

September 1974

## **Association of Mexican Cave Studies Newsletter, Volume 5, No. 1, September 1974**

Association for Mexican Cave Studies

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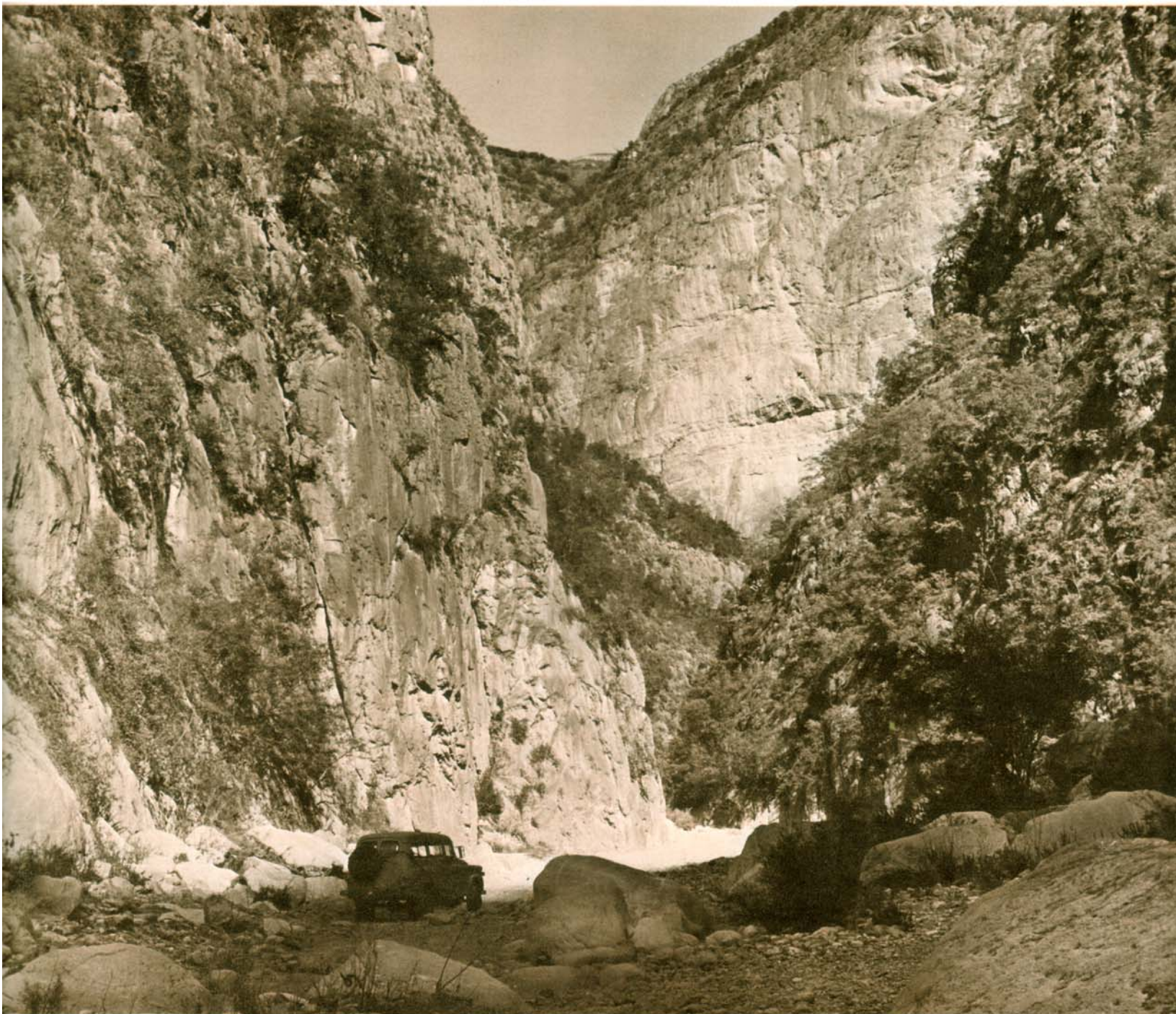
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Association For  
**Mexican Cave Studies**  
NEWSLETTER





The Association for Mexican Cave Studies is a non-profit organization whose goals are the collection and dissemination of information concerning Mexican caves. The AMCS publishes a Newsletter, Bulletin, and Cave Report Series which are available to any sincerely interested conservation-minded person. The AMCS Newsletter is published six issues per volume as frequently as necessary at a cost of \$5 US per volume. Information concerning the other publications is available upon request. Potential contributors are urged to submit articles for publication. The article may cover any phase of Mexican speleology. Trip reports are requested from all trips. All correspondence and orders for publications should be sent to:

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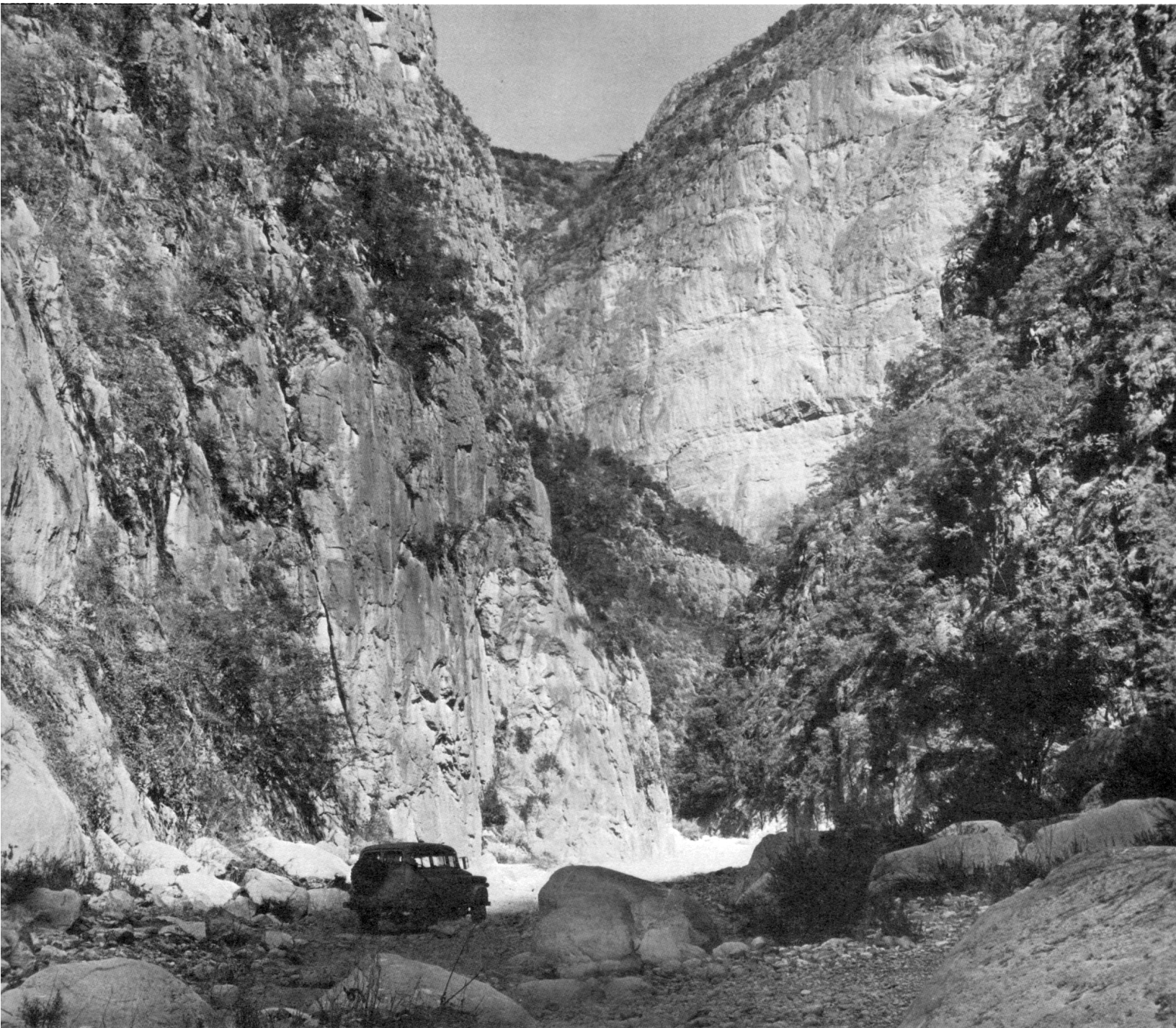


**THE SPELEO PRESS**  
*Austin                      Texas*

### *Cover Photograph—*

If you fancy yourself as a successful cave hunter, may we suggest Cañon de la Huasteca for your next objective. The Cañon area is quite extensive, covering several hundred square kilometers, and is characterized by high, parallel mountain ridges of massively bedded limestone, and a drainage system forming deep canyons that both parallel and cut directly across the ridges. The photograph shows one of the many points where the stream has cut directly through the ridge, exposing, in places, limestone sequences as great as 400 meters. The network of roads in the area make use of these natural water gaps as well as smooth gravel stream beds. Perhaps the most popular route (four-wheel drive) through the area begins at Santiago, N.L. and ends at Santa Catarina, N.L. It is about 100 km long and the river bed is followed down stream. The trouble with all this limestone is that hardly any caves are known. Climbing the mountain walls is rugged and very few people live in the area to give directions. For this reason cave hunting is a real challenge, but should prove rewarding for the determined.

Association For  
**Mexican Cave Studies**  
NEWSLETTER





## NEWS AND NOTES

Our regional correspondent in Pennsylvania, Nevin Davis, recently passed on some news from Jorge Ibarra in Mexico City. On 2 November 1973, Lorenzo García Gallardo became the first Mexican to descend Sótano de las Golondrinas. His ascent took 12 hours because of poor training and entanglement of the *belay* rope (see Reviews in this issue for more details). Eduardo Castro, as mentioned in vol. IV, no. 4, visited the pit with an AMCS group on 25 December 1973. On 5 February 1974 another Mexican group of six descended the pit and prusiked out easily. Mexico City cavers have also recently visited Pozo Melendez, Cueva la Chifladora, and Sumidero de Sacatecolotla (near Taxco).

On a May trip to Cd. Valles William Elliott met Steve Lebel, Rick Davis, Donald Evans, Bert Ammann, and Chuck Elliott, vertical enthusiasts from Maryland. Some had descended the skylight in Cueva de El Abra and found it to be 380 ft (116 m) deep. As far as we know, this is the first such descent. Various members of the group also visited Sótano de las Golondrinas, El Sótano, Sótano de Puerto de los Lobos, the skylight in Ventana Jabalí, and other deep pits. Elliott was rather shocked to hear the description of several of their party speed-rappelling, in 2 1/2 minutes, to the bottom of Golondrinas. After several such descents a new rope was essentially ruined. There is only one word to describe such behavior—stupidity.

Rumor has it that John Fish plans to start publishing some of his studies on the Sierra de El Abra soon in *The Canadian Caver*. We certainly hope so.

The editors would like to thank Don Broussard for compiling the index to AMCS Newsletter, volume III, which was issued with vol. IV, no. 5-6. Before leaving for Venezuela and Cueva de Guacharo with Tom Wright, Don did the index for vol. IV, which we plan to publish soon.

John Graves reports that the following note was found in the entrance room of Sotanito de Ahuacatlán:

Suckholito  
18 Dec 1972

- All to the bottom:
1. Jack W. Hart, NSS 4960, Rockeater PED.
  2. Jim Youmans, NSS 7004, Rockeater DCG
  3. B.C. Thompson, NSS 13814
  4. David Stidman, NSS 9543, Spectre Grotto, Carthage, Tenn.
  5. Ted Wilson, NSS 11352
  6. Marion O. Smith, NSS 9164, not as bad as the top name indicates
  7. David W. Teal, NSS 11982, Huntsville Grotto, GSS, deserves its name

This is about the 3rd group to visit this pit. Advice: Do not have more than 2 persons at the bottom of the pit. Its small with no protection from falling rocks. Voice communication is not possible. Ledge will fray rope about 600 ft. down.

Craig Bittinger reports in the *NSS News*, 32(6):102, that "Two week-long expeditions from Austin got good results. One finished mapping Dos Bocas, near Taxco, with the length of the Chontalcutlan cave approaching 18,000 feet. This group also surveyed Grutas de Carlos Pacheco and the back of Cacahuamilpa. The second Austin team continued the exploration

of Sótano de San Francisco and bottomed it at -650 feet. They then looked for new caves, ending up in Valles where an effort was made to connect Tinaja and Arroyo. A lead was found, but lack of enough rope to do a 10 foot drop stopped any more progress.” Ed. Note: The map of Sótano de San Francisco is published in this issue on p. 4.

The following miscellaneous items have appeared in *The Texas Caver*, vol. 19, nos. 3-5. Since no trip reports have been received they are partially reprinted here:

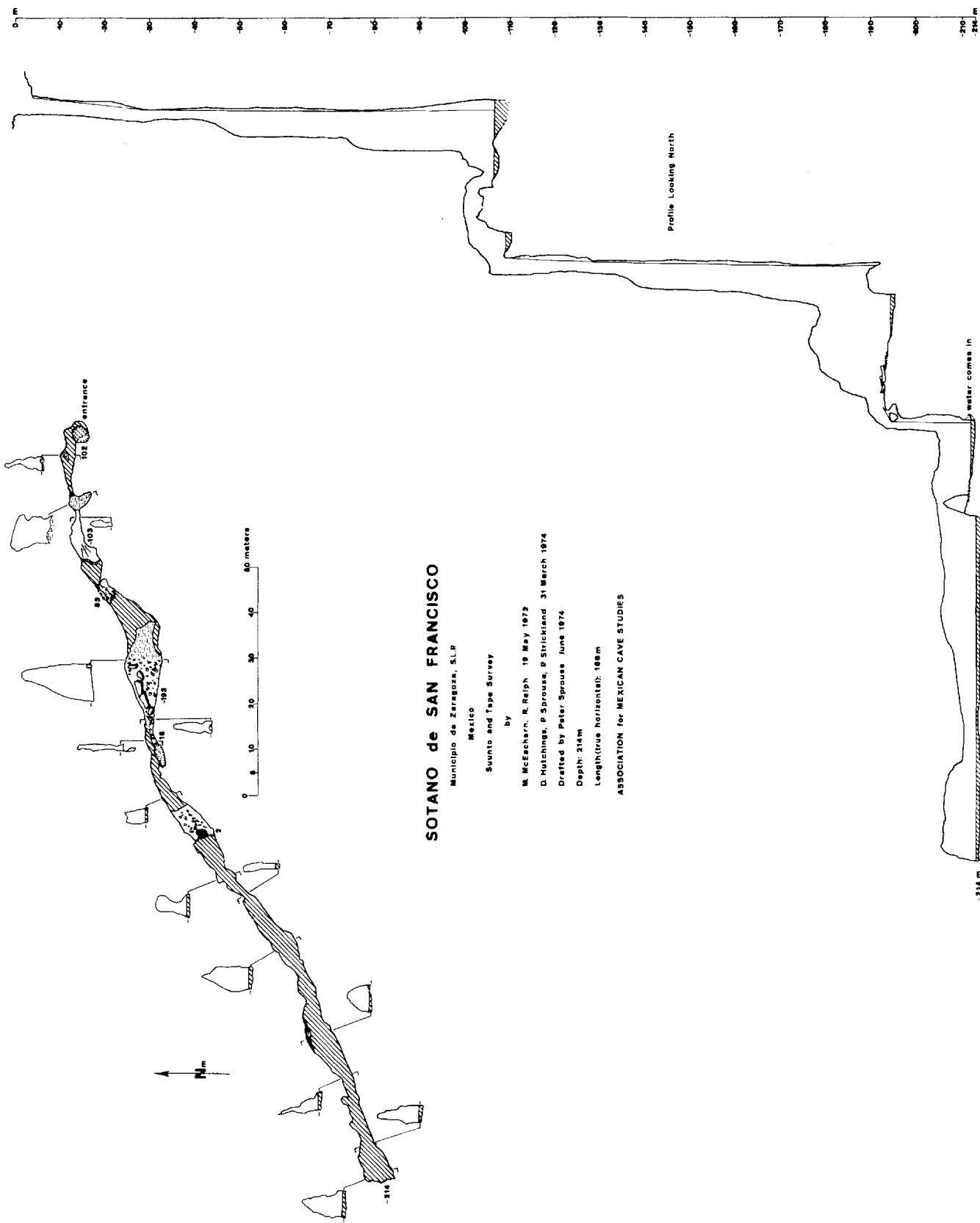
Several members of the Greater Houston Grotto “visited the Rfo Purificación area northwest of Cd. Victoria during the Christmas-New Year’s vacation, surveying and checking leads.” (TC, 19:42)

A lot of caving by the University of Texas Grotto was done in Mexico over the Christmas Holidays. Extensive exploration occurred in the Chapel area of the El Abra Range and in the Sótano de las Golondrinas Area. A club trip to Bustamante was planned at the first UTG meeting of the Spring semester. On January 18 Roy Brooks, Susan German, Jay Jorden, Preston Forsythe, Ron T. Kopel, Mary Conner, Neal Morris, Peter Strickland, John Steele, Rene Shields, Barbara Vinson, and Willie Vinson left for Mexico and visited La Gruta del Palmito and El Carrizal. On January 26 Craig Bittinger, Ron Ralph, Peter Sprouse, Jay Jorden, Terry Sayther, and Richard Booth went to the Bustamante-Carrizal area investigating Pictograph caves and sites. (TC, 19:70)

Several Greater Houston Grotto members have made trips to the Bustamante area in recent weeks, discovering caves near the summits of the Sierra Gomas and Sierra Bustamante. Others have recently returned from a road-logging trip to the Sierra Madre Oriental south of Monterrey. (TC, 19:70)

On February 9 there was a large group of cavers from UT, A&I, and SWT at Bustamante, Nuevo León, México. Arriving in six vehicles, some of the people present were Preston Forsythe, Logan McNatt, Blake Harrison, T.C. Ferret, Dale Pate, Brian Clark, Rebecca Loughheed, Thomas Moore, Neal Morris, Barbara Vinson, Amador Cantu, Glenda Dawson, Paul Duncan, Stan Bittinger, Ann Baltrazak, Wayne Klemke, Terry Sayther, Craig Bittinger, Pat Asnes, Molly Asnes, and last but not least, Harold (Termite) Romike. People visited La Gruta del Palmito, mapped in Precipicio, and recorded numerous pictograph sites in the area. On March 9, Craig Bittinger, Terry Sayther, Nancy Sayther, Mary Conner, Charlotte Rogers, and Debbie Flanagan drove to Gruta de Carrizal, N.L., México. They discovered two small caves and recorded numerous petroglyphs.





# **SOTANO de SAN FRANCISCO**

Municipio de Zazaro, S.L.P.

Mexico

Survey and Tape Survey

by

M. McEachern, R. Ralph 19 May 1972

D. Hutchings, P. Sprouse, P. Strickland 31 March 1974

Drafted by Peter Sprouse June 1974

Depth: 214m

Length (true horizontal): 188m

ASSOCIATION for MEXICAN CAVE STUDIES

# ***TRIP REPORTS***

**Date:** 29-31 May 1973

**Destination:** Potrero Redondo, Nuevo León

**Persons:** Mike Connolly, Charles Fromén, Charles Pace, Blanca Ortega Pace (Sr. Manuel Ortega Sandoval); Ernie Gaw, Vicky Gaw, Lloyd Pond, Ferrel Pond.

