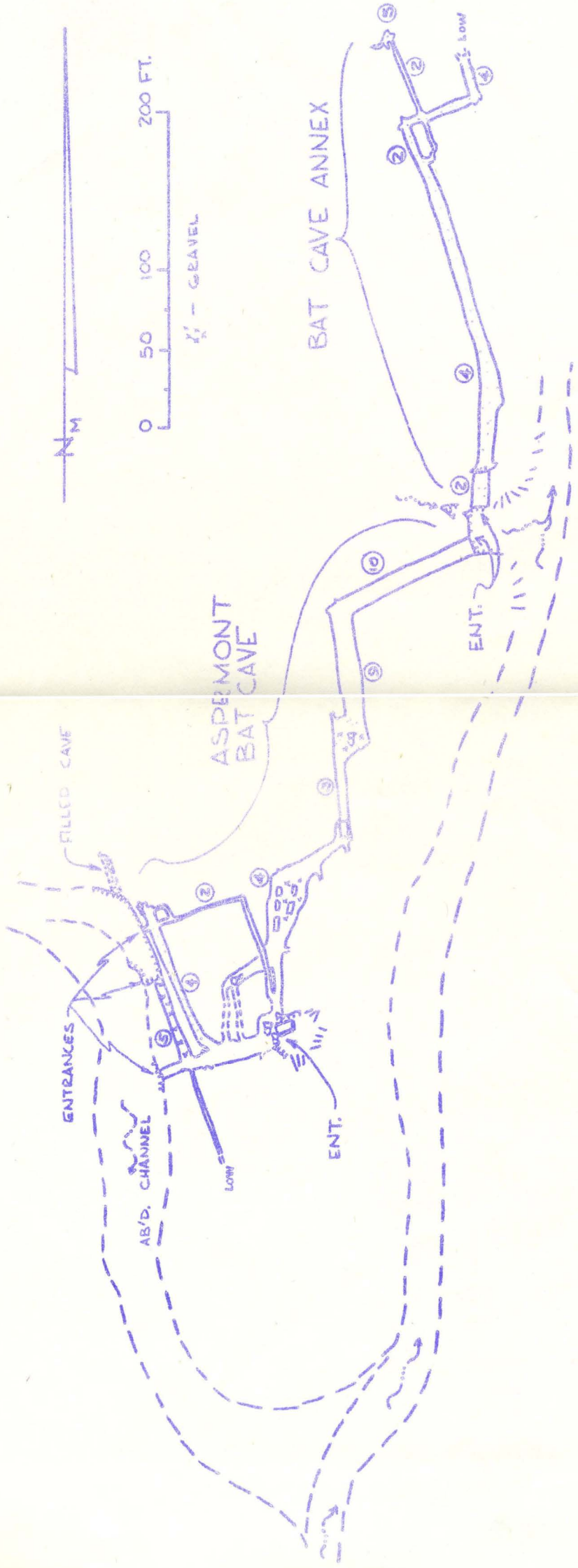
Ref: TSS files

BAT CAVE ANNEX

Northwest Texas (# 2)

Owner: W. F. Martin

Description: Bat Cave Annex is part of the same phreatic joint-maze as Aspermont Bat Cave, but has been separated from it by erosion. The entrance to the cave is about 20' north of the lower entrance of the main cave. This entrance, about 1' high and 7' wide soon opens into a 3' high passage that extends north for 70' to a slight bend. From this bend the passage extends northward for 170' to a sharp right turn and, past this turn, to the east for 50' to a sharp bend to the north. From this last north bend the cave continues for about 40' to a silt mound that completely blocks the passage. Near the end of the cave are several small north-south cross passages. The cave was mapped in May 1963 by James Reddell and Bill Russell. (See map, page 45)



STONE WALL CO., TEXAS
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Geology: The floor of the cave is covered by a deposit of clay and silt of unknown depth. It would be interesting to know the depth of this deposit as it would reveal the size of the original phreatic openings invaded by the stream flowing through Aspermont Bat Cave. A passage similar to the Bat Cave Annex also continues to the north of the upstream entrance of Aspermont Bat Cave, but some dirt removal would be required to enter it.