The group left Houston about 4 p.m. Friday and spent the night at Ojo de Agua. The next day they drove on past Horsetail Falls where they met Ernie and the others, who were having overheating problems with their car. They reported that it had been impossible for them to cross the border at the Cd. Aleman entry point because they didn't have enough money and had been forced to enter via McAllen.

Both groups proceeded slowly along the steep road beyond El Cercal where they established camp. Ernie's group, distressed because of the rain that was about to set in and the difficulties with his car, debated returning to Monterrey. After lunch, Charles F., and Mike set out for Potrero Redondo on the bikes, leaving the others in a state of indecision.

The light mist served to keep the dust down on the roads and Mike and Charles arrived in Potrero Redondo within an hour. Leaving their bikes at the house of Juan Torres, they hiked down to Las Truchas Waterfall, below the town, and started the climb to the caves on the opposite wall of the canyon. The rain had made things very slippery so that the climb took about 3 hours. Deciding that it would be too dangerous to descend in the dark, they spent the night in one of the caves.

The early morning light proved the view from the caves to be as spectacular as might be imagined, with the waterfall framed by surrounding canyon walls and the road dimly visible in the distance. The two explorers climbed back down to the waterfall and headed back for town, checking for cave openings that had been visible from the road. When they arrived in town, they stopped at the tienda for several cocas grandes and questioned the locals about more caves in the area. They heard reports of several caves which had not been entered and, with a map drawn by one of the villagers, they set out to locate them. After spending several hours in fruitless searching, they headed back to town where they encountered José and Jesus Beltran, who offered to guide them to one of the caves.

This particular cave turned out to be a water passage with deep, cold water. The entrance was located about 10 ft above the water level at the time of their visit. However, the guides explained that during the month of August the water actually flows from the cave, completely submerging the entrance. Due to the depth and temperature of the water it was decided to return at a later date with rubber raft and suitable equipment.

While returning from this cave, the guides seemed to notice for the first time the 150 ft rope on one side of the bikes. This prompted them to casually mention something about a sótano in the vicinity. Trying to restrain their excitement, Mike and Charles asked



about the location and learned that it was only a short distance from town. They returned to town and headed up to the sótano located about 1/4 mile away. The entrance (Sótano de Potrero Redondo) was about a 70 ft drop (surveyed later and found to be 57 ft) into a room, with large formations, and a series of incredibly thin rimstone dams at one end. A passage leads down from one side of this room over a series of flowstone waterfalls until reaching a small opening about 60 ft below the entrance room. From there, a complicated crawlway extends for a distance of about 100 ft to a large muddy terminal room.

Due to failure of photographic equipment, lack of mapping instruments, and the fact that neither of the explorers had eaten in 24 hours, it was decided to return to the surface and begin the journey back to camp. Darkness was falling as they departed and the return trip took several hours; including a stop to discuss a cave lead with Martín Gutierrez, who offered to act as a guide any time they wanted to check it out. This particular cave is of the walk-in variety and is located about 4 mi upstream from Gutierrez's house. The duo arrived in camp about 11 p.m. to discover that the others were ready to contact the American Consulate to find out what had become of them! ?

The next morning, Charles and Mike explored El Alamo Canyon by motorbikes. Sra. Liberata Sausera de Sanchez, of Rancho el Alamo, indicated that there were no caves in the vicinity, and very infrequent traffic through the canyon. The scenery, however, was quite spectacular. They returned to camp and loaded up for the return to Houston. Sr. Ortega, who had come up the night before from Monterrey, would return to Houston with them. A brief stop in Monterrey was made to visit the Ortega's relatives.

**Date:** 30 November - 2 December 1973

**Destination:** La Gruta del Palmito and La Gruta de Carrizal, Nuevo León

**Persons:** William Ballard, Debbie Flanagan, Keith Heuss, Mike Hill, Sylvia Hurd, Frances McCauley, Katie Monahan, Janel Nye, Hal Odem, Dale Pate, Frank Sodek, Bill Thomas

**Reported by:** Dale Pate

Our three vehicles made it to Bustamante Canyon by 4:00 a.m. where we encountered John Graves and a group from San Marcos. After a restful sleep of a few hours, we were up and headed for Palmito while the others were headed for Precipicio. We stayed in the cave for about four hours and got out while it was still light. Saturday night was spent at Ojo de Agua where several carloads from A&I, including Tom Wright, were camped. After a long delay the next morning, we finally got to Carrizal. We visited a large part of the cave and swam out the water entrance. How long can you tread water while holding a Nikkormat above your head? It would have been a quick trip home had Frances remembered to bring both her books back from Carrizal. As it was, we only had an hour delay.

—Reprinted from *The Texas Caver*, 19(3):47.

**Date:** 27-31 December 1973

**Destination:** Gruta del Palmito, Grutas del García, Huasteca Canyon, Cueva de la Boca, Nuevo León

**Persons:** Paul Bonner, Joe Everton, David Foster, Jim Jasek, Jane and Mimi Laurens, Francis McCauley, Gary Parsons, Frank Sodek, Alicia Wisener.

**Reported by:** Alicia Wisener

T.C.A. took advantage of the semester break with a trip to Mexico. Seven of us left Thursday and got to Bustamante about midnight. We met some cavers from Illinois who had just done Carrizal and Gruta del Precipicio. The next morning we all hiked up to Palmito while the sun got surprisingly hot for December. We visited the Hidden Room and the Birthday Passage before our time ran out.

Jim, Mimi, and Joe met us the next morning at Ojo del Agua and we all headed for Grutas del García. The caves are massive and rival Palmito although the formations are no longer active. The cable car up the mountain is a real experience as is a commercial tour with 200 people who wander away from the guide at every opportunity. We got through about 4:00 p.m., got to Monterrey a little later, and headed for Huasteca Canyon. It was pitch dark by the time we got up the mountain so we ate and crashed.

There was an abundance of frost the next morning and it was *cold*. However, 30 minutes after the sun got into the valley we were all in shirt sleeves. In the beautiful weather we hiked into the canyon. We got only as far as the spectacular waterfall before high water blocked our passage. Our friends from Illinois showed up a few minutes later in a 4WD truck and proceeded on through the fifty mile canyon. We visited another gorgeous canyon a couple of miles away and then started down the incredibly scenic road we had traveled in darkness the night before. We headed for Cueva de la Boca and got there about dark. The entrance revealed itself as a massive (35 meters by 35 meters) blotch of darkness on the mountainside across the river. Eight of us hiked up and did the cave. It gave Francis and me the creeps with its many man-made shafts that kept popping up right at our feet. The cave had been mined extensively for phosphates.

Monday morning we headed for the border where we met a cold front just blowing in. The original seven did the turista bit in Nuevo Laredo before crossing the border where we were royally shafted in a crappy cafeteria in Laredo. We got back to Temple just thirty minutes before the new year.

—Reprinted from *The Texas Caver*, 19(3):48.

**Date:** 21 December 1973 - 12 January 1974

**Destination:** Zacapoaxtla-Cuetzalan Area, Puebla; Acatlán, Oaxaca; Soledad Atzompa and Cofre de Perote, Veracruz

**Persons:** William Elliott, Bob Harr, Roy Jameson, David McKenzie, James Reddell

**Reported by:** James Reddell and William Elliott

*21 December*—James Reddell, Bill and Nell Elliott leave Lubbock in Bill's truck at 6:00 p.m. We drive to Georgetown arriving at 2:00 a.m.

*22 December*—After leaving Nell at her parents we drive on to Austin where we find David and Bob waiting. We pack the truck, pick up Roy Jameson, and finally get on the road at 4:00 p.m. We cross at Reynosa at midnight with no trouble and drive all night.

*23 December*—We reach Tampico at 6:00 a.m., finally find the ferry, cross, and eat



breakfast. We decide to take a shortcut from El Tajin but decide that the road is so rough that it would take us longer than by the highway so we continue on the highway to Papantla. We camp among pines at more than 7000 ft elevation.

*24 December*—We drove on to Zacapoaxtla where we eat. We then drive on across the Rfo Apulco and get out to try to find an elevation benchmark to use to set David's altimeter. A gust of wind sends our area map over the bridge but it fortunately catches on a bush about 30 ft below the bridge and we are able to recover it. Following Nevin Davis' road log we check out the entrance of small cave just below the town of Coctapqual. It proved to be an unclimbable pit about 20 ft deep so we left it until later. We drove on and took what we thought to be the road to Jonotla. Instead it was a new road to the village of Santa Lucia. We discovered the entrance to a large cave, Sima Esteban, at about an elevation of 5000 ft. Everyone rigged the western pit entrance (40 ft) and Roy went down. As Bill prepared to descend James showed up at the bottom of the entrance. He had entered the large dolina on the east side of the road and found a stream entering. It proved to be the same cave. Collections and photographs were made in the cave and a map begun (see AMCS Newsletter, 4(5-6):187, pl. 6). We camped in a dolina not far from the cave entrance.

*25 December*—Bob, Roy, and Bill continued the map of the cave while David and James set out on a reconnaissance of the nearby karsted countryside. They first located the entrance to Cueva de Olivares and sketch-mapped it and made a good collection in it (see AMCS Newsletter, 4(5-6):187, 189). From here they went on to check other leads but became separated. David went to Cueva de la Barranca (see AMCS Newsletter, 4(5-6):188), Cueva de Guayateno (see AMCS Newsletter, 4(5-6):188, 190), Cueva de Xilipa (see AMCS Newsletter, 4(5-6):188, 190, where it is misspelled Chilita), and Sumidero de Cuaucteno (see AMCS Newsletter, 4(5-6):189). James made collections on the surface, noted several promising leads, and got hopelessly lost in a pea-soup fog which descended before noon. David and James returned to the truck and not too much later the others appeared to report that two pieces of rope and come untied while being pulled up a waterfall and were lost in a deep plunge pool. We camped again in the dolina despite a miserable night of fog and light rain.

*26 December*—Bill and Roy took a block with a big hook on it and returned to the cave where they retrieved one piece of rope. David and James worked on a location map of the area and looked at other cave entrances. We drove on to Jonotla, checking out While James explored a small nearby cave, Cueva Murciélago de Xocoyolo, everyone else made a collecting-photographing trip into Cueva de Xocoyolo (see AMCS Newsletter, 4(5-6):174-175, pl. 2). After a quick trip into Cuetzalan in dense fog we returned to the house of Rafael Arellano where we obtained directions to two nearby caves. David and Roy went into Cueva de Octimaxal Sur n. 2 while Bill and James went into Cueva de Octimaxal Sur n. 1 (see AMCS Newsletter, 4(5-6):177-179). Upon returning from Octimaxal Sur n. 1 James took a long walk into the gorge of the Sumidero de Atepolihuit in search of Grutas de Atepolihuit. He met three amateur Mexican cavers returning from the Grutas. Darkness began to fall before the long walk to the Grutas could be completed so James returned and we all went into Cuetzalan to spend a dry night in a cheap hotel.

*28 December*—The day was the first really clear day we had seen so we took advantage of it and drove along the main road slowly looking at scenery and karst features. We turned off on the road to Xochitlán, hoping to be able to drive on to Grutas Karmidas. In town we took a wrong turn and drove to a point where it was blocked by men working on the road. At the edge of the town one small cave was checked and found to be nothing more than a

40 ft long fissure. We returned through town and took the right road. It essentially ends at the Río Tecuantepec where the bridge across the river has not been completed. We then hiked downstream to find the Grutas de Ateno (see AMCS Newsletter, 4(5-6):185-186, pl. 5). We photographed, collected, and mapped until 1:00 a.m., at which time we returned to the car and found a campsite.

*29 December*—Everyone but James returned to Grutas de Ateno to finish the map and take more photographs. James walked around on the surface collecting and checking other caves. In addition to looking at many spring-type entrances, some rather promising, he entered and made a good collection in Cueva de los Camarones (see AMCS Newsletter, 4(5-6):186). After everyone returned from Ateno we drove back along the road to check several sinks we had seen on the way into the river canyon. Bill and Roy hiked down the bed of an arroyo which was found to end in the impressive entrance to Sumidero de Cuetzaltamanes (see AMCS Newsletter, 4(5-6):186). David located and explored a small cave, Cueva de la Vibora (see AMCS Newsletter, 4(5-6):186). We then returned to the same campsite and slept.

*30 December*—We logged the road back to the highway, stopping off to try to locate the entrance to Cueva Xochitl (see AMCS Newsletter, 4(5-6):162-163). David, James, and Bill set off in search of it, but David and Bill turned back while James was doing a little surface collecting. On the way back he ran into an Indian who showed him the obscure entrance. He explored the cave back to the drop and made the best collection of the trip. After his return to the car we completed the road log and drove on to Veracruz where we camped near the airport.

*31 December*—We got up early and took Bob to the airport so that he could fly back to Austin and his job. We drove on to Acatlán. Upon arriving we tracked down the rumor of the deep sinkhole which opened up after the earthquake. It proved to be quite small (see AMCS Newsletter, 4(4):112) so we drove on to Luis Calderon's house. We hiked down to Cueva del Nacimiento del Río San Antonio and went back to the breakdown mountain at the end of the main passage. We had been told of a continuation beyond this breakdown which had been discovered by Peter Strickland and Jim and Julie Rodemaker on an earlier trip. We quickly found the opening, surveyed through the breakdown, and along the main passage to a side passage which we mapped to a siphon. Altogether we mapped a total of 1160 ft before giving up and returning to camp.

*1 January*—We entered the cave about noon and mapped the main passage to a siphon (about 3000 ft) and a gross muddy side passage which ran for 1000 ft to another siphon. This completed the map of the cave so we returned to camp and celebrated by eating a whole hershey bar. The total length of the cave is about 15,000 ft.

*2 January*—We slept late and then David and Roy were taken to Cueva del Lencho Virgen, a small complex of passages on a hillside north of Cueva del Nacimiento del Río San Antonio. We then drove into town to eat. On the way back we took a new road being built up into the mountain range. It supposedly is to go to a ranch containing a large sumidero. We were shown a few small caves containing eyed fish, but were otherwise of little interest.

*3 January*—We all went to Cueva del Lencho Virgen to make a collection. It is a multi-level maze with at least three entrances. We explored at least 500 ft of passage. We then drove on towards Orizaba, stopping at Cueva del Ojo de Agua Grande to collect. We got a hotel and spent the night in Orizaba.

*4 January*—We drove up to Soledad Atzompa (about 6900 ft) over very slick, steep roads. We arrived at Soledad in a heavy mist and obtained permission from the Presidente



to camp and to look for caves. About 20 men and boys immediately set out with us to show us caves. We were first taken to Sumidero de Oxtotempa. A small cold stream entered the cave by rushing down a steeply inclined slope and then over a short drop. From here we were shown to a second sumidero, Sumidero de Oxhaustempa. A smaller stream runs along a large dolina and then plunges over a drop of about 100 ft. Both caves are extremely promising, but lack of time prevented our entering either. We were then shown about 10 other entrances, but since it was late in the day we postponed entering any of them until the next day. We camped under the porch of the small schoolhouse.

*5 January*—We got an early start and, accompanied by about six Indian kids, we went to the first sótano, Sótano de Lomapa. Roy entered it and found it to be 53 ft deep with no passages from the bottom. While he explored this pit, Bill went into a small unnamed pit nearby. It dropped 35 ft to a point where it narrowed to 1.5 x 1 ft and continued to drop. No attempt was made to explore this narrow crevice. The third sótano of the day proved to be far more interesting. David, Roy, and Bill entered it. A large funnel-shaped hand-line entrance led into a passage with drops to a total depth of 185 ft. From here a small hole leads to a drop of over 100 ft which was not explored. They surveyed out of the cave, which was named Sótano de Teamácan, and re-joined James on the surface who was directing the collecting activities of all the kids in the neighborhood. In exchange he



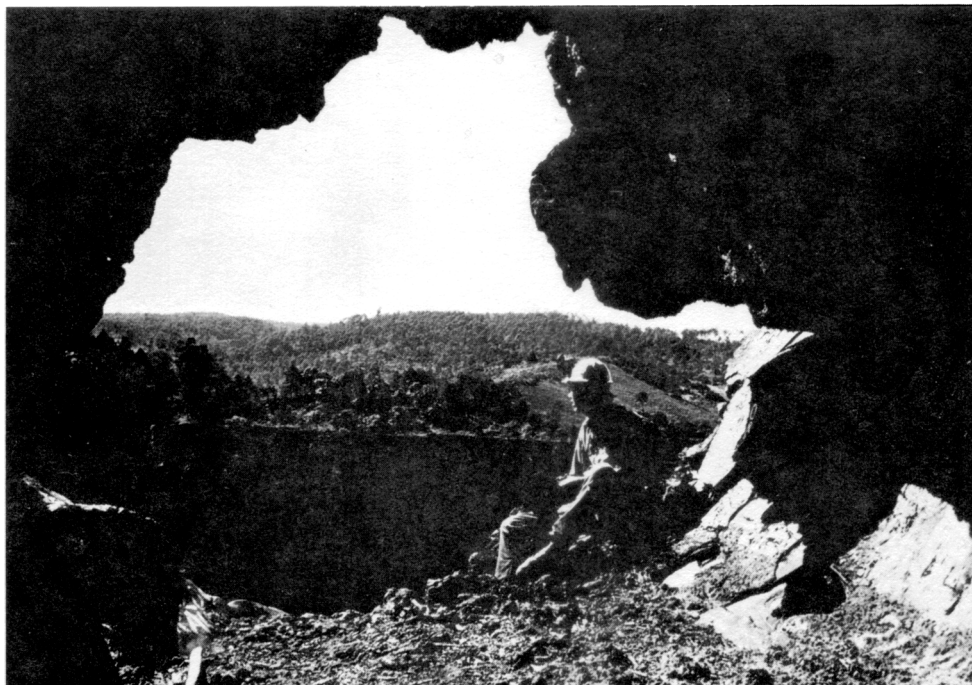
David McKenzie at the entrance to Sótano de Teamácan.

taught them English words and phrases. The next cave was the only one we saw with a horizontal entrance. A duck-under opening led to a walking passage for about 100 ft to a 75 ft drop. Roy descended the drop while the others collected. At the bottom of the drop a fissure led steadily down for an additional 100 ft to an unclimbable drop which was not entered. The name of this cave was found to be Cueva de Mazateopa. Several additional caves and pits were seen on the way back to Soledad but it was too late to check them. We again camped at the schoolhouse and talked to the local people and James continued his English lessons until he was threatened with bodily harm by the remainder of the crew. It being the 12th Day of Christmas, church bells and fireworks lasted much of the night.

*6 January*—Bill woke up sick so the others hiked up a ridge in hopes of a good view of Pico de Orizaba. While Roy and David walked down into a valley to check an impressive sumidero (this proved to be Sótano Itamo) James made surface collections and returned to the truck. Conversations with local people and Bill's illness led us to decide to await further explorations in the area since we were particularly eager to see what had been done by the group of Pennsylvania cavers. The local people had told us of several trips to the area by them and by their explorations in a very deep (1500 ft) cave. We drove down off of the mountain and went to Cueva Macinga south of Orizaba and camped.