Ref: TSS files

GREEK CAVE

Northwest Texas (# 3)

Owner: W.F. Martin

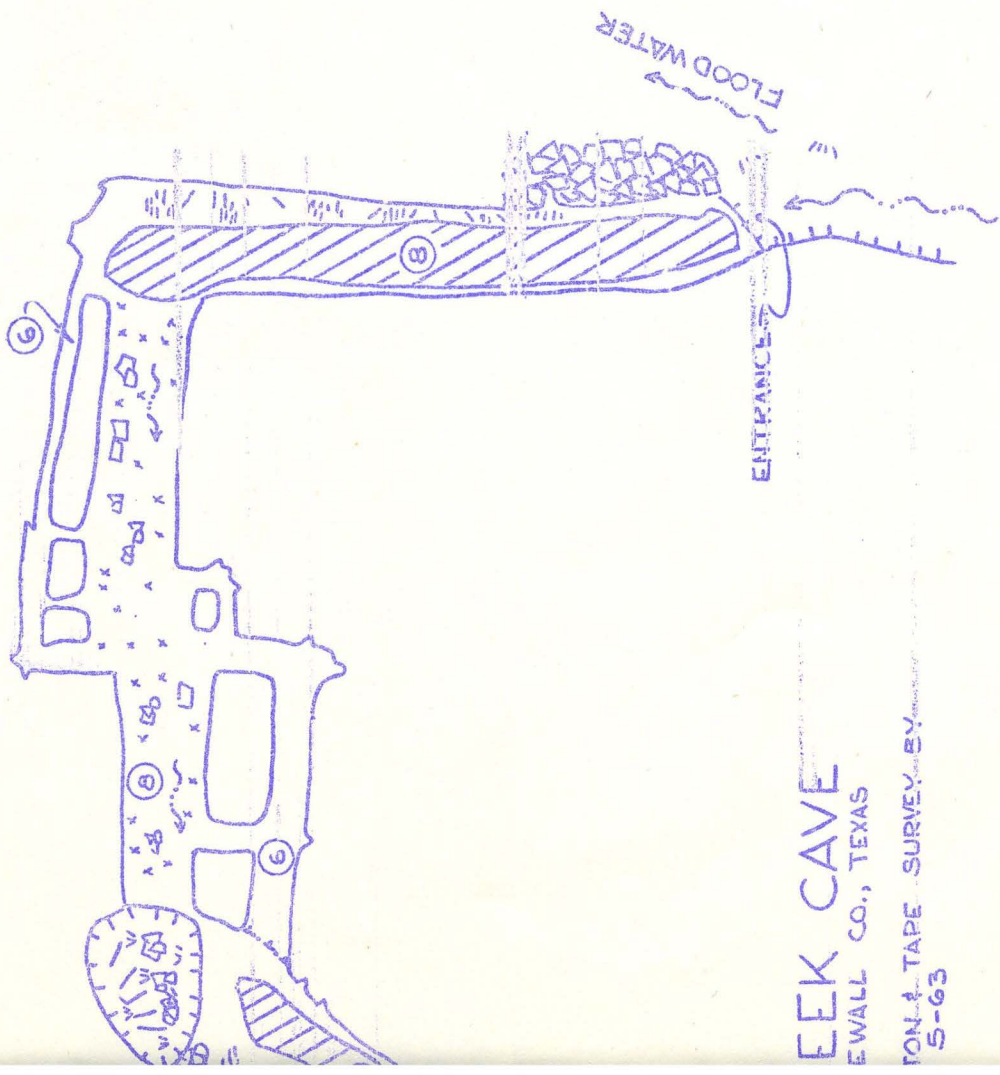
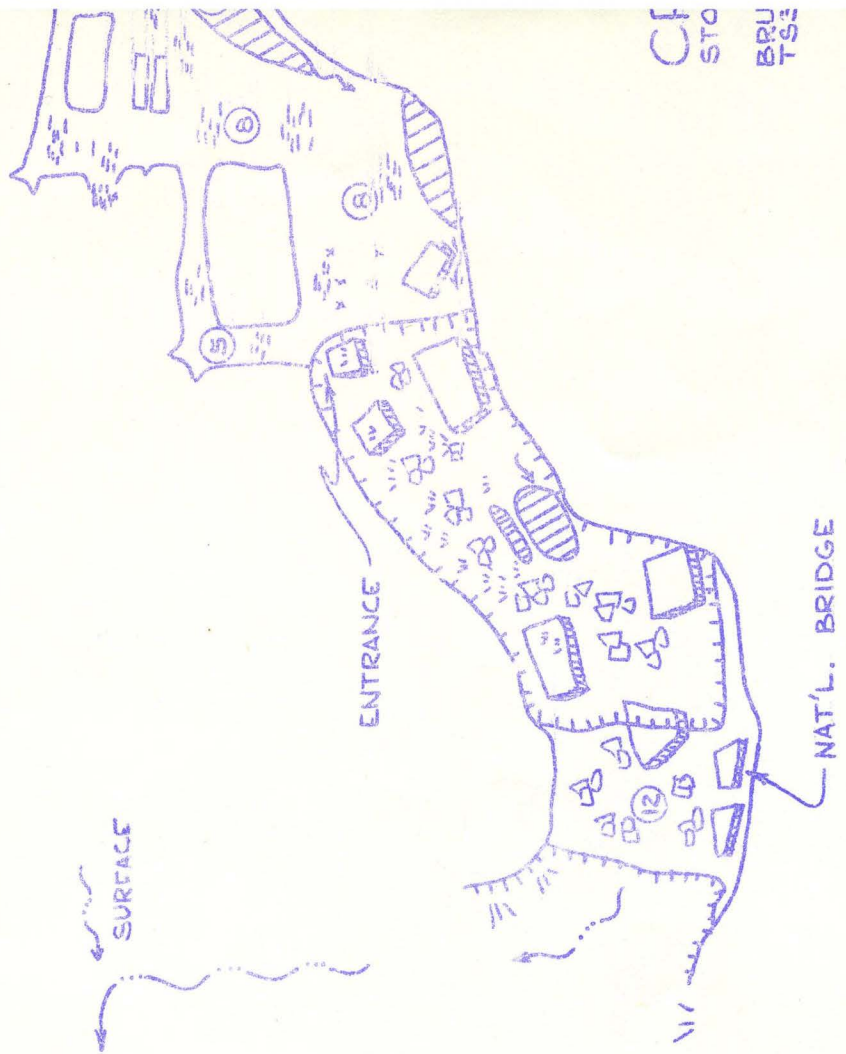
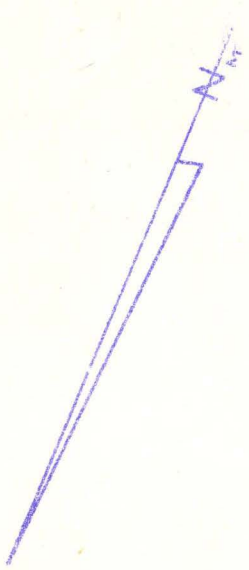
Description: Greek Cave is a joint-maze of relatively large dimensions which has been invaded by a surface stream. The stream enters the system through an 8' high, 20' wide entrance at creek level. From this entrance the stream follows a strongly joint-controlled passage to the ENE. The floor of this large passage is mostly covered by a lake averaging three feet deep. This lake can be bypassed by following a mud bank along the south wall. One hundred and thirty feet from the entrance the cave makes an almost right-angle bend and follows another set of joints to the south. For the next hundred feet there is one large 8' high, 15' wide main passage, paralleled on the east by a smaller walking passage. At 100' the east passage rejoins the main passage, and a similar side passage develops to the west of the main passage. These side passages are connected to the main corridor by several short connecting passages. About 200' past the end of the lake the cave again makes an almost right turn to the southwest. At this bend collapse has opened a sink to the surface. From this sink the cave continues as a 15' wide, 10' high main passage, paralleled to the north by a smaller walking passage and interconnected frequently by short cross passages. Seventy feet past this first collapse sink the cave makes another right-angle bend and enters a long collapse sink. This sink, about 100' long and 30' wide, is floored with breakdown and bounded by generally unclimbable walls. This sink is connected to the creek valley by a short section of cave passage that forms a natural bridge 12' high and about 25' wide and long. Throughout the cave there is much mud and organic debris left by the creek during its floods. Much of the creek's flood-water appears to use the cave even though the channel through the cave is only a few feet lower than the outside channel. The cave was mapped in May 1963 by James Reddell and Bill Russell. (See map, page 47, and passage rose, page 48)

Geology: The cave was almost certainly formed by slowly moving phreatic water dissolving along a strong system of joints. This system of large elliptical joint-controlled passages was invaded by the surface stream and will soon be destroyed by it. The stream has cut through the original gypsum floor and has reached a softer, easily eroded red clay. Erosion of this bed has undermined many of the pillars between the passages, and as there is never over 10' of overburden, collapse soon follows.

Biology: Dr. Donald W. Tinkle visited the cave during his bat studies and banded a number of Myotis velifer incautus (Allen) in the cave. In April 1960, 7000-8000 Myotis velifer incautus were found roosting in the cave. In June these were replaced by Tadarida brasiliensis mexicana (Saussure).

Bibliography: See references # 8, 11, and 14.

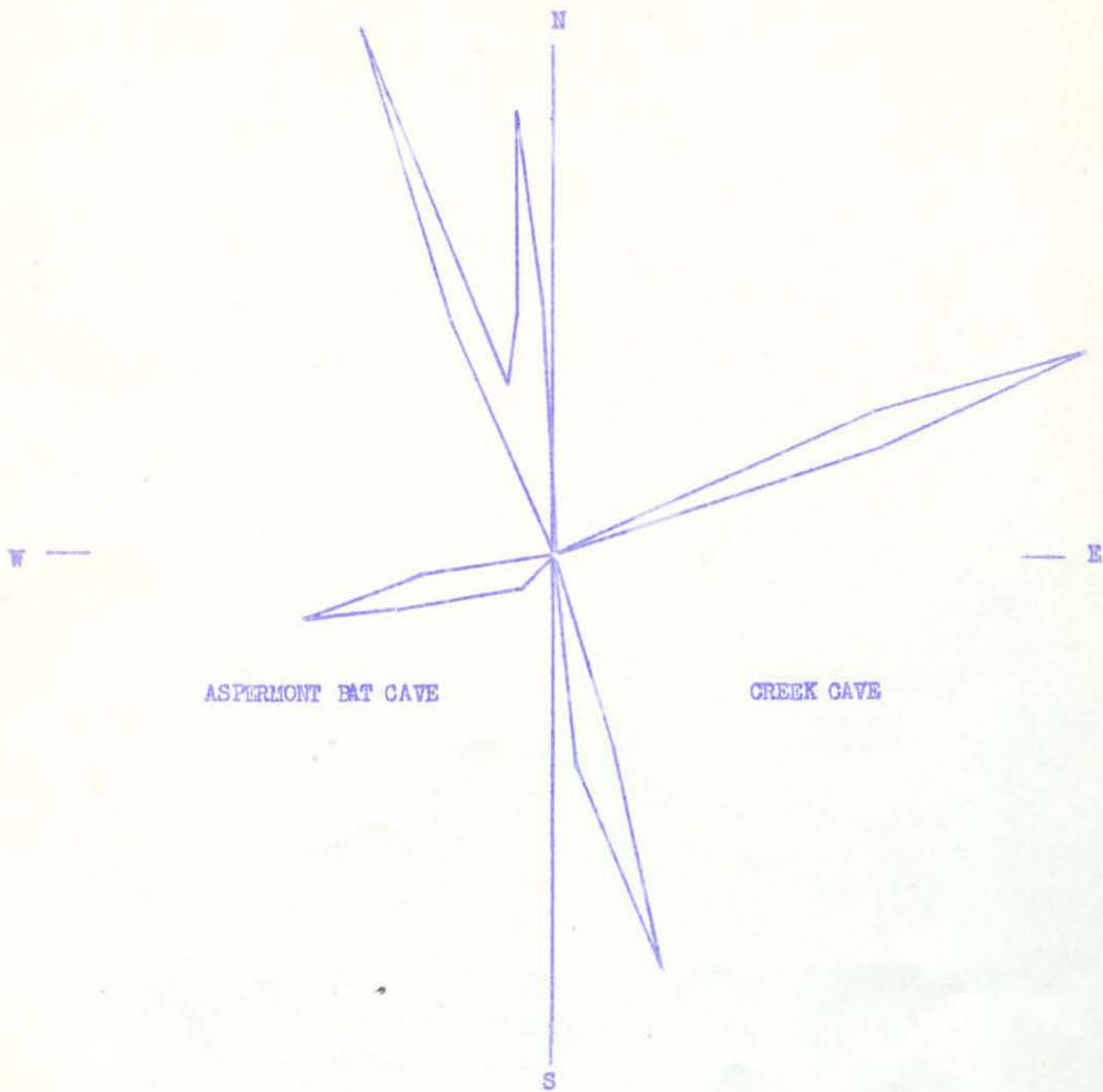
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CREEK CAVE
STO E WALL CO., TEXAS

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— GRAVEL



PASSAGE ROSES OF ASPERMONT BAT AND CREEK CAVES

STONEWALL COUNTY, TEXAS

Scale: 1" = 100'

BIG MOUTH CAVE

Northwest Texas (# 39)

Owner:

Description: The entrance to the cave is along the side of a short draw which runs into the North Fork of the Red River. A small stream runs out of the cave after local rains. The entrance is about 20' wide and 12' high. The entrance room is about 30' long, 30' wide, and 15' high. Just past this room the cave opens into a second room, about 30' long, 20' wide, and 15' high, with much breakdown and silt on the floor. From this room a low, 4' wide passage extends to a third room. A passage to the left leads as a crawl for about 30' to breakdown. It is possible to crawl over this breakdown and enter a 1' high, 3' wide crawl which extends about 150' before becoming too small to get through. In wet weather water runs from this crawl. Much air blows through it. From the junction room a passage leads to a fourth room. A passage to the left in this room circles back towards the entrance for a few feet and then ends in a small room after about 75'. Continuing down the main passage it is possible to crawl in a 1'-3' high passage for about 200' beyond the last surveyed point where the passage ends in a breakdown-choked room. Much air blows through this passage and water runs out of it in times of rain. Both crawls are almost certainly fed by surface sinks above the cliff. Many of these were observed in an examination of the surface above the cave. The cave is almost entirely vadose in origin.

Biology: The cave is inhabited by the Cave Bat, Myotis velifer incautus (Allen). A beetle, Agonum (Rhadin) rubrum Barr, has been described from the cave and a milliped of the genus Nannotene awaits description. A biological collection was made by James Reddell and Bill Russell in May 1963. At that time, besides the Rhadine beetles and millipeds, the following animals were collected: beetles, spiders, epigean isopods, collembola, and a centipede.