*7 January*—We went into Cueva del Ojo de Agua de Tlilapan to see if the recent earthquake had caused any damage to the cave. To our surprise and interest we found that nothing at all had been shifted in the cave. Even the poorly cemented breccia ceiling and loose breakdown on the cave floor were apparently unshifted or affected by the quake. We ate in Orizaba and drove toward Huatusco to check out roads in the area. We finally found a deep canyon which was reported to have caves. Since the canyon was entirely in igneous rocks and from descriptions of the caves by local people we decided they were large shelters in rhyolite and not worth the time to descend into the canyon to try to locate them. We then drove on to Jalapa and camped near Las Vigas where we hoped to locate and explore a large rumored lava tube.

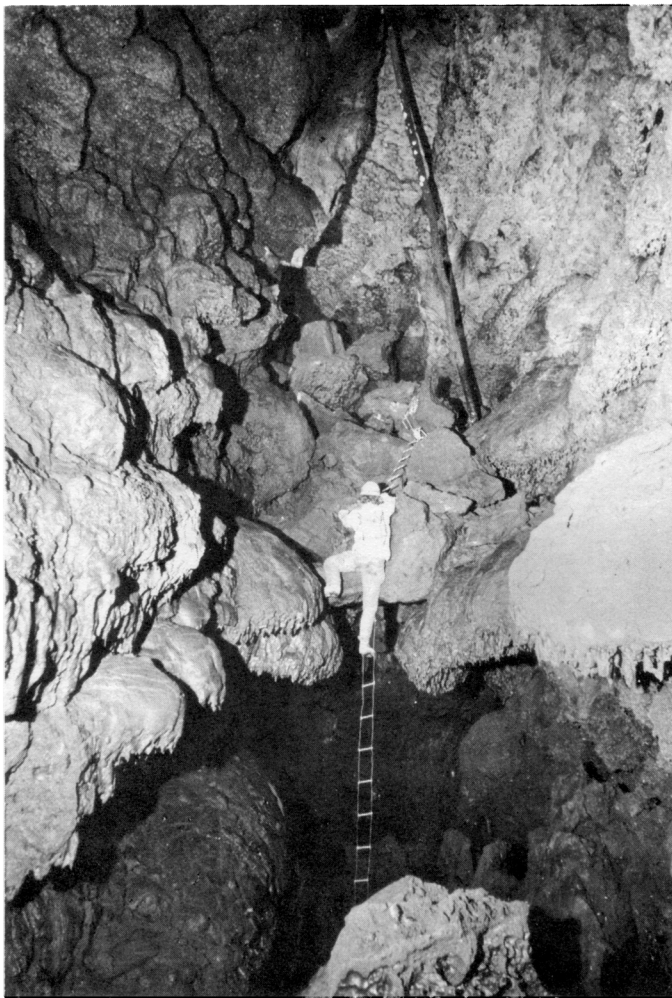
*8 January*—After pushing the truck to get it started we drove 4 km S of Las Vigas and



David McKenzie in the upper entrance to Cueva del Volcancillo. The crater is visible from the entrance.

were directed to El Volcancillo. A small boy led us uphill for about half an hour where we encountered the 400-500 ft in diameter, 150 ft deep crater of El Volcancillo. A cave about 15 ft below the lip of the crater led back for 100 ft to a large collapsed segment of the tube. From the lower end of this collapsed area a slope down led into the main passage of Cueva del Volcancillo. The floor of the cave is almost entirely covered with very jagged, irregular breakdown blocks, making travel through it somewhat difficult. We mapped about 1000 ft and left. We returned to our previous campsite for the night.

*9 January*—We returned to the cave and mapped an additional 800 ft to a breakdown choke. The entire cave is negotiable with only a 15 ft unclimbable drop below a small skylight entrance about midway through. We attempted to find a way through and over the breakdown choke (apparently where breakdown has occurred between an upper and lower segment of the tube). Upon exiting the cave we were told by a man living near the cave that you can squeeze by the breakdown (es muy feo) and continue for a very long distance at which point you can hear trucks passing overhead. If this is true, and he seemed to know the cave very well, it will be a very long and very deep cave. At the point where the survey stopped the total depth is about 450 ft (see map, pl. 1). While Roy and Bill photographed in the cave David and James went to another cave, Cueva del Larco. A long collapsed seg-



Roy Jameson at the drop in  
Cueva del Volcancillo.



ment of lava tube formed the lower entrance. At the upper end a steep slope and a ladder led down to a breakdown-floored room. No negotiable passages led from the bottom but a large passage could be seen about 50 ft above the cave floor. The same man who had described the continuation of Cueva del Volcancillo to us informed us that a ladder had once led to this upper passage and that from here it went back to a drop into a long cave passage. From Las Vigas we drove on to south of Tampico and camped.

*10 January*—We drove on to Reynosa, crossed the border, and drove to Austin, arriving at 2 a.m. Stayed at Terry's house in Austin.

*11 January*—Spent the day in Austin.

*12 January*—Bill and James returned to Lubbock.

**Date:** 4 January 1974

**Destination:** Cueva de Sacatale and Sótano de Sacatale, Ciudad Valles, San Luis Potosí

**Persons:** Alexia Cochrane, Don Coons, Dale Pate, Ivy Atherton, Jim, Julie, and Eli Rodemaker

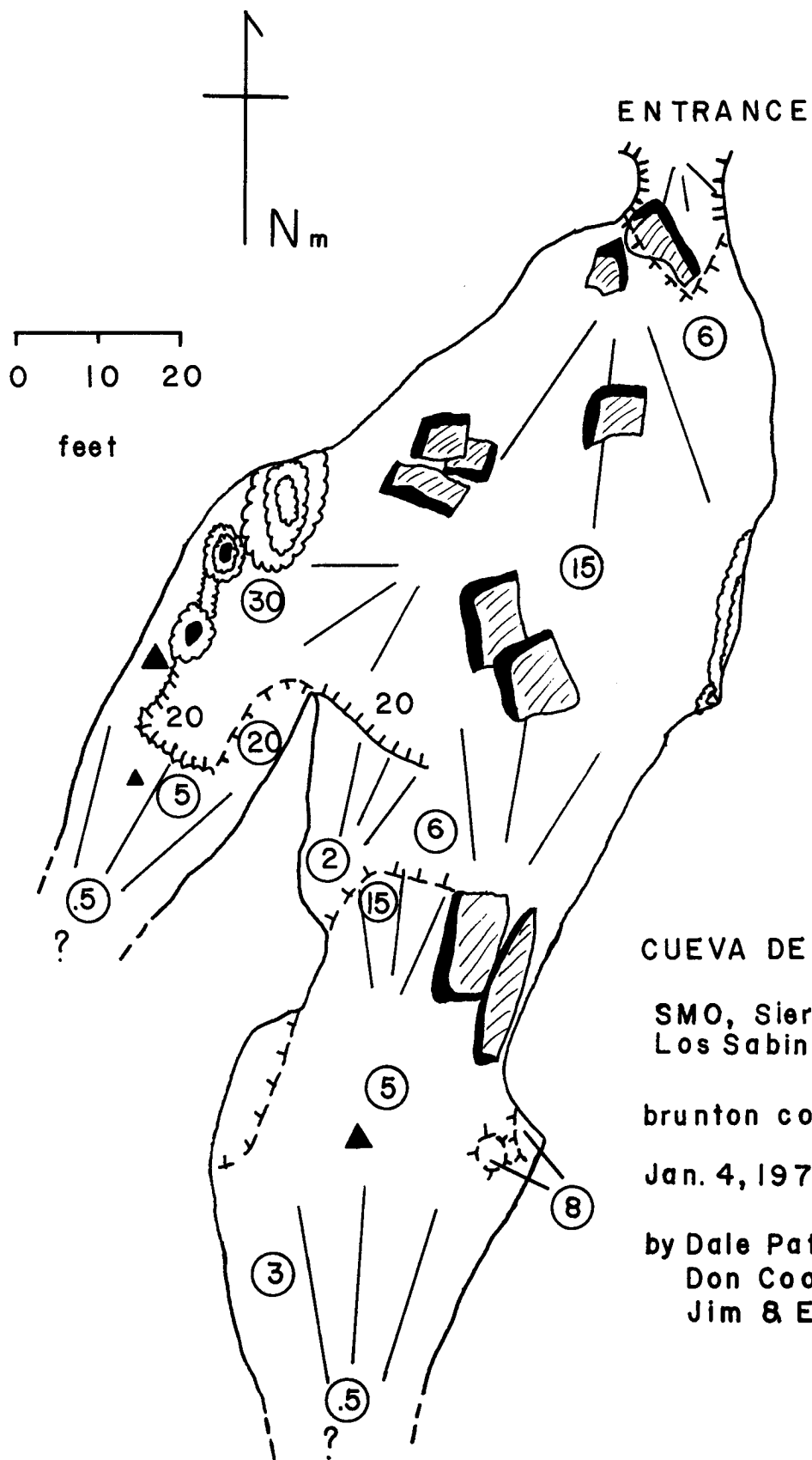
**Reported by:** Don Coons

Alexia and I arrived at Los Sabinos the evening of the 3rd. We had been caving in northern México with friends and so were somewhat late in arriving at the "Christmas happening." We heard of a small cave and new pit that had been discovered by Julie, Jim, and Craig Bittinger two days before. They had hired guides at Los Sabinos who talked of a "cueva grande" and were shown a new road that led southeast of the village to within a 10 minute walk of the El Abra crest. The cave turned out to be disappointingly small, but a small nearby pit complex turned out to be "about 500 ft deep." Julie, Alexia, and Ivy planned to survey the pit, while Jim, Dale, and I were to survey the cave and then descend behind the women to photograph. We left around 12 PM and arrived at the pit about 1 PM. The pit was rigged, the women on their way down, and we on our way to the cave by 1:30. We arrived some 15 minutes later with little difficulty.

Cueva de Sacatale consists of a medium-sized entrance room with two smaller upper levels (see map, p. 14). It is located just a few dozen yards east of the El Abra crest and trends basically north-south. It seems to be a section of some larger passage that has clay-filled at one end and collapsed at the entrance. We completed our survey and found upper and lower jaws of a larger vertebrate at the bottom of a breakdown hole. These were collected by Jim for identification and we started back to the pit. Los Sabinos was visible at one point on the trail near the cave. The compass showed it at 267°.

We arrived back at the pit about 5 PM. Jim and Dale built a fire while I walked down a nearby trail. One 20 ft hole and a lot of jungle later I got back about dark. The women were out around 7 PM. They had rigged and nearly bottomed the pit, but decided that time was too short and the sketches too complicated to attempt a survey. We started in to recover the rope, photograph, and survey as much as time allowed.

Sótano de Sacatale is a small diameter multiple drop pit with many active formations (see map, p. 16). The entrance drop is 6 ft wide and 103 ft deep. A ledge is encountered at 50 ft. Twenty horizontal feet below a formation natural bridge leads to the second drop, which is 204 ft over major ledges at 87 ft and 119 ft. It is adorned with many 10 ft long, tapered stalactites and columns, flowstone cascades, and small, crystal-covered stalactites. The last 70 ft opens into the largest room of the cave. The floor of the room is dominated by a large "table" formation. This is a flowstone shelf, decorated by 4 in high stalagmites, that has been undercut by removal of clay. A large skull was found in this room, but I did



# CUEVA DE SACATALE

SMO, Sierra de El Abra,  
Los Sabinos area

brunton compass & tape

Jan. 4, 1974

by Dale Pate  
Don Coons  
Jim & Eli Rodemaker

not notice from what animal it was. The final drop is 55 ft through a breakdown choke at 36 ft. This was named Crystal Pit because of many large 5-sided calcite crystals on the walls. Each crystal would absorb the light of a flashlight and glow without transmitting it to adjacent crystals.

From the bottom of the Crystal Pit, the cave gets steadily smaller and reaches a muddy belly crawl within 100 ft. One upper lead about 30 ft from the base of the last drop was noted but not entered. The total surveyed depth was 370 ft. The cave seems to be developed entirely along one joint, with greater passage diameters at lower levels. A great deal of secondary mineralization makes it hard to follow in some places. The lower three rooms are actually the same chamber with a clay and breakdown false floor below the largest room, and a breakdown floor halfway down the Crystal Pit. Shortly after reaching the lowest level, we all three agreed that the passage seemed unusually muggy and noticed that our breathing was faster than usual. Our lights seemed to be burning normally, but we terminated the survey and decided to leave. We exited with no trouble and were out of the cave by 11 PM and back to Los Sabinos shortly after 12.

Joe Lieberz and a group of people whose names I did not catch returned to the Sótano on the 6th. He checked the upper lead and reported 400 ft more passage with many helictites. It ended temporarily at a 20 ft high mud bank in a narrow canyon "over 200 ft high." The mud bank is reportedly climbable, but he was alone at that point and did not want to try it.

**Date:** February 1974

**Destination:** Salto de Agua, Chiapas

**Persons:** Alexia Cochrane, Don Coons

**Reported by:** Don Coons

Alexia and I were headed east to the Yucatán after two weeks of mapping near Acatlán, Oaxaca. We had heard of a large, beautiful waterfall near Palenque and saw Salto de Agua marked on our map just off the highway west of there. Twenty kilometers of Volkswagen-bending "road" later, we arrived at Salto de Agua, the town, that is. It seems there are two waterfalls near the town. Cascada de Agua Azul is 80 kilometers away and can only be reached by airplane, which costs \$12 (U.S.) per person. Las Cataractas are 5 km. away and can be reached by trail, or boat at high water.

We hiked out to Las Cataractas the next day. It was a pleasant walk, though somewhat hot. The waterfalls are actually a series of large travertine rapids in the Río Tulija. The largest is only 8 to 10 ft high, but they run for more than half a mile where the river is over 100 yds wide. It was a fine place for swimming, sliding, and generally pulping one's body in the froth and spray. We learned of several caves, "grande y chica," at the spring near town where we had camped the night before.

The area around Salto de Agua consists of long, low-lying limestone hills separated by wide shallow valleys. The valleys have been cleared for cattle grazing and a widely varied agricultural system, but the karst hills are still covered by jungle. The town itself is somewhat of a surprise after the bad road in. A railroad apparently serves as its main transportation link so that it is supplied with restaurants, hotels, a bank, and even a taxi.

We returned from the waterfall about 5 PM, ate, and drove back to the spring to try to locate the caves. We met Señor Miguel Rodello there, a local jefe, who showed us the entrance to a small cave near the road and offered to send a man out the next morning to show us the large cave. José Gerónimo arrived that evening and said that we would

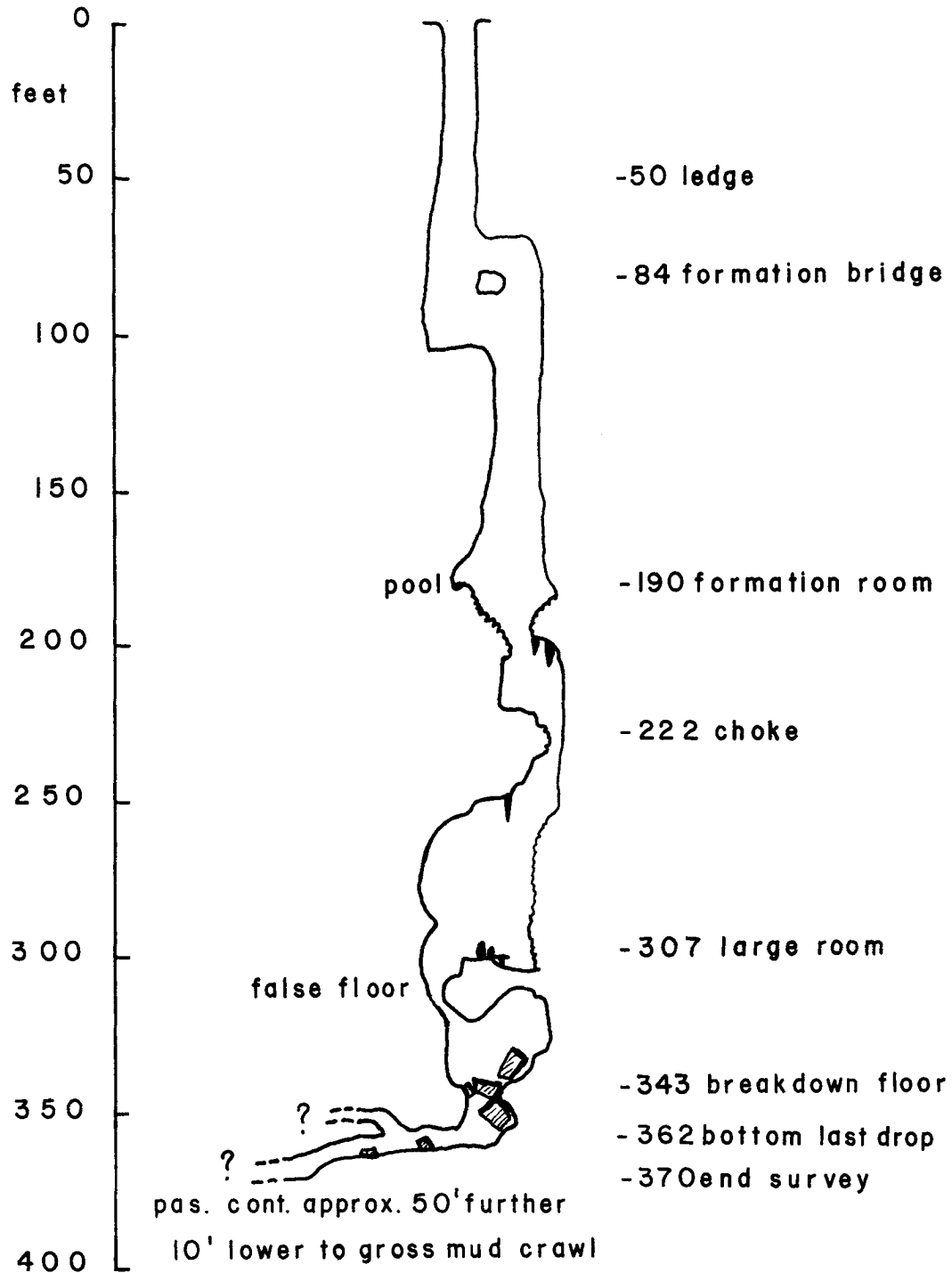
# SÓTANO DE SACATALE

SMO, Sierra de El Abra  
Los Sabinos area

brunton compass & tape

Jan. 4, 1974

by Dale Pate  
Don Coons  
Jim Rodemaker



need permission from the land owner but agreed to return at 9 the next morning.

He arrived at 10 and we set out to contact the owner. We soon learned that he was not home and was not expected to return until 2 PM. Bummer! I tried to locate the entrance alone, but there were no clear paths and the heat and jungle were too much to allow a great deal of crashing on vague directions. By noon the heat was worse, so we decided to take a swim and leave. At 1 PM, the overseer of the property appeared and offered to take us to the cave himself. Back to the jungle!