History: The cave is quite well known locally and visited frequently by local people. Previous explorations include a trip to collect beetles by Dr. Thomas C. Barr and Dr. Donald W. Tinkle. Dr. Tinkle later returned to the cave in the process of his study of bats in the area. It was mapped in May 1963 by James Reddell and Bill Russell. (See map, page 50)

Bibliography: See references # 1, 3, 4, 6, and 9.

Ref: TSS files

SMALL MOUTH CAVE

Northwest Texas (# 40)

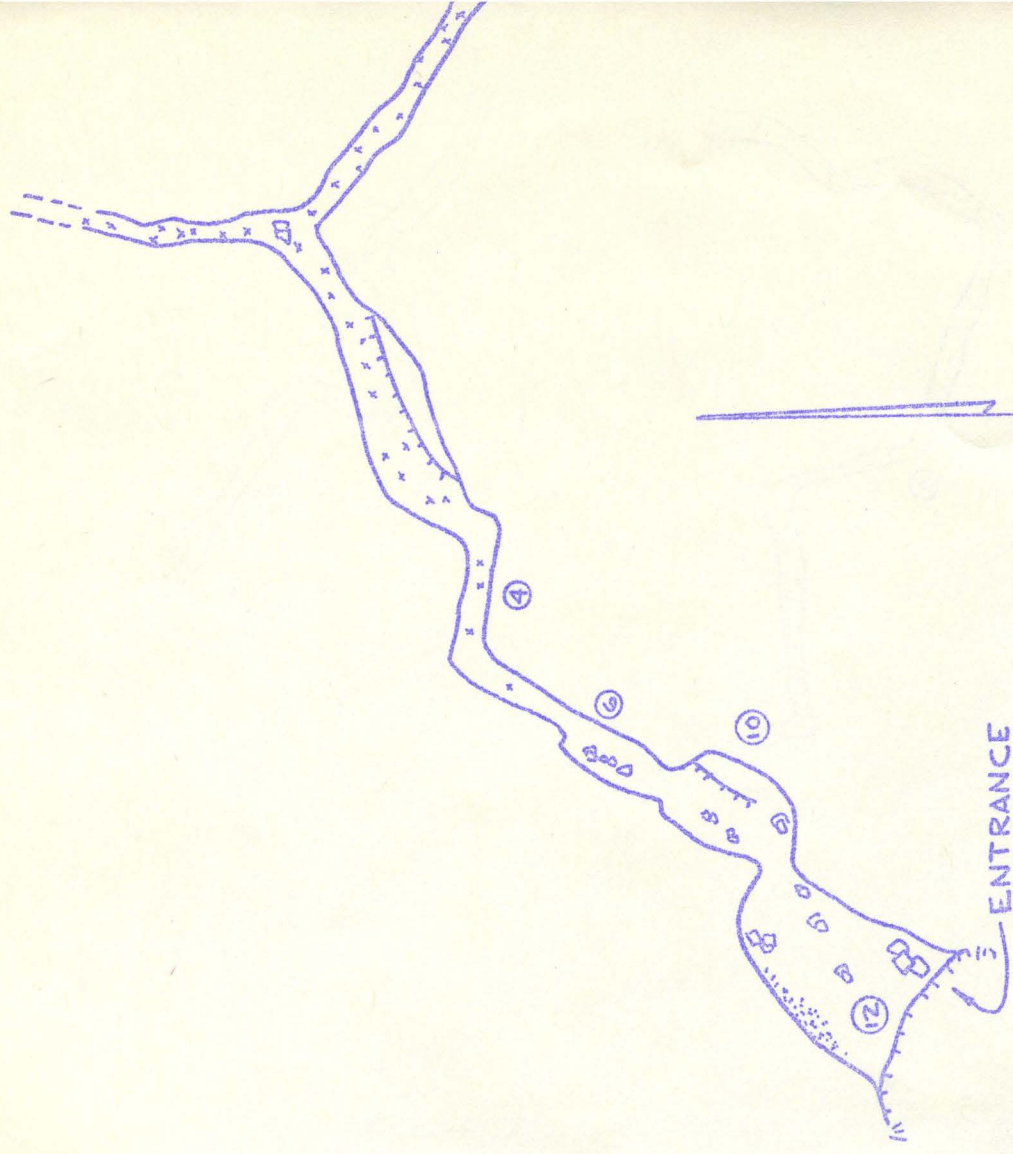
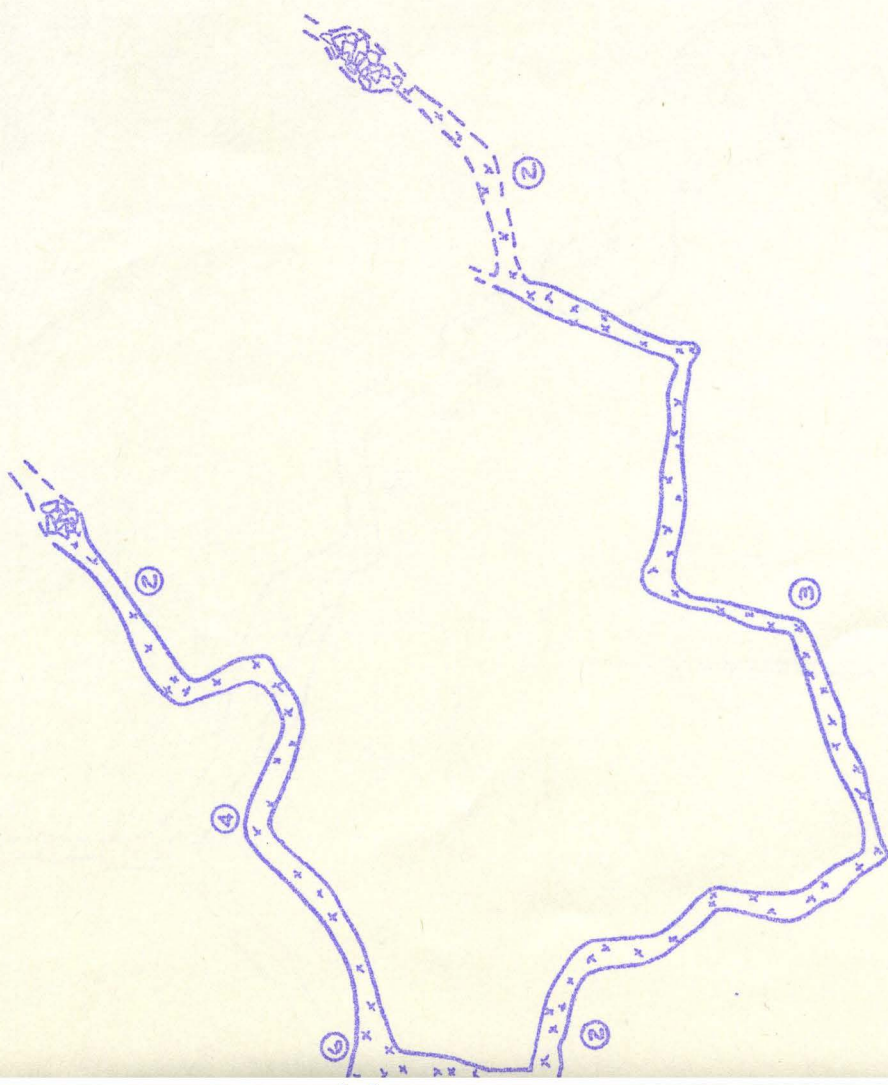
Owner:

Description: Small Mouth Cave has two sections of entirely different character, a lower stream level and an upper silt-floored room. The stream in the lower level is fed by several surface sinks and carries water only after heavy rains, but at these times large quantities of run-off flow through the cave. This stream level passes directly underneath the silt-floored room and flood waters are undermining the silt beneath this room, forming a 15' dome. This dome exposes numerous bones and layers of charcoal left by Indians camping in the room above. From beneath this upper room the stream passage continues through breakdown to a lower entrance

BIG MOUTH CAVE

WHEELER CO., TEXAS

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SOFT
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x - GRAVEL

ENTRANCE

at the level of the North Fork of the Red River. The upper room is a level silt-floored room 40' long, 30' wide, and 10' high, with a large walk-in entrance at its west end. From the north side of the room a passage leads from a shallow sink and connects with the lower level. The cave was mapped by Bill Russell and James Reddell in May 1963. (See map, page 52)

Archaeology and Paleontology: The cave is quite possibly an import archaeological and paleontological site since over 15' of deposits containing bones and charcoal have accumulated beneath the upper room, indicating that the room was inhabited for a great period of time. An examination of a small collection of bones from the cave indicates that the deposit is probably at least a few thousand years old. One artifact taken from near the top of the deposit could not be positively identified but is less than 2000 years old. A preliminary and incomplete faunal list of bones taken from the cave follows:

- Class Reptilia
 - Order Chelonia
 - Unidentified turtle remains
 - Order Squamata
 - Unidentified snake and lizard remains
- Class Aves
 - Unidentified bird remains
- Class Mammalia
 - Order Artiodactyla
 - Bison sp. --- bison
 - Odocoileus sp. --- deer
 - Order Lagomorpha
 - Lepus sp. --- jackrabbit
 - Sylvilagus sp. --- cottontail rabbit
 - Order Rodentia
 - Neotoma sp. --- wood rat
 - Sigmodon hispidus --- Hispid cotton rat
 - Perognathus merriami --- Merriam's pocket mouse
 - Perognathus cf. hispidus --- Hispid pocket mouse
 - Microtus ochrogaster --- Prairie vole
 - Microtus sp. --- Meadow vole

Biology: A collection of invertebrates was made in the cave by James Reddell and Bill Russell in May 1963. This included an undescribed species of milliped also found in Winkmill Crack and Big Mouth Cave (Nannolene sp.), spiders, and beetles, including Agonum (Rhadino) rubrum Barr. The cave is inhabited by Nyctis volifer incantus (Allen).