We arrived at the large entrance in about 5 minutes, since it was only about 200 yds from the spring, and began exploration by the light of my carbide and his quart bottle of kerosene with a paper wick. The cave turned out to be quite large and well worth the effort spent in locating it. It appears to be phreatically formed along approximately 12 parallel joints running nearly perpendicular to the hillside. Passage diameters on the joints range from 10 to 30 ft wide and 15 to 70 ft high, with smaller diameter interconnecting passages and windows. Floors are mud and guano for the most part, although the cave is quite well decorated and has many erratic stalagmitic formations. A 10 ft pit at the large entrance separates the cave into two parts. The "upper" section is reached through the large entrance, while the "lower" area is more easily accessible through a smaller, nearby entrance. The pit is climbable, barely, A cable ladder would help a good deal.

I believe I saw all of the obvious, accessible passage, but did not by any means check all leads. I would estimate the cave as being well over one-half mile long. I did a sparse preliminary biological collection and noted many pot sherds throughout the cave as well as two negative hand cast paintings near the entrance. The pot sherds were rather small and nondescript. Since the cave is frequently entered by the local people, I suspect there were a good deal more at one time. I would like to return to map the cave, or give directions to anyone interested in doing so. At the time, however, the Yucatán beckoned and we decided to leave.

After a second dip in the spring to dilute some of the sweat and guano I had accumulated, we headed out. We tried to check a lead on a cave "so large you can't reach the end of it in one day." It's near a rancho called El Chival. We thought the rancho was on the road out, but were soon informed that it was 6 km west of the road by trail. Anyone want to find a cave?

**Date:** 9-13 March 1974

**Destination:** La Gruta del Palmito, Bustamante, and Huasteca Canyon, Nuevo León

**Persons:** Gary Caldwell, David Cullen, David Finrock, Cathy Hargrave, Chris Hentzen, Jack Morgan, Neal Proctor, Dan Ross, Doug Symank, Wayne Walker, Gary White, and Alicia Wisener

**Reported by:** David Finrock

The A.S.S. took advantage of spring break by taking what was the first trip to Mexico for most of us. We were immediately hassled at the border by officials who incredibly asked some of our "long-haired" Aggies to get haircuts. With much perseverance (but not one haircut or bribe) we got everyone across the border and into camp near Bustamante Saturday night. With what pidgin Spanish Alicia and I could muster, we got our "doce billetes para la gruta" and did the cave both Sunday and Monday, with Alicia acting as our guide to some of the prettier and more remote rooms. Tuesday we made our way to Cola del Caballo and then to Huasteca Canyon, which was completely dry, but still beautiful. The return trip was uneventful—except



that Chris' fuel line broke, Doug's VW caught on fire, Wayne's and Don's cars both drowned in high water, and three of the four cars got lost in Monterrey, (the one that did know where it was had an unexpected encounter with a rather large bus while travelling the wrong way down a one way street). Back in Nuevo Laredo, we all played turista for a while before the U.S. customs officials had their turn to screw us by ordering *everything* out of the car for inspection. I'm sure they must have been puzzled by the smell of the charred battery and burned insulation under the VW's rear seat, but they didn't say anything. We all fell in love with Mexico and vowed to return soon, but a word of warning: never mention Monterrey to any of us.

—Reprinted from *The Texas Caver*, 19(5):79.

**Date:** 29-31 March 1974

**Destination:** Gruta del Precipicio, Río Sabinas (Bustamante) Canyon, Nuevo León

**Persons:** Charles Fromén, Ralph Batsche, Fred Messic, Sheila Balsdon, Tom Iliffe, Ernst Kastning

**Reported by:** Ernst Kastning

This was just about the last favorable weekend to have our long-awaited trip to Gruta del Precipicio before the hot weather would make the long climb up Río Sabinas Canyon's south wall unbearable. We planned to make it a photographic trip.

The climb to the cave is certainly an uphill fight. The long scree slope, the knife-edged, nearly vertically-bedded limestone ridge, and numerous man-eating plants created a challenging obstacle course during our four hour ascent. We reached the short plateau over the cave about noon, having successfully avoided the sun by staying in the shade of the mountain. Our 30- to 40-pound packs contained food, water, and sleeping and climbing gear for our stay in the cave.

Once around the corner of the precipice and inside the coolness of the cave, we slept for an hour and a half and then proceeded the 1000 or so feet to the first drop. Charles, Sheila, Fred, and Tom descended. Tom had a close call when his jacket became ensnared in his brakebars about one-third of the way down the 150-foot drop. I advised him to cut the tangled piece of clothing away with his pocket knife. Having done this, he then proceeded uneventfully down the remainder of the pitch in his newly ventilated cave garb.

Ralph and I remained topside to photograph the upper level. The passing of vertical gear in the pits would drastically lengthen the remainder of the group's stay in the lower passages and lessen their sleep for the next morning's trek down the mountain and 400-mile return drive. Ralph and I sat in the entrance during the remaining daylight hours and enjoyed the incredible view of the canyon. Vultures soared silently past our commanding perch. Then we systematically photographed our way back to the pit and checked the numerous leads enroute. About 10:00 p.m. we bedded down for the night in the quiet solitude of the cave. Various unidentified arthropods crawled over us as we slept. About 4:00 a.m. the others arrived in camp and sacked out after a successful photographic venture to the Big Room.

The next morning we descended to the Ojo de Agua campground in the canyon floor and treated ourselves to a leisurely swim in the spring-fed stream. The pickup ride back to Houston was pleasant as we were able to rotate driving and sleeping in the comfortable cots in the back.

Speaking as a born-and-raised northeastern caver, México is something else!

**Date:** 15 May - 8 June 1974

**Destination:** Sierra de El Abra and Micos area, San Luis Potosí

**Persons:** William Elliott, Andy Grubbs, Robert Hemperly, Neal Morris, John Prentice,  
Carmen Soileau, Barbara Vinson, Greg Walker

**Reported by:** William Elliott

*15 May*—John and Carmen drove down from Lubbock and met me in Austin. We picked up Robert in San Marcos and crossed over at Reynosa that night.

*16 May*—Halfway between Cd. Mante and Cd. Valles we stopped and looked at a Le Torneau “jungle eater.” This machine is about 50 ft long and sits on three 7 ft high, 6 ft wide steel tires that have blade-like lugs. The thing weighs 90,000 kg and has a tree-pushing apparatus on the front. It seems to be very effective, having leveled the thorn forest for some distance around. We continued to Valles and spent the night at Sr. Gloria’s house.

*17 May*—We rented a house at Number 16 Calle Allende for 100 pesos a week. The owner of the Hotel Covadonga, Rafael Aguirre, told us of a possible blind fish cave south of the Río Tampaón. Since the purpose of the trip was to map blind fish caves for Dr. Mitchell’s ongoing blind fish research project, we planned to visit the cave and check it out. That night, Bill Russell, Neal Morris, Barbara Vinson, and Andy Grubbs arrived from Mexico City where they had just bought many of the new, excellent topo maps that the government recently started issuing.

*18 May*—Russell and crew continued on to the Sierra de Guatemala to meet another group of Austin cavers. We drove to El Pujal to map two fish caves that Mitchell and Russell had found three years ago. We hired some guides, Victor and Enrique Gonzalez, who first took us to Rancho Viejo, about 4 km NE of El Pujal. To reach this, take the gravel road E of Pujal (paralleling the Río Tampaón) for 3.5 mi (5.6 km), turn onto a dirt road heading N and drive 2.4 mi (3.9 km). Here there is a group of four houses and a pool against the east face of the El Abra range. The pool, El Nacimiento del Rancho Viejo, is a very dirty one and discharges water only in wet weather. About 100 m up an arroyo from the houses is Cueva del Rancho Viejo. The entrance is 2 m in diameter and there is a climbable 8 m drop to a room with a deep pool on the left. The pool contains eyed fishes. The passage continues 60-100 m to a small pool. The last 30 m is a crawlway which slopes down steeply. We collected eyed *Astyanax mexicanus* (close relative of the cave fish) and cichlids here. Near the entrance is an upper level that extends 120-150 m. We then returned to El Pujal, where we were shown the dirt-filled entrance of Cueva El Mante. Further up the hill, east of Pujal, they showed us the entrance of an unnamed cave. Robert and Victor dug in the entrance room for awhile, finding a steep, sloping passage that was too tight to enter. We went further up the hill onto the Ejido Alvaréz Obregón to a double pit, which they said was Los Cuates (the Twins), one of the fish caves we were looking for. Further east and just north of the trail was a cylindrical pit that may drop 30 m. They took us on toward the Cañon del Toro to look for another pit, but couldn’t find it. We returned to the double pit, which Robert and I entered and mapped. It was a 42 m drop to a 4 m long fissure floored with cobbles. This was not Los Cuates.

*19 May*—We went to Sótano de las Piedras, 8 km NE of Valles, to finish mapping the cave. After reaching the end of the survey, 270 m from the entrance, Robert dropped the Brunton in a deep lake. We surveyed only 38 m.

*20 May*—John and Carmen were sick, we rested.

*21 May*—We returned to Piedras and completed the survey, bringing the cave to 405 m long and 47.5 m deep.

*22 May*—We dug out the entrance of El Mante, only to find the cave seemingly filled with dirt about 1 m in. John and Robert continued digging in the other cave while Carmen and I began the surface survey from El Mante to El Pujal.

*23 May*—John and Robert were sick. Carmen and I surveyed through El Pujal up the highway toward Cueva Chica. That evening Steve LeBel, Rick Davis, and Donald Evans, vertical enthusiasts from Maryland, showed up from a trip to Golondrinas. They went with us to El Pujal that night, where Robert took them to dig in the cave while Carmen and I continued the surface survey. John Mikels, his new bride Jo, and a crew of cavers from Pan American Speleological Society in Edinburgh, drove up on their way to Xilitla and talked for awhile. They have been working in the El Barretal area of Tamaulipas over the last few months, as have David McKenzie and Roy Jameson. They promised to send the AMCS a report on their findings. Robert and the pit cavers returned saying they had gotten down the steep, dirt slope to a muddy room.

*24 May*—Robert and the pit cavers went to the Nacimiento del Río Choy while John, Carmen, and I completed the survey to Cueva Chica. Carmen and I went through the cave so I could draw a profile to complete the cave survey, started back in 1970. Morris, Vinson, and Grubbs returned from a week in the Sierra de Guatemala, having found nothing but debris-choked sinks and razor sharp karren.

*25 May*—John, Robert, Carmen, and I found the real Los Cuates in a large, overgrown sink 100 m N of the cave Robert had dug in. One pit drops 26 m into a 20 m long fissure with a small pool on the left with eyed and eyeless fishes. The other drops 22 m into a N-S fissure which goes 19 m to the S to a small pool with eyed and eyeless fishes. To the N we surveyed 42 m over a high breakdown slope to the top of a 5.5 m drop, then 20 m more in a high, muddy fissure. Robert explored further to a lake.

*26 May*—Rafael Aguirre gave us directions to a vampire cave 2 km S of the Río Tapaón. The cave is owned by Rodolfo Villareal, a local rancher, but we could not get a name for it. The cave is located E of the highway at the top of a hill and at the end of a 1/2 km dirt road. The entrance is in a small sink and descends 7 or 8 m. This is barely climbable with a log that has been left in the entrance with steps cut in it. The cave is very hot and heavily inhabited by vampires. It extends perhaps 150 m through stooping and walking, winding passage to a deep pool covered with floating debris. No fish were seen. Dr. Clay Mitchell supposedly studied the vampire population here. Andy, Neal, and Barbara mapped farther in Los Cuates and collected cave fish while John, Carmen, and I mapped the sink and down to Cueva El Mante. Robert went to Oaxaca for a few days.

*27 May*—Carmen and I mapped an arroyo system, pools, and well near El Pujal. The arroyo is a backflood channel from the river and is the probable route by which eyed, river fishes enter the local cave systems, since it comes up to some small tinajas which are probably connected to the caves. The others finished mapping Los Cuates, resulting in a total length of 394 m and a total depth of 33 m for the main section.

*28 May*—We washed out muddy rope and tired bodies in the cascade below the hydro-electric station near Micos, then drove S of Micos about 10 km to Cueva de Otates. While the others collected cave fish in the stream passage, I went to look for Cueva de Lienzo to the south, but could not find it.

*29 May*—We all went to Sótano de la Tinaja to try and make a connection to Sótano del Arroyo. We went into the Left-hand Water Passage and split into two groups at the “Y”. Neal, John, and I went to the left to a dome room, where Neal bolted 6 m up into an upper level passage. We explored about 100 m of wet, muddy passage, which kept going through a pool, but we had to turn back because of difficulties with John’s electric light. Neal

joined the others while John and I exited to find Carmen waiting at the truck. We waited for several hours while the others broke into new passage. It is not known yet whether they got into Arroyo. We returned at 3 AM to find Peter Strickland and the rest of the Guatemala crew sacked out at the house.

*30 May*—A day of rest. Robert returned from Oaxaca. Peter and ten others headed to Austin in his truck late in the afternoon, leaving John, Greg Walker, and me.

*31 May*—John, Greg, and I began mapping from the back of Cueva de Otates. We began where the stream disappears into the left wall. The cave goes on at the bottom of a sloping, muddy 7 m drop, but the air is quite bad and we had difficulty breathing. We mapped to the bottom of the 7 m drop from the entrance room, about 250 m, collected invertebrates, and photographed.

*1 June*—We located Cueva de Lienzo, mapped it (90 m long, 11 m deep), and collected eyed and eyeless fishes in the small pool at the bottom. We found the arroyo to Cueva del Río Subterráneo, which has already been mapped by Bill Russell and David McKenzie, but missed the main entrance which is apparently behind a hump. We thought the cave was plugged, since the arroyo runs into two alcoves filled with dirt. We returned to Otates and finished the survey, bringing it to 270 m long and 14 m deep. The black dirt roads were muddy on the way back and we nearly fishtailed off the side several times.

*2 June*—We met a group of backpackers from Austin on their way to Golondrinas.

*3 June*—We drove to Damian Carmona, W of Micos, to check out some leads Neal had gotten in Valles. Rafael Acuña of the Rancho Aguacate, and some other men took us N to a fissure on the western edge of a cane field at the base of the Sierra de Peñas. This is used as a well. I started to chimney into it, but as my head got below ground level I noticed that the air tasted bad and my light went out, even though it had a 3 inch flame. Then I began to breathe heavily. I came up and tested the air with my lamp several times. Each time it went out about 1/2 m below ground level. All were amazed and we left muttering “mal aire.” We then went to a small pit 100 m N of there and just E of the road. The air was not so good, and the cave was only 5 m deep and 20 m long and filled with mud. We hiked up the canyon from El Quince along the beautiful, crystal clear, Río Ojo Frío, to Cueva del Nacimiento de El Quince. The cave is about 100 m above and to the right of the cataract at the top of a talus slope. A 3 m handline drop leads into a 15 m long, 7 m high room to the left, then down a slope into a smaller room with a tight fissure on the left inhabited by vampires. Large fruit bats also inhabit the cave. A narrow fissure goes to the right from the entrance for about 15 m to a 5 m diameter dome room. During high water the cave is supposed to discharge water, but it was dry today.

*4 June*—We started packing to leave, then went out to Santiaguillo, 3 km S of the Río Tampaón, to check out a small cave. Cueva de El Sabino is about 100 m up an arroyo E of the turnoff to Santiaguillo. A pipeline leads to the entrance of this water cave. Eyed *Astyanax* were seen behind a small dam just outside the entrance. The water passage goes 30 m to a siphon, but we saw no fish in the cave. We did see frogs and vampires. We left Valles and spent the night at the Nacimiento del Río Frío.

*5 June*—We entered Sótano Escondido (about 1/2 km SW of Gómez Farfás) at 10 AM and spent 10 1/2 hours surveying and collecting cave fish. The cave is 148 m deep and 100 m long. A 100 m rope may be used to descend the 34 m entrance drop, a series of short drops totalling 20 m, and a 24 m drop. The cave goes under itself in corkscrew fashion through some “squiggly” passage to the top of a 21 m drop, which can be rigged with a 30 m rope. Then a drop of 20 m and a sloping drop of 7 m can best be rigged with a 50 m rope, due to offsets. The bottom room is very muddy and goes 20 m to a large pool with hundreds of eyeless fish. The next day we returned to Austin.

# **ARTICLES**

## **MEXICAN TOPOGRAPHIC MAPS**

by William H. Russell

High quality detailed topographic maps at a scale of 1:50,000 (the same scale as the USGS 15 minute quadrangle) now cover extensive areas of interest to cavers. This topographic mapping program was started two years ago by the Comisión de Estudios del Territorio Nacional (CETENAL), in Mexico City. They hope to have the rest of the country mapped within a few years and at their present rate of progress they will achieve their goal. The maps cover an area of 20 x 15 degrees—thus the mapped area is the size of one and a half USGS 15 minute quadrangles. The maps are printed on sheets 34 by 25 inches, which includes a border and a legend. The mapped area is 34 x 28 kilometers. This relatively large mapped area is handy as it reduces the number of maps needed to cover an area and makes it likely that two adjacent caves will be on the same map. The contour intervals are either 10 or 20 meters depending on the local relief. The maps are printed with green overprint and are pleasing to the eye.

Topographic maps now available extend from the west coast east to Victoria and Pachuca, north to 24 degrees (Durango) and south to 20 degrees (Pachuca). Unfortunately the edge of the mapping extends east to 99 degrees only between Cd. Victoria and Cd. Valles but this includes all of the Sierra de Guatemala and the area west and north of Micos. South of Cd. Valles the eastern edge of mapping is irregular, unfortunately omitting all of the Xilitla and Aquismón area, but covering the area west of El Sótano (the east edge of the map bisects the pit). Large areas of México are soon to be mapped, next will be areas in northern México between Cd. Victoria and Chihuahua, the Baja California peninsula, and Tabasco.

These maps are one of the few genuine bargains still existing. The price, post paid, from Mexico City is 5 pesos (40 cents). (How about that, USGS? ) Maps can be ordered from the two offices listed below. The Insurgentes office is a small sales office and will

CETENAL  
San Antonio Abad No. 124  
México 8, D. F.  
MEXICO

CETENAL  
Insurgentes Sur No. 1694  
México 20, D. F.  
MEXICO



probably give faster service on small orders, while large orders of over four or five of the same map should be sent to the main office on San Antonio Abad. Service is likely to take a month or so. Index maps (Indice de Hojas) are available free. The AMCS will attempt to maintain a few maps in Austin to provide a few maps for trips going to México, but as our stocks are limited this service cannot be counted upon. Needless to say these maps show large areas of sinkholes and sinking streams not yet investigated. Mexican caving will never be the same. Promising cave areas can be easily located, the best routes of access planned, and once found individual caves can be located with accuracy.

## PETROGLYPHS AT SÓTANO DE LOS MONOS, SIERRA DE EL ABRA, SAN LUIS POTOSI, MEXICO

by John W. Greer

### Abstract

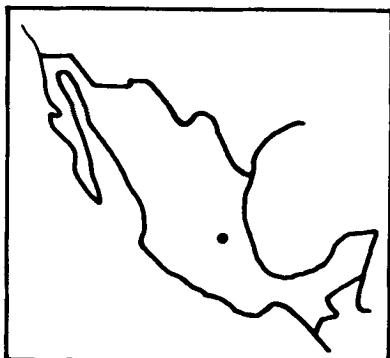
A small upper room at Sótano de los Monos in east-central México contains humanoid, animalistic, and geometric petroglyphs, including bundle figures. From the naturally lit room, burials probably were dropped down the 141 m vertical shaft.