Bibliography: See reference # 9.

Ref: TSS files

UNNAMED CAVE

Northwest Texas (# 41)

Owner:

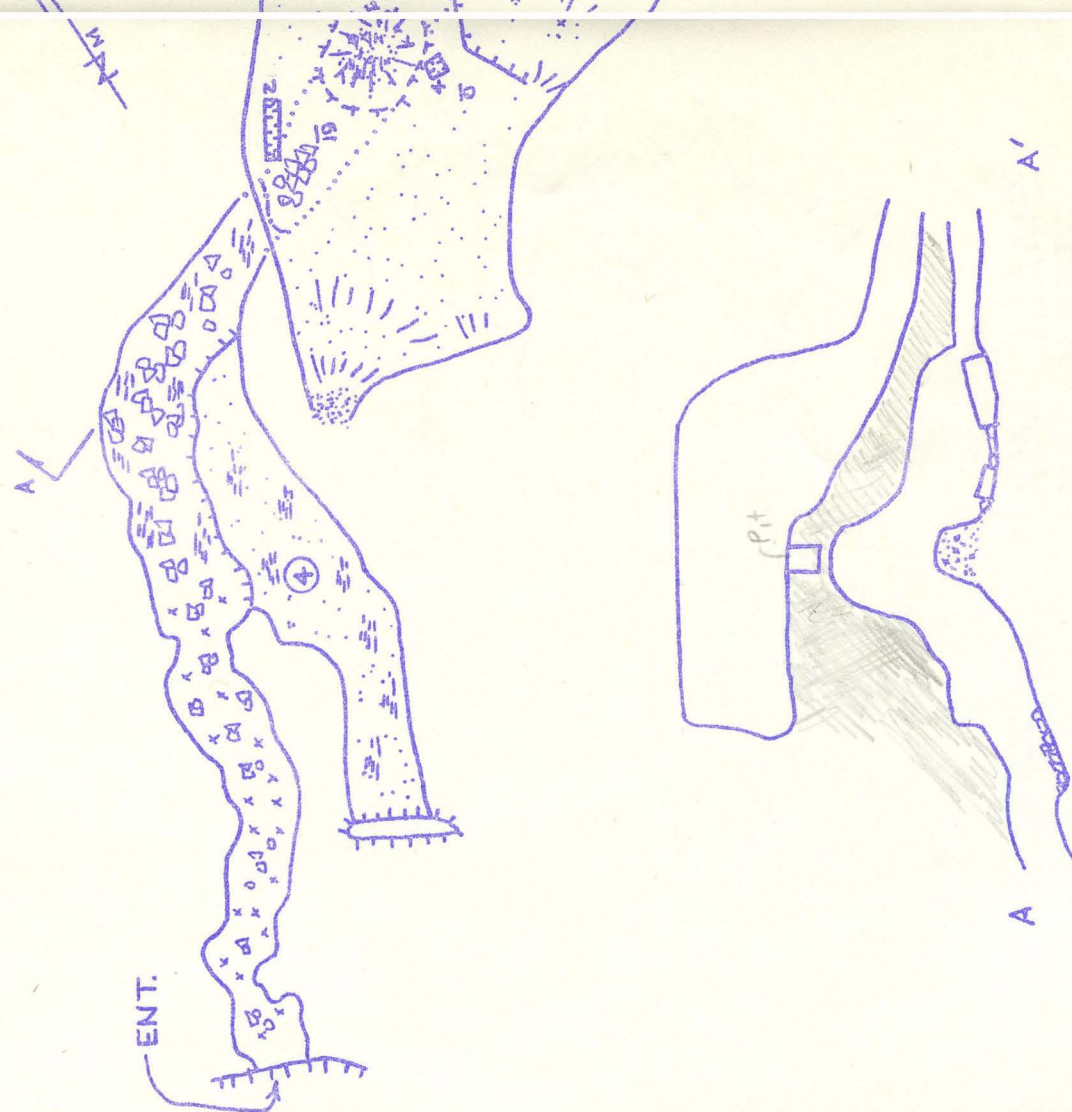
Description: This small unnamed cave is a 3' x 3' crawlway opening onto the cliff between the entrances of Big Mouth Cave and Small Mouth Cave. It was not explored because of lack of time but probably connects with a surface sink above the cliff.

Ref: TSS files

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SMALL MOUTH CAVE
WHEELER CO., TEXAS
BRUNTON & TAPE SURVEY BY
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PROFILE A-A'

BATEMAN RANCH SINKS

Northwest Texas (# 2a)

Owner: Bateman Ranch

Description: The surface above the entrances to River Styx Cave and Salt Spring Cave is pitted with large sinkholes and karst valleys ranging in size from 50' in diameter to over 1/4 mile long and 20' to 100' deep. Most are blocked by breakdown at their lowest points, but by no means all have been visited or adequately explored. Many may be new caves, while others may prove to be entrances of River Styx Cave.

Ref: TSS files

CAMPBELL RANCH SINKS

Northwest Texas (# 4a)

Owner: Frank Campbell

Description: In the area of a few square miles thirty or forty sinks were investigated, only a few of which led to caves. Most are shallow dirt-filled depressions, while several are shallow cracks or breakdown areas. Digging in a number of them will probably lead to caves, while there are doubtless hundreds of sinks on the ranch which were not investigated.

Ref: TSS files

RATTLESNAKE SINK

Northwest Texas (# 5a)

Owner: Frank Campbell

Description: This is a 20' wide, 40' long depression with a 2' high, 6' wide entrance leading off on the east side. A large rattlesnake at the entrance prevented its exploration, but it appeared to lead into a cave.

Ref: TSS files

RED RIVER SINKS

Northwest Texas (# 6a)

Owner:

Description: An extensive sinkhole area lies above the North Fork of the Red River in the immediate vicinity of Big Mouth Cave and Small Mouth Cave. Many of these were hastily examined, but many more were just noted. Some certainly should lead into caves.

Ref: TSS files

SALT SPRING SINK

Northwest Texas (# 1a)

Owner: Bateman Ranch

Description: Salt Spring Sink is a large sink about 1/4 mile northwest of Salt Spring Cave. This sink is about 50' deep and 100' x 100' at the top. The walls of the sink are vertical except for the south wall which can be climbed. Along the west side of the sink there is an extensive series of fissures separating large blocks that are sliding into the sink. Much of the collapse that formed the sink appears to be recent, and it is probably still being enlarged.

Ref: TSS files

VEST RANCH SINKS

-54-
Northwest Texas (# 3a)

Owner: Sam Vest

Description: Numerous shallow sinks were observed on the Vest Ranch while looking for Pothooks Cave and Lost Cave. One was filled with barbed wire but reportedly leads into a cave passage. Others had narrow crevices at the bottom which might possibly lead to caves. Lack of time prevented full exploration of the area.

Ref: TSS files

RUMORED CAVES

ACME CAVE

Hardeman County

Owner:

Description: The entrance to the cave "is small, requiring that an adult crawl to enter. Gavern then enlarges to provide stand-up room and is a favorite spot for bat hunters." (James, 1963) Located south of Acme.

Bibliography: See reference # 7.

Ref: TSS files

FOREST CREEK CAVE

King County

Owner: Bob Masterson; JY Ranch

Description: The cave is located on a canyon that drains into Forest Creek and thence into the South Wichita River.

Bibliography: See reference # 7.

Ref: TSS files

GUN BARREL CAVE

Cottle County

Owner: Y Ranch

Description: This is one of several caves reported on the ranch, which is located east of Hackberry. The cave is in a canyon which drains into the Middle Fork of the Wichita River.

Bibliography: See reference # 7.

Ref: TSS files

LITTLE FOLKS CAVE

Randall County

Owner: Palo Duro State Park

Description: This cave is reported to be inhabited by bats. It is possible that it is an alternate name for one of the caves included in the body of this report.

Ref: TSS files

O'GORMAN CAVE

Wheeler County

Owner:

Description: The cave is located east of highway US 83 just before it crosses the North Fork of the Red River. Reference comes from the NSS files which have a highway map with a symbol denoting a commercial cave at this point and the name O'Gorman Cave beside it. No commercial caves are known from this area, but the cave could certainly exist.

Ref: NSS files

PALO DURO CAVE

Randall County

Owner: Palo Duro State Park

Description: The entrance is reported as being 10' high and 8' wide with a room 50' high and 50' wide just inside the entrance. A portion of the back wall could be seen about 20' from the entrance. The entrance was apparently opened by recent rains. Fear of rattlesnakes prevented further investigation. This report comes from an unidentified newspaper clipping, and the location of the cave is not known. It is, of course, possibly though not likely that it is one of the caves already included in this report.

Ref: Bob Hudson

WISE CAVE

King County

Owner:

Description: Nothing is known of this cave except that its entrance is probably located along the South Wichita River.

Ref: Donald W. Tinkle

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