### Introduction

Recently, members of the Association for Mexican Cave Studies (AMCS) located a vertical pit known locally as Sótano de los Monos. They made the initial descent of the 141 m (464 ft) vertical entrance shaft, briefly recorded a few of the petroglyphs in the upper cave, and later returned to fully explore and map the upper cave passage and the lower cavern systems (AMCS cave files, Austin, Texas, USA). In June 1972 I revisited the cave and recorded the petroglyphs, which are described here. No other archeological materials were observed.

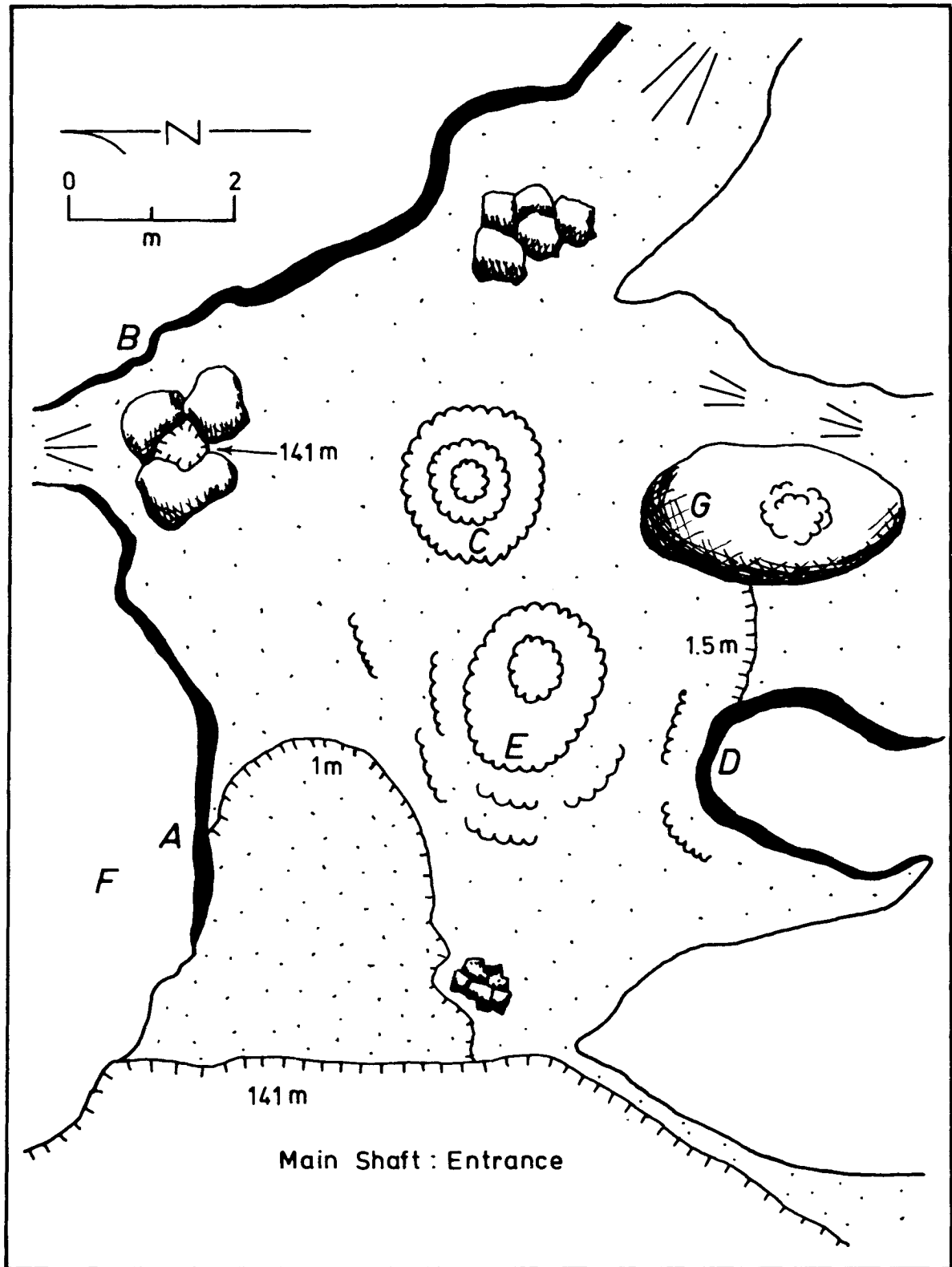
### Location and Description

Sótano de los Monos is located in the south-central part of the crest of the Sierra de El Abra, 16 km northeast of Cd. Valles in east-central México in the state of San Luis Potosí (Russell 1972a:127; 1972b:140) (see location map). The crest of this karsted limestone range is moderately dense jungle and brush, necessitating passage along the few trails or with machete.



The natural entrance shaft is 15 x 30 m across and drops 141 m to a large room leading to an underground system reaching a total depth of 290 m (951 ft). A presumably older horizontal cave, the remaining portion 61 m long, is near the surface next to the pit entrance. The entrance room to the upper cave is approximately 10 x 7 m, overlooks the main shaft, and contains petroglyphs. A small hole, 0.6 m in diameter, in the floor opens into a 141 m vertical shaft paralleling the main shaft and joining it at the bottom (see map, p. 24).

Inset location map of México.

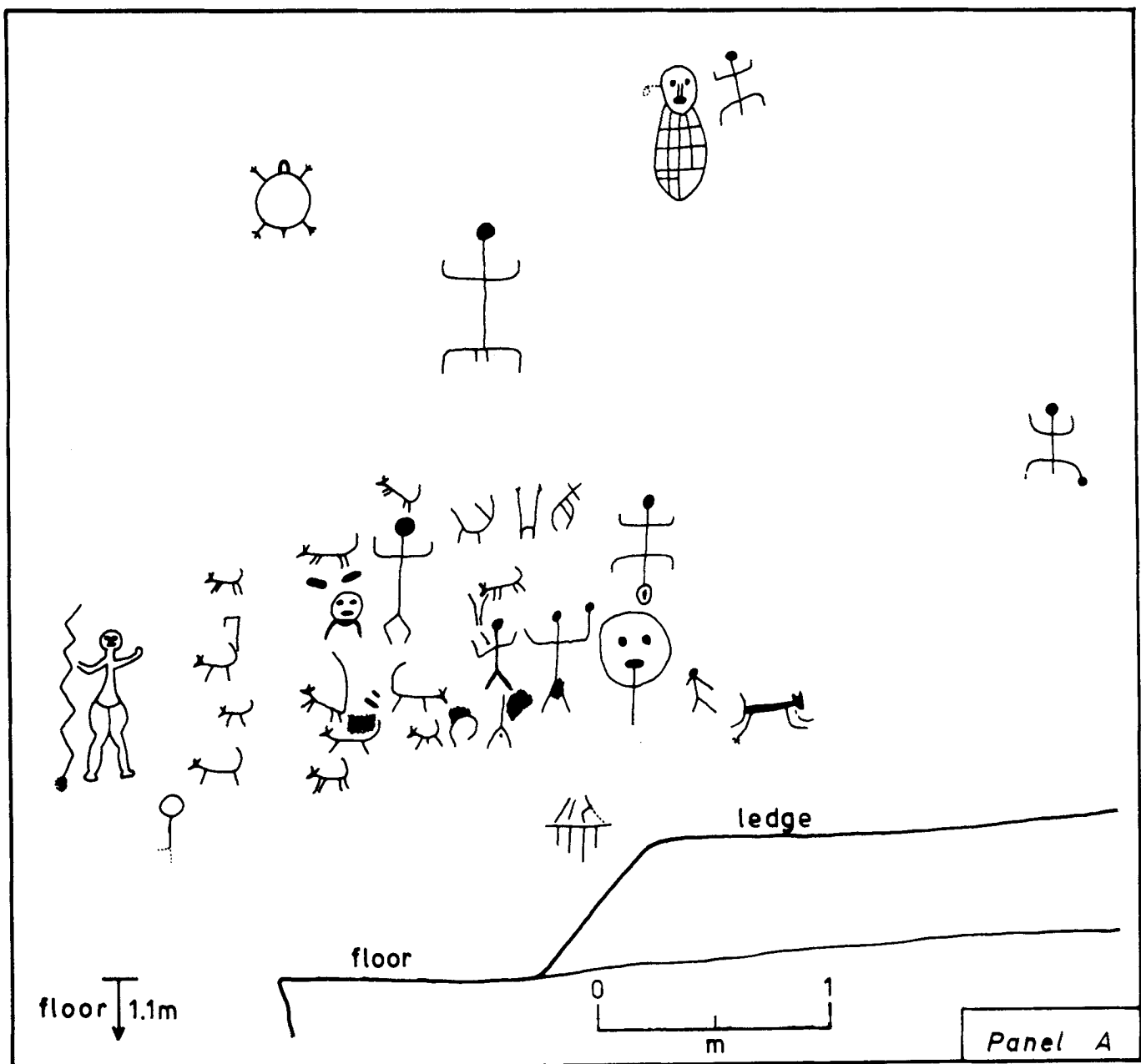


Entrance room to upper cave at Sótano de los Monos. Petroglyph panels are labeled in letters according to text descriptions.

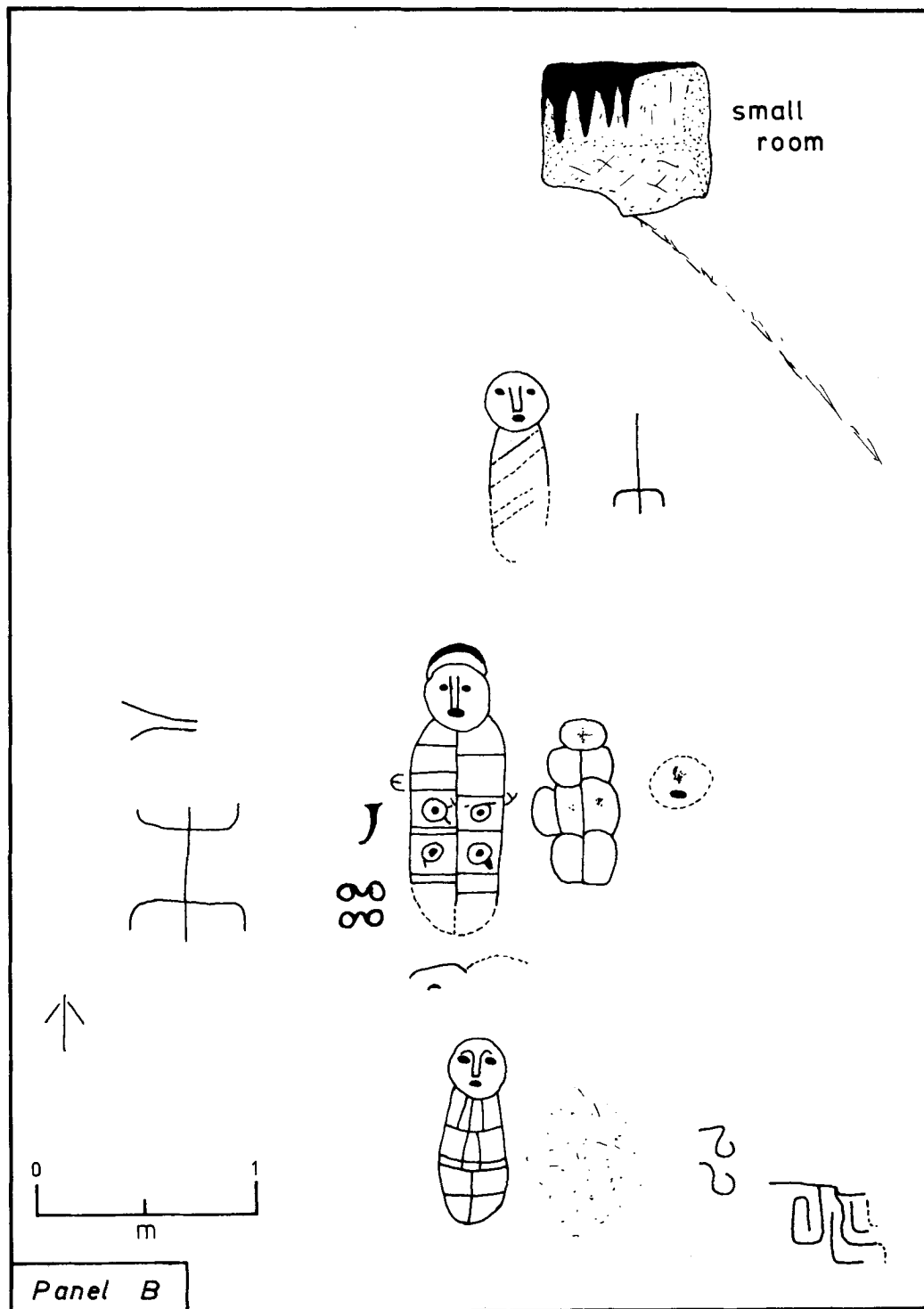
### Petroglyphs

The soft flowstone surface on walls in the upper entrance room contains numerous petroglyphs. Most are about one meter or more above the floor, approximately at waist level or higher. All apparently were pecked, and most smoothed slightly, to lines usually 1.0-1.3 cm wide and 0.5 cm deep. The smallest figures are the Panel A coatimundi ( ? ) figures (15 x 25 cm) and the largest the Panel B bundle figures (36 x 66 cm). All recognizable petroglyphs were recorded. Some of the faintest figures were chalked in for recording and photographing, but none originally contained any sort of pigment.

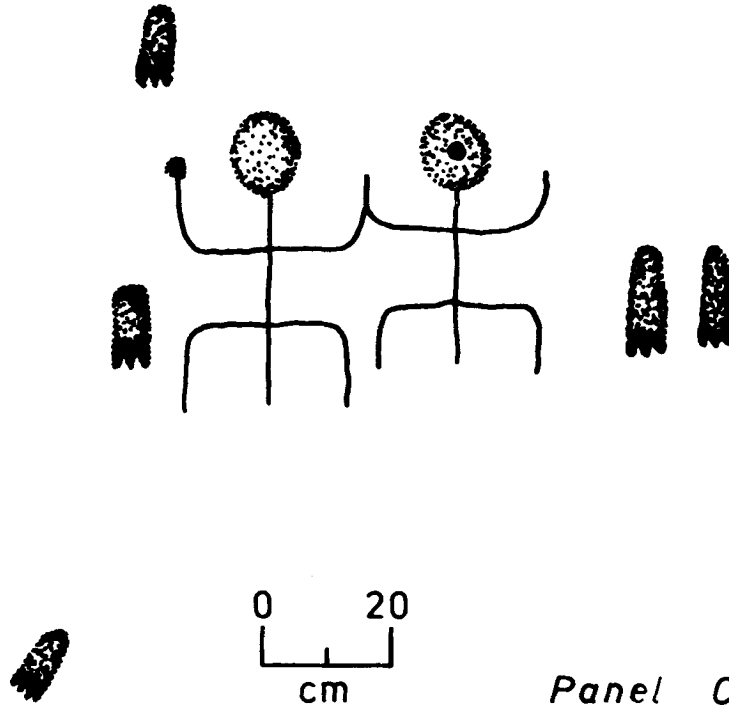
*Panel A.* This is the main panel and takes up most of the flowstone-covered north wall. It is nearly covered with numerous small animal figures (presumably coatimundi, dog, or tigre), a few stick men, a turtle with three-toed feet, a bundle figure like those on Panel B, a woman next to a zig-zag line, and several indistinguishable grooves and scratches (see below).



*Panel B.* This panel is on the back wall directly above the opening to the smaller shaft and faces west toward the main shaft. It is composed of at least four bundle figures, three stick men, and a few geometric designs not duplicated on other panels. The two complete and best recognizable bundle figures are 23 x 60 cm and 33 x 92 cm. A small square, flat-floored alcove 1.1 x 1.1 x 0.6 m deep is 1.4 m above the upper figures or 5.2 m above the floor. It can be reached without equipment but contains no cultural debris (see below).

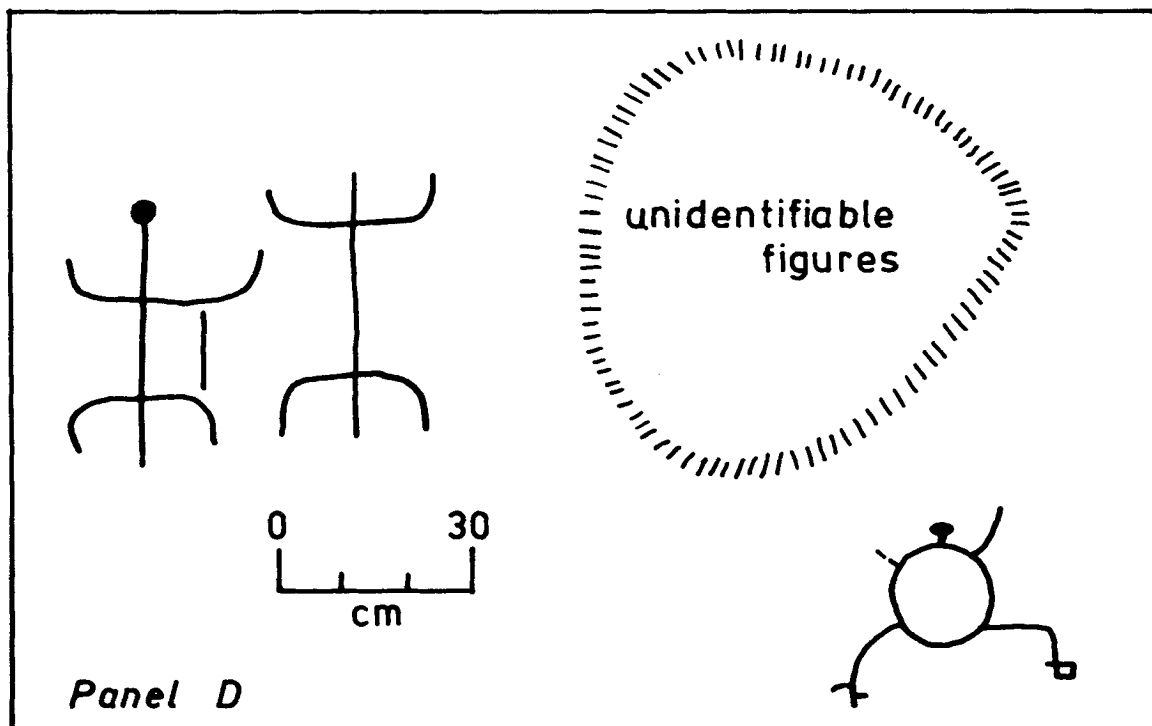


*Panel C.* On a large flowstone boulder in the center of the room are two adjacent stick men with joined hands. The heads are large, very shallow, circular depressions, one with a small, shallow, secondary pit in the center. The men are essentially surrounded by five foot-prints 12-17 cm long (see below).



*Panel C*

*Panel D.* A large spider or tick-like figure, two stick men, and a few indistinguishable line fragments are about one meter above the floor on a flowstone ledge or flowstone-covered boulder on the south side of the room (see below).



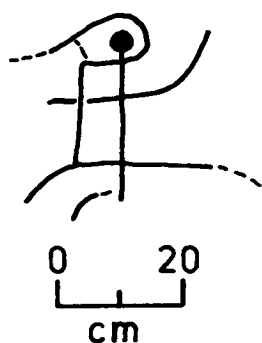
*Panel D*



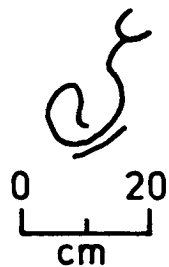
*Panel E.* A presumably single, man-like figure is on the west end of a flowstone boulder in the middle of the room (see below).

*Panel F.* Two stick men and several indistinguishable figures and light scratches are high on a vertical flowstone wall 1.4 m above the turtle at the sloping upper part of Panel A. It was impossible to discern whether the men have very slightly indented circular heads or no heads at all. Each hand and foot of the complete human figure has three digits (see below).

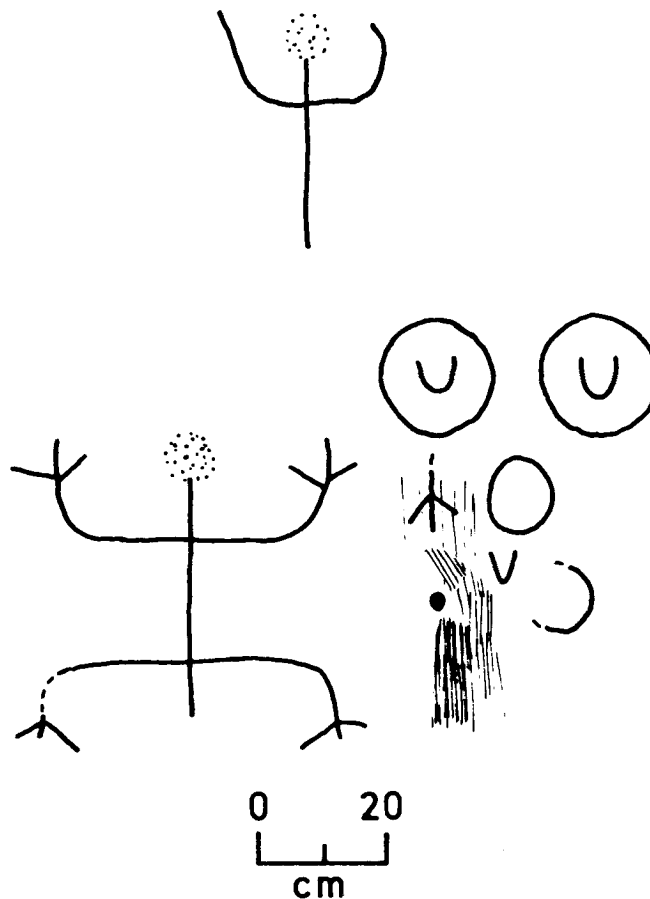
*Panel G.* A small group about one meter above the floor on the west end of a big flowstone formation is indistinguishable except for a single, presumably geometric element (see below).



*Panel E*



*Panel G*



*Panel F*

### Discussion

Presumably some activity pertaining to the pit was performed in the area of the petroglyphs. Figures occur only in this room, although there are suitable walls and flowstone surfaces in natural light in other parts of the cave. Figures abound on most of the suitable flowstone surfaces in the entrance room, although they do not seem to have any relationship to each other. They do not, however, seem to be idle doodling and may represent different activities of different visits.

It seems likely that bundle figures on Panels A and B represent burial bundles to be dropped down the shaft immediately below Panel B. This small diameter shaft is vertical and as deep as the main pit entrance. Occasionally it is possible for a rock to fall free the total distance, but bundles undoubtedly would bounce on the walls. Wall indentations and ledges in the pit and the floor at the bottom were checked for potsherds, bone fragments, and other debris, but results were negative.

Although burials could have been thrown into the main shaft from the room, it is believed that they were not. Bundles in the main shaft would remain in natural light and would be visible from the surface, while ones dropped into the secondary shaft quickly fall into darkness and can be heard striking the bottom only as a faint echo coming from the bottom of the main shaft. Bundles thrown into the main shaft *from the room* probably would initially land on a natural bridge less than 30 m below the room and might lodge there.

Explanations of other figures are nearly impossible. The unique figure of a woman holding lightning (or a snake) in Panel A is reminiscent of many Mexican figurines and likely represents an attempt to attract divine assistance in such daily activities as farming. Coati-mundis ( ? ) are numerous on Panel A but are absent elsewhere. The lone turtle in the corner of Panel A and the large spider-like figure in Panel D are un-alike and likely represent different objects. Men are all stick figures with the usual pendant phallus portrayed in various ways. Human stick figures are on all panels and in three instances (in Panels A, C, and D) are standing in pairs—the pair on Panel C have joined hands. Appendages with three digits occur with stick men in Panel F, humanoid footprints in Panel C, the turtle in Panel A, and the tick-spider in Panel D.

Figures very similar to those at Monos also occur in remote sections of Loltún near Oxkutzcab in central Yucatán. These include bundle figures, human females with fattened hips, and linear male figures. Photographs from Thompson (1897:Pl. II, fig. 1, and Pl. IV, fig. 1) are not quite clear enough to provide sure comparisons, but David McKenzie, the first to visit Monos, also has visited Loltún and reports (personal communication) that the figures are very similar.

Gamio (1967:Foto 23) pictures a group of stone idols from Cola de Palma in Oaxaca having remarkably similar form and designs to the Monos petroglyphs. They are also the same size. Ceramics from that site are all from the Classic period. The age of the Monos figures is unknown.

The absence of pottery or other archeological materials suggests that Monos had a presumably religious function, possibly with different activities, and was not used for habitation or temporary shelter. The *total* absence of sherds, however, is still curious. It also is impossible to ascertain whether the fine grade calcite crystal here was aboriginally collected for pottery temper, since relatively recent mineral prospecting has disturbed a huge quantity of the formations. Also unknown is the cultural relationship of Monos with the nearly adjacent Hoya de Higuerón (Greer ms.a) and such nearby occupied caves on the east face of the range as Ventana Jabalf, Cueva de las Manos, and Cueva Cerámica (Greer, 1974; ms.b).

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### RECENT STUDIES ON THE INVERTEBRATE FAUNA AND ECOLOGY OF SUB-TROPICAL AND TROPICAL AMERICAN CAVES

by **Stewart B. Peck**

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Ottawa, Ontario, Canada

#### Abstract

The invertebrate fauna of temperate North American caves is now fairly well known at a taxonomic level, through the efforts of several generations of investigators. In contrast, the intensive study of the fauna of sub-tropical and tropical American caves began comparatively recently. A review of the advances in knowledge of these faunas is presented, based on some of the literature combined with the author's field experiences and data in sub-tropical and tropical American caves. Special consideration is given to the North, Central, and South American continental localities of Florida, Texas, México, the Yucatán Peninsula, Guatemala, British Honduras, Panama, Trinidad, and Venezuela. The islands considered are Jamaica and Puerto Rico in the West Indies, and Hawaii and the Galapagos Islands. Generalizations are given on the ratios of troglobites to troglaphiles, and aquatic to terrestrial species in the various areas, as well as aspects of guano ecology.

The fauna of sub-tropical North American caves is relatively well known. The fauna of tropical American caves is not yet well known. However, enough was known so that generalizations were made, stating that tropical aquatic troglobites are mostly all derived from marine rather than freshwater ancestors, and that tropical terrestrial troglobites are almost completely non-existent (Vandel, 1965:271-276). Nicholas (1962) lists some of this fauna. In the light of more recently acquired data, the generalizations will have to be altered or entirely re-written, for the distribution and evolution of tropical American cave faunas is proving to be much more complicated than previously suspected.

The purpose of this paper is to review some of the progress that has been made in recent years in our knowledge of the invertebrate faunas of the caves of the American sub-tropics

and tropics. The review is personal in that it is based heavily on my own experiences and acquaintances. It is also not comprehensive, in that no attempt has been made to seek out and include every paper on the subject, because of a lack of space. The goal is to make more widely known some of the faunal survey research that has recently been completed or is now underway and is not yet published, to encourage more of this research in poorly known regions, and to encourage more evolutionary and ecological syntheses of this information.

For purposes of organization the discussion will cover the cave regions in a north to south order. As will be seen, the use of the terms tropical and sub-tropical are used in a relative sense, and not as usually defined by geographers.

### The United States

**Florida.** Eleven aquatic troglobites (all crustaceans) are known from Florida. An amphipod, isopod, palaemonid shrimp and five crayfish were listed by Warren (1961), and three additional crayfish were added by Hobbs (1971) and Hobbs and Means (1972). Nineteen species of terrestrial invertebrates are known of which only one is a troglobite, a *Pseudosinella* collembolan. The *Islandiana* spider, reported as a troglobite (Peck, 1970), has since been found to be *I. unicornis*, also known from Texas. Fourteen species are troglaphiles and 3 species are troglloxenes (Peck, 1970).

**Georgia.** Few caves occur in south Georgia. Most of the 130 species (24 to 27 troglobites) of invertebrates known from Georgia caves (Holsinger and Peck, 1971) occur in the northwest corner of the state. One aquatic troglobite species which occurs in the south (a crayfish) also occurs in Florida, and some of the troglaphiles are also shared with Florida.

**Alabama.** Little is known of the cave fauna of south Alabama. A survey which I am compiling for the state lists about 300 species of invertebrates (only terrestrials and based on the work of others and my own collections from over 500 visits to over 200 caves) but few of these species are in the southern half of the state. The only southern troglobite is an undescribed amphipod. Many of the troglaphiles in the southern part of the state are the same species as in Florida and Georgia (personal data).

No caves are known from southern Mississippi or Louisiana.

**Texas.** A rich invertebrate fauna has been found in Texas, but in the more temperate elevated interior, not on the coastal plain. Reddell (1965, 1970a) has reported 298 species of non-insect invertebrates, with about 70 of these being troglobites. Reddell (1966, 1970b) has likewise reported 280 species of insects, of which about 15 are troglobitic. An analysis was not made by Reddell of the numbers of aquatic or terrestrial troglobites, but by Mitchell (1969), who, in comparing the cave fauna of Texas, considered as "temperate," totaled 36 aquatic and 59 terrestrial troglobites. This number was compared to a "tropical" region, the Sierra de El Abra of México, with 10 aquatic and 6 terrestrial troglobites. The Texas faunas were again reviewed by Reddell and Mitchell (1969) and Mitchell and Reddell (1971); the total invertebrate fauna was raised to about 700 species, and the numbers of terrestrial and aquatic troglobites revised to 70 and 30 respectively.

Few detailed ecological studies on Texas troglaphiles or troglobites have been published. Aspects of ecology of the troglobitic agonine carabid beetle *Rhadine subterranea* (Mitchell, 1971a, 1971b, 1971c) and for two millipedes (Bull and Mitchell, 1972) are now known. The total number and density of several species of arthropod cavernicoles has been measured in a Texas bat cave. Mitchell (1970) calculated that the guano (and bodies?) of 4,984  $\pm$  3,391 Mexican freetail bats supported a combined mid-summer population of about 66,813 crickets, bedbugs, and three species of beetles in one part of the cave only, in addi-

tion to population densities of up to 135 per dm<sup>2</sup> of fleas, pseudoscorpions, bedbugs and beetles. More such studies such as this are needed from temperate and tropical guano caves to evaluate the ecological hypotheses of Poulson (1972).

Summary explanation of lack of terrestrial troglobites on coastal plain of southern U.S. The troglobite fauna of central Texas, with a greater proportion of terrestrial species, occurs at the same latitude as the coastal plain of the southeastern U.S. where the fauna contains a greater proportion of aquatic troglobites. It is worth noting that this latitude is the same as that of the northern half of the Sahara Desert of Africa. This comparison of Texas and the southeast shows that latitude itself is not the prime factor leading to a small terrestrial troglobite fauna in the southeast. The main factors are rather a comparative scarcity of suitable cavernous strata, combined with the eustatic low and high sea levels accompanying Pleistocene glacials and interglacials. More caves were drained and exposed, available for terrestrial colonization, during the low sea levels which occurred during times of glacial maxima. Any potentially troglobitic terrestrial colonists that occupied these caves in a late glacial or early interglacial were exposed during the late interglacial to the rigors of decreased, and finally no, genetic contact with epigeal populations. At the the same time, terrestrial cave environments were being reduced in area by rising sea levels and water tables. Several of the present day terrestrial troglaphiles of Florida may already be genetically isolated populations because they are not known from the epigeal environment on the coastal plain. If this genetic isolation makes these species potential troglobites, their potential will likely not be realized if the caves are gradually flooded directly or indirectly by a continuing marine transgression. Through this mechanism we may expect that the Southeast coastal plain through the Pleistocene has not had a terrestrial troglobite fauna that persisted through a full cycle of glacial-interglacial sea level fluctuations. The presence of aquatic troglobites, however, shows that in at least the last interglacial high sea level "islands" of subterranean fresh water persisted, notably in north and central Florida.

**Hawaii.** F. G. Howarth has recently investigated the invertebrate fauna of over 50 lava tube caves in Hawaii, and found at least 20 species of cavernicoles, of which at least 5 are specialized species (Howarth, 1972, and personal communication).

### México

It has long been known that México has a cave fauna, but the luxuriance of this fauna has only recently been realized. One of the earlier attempts at surveying the fauna over a wide area was that of Pearse (1938). He found, for the Yucatán Peninsula, 261 species of invertebrates in the caves, of which 26 were considered to be troglobites, and of these, 6 species were aquatic. Pearse likewise analysed the fauna according to feeding habits (the trophic levels through which energy flows in the cave community) finding 31 species to be "vegetarian," 62 predators, 67 parasites, 71 scavengers, and 13 coprophages.

More recent contributions have come mostly through the activities of members and associates of the Association for Mexican Cave Studies (AMCS), centered in Austin, Texas. Many of these contributions, as well as previously reported species, are listed by Reddell (1971), totaling 759 invertebrate species from Mexican caves, from a bibliographic compilation of 710 references (many of which deal exclusively with vertebrates). About 90 species are considered to be troglobites, and although this figure is not computed by Reddell, about 21 of these species are aquatic. Consequently, the whole of México (in 1971) had a known fraction of 23% of its troglobites being aquatic (Yucatán also had 23% aquatic troglobites), while the El Abra region (Mitchell, 1969) had 62% aquatic troglobites.



These figures are unfortunately out of date now because of the new taxa of annelids, beetles, arachnids, and diplopods (including new troglobites), contained in the collection of papers edited by Reddell and Mitchell (1971).

Additional recent contributions have resulted from the 1969 expedition of Sbordoni and Argano (1972) to México. New finds of troglobites not yet in press resulted from field work by Reddell and others in 1972 in the state of Oaxaca and in Yucatán in 1973. Some of this and other new Mexican (as well as for other areas of Central America) collections will be covered in Bulletin 5 of the AMCS to be published in mid 1973.

No ecological studies have been conducted on the Mexican cave invertebrates, and only the ricinuleid *Cryptocellus pelaezi* has been studied in detail and this was limited to its morphology (Pittard and Mitchell, 1972).

### Central America

**British Honduras (Belize).** No information was available on the cave fauna of this country prior to my field work there in 1972. Unfortunately, only 6 caves could be studied in a period of one and one half months, mostly because exceptionally heavy rains prohibited field travel and flooded several of the caves we intended to study. Nevertheless, about fifty species were collected in the caves, of which 11 are new. The new species include troglobites in the groups Diplopoda, Araneae, Opiliones, Pseudoscorpionida, Isopoda, and Decapoda, of which only the last two are aquatic. Some measurements were made of the fauna of samples of vampire guano.

**Guatemala.** Before 1969, little was known of the invertebrate cave fauna of Guatemala. Nicholas (1968) reports collecting about 50 species (including bats) in 12 different Guatemalan caves but no detailed list has yet appeared. As a result of my 1969 field work, I collected over 70 species of invertebrates of which 30 were new species. From this and the work of others the Guatemalan cave fauna is now known to contain as troglobites (mostly undescribed) a flatworm, spider, two pseudoscorpions, a rhachodesmid milliped, a *Bogidiella* amphipod, a catopid beetle, an agonine carabid beetle, and possibly a pseudothelphusid crab.

More recent field work has been performed by AMCS members and this has contributed additional species to the fauna. My data will be combined with that assembled for the AMCS by Reddell in a later paper.

The only ecological studies are some I have made on guano invertebrates. Vampire guano was found to contain large proportions of nematodes, 13 psychodid and 30 drosophilid fly larvae and 0.23 gm of solid debris per 10 ml of liquid guano. A sample of fruit bat guano in the entrance zone of Lanquin Cave contained 13 taxa of invertebrates (excluding Acarina) while a similar sample from 200 m inside the cave contained 11 taxa (excluding Acarina). However, the proportions of abundances of the faunas were very different, with large numbers of *Brachystomella* and *Onychiurus* collembola, *Solenopsis* (?) ants, staphylinid and ptiliid beetles, and Acarina. In contrast, the sample from 200 m inside contained large numbers of *Amnestus* hemiptera, isopods, chernetid pseudoscorpions, and *Folsomia* and *Isotomiella* collembola. Although the final analysis is not complete, both samples had similar total numbers of arthropods, with a density of about 2 per gm of wet guano (about 1 per ml of guano).

**Honduras, Nicaragua, Costa Rica, Panama.** Little is known of caves in these countries. Honduras is known to have some cave potential (Finch, 1969), and limestone caves are known in Costa Rica near Arenal and Puntarenas (personal data).

Chilibrillo Cave, Panama, has been repeatedly collected for fauna. This has been summarized by Peck (1971), with a list of 67 species, of which three are possibly troglobites. This

community was composed of similar numbers of species of predators, guano-scavengers, and detritivore-herbivores. Since this study, the cave has been fumigated to remove the bats. Undoubtedly bats have since moved back into the cave, as have a new suite of invertebrates. This recolonization of the cave, in the light of acting as a vacant niche, would be worthy of study.

### The Greater Antilles

**Cuba.** A number of speleological expeditions have visited Cuba in recent years (for instance, Botosaneanu, 1970). To my knowledge, the Cuban fauna of aquatic and terrestrial troglobites and troglaphiles has not been summarized. Someone could provide a useful service to biospeleology by doing this.

**Jamaica.** Field work has shown Jamaica to have the richest cave fauna of any island in the Caribbean. I have investigated 19 caves on the island in 1968 and 1972-73, and this plus the work of others has resulted in a list of 103 species which are judged to be non-accidental residents of the caves. Nineteen species of troglobites are now known and include 1 onychophoran, 6 spiders in 4 families, 2 phalangodid harvestmen, 1 *Sesarma* (grapsid) crab, 1 palaemonid (*Troglocubanus*) shrimp, 1 *Hadzia* amphipod, 1 terrestrial isopod, 1 mysidacean (*Stygionysis*) shrimp, 1 *Troglopedetes* collembolan, a roach, a cixiid bug, and two carabid beetles. Of the above troglobites, only the harvestmen, grapsid, and palaemonid are described. Most of the troglaphilic species are likewise undescribed, and many are not known from epigeal sites, despite the large amount of entomological field work that has been performed in Jamaica.

Some work has been done with the quantitative ecology of Jamaican bat guano, but a full analysis is not yet completed. Some mite densities of over 50 per ml of dry insectivorous bat guano were found.

**Hispaniola.** This island has good potential for cave fauna, but none is known. A reconnaissance of caves has been conducted in Haiti (Dunn, Schmidt, and Taylor, 1959), listing 38 localities. Caves are known in the Dominican Republic only as vertebrate paleontology sites (personal data) and the government is presently actively discouraging cave field work because of guerilla activity.

**Puerto Rico.** Seventy-eight species of free living invertebrates are known to inhabit caves in Puerto Rico (Peck, 1973). Fifty-two of these are known by precise species name, of which 23 species are also known from the American mainland, 6 are West Indian in distribution, and 23 are endemic to Puerto Rico. Sixteen of the endemics are known from non-cave habitats, while the non-endemic species are usually known to associate with caves in other parts of their ranges. Ninety percent of the total fauna is troglaphilic, with only 2 definitely troglobitic species known (the amphipod *Allovecelia gurneei* and the atyid shrimp *Typhlatya monae*). In feeding habits, the fauna is composed of 55% guano scavengers, detritovores, and herbivores, and 45% predators. Most if not all of the fauna, including the troglobites, probably has a short history of association with Puerto Rican cave habitats, dating only from and since the Pleistocene.

Detailed ecological studies were conducted in Aguas Buenas Cave in May 1973. The population densities of bats, and the rate of bat guano input into the cave community were measured. The structure was determined for the biomass and trophic levels of the invertebrate community which use the guano as a food base. Respiration rates and quantitative differences were measured for the biota on insectivorous and frugivorous bat guano.

### South America

This continent is still the “terra incognita” of biospeleology as pointed out by Vandel (1965) but some progress is being made. Strinati (1971) summarized much of the known invertebrate fauna.

**Trinidad.** Many caves exist here, with a varied fauna, but no attempt at summarizing the fauna seems to have been made. Snow (1962) indicates caves inhabited by the oilbird, and these caves should have a large invertebrate fauna. The ecology of some of the guano fauna of lowland bat caves has been extensively studied by Miss J. P. Darlington and Stuart Hill and others at the University of the West Indies in Trinidad (Hill is now at McDonald College, McGill University, Ste. Anne de Bellevue, Quebec, Canada) but no results have been published. They found Tamana Cave to have 53 species of invertebrates, but none were troglobites. Small guano arthropods had densities of 1,628,000 per m<sup>2</sup> to a depth of 7.6 cm. *Eublaberus* roaches had densities of up to 5000 per m<sup>2</sup> (up to 2775 gm fresh weight roach per m<sup>2</sup> of guano).

**Venezuela.** Cave invertebrates in Venezuela are recently mostly known through the collections of Carlos Bordón and Omar Linares, of Caracas. Bordón has collected throughout the country, while Linares has concentrated on Cueva del Guácharo, finding (unpublished) about 100 invertebrate species, of which several seem to be troglobites. I made collections in 1971 in Cueva Alfredo Jahn (see also Strinati, 1971) and caves on the Paraguaná Peninsula and found about 20 species of invertebrates (no troglobites) but these are not yet all determined. Other cave fauna data can be found in the “Boletín de la Sociedad Venezolana de Espeleología.”

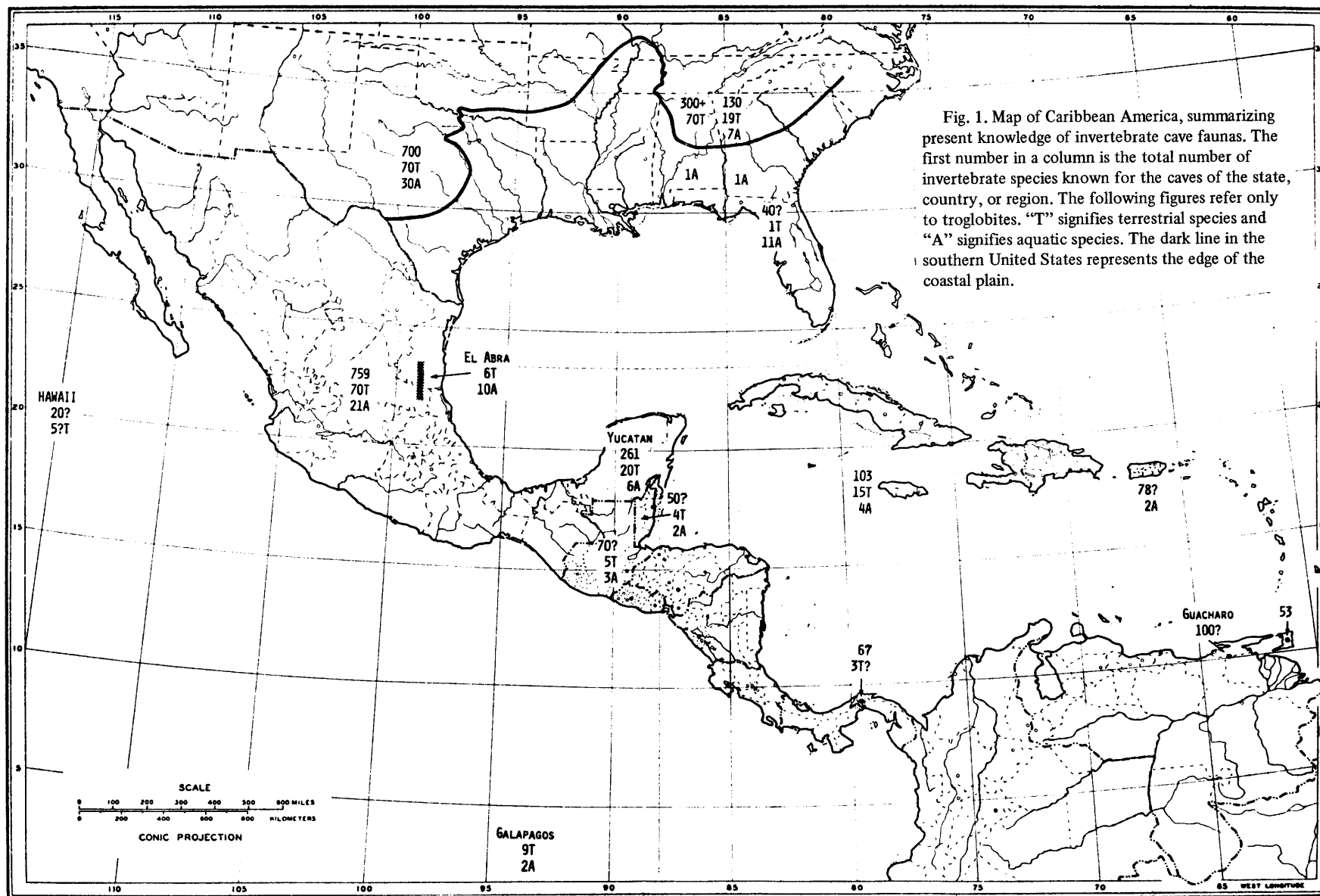
Samples of vampire guano from Cueva Alfredo Jahn were found to contain 18 arthropods per ml, of which 15 were drosophilid larvae, comprising 0.13 ml of volume for every 1.0 ml of guano (personal data).

**Ecuador.** Although caves (but no fauna) are known from mainland Ecuador, an interesting cave fauna has been found on the Galapagos Islands (Leleup, 1968, 1970). The troglobite fauna is known to include a tenebrionid beetle, a dermapteran, a small-eyed opilionid, 5 spiders, a shrimp, an amphipod, and a terrestrial isopod.

**Colombia, Brasil, Peru, Uruguay, Argentina, Bolivia, and Chile.** The fauna of these countries is summarized by Strinati (1971), but other taxa are known (personal data). C. Bordón of Caracas made a 6 month collecting trip down the length of the continent in 1972 and made many cave collections in these countries. This one expedition alone should add significantly to what should still be known as the “terra incognita” of biospeleology.

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## NEW ROAD TO REAL DE CATORCE

by Glenn Darilek

This scenic and historic mining town has been put well within the reach of the determined tourist because of a new road which has been cut through the desert. Although there is at least one cave in the area (see Texas Caver, January 1973), a sightseeing trip for picture taking alone is certainly worthwhile. The road log which follows should help you find the new road.

### Road Log to Real de Catorce April 6, 1974

Miles	Kilometers	
0.0	0.0	Between kilometer posts 9 and 8 on the highway from Saltillo to Matehuala is the turn-off for Cedral and Catorce. Turn right if you are coming from Saltillo
5.9	9.4	Cross railroad track.
9.6	15.4	Turn-off to the village of Acapulco (1 km). No relation to <i>the</i> Acapulco.
10.3	16.5	La Agua
11.1	17.8	School
11.35	18.2	Take a sharp turn to the left into the town of Cedral.
11.8	18.9	Start onto cobblestone pavement in road.
11.95	19.1	Nice plaza to the right with a large church.

12.0	19.2	Turn right on the next street past the plaza for the new road to Catorce. The old road used to be reached by continuing straight until you leave the town and continuing across the desert on the crudest of roads, picking your way among the maze of parallel roads cut across the desert by the Mexicans. Every time the old path got worn, a new path was cut through the cactus to afford a slightly better road.
12.3	19.7	20 de Noviembre School
12.45	19.9	Start paved road and leave Cedral.
18.2	29.2	Just after a slight rise, turn left onto the graded dirt road to Real de Catorce. The paved road continues on across the desert to some marginal irrigation farms, a cross on a hill, some railroad tracks, and beyond.
24.7	39.5	Road cut
27.3	43.7	Graded dirt road ends here (the remainder of the road to Potrero has not been finished at this time).
27.9	44.6	This hacienda was once used to load ore into railroad cars. The cars were backed into a trench, leaving the tops of the cars at ground level so that they might be filled easily.
28.8	46.2	Town of Potrero. Beware of the local kids jumping onto your car, asking for money. Take a gradual left turn here to get back onto the graded dirt road.
28.9	46.3	Turn right onto the continuation of the graded dirt road.
30.0	48.0	Shelters on the left.
30.3	48.3	Spil area on the left. These ore washings are being stockpiled for the day when it becomes profitable to re-refine it.
30.4	48.6	Inhabited shelter houses on the right.
30.9	49.5	Santa Anna Mine. Notice the church high on the mountain to the left, and the handball(?) court near the entrance to the mine workings. Continue to the right, up the mountain.
31.6	50.5	Look back towards the Santa Anna Mine for a view of the entrance to La Cueva-Mina de Real de Catorce (January 1973 Texas Caver)
31.85	51.0	Parking space on the one way mountain road for a view of Potrero.
32.5	52.0	Enter Ogarrio Tunnel and the world beyond of Real de Catorce. A short distance inside the tunnel notice the shrine on the right.

## **LAS GRUTAS DE JUXTLAHUACA**

by Skip Roy

Las Grutas de Juxtlahuaca is a federally owned cave 4 km from the village of Colotlipa, which in turn is roughly 37 km from Chilpancingo, the capital of the Mexican state of Guerrero, the state in which Acapulco is located. Its original and consequent preservation stems from the discovery of several cave paintings of Olmec origin and estimated to be roughly 3000 yrs old, hence the oldest cave paintings in the New World. In addition, further exploration with the help of Dupont's finest boom-boom cave maker produced a new section with beautiful



lakes, rimstone, and flowstone, including a long passageful of anthodites, probably the most beautiful in the world.

A tourist tour is available free Monday through Friday 8 to 5, although there are several items that will still end up on the bill. To take the tour, ask for Andres or Enrique Ortega in Colotlipa—you'll be in good hands from there. If you want to see the anthodites, be prepared for a swim, some sharp-edged crawls and a long trip. The wet season (June through November) turns the swim into a sump. The trip through the archaeological section is easy and well worthwhile. One further note—although the road is better now, a honky car still might balk a little bit here and there.

Juxtlahuaca means beautiful blue-green valley—or so John Fish said in his article on caves of Guerrero in an old AMCS newsletter. The valley can be seen from the cave entrance. Even after some 5,000 years of occupancy, it is still an organic gardener's delight, rich with the minerals from volcanic rock, lime from the limestone, and abundant water from several nearby streams. It *is* blue-green, especially in low light, and it *is* beautiful; it is to be hoped that the new cave road, electricity, and the anticipated flocks of turistas don't wipe it out entirely.

The entrance is not grand or beautiful or even noteworthy—except for the stench of the accumulated wisdom of much more than 5,000 years of occupancy by a large and active vampire bat population. There *is* the new gate, somewhat out of place here, but itself a welded museum piece—gears, springs, etc. And too it is the home of Enrique's pet bat-eating snake, guardian of the portal to the depths.

The nature of the first section of the cave is immediately apparent; the weird acid-eaten silhouettes of old stal masses, the mud and guano floors with rock paths through the purple-black pools of fresh vampire feces. The passage here is small on the Mexican scale. The walls and ceiling are pocked with phreatic grottos, leaving little doubt in the Yankee caver's mind that things are indeed different in the tropics. Small fruit-eating bats whip by, and an occasional larger vampire. On the left is an opening to a small cluster of 10 m pits—complete with skulls cemented in flowstone, javelina jaws, etc. The amount of human bone and potsherds in this part of the cave is astounding.

The first junction is just past the original cave gate, about 150 m inside the entrance. Here the cave's personality changes greatly—I won't say for the better, but at least I'm always glad to get beyond those decayed formations. Bats? Did I say something about vampires a while ago? Turn left at the junction and climb up the oozy slope, follow the rising temperature to find the right (wrong? ) hole leading to the Inferno, the biggest passage in the cave and the least explored part of the cave. Several feet of purple-red vampire sleaze on the floor and 250,000 vampires hanging on the ceiling.

The tourist trip (and anybody else with good sense and not surveying) turns right and stays in the lower level, the formations no longer bothered much by bat-generated uric acid but still not active. More human burials—here an alcove with only children, there one with adults, rib cages in flowstone. The phreatic pocketing becomes more pronounced—how in hell do you sketch a formation forest in a passage composed of the random intersection of random pockets, hollows, and bedrock curtains?

A short crawl through Paso del Toro and into the first major room on the tourist trip. The beauty of the cave starts to take hold. Once again a junction—lower level to the right, filled with columns; and a big passage to the left—which way?

Well, either way. To the right—slick rocks, massive formations that bring out the best/worst in the guides—marimbas, giant tits, the whole thing; there is surely a common bond between the cave guide, the used car salesman, and the pimp. Anyway, just before La Lech-

era, a perfect breast-form 2 m high (complete with stone nipple and a suckling cave guide now and then), a passage with several more burials heads left through a dodge—around stalactite mess and back to the main passage. The other way, straight ahead past the mammi-formation, down a slick mother climb, on and on and on, eventually there is the other entrance, a small sink “con abejas i avispas”—with bees and hornets.

So now we're back to the main passage, and let's backtrack to that first big room—the Salón del Toro. Someplace in here the Ortegas have their first beer stash—yes, that warm Tecate tastes pretty good—but there will indeed be a reckoning back at Colotlipa—La Cuenta strikes terror deep into the hearts of visiting American speleologists and cave bums.

A burp or two then onward—to the left a high lead with lots of pretties, then on the right the passage back to the enlarged mammary gland, followed by a low lead to the right—not on the normal camino de turistas but pretty, pretty, pretty, complete with a non-electric reverberating fuzz-tone echo chamber pool that might be pushed in the dry season. (I might as well say it now—nothing really “ends” in this cave—everything's just plugged up with flowstone—and, if you balance your sense of aesthetics against your desire for more cave, temper it with the Mexican government's twin purposes of preservation and tourist development, who knows? Old Andres might take you out on a passage hunting trip after you get to know him. Maybe not. But I always had the feeling that there is more cave there.)

After the echo chamber passage there are no side passages for a while—the main passage features are enough to over-activate your neurons anyway. Huge columns, one called the Pillar of the Constitution (or whatever the equivalent of that is in Spanish). There is a small trench in the floor that the guides tell you was dug by the Olmecs to drain water away (by now you might think that the Olmecs not only hollowed out the cave and made the mountain, but created the very limestone itself—a point with which the guides might agree). Then the ceiling goes out of sight, the floor becomes level, smooth—strangely smooth like a well-used set of steps. A massive flowstone cone fills the right wall, an altar carved near the top. Ah, at last, the Ballroom, home of the oldest technicolor cave vandalism in the New World—and who? The Olmecs of course. One is a jaguar/human, a standing man with a tail done in red, yellow, and black. The other is a feathered serpent. These are the two most important gods in the Mexican pantheon and are woven together throughout Mexican culture history. (Just one anecdote: The reason that Moctezuma II gave in to Cortez was the returning Quetzalcoatl, the feathered serpent god who in real life had been a Toltec priest circa 987 A.D., exiled from the city of Tula by the military jaguar cult. Quetzalcoatl and his followers sailed to Yucatán where they gained dominance over the Maya and built the city of Chichén Itzá.)

The paintings are there, and the experts vouch for their authenticity. Far be it for me to question. I guess I've seen too many petrified baby's heads and assorted other natural hogwash wonders in American commercial caves to fully believe anything that a cave guide tells me. Juxtlahuaca has the best guides of the lot, however.

It's still a short crawl through the section Andres dynamited, and on the other side it's a new world. No mud, no bats, no guano, no artifacts. Clear rimstone pools, calcite rafts, crystal crusts. At one self-contained pool the guides make one wash all the mud from one's clothes and boots in an effort to retain the cave's pureness. Next comes the Salón de Navidad, a wade, a swim or a sump depending on the season. The water is so clear that it seems as if one is flying, suspended over the usual complement of stalagmites and breakdown blocks. Here the guides go loco, diving, turning flips, imitating dolphins. Once a guide said that he was glad to see the hippie girls come because they take off their clothes and he doesn't have

to go to the dirty movies that month. An alcove part way through the pool offers a resting place and some draperies inlaid with beautiful marble-sized calcite nodules. Then comes the sump or duck-under and POP! –back into a big room. The water makes obscene sucking noises filling the odd pockets on the walls. There are two levels leading from this chamber, an upper one with superb cave pearls and a mural in the Mayan style by a modern Mexican artist, and a low grovelly breakdown crawl that leads to a section known as the Jardín de Rosas or Rose Garden. Here begin the anthodites. Anthodites are pretty rare as well as spectacularly beautiful, literally crystal flowers or radiating aragonite needles. At the Rose Garden, the walls are covered with them. What can I say, except that it is impossible to render the high points of natural beauty into black words on white paper.

The usual trip ends here, going back by nearly the same route, making the other half of the loops, perhaps drinking another beer or two to the tune of Andres' jokes and the metallic ting of water dripping on well-placed empty beer cans. "Hear that?" "Those are the workmen." So says Andres.

But let's push on through the Rose Garden which is, after all, only an anteroom on the edge of the beautiful anthodites. A short walk, a few small climbs, some breakdown crawls. The cave becomes drier and drier, crystals become larger. Anthodite sections alternate with sections of white powdery rock. Aragonite sand makes up the floor. One tricky climb deserves a handline. Then a white paradise, a true fairyland, the fabled Crystal Cave. Merlin could be waiting here for rebirth. Pine-like anthodite stalagmites two and three feet high. Long crystal needles, the whole room so delicate that it cannot possibly survive. Once again, words fail. Past this point are some more anthodites, more squeezes. Finally, the passage gets wet again, with flowstone instead of crystals. A too-small hole in a plug, bats flying through it into the ever-present virgin cave beyond. Time to quit, turn around, leave the cave. After all, Acapulco is only a couple or five hours away.

When I talked with Andres last summer he told me about a new fairly long section near the back of the cave—no formations or artifacts but about a kilometer long and very tight. But it should be mapped. There are also some short sections that were underwater when we were there—right near the Salón de Navidad. Other than this and a paucity of good pictures of the anthodites, I'm fairly well satisfied with the record of this cave since a Mexican geomorphologist has started to do some very detailed geology. He's welcome to it. One last thing. This map (see inserted plate) and these experiences, and in some ways, this article belongs as much to Bill Steele as it does to me.

—Extracted from *Inside Earth*, No. 3

## RECENT PUBLICATIONS ON MEXICAN SPELEOLOGY

## Abstracts

Barr, T. C., Jr. 1973. *Speocolpodes*, a new genus of troglobitic beetles from Guatemala (Coleoptera: Carabidae). *Psyche*, 80:271-276.

*Speocolpodes franiai* n. gen. et n. sp. is described from two female specimens collected at Seamay Cave, Alta Verapaz, Guatemala. It is the first troglobitic beetle from Guatemala and the farthest south of any troglobitic beetle in North America. *Mexisphodrus*, previously thought to belong to the Sphodrini, is discussed and its affinities to the colpodines discussed.

Barr, T. C., Jr. 1974. Revision of *Rhadine* LeConte (Coleoptera, Carabidae). I. The *subterranea* group. *American Mus. Nov.*, 2539. 30 p.

The genus *Rhadine* includes about 60 species, of which 11 are troglobites found only in Central Texas. These troglobitic species encompass the *subterranea* group. This paper includes the description or redescription of all of the members of this group. It makes brief reference to *R. araizai* Bolívar, *R. pelaezi* Bolívar and Hendrichs, and *R. boneti* Bolívar and Hendrichs, all from Mexican caves. Barr does not consider these last two to be true *Rhadine*, but to belong to another genus of primitive agonines.

Brignoli, P. M. 1973. Il popolamento di ragni nelle grotte tropicali (Araneae). *Internatl J. Speleol.*, 5:325-336.

This paper discusses the differences between the spider faunas of tropical and temperate caves. Most spiders of tropical caves are reported to ambush their prey or actively search for it whereas the spiders of temperate caves capture prey in webs. Mention is made of several Mexican cave spiders and the report includes numerous distribution maps showing the relationships of the New and Old World cave spider faunas.

Fromén, C. 1974. 10 years looking for caves around Bustamante. *Texas Caver*, 19:63-65.

This brief article summarizes the last 10 years of cave-hunting by the author in the mountains near Bustamante, Nuevo León. Included are brief descriptions of the discovery and exploration of numerous small caves. These caves are briefly described with the map of one (Cueva del Mercurio) being included. The caves are located on two cross-sections of the mountain ranges under discussion.

Gertsch, W. J. 1974. The spider family Leptonetidae in North America. *J. Arachnol.*, 1:145-203.

The spider family Leptonetidae includes two genera and 44 species in North America. Of these nine cave-inhabiting species occur in the Appalachian Mountains, nine in the Edwards Plateau of Texas, and nine in México. *Leptoneta limpida* n.sp. is a probable troglobite from Cueva de los Riscos, Durango; *L. capilla* Gertsch is a troglobite from Cueva de la Mina and Cueva de la Capilla, Tamaulipas; *L. isolata* Gertsch is a troglobite from Grutas de García, Nuevo León; *L. delicata* Gertsch is a possible troglobite from an "iron mine" 2 km east of Pinal de Amoles, Querétaro; *L. pecki* Gertsch is a possible troglobite from Grutas de San Bartolo, Nuevo León; *L. reclusa* Gertsch is a probable troglobite from Cueva de Chorros de Agua, Nuevo León; *L. rainesi* Gertsch is a troglophile from Cueva de El Pachón and Wet Cave, Tamaulipas; *L. bonita* n.sp. is a troglo-

phile from Cueva Bonita, Tamaulipas; and *Archoleptoneta obscura* n.sp. is a troglophile from Cueva del Tío Ticho, Chiapas. Only two epigean species of the family are known from México: *L. brunnea* n.sp. from Hidalgo and *L. modica* n.sp. from Nuevo León. The reasons for not using *Neoleptoneta* Brignoli for the Mexican species are given and a new subfamily (Archoleptonetinae) and new genus (*Archoleptoneta*) are erected for three primitive species from California, Texas, and Chiapas.

Husson, R., F. Graf, J. P. Henry, G. Magniez, C. Marvillet. 1973. Les recherches biospéléologiques poursuivies au Laboratoire de Biologie Animale et Générale de la Faculté des Sciences de Dijon, p. 113-133. In: *Livre du cinquantenaire de l'Institut de Spéologie "Émile Racovitza"*. Bucuresti: Editura Academiei Republicii Socialiste România.

This brief review of the work of the Laboratoire de Biologie Animale et Générale de la Faculté des Sciences de Dijon includes a brief discussion of the two Mexican troglobitic stenasellid isopods, *Mexistenasellus wilkensi* and *M. parzefalli*.

Jones, J. K., Jr., H. H. Genoways, and T. E. Lawlor. 1974. Annotated checklist of mammals of the Yucatán Peninsula, México. II. Rodentia. Occ. Pap. Mus. Texas Tech Univ., 22. 24 p. This checklist includes published records of cave remains of 17 rodents from Actun Has, Actun Coyok, Actun Spukil, Loltun, Actun Chacaljas, Actun Lara, Actun Oxkintok, Actun Jih, and Actun Xkyc, Yucatán. In addition all other current and published records for rodents in the Peninsula are included.

Jones, J. K., Jr., H. H. Genoways, and J. D. Smith. 1974. Annotated checklist of mammals of the Yucatán Peninsula, México. III. Marsupialia, Insectivora, Primates, Edentata, Lagomorpha. Occ. Pap. Mus. Texas Tech Univ., 23. 12 p. This checklist includes published records of cave remains of 2 opossums, 1 shrew, and 1 armadillo from caves in Yucatán. In addition all other current and published records for these five orders are included.

Kawakatsu, M. 1974. A report on caves of the United States and Mexico. Japan Caving, 6:23-29. (In Japanese) This is a popular account of two trips to the United States and México by a Japanese flatworm taxonomist, Masaharu Kawakatsu, for the purpose of collecting flatworms. He was accompanied on both trips to México by Dr. Robert W. Mitchell and other cavers and cave biologists from Texas. The first trip was to various caves in the Sierra de Guatemala and Sierra de El Abra, while the second was primarily to caves in the Yucatán Peninsula.

Márquez Mayaudon, C., and J. Ramos Elorduy de Conconi. 1974. Un nuevo ricinulideo del género *Cryptocellus* Westwood para la fauna de México (Arthropoda, Arachnida). J. Arachnol., 1:73-84.

*Cryptocellus gertschi* n.sp. is described from an epigean habitat at Playa Escondida, Catemaco, Veracruz, México. It is found to be most closely related to the epigean *C. spinotibialis* Goodnight and Goodnight from Chiapas, and to the cave-inhabiting species, *C. pearsei* Chamberlin and Ivie from Yucatán. A key and resumé of all of the species of the genus *Cryptocellus* is given. This includes seven cave species from México.

Sbordoni, V., and M. Cobolli-Sbordoni. 1973. Aspetti ecologici ed evolutivi del popolamento di grotte temperate e tropicali: Osservazioni sul ciclo biologico di alcune specie di *Ptomaphagus* (Coleoptera Catopidae). Internatl. J. Speleol., 5:337-347.

This paper gives the results of a study of the degree of adaptation to the cave environment in the two phylogenetically related catopid beetles: *Ptomaphagus troglomexicanus* Peck, a troglobite from a cold high altitude cave in the Sierra de Guatemala of Tamaulipas; and *P. spelaeus* (Bilimek), a troglophile from a warm lowland cave (Grutas de Cacahuamilpa, Guerrero). These two species are also compared to *P. pius* Seidlitz, an epigeal species from southern Europe. *P. troglomexicanus* is found to be strikingly different in many morphological features from the other two species. It is concluded that evolutionary rates in cavernicoles are strongly affected by the ecology of the cave, mainly depending on the degree of energy input into the caves.

Schultz, G. A. 1974. *Mexicerberus troglodytes* n. gen., n. sp. from a cave in Mexico, with notes on isopod crustaceans of the Microcerberidae from the New World. Crustaceana, 26:308-312.

The genus *Mexicerberus* is described to include a single species (*M. troglodytes* n.sp.) discovered in La Cueva de la Mina, Tamaulipas. This is the first species in North America not to be associated with a marine beach habitat. It is a troglobite. The genus *Microcerberus* is also reviewed.

Steyskal, G. C. 1973. A new species of the genus *Archiborborus* Duda from Mexico (Diptera: Sphaeroceridae). J. Kansas Entomol. Soc., 46:154-157.

*Archiborborus (Procpromyza) mexicanus* n.sp. is described from Sótano de El Porvenir, near El Porvenir, in the Sierra de Guatemala, Tamaulipas. This sphaerocerid fly is of interest in that it extends the known range of the genus *Archiborborus* north from Colombia, South America.

Vomero, V. 1973. Stato attuale delle conoscenze sugli Histeridae ipogei. Internatl. J. Speleol., 5:361-367.

The troglobitic and endogeous Histeridae of the world are reviewed and the degree and types of adaptation to the cave and soil habitat are discussed. Only five truly troglobitic histerids are believed to be known: *Spelaecritus anophthalmus* Jeannel from Asia Minor, and four species of the genus *Troglobacanius* from México. *T. maya* Vomero is known from Grutas del Coconá, Tabasco; *T. reddelli* Vomero occurs in Grutas de El Puente and Cueva de los Vampiros in the Sierra de Guatemala, Tamaulipas; *T. bolivari* Vomero is found only in Sótano del Tigre, Sierra de El Abra, San Luis Potosí; and *T. sbordonii* Vomero inhabits Sótano de Gómez Farfás, Sierra de Guatemala, Tamaulipas.

## REVIEWS

La fabulosa exploración del Sótano de las Golondrinas, by José Luis Beteta. Contenido, No. 130, March 1974, pp. 18-37.

This is an account of the first Mexican expedition to Sótano de las Golondrinas, San Luis Potosí, and of the near death of one of its members. The expedition took place in November 1973. The author seems to know nothing of the AMCS or of the 1967 exploration of this 330 m pit (see AMCS Bull. 2). The story is illustrated with thirteen color

photos, three black and whites, and the color cover photo, which is a reproduction of fig. 6 in AMCS Bull. 2, the photo of the entrance from the bottom. The author never mentions the AMCS and he takes credit for all the photos.

Even though the article is written with a definite sensationalist, macho explorer “slant,” there are some interesting bits of information, such as the legend of the last Huastec sacrifice at the pit, as told by a local “india vieja,” Chumén. It is probably news to all of us that the Huastecs ever threw maidens into sótanos. If the author is at all credible, the legend bears further investigation. According to Chumén, who told the story in Huastec to a Spanish interpreter, some time before the coming of the Spanish to the Huastecan region, the pit contained sacred water and was regularly used for human sacrifice. The legend goes that the maiden, Calmallí, was being taken to the pit by a retinue of priests. She had been purified with incense and copal and led to the 15 m high censer stone, which supposedly still stands in the center of an esplanade near the Golondrinas trail. Chumén’s hut stands a few meters away. The priest Thimal Hejat spoke the words and the group continued to the pit. But the gods were angry with the Huastecs because of their arrogance. Calmallí was sacrificed. The mountain shook, the heavens groaned, and the priests prostrated themselves at the edge of the pit. In the pit they saw a giant whirlpool form and suck the waters of the dead into the earth. Even though two streams keep trying to fill it, the pit remains dry to this day because the gods have not been placated. Hard times then befell the Huastecs in the form of white men and their guns. Thimal Hejat, priest of health, and Tzitz-In, priest of birds, tried valiently to organize a defense, but the Huastecs fell like leaves in autumn. Then a miracle happened. Thousands of red vipers came out of the pit and attacked the white men. They were led by a large viper who wore a necklace of sacred blue flowers, the same as were thrown on the trail in front of Calmallí. It was apparent that Calmallí had escaped divine imprisonment and had returned to save her people. When the white men had been driven off, Calmallí reunited her people, who then watched as the vipers metamorphosed into swallows and dove into the sótano, where they have nested ever since. Hence, the name “Sótano de las Golondrinas.” The author claims to have seen pictographs in a cave near the trail, depicting a group of warriors marching a maiden to the pit and tossing her in.

The Mexican expedition hoped to explore the pit and find archaeological remains and a cave. They were aware that they were not the first to enter it. After taking two days to reach the pit from Aquismón, they rigged the pit with a “descendedor” system, which the author describes as “...a set of harnesses, pulleys, counterweights, and safety lines.” He says, “It is difficult to explain in detail the functioning of this apparatus...” (my translation). A safety line was run from the opposite side of the pit, but it is not clear if the descent was by rappel, although the description suggests that. The first, and as it turned out, the only one to enter the pit was Lorenzo García Gallardo. Dressed in white overalls, white knee socks, and an orange military helmet (illustrated), he descended at 11 AM, November 2, taking thirty minutes to reach bottom. Finding nothing on the bottom but bird guano and dead birds, he communicated his disappointment by walkie-talkie and began his ascent at 2 PM, apparently with a Gibbs ropewalker-ascender box system and a belay line. The painful “millimeter by millimeter” ascent is explained by the author. By 12 PM he still had 100 m to climb and was exhausted. Could this have had something to do with his Gibbs ascenders possibly being rigged upside-down, as shown in a photo? We can only guess. Lorenzo hooked his “descendedor” onto the safety rope, but the line was tangled in some branches 20 m from the pit. The author grabbed a machete and started hacking at the branches while standing on a cable ladder. Suddenly he found himself airborne and grabbed the ladder with both hands. The ladder had slipped and he fell several meters, almost into the pit. All



the flailing served to dislodge the rope. Lorenzo continued up, half under his own power, half pulled by his companions, Daniel Sáenz, Pompeyo García, and Francisco Hernández. After twelve hours on the rope, he was out. They returned to Mexico City the next day without attempting further descents, although they had all planned to.

I hope that this article, having been published in a popular magazine, will not set off a rash of similar "expeditions." Other Mexican groups have since descended and ascended with no problems (see News and Notes). I predict that a death will probably occur at Golondrinas within the next year or so if it becomes a popular place for thrill seekers. The pit is heavily visited by American speed-rappelling freaks as it is, so it may only be a matter of time anyway. Beteta hopes to guide a group of scientists to the pit to look for sacrificial remains. If they get there in one piece, they may find fresh bones.

—William R. Elliott

Ed. note: Back issues of *Contenido* are supposedly available for 12 pesos (\$0.96) from *Contenido*, Morelos 16, 3er Piso, México 1, D. F., México.

*The Well of Sacrifice*, by Donald Ediger. Garden City, N.Y.: Doubleday and Co. 1971. 288 pp., 16 color plates.

The Sacred Cenote (or Well of Sacrifice) at Chichén Itzá in Yucatán, México, is one of the more important archeological sites in Yucatán. It has intrigued modern-day explorers as much as it did the ancient Maya who worshiped the god Chac living in its depths. Many attempts to excavate the bottom of the well, which served as the focal point for the worship of the pilgrims who visited Chichén Itzá for hundreds of years, failed because of the depth and murkiness of the water. The well was remarkable for its use as an oracle and for its sacrificial nature. Legends of its use as a recipient of the bodies of the most beautiful virgins of Mayab abound. It is known that women thrown into the well were frequently not killed but were pulled out to receive the message from Chac. One of the great historic events in the history of Chichén Itzá was the leap by the great Mayan hero, Hunac Ceel, into the well when the victims of the plunge failed to survive. Hunac Ceel survived the fall into the well and reported that Chac gave him the power over the city. He received it and ruled Chichén Itzá afterwards.

This volume, however, fails to give much idea of the history of the nature of the Sacred Cenote. The few brief historical sketches in the book are interspersed with accounts of how the author learned to skin-dive so he could visit the bottom of the well, endless accounts of rain, tea drinking, and attempts to turn a dreary expedition into an exciting adventure.

This volume is the account of an expedition sponsored by the Mexican National Institute of Archaeology and History and the Club de Exploraciones y Deportes Acuáticos de México and financed by United States commercial concerns, such as Purex Corporation and the Ford Motor Company. The original plan was to pump the cenote dry, a project obviously doomed from the start since the cenote is directly connected to and fed by waters of the Yucatán water table. Holes in the walls of the cenote contained noticeable currents feeding the waters of the cenote. Their attempts to lower the water level succeeded only to the extent that a large dump-ground of an earlier attempt to excavate the cenote with dredges was partially exposed. This

permitted archeologists to go over the leavings of the earlier excavation with some fairly good results. When it finally became apparent that this method was a total failure it was decided to clear the waters of the cenote which are a dark green from algae, combined with the brown of suspended particles. A combination of chlorination, filtration, and flocculation did succeed in clearing the water so that divers could pick artifacts, bones, and pottery directly off of the floor of the cenote. This permitted the recovery of a considerable quantity of archeological material, some of real value. One of the more interesting aspects was the recovery of the bones of hundreds of children, indicating that the sacrificial victims were not usually the beautiful virgins of popular myth.

It will be left up to the study of the archeological material to determine how successful the expedition was, but one is inclined to suspect that the vast sums of money invested in this venture could have been far better spent elsewhere. No accounting is given of finances but a casual statement that it cost \$6,000 a month to run the office in Pompano Beach, Florida, gives some idea of the amount of money which was poured into the recovery of relatively few artifacts.

Despite every effort to justify the expedition it seems obvious that a combination of ignorance about the nature of the cenote (why was there no competent hydrologist along? ) and the presence of many extraneous personnel (such as the sons of sponsors) led to its failure. As a side aspect a comment such as this leads a cave biologist to shudder, "Although we had killed all life in the cenote..." It will be interesting to see if the life of the cenote has returned. It is unfortunate that serious biological studies were not conducted before the experiment with clearing.

Aside from the factual over-simplifications, historical casualness, and failure to give any good idea about the reason why the Sacred Cenote is important (the author keeps referring to it as a "time capsule of the Maya"), the book is an attempt to bring excitement to what was seldom an exciting few months. This is really unfortunate because the proper treatment of the Sacred Cenote should provide enough excitement without attempts to build suspense. A few incidents did lead to possible injury or death of members of the expedition, but to try to make you think these were part of the "curse of the Cenote" is really unnecessary.

The book is attractive, with beautiful color photographs of the cenote and the artifacts recovered. Many black and white photographs also enhance the account. A map of Yucatán showing the location of the cenote would have been helpful for those who know nothing about the area. References to temples in and around Chichén Itzá would have been made easier to place with a map. And finally a map of the Sacred Cenote itself seems certainly to be an absolute necessity. The failure to include these is puzzling. Perhaps the author felt they would have been too technical for a popular book, but to try to describe the location of fallen temples around the cenote and to picture a sacrifice without our being able to visualize it only detracts from the narrations themselves.

Our knowledge of the Well of Sacrifice is not greatly increased by this book, nor is the book sufficiently fascinating by itself to stand as popular reading. For those who might expect a fascinating account of an expedition such as many good mountaineering or caving books are will be disappointed.

—James Reddell